Stage 1 Preliminary Site Investigation

221-227 and 289-311 Luddenham Road, Orchard Hill, NSW, 2748

5046200067

Prepared for HB+B Property Pty Ltd
1/07/2020

Construction Sciences

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Executive Summary

Construction Sciences Pty Ltd (CS) was engaged by HB+B Property Pty Ltd, to undertake a Stage 1 preliminary site investigation (PSI) for land located at 221-227 and 289-311 Luddenham Road, Orchard Hills, NSW, 2748 (the site).

The site is legally identified as part Lot 1 in Deposited Plan (DP) 1099147 and part Lot 242 in DP 1088991. At the commencement of this project, CS understood that the Site is currently a rural residential property with open space agricultural land attached. The Site is proposed for development into a commercial and industrial land use comprising of large warehouses and industrial units. This PSI is required to provide information regarding the land contamination risks at the site for due-diligence purposes, and to support a future development application in accordance with the State Environmental Planning Policy (SEPP) No. 55.

The objectives of the project are to assess the presence of contamination on-site, and provide conclusions regarding the suitability of the site for future land use scenario, consistent with 'Commercial / Industrial' as defined in the *National Environment Protection (Assessment of Site Contamination) Measure 1999*, as amended May 2013 ('NEPM', NEPC, 2013)

The primary objectives of the project were to assess the potential for contamination to be present on site, provide advice on the suitability of the site for the proposed commercial/industrial land use scenario and provide recommendations for further investigation, management and/or remediation of the site (if warranted).

The scope of work undertaken to address the project objectives included a desktop review of readily available documentation pertaining to the site, a site walkover, intrusive works involving excavation of 25 test pits, soil sampling and screening of results against the proposed commercial/industrial land use scenario.

A number of areas of environmental concern were identified on the site and are presented in the table below.

ID	Description	Contaminants of Potential Concern
AEC01	Imported Fill	Hydrocarbons, pesticides, metals, asbestos
AEC02	Stained soils and incomplete combustion	Asbestos, PAH and metals
AEC03	Green house and adjacent crops	Pesticides, asbestos, PAH and metals
AEC04	Former Crops	Pesticides and metals
AEC05	Previous motor vehicle storage	Hydrocarbons, metals
AEC06	Soil stockpiles with foreign material inclusions (SP1-SP4)	Hydrocarbons, metals, PAH, pesticides, asbestos
AEC07	Soils adjacent to above ground diesel tank	Hydrocarbons, PAH, asbestos and metals
AEC08	ACM fragments stacked on surface	Asbestos
AEC09	Oil intermediate bulk container (IBC)	Hydrocarbons, PAH and metals
AEC10	Old fibro cottage walls broken	Asbestos
AEC11	Household/Demolition surface waste	Asbestos and metals
AEC12	Two underground septic tanks	Coliforms, enterococci, E.coli, metals, OCP

Based on CS's assessment in the context of the proposed land use scenario, CS makes the following conclusions:

> Bonded asbestos contamination was identified in fill, at sample location TP21, which may present an unacceptable human health exposure risk;

> Bonded asbestos was identified on the surface near TP16 and the old fibro cottage, which may present an unacceptable human health exposure risk and unacceptable aesthetics risk;

> It is likely that other buildings located onsite may contain hazardous building materials, including asbestos, lead and zinc, which may present an unacceptable human health exposure risk and currently pose an aesthetics risk;

> Potential underground septic tanks are considered likely, which may pose an aesthetic risk;

> The above ground diesel tanks, surface household/demolition waste and IBC containing waste engine, may pose an aesthetic risk;

> Potential unexpected finds of underground asbestos containing infrastructure may pose an unacceptable human health exposure risk;

> The site could be made suitable for the proposed land use scenario, subject to:

- A hazardous building material survey of all buildings prior to demolition;
- Validation sampling of soils around the footprints of buildings, following demolition;
- Decommissioning of septic tanks and above ground tanks;
- Inspection and removal of all household/demolition waste; and
- Management and/or remediation of the bonded ACM and potential friable asbestos / asbestos fines in soil at TP21; and
- Procedures being detailed for management and/or remediation of unexpected finds of asbestos infrastructure.

Based on these conclusions, CS makes the following recommendations:

> Undertake a supplementary assessment of the identified asbestos risks, in order to delineate the lateral and vertical extent of the identified asbestos at TP21;

> A remedial action plan (RAP) should be prepared to include, but not limited to:

- Remediation methodology;
- an unexpected find protocol for potential unidentified asbestos contamination or additional contamination found during earthworks;
- supplementary validation of building footprints post-demolition;
- validation inspections of footprints of locations which were identified as an aesthetic risk; and
- Import protocol which will validate material to be imported and guide material tracking.

A site validation report (SVR) should be prepared at the completion of all management / remedial works, confirming that the site has been made suitable for the proposed land use scenario

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1 Introduction

1.1 General

Construction Sciences Pty Ltd (CS) was engaged by HB+B Property Pty Ltd, to undertake a Stage 1 preliminary site investigation (PSI) for land located at 221-227 and 289-311 Luddenham Road, Orchard Hills, NSW, 2748 (the site). For the site location and locality, refer to **Figure 1**.

The site is legally identified as Lot 1 in Deposited Plan (DP) 1099147 and Lot 242 in DP 1088991. At the commencement of this project, CS understood that the Site is currently a rural residential property with open space agricultural land attached. The Site is proposed for development into large warehouses and industrial units, which would classify as commercial and industrial land use. This PSI is required to provide information regarding the land contamination risks at the site for due-diligence purposes, and to support a future development application in accordance with the State Environmental Planning Policy (SEPP) No. 55.

This Stage 1 PSI is hereafter referred as the 'project'. The report has been prepared utilising information obtained as part of the assessment process, and from experience, knowledge, and current industry practice in the assessment of similar sites.

This report must be read in conjunction with the explanatory notes, limitations and general notes, as set out in **Appendix A**

1.2 Objectives

The objectives of the project are to assess the presence of contamination on-site, and provide conclusions regarding the suitability of the site for future land use scenario, consistent with 'Commercial / Industrial' as defined in the *National Environment Protection (Assessment of Site Contamination) Measure 1999*, as amended May 2013 ('NEPM', NEPC, 2013)

Specifically, the objectives of the contamination assessment will be to:

> assess the potential for contamination to be present on site, as a result of past and current land uses;

> provide advice on the suitability of the site (with respect to contamination) for the proposed commercial/industrial land use scenario;

> provide advice on contamination risks for the purpose of due diligence; and

> provide recommendations for further investigation, management and/or remediation of the site (if warranted).

1.3 Scope of Work

The scope of work undertaken to address the project objectives included:

> Desktop review of readily available documentation pertaining to the site including current and historical aerial photographs, land title records, Section 10.7 (2) planning certificates, land contamination record information in the NSW Environmental Protection Authority (EPA) online public registers;

> Review of the environmental condition of the site and surrounding area including topography, geology and hydrogeology;

> Site walkover to assess the current site condition and land use, as well as surrounding land uses;

> Review of site history and results of walkover to assess areas of environmental concern (AEC);

> Excavation of test pits in AECs identified following desktop review and the site walkover;

> Judgemental soil sampling based on locations of AECs and potential soil contamination issues, if any;

> Laboratory testing of soil samples for a suite of selected potential organic and inorganic contaminants;

> Interpretation of the results of laboratory testing in the context of the adopted investigation criteria, field observations, local geology and hydrogeology, and site history;

> Development and documentation of a site-specific Conceptual Site Model (CSM) based on the available information; and

> Preparation of this report which provides an assessment of the soil contamination, and discusses the suitability of the site for its intended land use.

Note: the intrusive works, soil sampling and analysis are intended to be supplementary to the site history review and walkover that comprises a Stage 1 PSI, to gain a preliminary understanding of analyte concentrations and subsurface soil conditions. The sampling density undertaken in this investigation does not satisfy the NSW EPA *Contaminated Sites: Sampling Design Guidelines* (NSW EPA, 1995) and is not intended for complete characterisation or validation of the site.

The report and scope of works was developed in general accordance with industry and NSW Environment Protection Authority (EPA) guidelines, particularly the *Contaminated Land Guidelines: Consultants reporting on Contaminated Sites Guidelines for Consultants Reporting on Contaminated Sites* (NSW EPA, 2020) and the NEPM (NEPC, 2013).

2 Site Identification

2.1 Site Location and Description

The site is an irregular shaped area of land, located at the corner of Patons Lane and Luddenham Road, approximately 1.3km west of Mamre Road. The locality of the site is presented in **Figure 1**.

The site currently comprises of the following general layout:

> Lot 1 DP1099147: caretaker housing, a large residential property on Luddenham road, a warehouse, a small unoccupied cabin (the 'Cabin'), horse stables and associated facilities, and a rectangular network of fenced yards for horse and sheep agistment.

> Lot 242 DP1088991: comprises of a residential building, a detached old abandoned fibro cottages (the 'Old fibro cottages'), open space paddocks for cattle grazing and four dams.

For purposes of clarity throughout the report, the 'Old fibro cottages' and the 'Cabin' are references to the building structures identified in the general site layout provided in **Figure 2**.

Table 2-1 provides a summary of the Site description and identification and details:

Table 2-1 Site Description Details

Items	Description
Site Address	221-227 and 289-311 Luddenham Road, Orchard Hills, NSW, 2748
Legal Identification	Lot 1 in DP 1099147 and Lot 242 in DP 1088991
Local Government Area	The City of Penrith
Current Zoning	Lot 1 in DP 1099147: – E2: Environmental Conservation – RU2: Rural Landscape Lot 242 in DP 1088991 – RU2: Rural Landscape Under the Penrith Local Environmental Plan 2010 refer to **Figure 4**
Site Area	816,260m^2 (approximately 82 hectares) refer to the site plan **Appendix B**
Geographical Coordinates	33°49'10" S and 150°45'36" E. (*Source: Google Earth*)

3 Geology, Hydrogeology, Topography and Acid Sulfate Soils

3.1 Topography and Elevation

A review of Nearmap aerial images indicates most native vegetation has been cleared and the site is predominantly covered in grasses with small patches of scattered tress throughout, with the exception of a residual dense natural bushland corridor, in the north west corner of the site. There are four dams visible across the site, located in Lot 242 DP 1088991.

A search of Google Earth indicates the site is relatively flat with an overall slope towards the north west. The site lies at elevations between approximately 36 m (northern boundary), 41m (eastern boundary), 37m (western boundary) and 50m (southern boundary), Australian Height Datum (AHD). A detail and level survey of site was not provided.

3.2 Geology and Soils

The Department of Mineral Resources Geological Survey of NSW Penrith 1:100,000 Geological Series Sheet 9030 (Edition 1) 1991, indicated that the site is likely to be underlain by Triassic-aged Ashfield Shale of the Wianamatta Group. This formation comprises shale, carbonaceous claystone, claystone, laminate, fine to medium-grained lithic sandstone, rare coal and tuff.

The 1:100,000 'Penrith Soil Landscape Map' indicates that the site lies within the Blacktown residual soil group. This group typically comprises friable brownish black loam to clay loam, over light grey silty clay to heavy clay which occurs as deep subsoil above shale bedrock. Limitations associated with the soil group include localised seasonal waterlogging, water erosion hazard, surface movement potential.

The 'Acid Sulfate Soil Risk Map' available on eSpade https://www.environment.nsw.gov.au/eSpade2Webapp indicates that there are no known occurrences of acid sulfate soils (ASS) in the vicinity of the site. Land management activities are not likely to be affected by acid sulfate soil materials. Furthermore, no evidence of suspected ASS was observed on-site during fieldwork. Therefore, further assessment of ASS is considered unwarranted.

The department of Infrastructure, Planning and Natural Resources 'Salinity Potential in Western Sydney 2002' indicates the Site lies in an area of moderate salinity potential.

3.3 Hydrogeology and Hydrology

A search of Australian Government Bureau of Meteorology, Australian Groundwater Explorer (http://www.bom.gov.au/water/groundwater/explorer/map.shtml) and WaterNSW (https://realtimedata.waternsw.com.au/water.stm) indicated that there is one registered groundwater bore (ID: GW105382.1.1) located within a 500m radius of the site. There were no registered bores for authorised extraction purposes within a 2km radius of the site

Summary information presented for the registered groundwater bore, GW105382.1.1, revealed the following:

> The bore was drilled in 2004 to depths of 252m below ground level (bgl) at a reference elevation of 40.9 m AHD;

> The geology encountered during drilling included CLAY (0-5m bgl), SHALE (5-80m bgl). Rock was encountered at a depth of 80m, and was comprised of SANDSTONE;

> The salinity in groundwater was measured at 2500 TDS mg/L indicating very high salinity water – not suitable for irrigation under ordinary conditions; and

> The depth to standing water level was reported at 24m bgl.

For a record of the groundwater bore search, refer to **Appendix C.**

There are four main dams located across the site, presumably used for onsite irrigation and agricultural feed purposes.

A review of readily available maps held on file by CS, indicated the nearest receiving surface water bodies included:

> Natural drainage channel, located within the preserved bushland corridor in the north west of the site, extending from Patons Lane on the northern boundary through the north west corner of the site and feeds into a dam west of the site, and extends diagonally south west;

> Blaxland Creek located approximately 1.6km north west of the site; and

> South Creek, located approximately 500m to the east of the site.

The surface water is expected to infiltrate permeable soils into underlying groundwater or flow over land into the nearest dam, natural drainage lines and creeks which ultimately discharge into the Hawkesbury River.

Based on the location of the identified surface water courses and site topography, the inferred groundwater flow direction at the site is considered likely to be towards the north.

4 Regulatory Records

4.1 Contaminated Land Management (CLM) Act 1997

4.1.1 Record of Notices

A search of the NSW EPA online contaminated land record of notices indicated that the site (and land located immediately adjacent to the site) was not the subject of:

> orders made under Part 3 of the Contaminated Land Management Act 1997;

> notices available to the public under section 58 of the CLM Act

> an approved voluntary management proposal under the CLM Act that has not been fully carried out and where NSW EPA approval has not been revoked;

> site audit statements provided to the NSW EPA under section 53B of the CLM Act that relate to significantly contaminated land;

> where practicable, copies of anything formerly required to be part of the public record; or

> actions taken by NSW EPA (or the previous State Pollution Control Commission) under section 35 or 36[1] of the Environmentally Hazardous Chemicals Act 1985.

A copy of the NSW EPA search record for the Penrith LGA is presented in **Appendix D**.

4.1.2 Register of Notified Sites

A search of the NSW EPA online list of NSW contaminated sites notified to NSW EPA indicated that the site (and land located immediately adjacent to the site) was not on the list.

4.2 Protection of the Environment Operations (POEO) Act 1997

4.2.1 Register of Licences, Applications, Notices, Audits or Pollution Studies and Reduction Programs

A search of the NSW EPA online POEO public register indicated that the site (and land located immediately adjacent to the site) was not the subject of an application, notice, audit, pollution study or reduction program.

The records revealed two NSW EPA protection licenses currently issued to SRC Operations Pty Ltd (the licensee), for the premises identified as Patons Lane Resource Recovery Centre and Patons Lane Landfill, located at 123-129 Patons Lane Orchard Hills, NSW, approximately 500m north-west of the Site.

The following details were listed for each environment protection license record:

> License no. 21259: The scheduled activity is resource recovery and waste storage. Wastes permitted to be processed and recovered includes, but not limited to; Excavated Natural Material (ENM), building and demolition waste, paper and cardboard, asphalt waste, and wood.

> License no. 21259: Extractive activities and waste disposal. Waste permitted includes Special Waste Asbestos, (includes only emplacement of material already on the premises) and General Solid Waste (non-putrescible).

CS considers this landfill unlikely to pose a risk to the site under the proposed land use scenario due to the following:

> All areas of the landfill are likely to be bunded, and aerial imagery indicates a number of surface water retention basins are located in the south eastern portion of the landfill;

> Regular monitoring of the groundwater is required under the NSW EPA license and there was no record of pollution incidents under the above contaminated land record search.

[1] Sections 35 and 36 of the Environmentally Hazardous Chemicals Act 1985 have been repealed. Notices under these sections are treated by the CLM Act as management orders.

> Furthermore, any potential offsite migration would likely flow into the natural drainage channel to the northwest of the site and flow in an inferred north-easterly direction, away from the site.

A copy of the search record is presented in **Appendix D**.

4.3 Environmental Planning and Assessment (EP&A) Act 1979

4.3.1 Section 10.7 Planning Certificate

A copy of the planning certificates issued under section 10.7(2) of the EP&A Act was obtained for Lot 1 DP11099147 and Lot 242 DP1088991, within the Site. The certificates provided the following information:

> Confirmed the zoning is E2 Environment Conservation and RU2 Rural Landscape (Lot 1 DP11099147) and RU2 Rural Landscape (Lot 242 DP1088991). The E2 zoned portion includes prohibition for development of warehouses or distribution centres;

> All or part of the land is identified in the Penrith Local Plan 2010, Clause 7.2 Flood Planning, which requires development consent prior to development;

> An item of environmental heritage is not situated on the land and the land is not located in a heritage conservation area;

> The land is not affected by any of the matters contained in Clause 59(2) as amended of the Contaminated Land Management Act 1997;

> The land has not been proclaimed to be within a mine subsidence district;

> Some of the land is bushfire prone land;

> The land is affected by the Asbestos Policy adopted by Penrith City Council. This infers asbestos, in bonded form, is suspected in building materials onsite; and

> The land is not advised as including or comprising an area of outstanding biodiversity value.

A copy of the certificates is presented in **Appendix E**.

4.4 Work Health and Safety (WHS) Regulation 2017

4.4.1 Schedule 11 Hazardous Chemicals

A site search with SafeWork NSW for Schedule 11 hazardous chemicals (dangerous goods)[2] on the site was not within the scope of work undertaken for this site.

CS's review of historical aerial photography and historical land title ownership records (refer Section 5.1 and 5.2 of this report), did not indicate a potential for licensable quantities of Schedule 11 hazardous chemicals (dangerous goods) to have been stored on the site.

CS considers that further assessment of the storage of licensable quantities of Schedule 11 hazardous chemicals (dangerous goods), within the context of this project, is considered not warranted.

[2] Under the Work Health and Safety Regulation

5 Site History

5.1 Aerial Photography

A selection of historical aerial photographs of the site were reviewed. A copy of each historical aerial photograph reviewed is provided in **Appendix F**.

CS notes, the aerial imagery 'site boundary' represents the entire lots cadastral boundaries (Lot 1 DP1099147 and Lot 242 DP 1088991) including the area west of the site outside the 'site' as defined in **Figure 2** for this investigation. Hence, the 'site observations' in column 2 of Table 5-1, exclude this area west of the site and any changes to this area are discussed in 'Surrounding Land Observations' column Table 5-1.

Observations made during the review (considered relevant to this project) are presented in Table 5-1.

Table 5-1 Aerial Photography

Photo Date	Site Observations	Surrounding Land Observations
1947	The land appears undeveloped, cleared of most trees and predominantly open space paddocks, indicative of land for grazing, and surface is covered in low lying vegetation. Possible fence lines visible dividing some areas of the site. A drainage line is visible intercepting north western corner of the site. A straight line of raised soils dissects the centre of Lot 242 DP1088991, potentially an underground pipe, which ends on the boundary of Lot 1 DP1099147	Stockdale Road, Paton's lane and Luddenham Road visible; Land is predominantly open space rural paddocks; Water pipe network visible south of the site running east to west; Residential building structures in south eastern corner; and South creek visible on the east.
1956	The 'old fibro cottages' are now visible in the south eastern corner of Lot 242 DP1088991.	Low density residential development immediately east of the middle of the site, and on south eastern boundary. Luddenham Road more defined. Possible dams located west of the site
1961	The following buildings appear erected: – Three small building structures and round yards in the location of the current horse stables; – the 'cabin', is visible in the north; – Rectangular excavation east of the cabin – Unknown structure in south eastern portion of Lot 1 DP1099147 Large oval shaped line of ground disturbance, possible some type of track on the eastern boundary of Lot 1 DP1099147 and patches of ground disturbance to the west	Scattered low density residential developments in the south east and west of the site. Large round excavation immediately west of the site, possible dam and patches of other ground disturbance

Photo Date	Site Observations	Surrounding Land Observations
	Southern portion (Lot 242 DP1088991) low lying vegetation has spread to the east	
1965	Lines of cleared vegetation in the southern paddocks. Rectangular network of fences for yards now erected in north eastern corner with dirt roadways	Various small ground disturbances appears to be for the construction of dams in immediate surrounding paddocks
1970	Southern portion of the site cleared of all low lying vegetation Large residential building is now erected near the main entrance, immediately adjacent to Luddenham Road. Adjacent horse stables to the west and various facilities now visible The current warehouse is now erected Small structure, possibly above ground storage tanks now visible to the south west of the horse stables. Fenced yards and horse stables attached at regular intervals, now extended to present day layout. All accessed by a network of dirt roadways. Ground disturbance in the centre of the site and a round small structure visible to the north of the cabin Unknown structure in south eastern portion of Lot 1 DP1099147 now not visible Transmission line easement now visible	Minor ongoing low density residential development. Dams further developed and horse track now visible west of the site. Kennett's Airfield now visible to the south
1978	Dams 1-4 now clearly visible Large building structure in north eastern area of Lot 242 DP 1088991 and small containers or machinery visible to the south Small container like structures and machinery, immediately west of small residential dwellings in Lot 242 DP 1088991 Various ground disturbance activities in the north western corner of the site	Large dam now visible in the south
1982	Ground disturbance in the north western corner of the site beneath the high voltage transmission line with evidence of anthropogenic materials on the surface	No significant change since previous image.

Photo Date	Site Observations	Surrounding Land Observations
	Small container like structures immediately north of the building, possible machinery and vehicles parked around the old cottage in Lot 242 DP 1088991	
1986	No significant change since previous image.	No significant change since previous image.
1991	Further ground disturbance in the north west corner of the site below the transmission line and evidence of anthropogenic materials stored on surface. Rectangular container like structure north of the cabin Vehicles parked west of the old fibro cottage	No significant change since previous image.
1998	Container not visible north of cabin	No significant change since previous image.
2007	Ground disturbance in locations including: – north western corner of the site, – Excavation below transmission line, adjacent to Paton's Lane – central eastern section of Lot 1 DP 1099147 – possible stockpile east of above ground diesel tanks – Surface stripped of vegetation and tilled to the west of dam 4 Asphalt rectangular sealed surface to the south east of the building in Lot 242 DP1088991 and asphalt sealed driveway leading from the same building to Luddenham Road. Gravel upgrade to surface of main entry driveway extending from Luddenham Road to the warehouse. Small structure visible to the north of Dam 4, in location of current chicken coupe	Paton's Lane quarry now visible north west of the site Possible stockpiling and storage of containers north-west of the drainage channel
2014	Rectangular surface area stripped of vegetation south of dam 1, possible location of crops. Possible rows of crops west of Dam 4 Building in Lot242 DP 1088991 renovated with extension on southern side. Gravel sealed surface around the perimeter of the	Further low density residential development to the east Filling has occurred in the location of the quarry

Photo Date	Site Observations	Surrounding Land Observations
	western and southern border of the building Filling possibly complete in north western corner of the site as the surface now looks level with no excavations Small stockpiles visible at four locations in yards in Lot 1 DP1099147 Stockpile previously east of above ground diesel tanks now removed Possible filling approximately 60m west of the building in Lot 242 DP1088991. Approximately 20 vehicles stored 50m south of the building. Materials stored on surface around old fibro cabin	
2019	Warehouse now has hard stand around boundary Anthropogenic material visible on surface: – approximately 50m west of warehouse; – immediately north of Dam 1 – north of the cabin; and – vehicles and other containers on hardstand around the warehouse Shipping containers now visible at the location of the current residential tenancy on eastern boundary of Lot 1 DP1099147	No significant change since previous image.

A review of the recent historical images accessed on Nearmap was also undertaken for the period November 2009 and April 2020. The images revealed the following potential contamination activities onsite:

> A market garden with rows of plants and possible greenhouse erected in the southern area of Lot 1 DP1099147, between 5th May 2016 and 26 March 2019;

> Filling in the north of the site, on the entry roadway at Paton's Lane, which looks to be related to resurfacing of dirt roadways, between 28th February 2020 until 25th April 2020;

> Ground disturbance and potential small stockpiles in four locations in the agistment yards, southern portion of Lot 1 DP1088991, between 5th May 2016 and 26th March 2019;

> Filling approximately 60m west of building in Lot 242 DP1088991 between 3rd July and 19th September 2013;

> Three stockpiles (identified as SP2, SP3 and SP4 in Figure 2) appeared between 12th September and 27th October 2019;

> Another small stockpile (identified as SP1 in Figure 2) appeared between 22nd January 2020 and 28th February 2020.

> Three additional stockpiles appear between 28th February and 25th April 2020, one near Patons Lane entry and another two south of the building in Lot 242 DP 1088991 (identified as SP5, SP6 and SP7 in Figure 2)

The images revealed the following relevant observations to surrounding land:

> Large stockpiles of materials in Lot 1 DP1099147, west of the boundary of the site, between 29th October 2019 and 25th April 2020

The review of historical aerial photography indicated a potential for land contaminating activities to have been undertaken on the site, specifically:

> Storage of containers and machinery which may resulted in chemical or hydrocarbon leaks, predominantly in the immediate surrounds of the buildings in Lot 242 DP 1088991;

> Potential uncontrolled filling and stockpiling sporadically between 1971 until present;

> Storage of containers and/or vehicles on unsealed surfaces between 1971 until present;

> Growing of crops between the 2007 and 2014; and

> Market garden between 2016 and 2019.

Further assessment of these identified potential land contaminating activities, in the context of other historical evidence reviewed during this project, and observations made during the site walkover (refer Section 6 of this report), is considered warranted.

5.2 Historical Land Titles

A selection of historical land title ownership records of the site, were reviewed for Lot 1 DP 1099147 and Lot 242 DP 1088991 and are discussed independently below.

5.2.1 Lot 1 DP1099147:

Observations made during that review (considered relevant to this project), indicated that registered proprietors of the site since 1925, have included:

> private individuals between 1900 and 1966. Occupations of relevance listed included farmers, graziers, merchants and hotel proprietors;

> S & M Fox Investments Pty Limited between 1966 to 1998;

> Ingham's Enterprises Pty Limited between 1998 to 2008;

> Darley Australia Pty Limited between 2008 and 2016

> Atilol Holdings Pty Ltd 2015 until present.

Darley Australia Pty Ltd is known for horse breeding which aerial imagery suggests and the site was later acquired by Atilol Holdings Pty Ltd for similar purposes.

There were no leases listed for the site.

There were two easements listed:

> Easement for Water Pipes

> Easement for Transmission Line 200 feet wide

The review of historical land titles indicated a potential for land contaminating activities to have been undertaken on the site, specifically:

> Agricultural activities between 1925 and 1955;

> Horse breeding and various agricultural activities between 2008 until present;

These activities may have resulted in use of pesticides, heavy metal contamination of soils from poor farming practices and hydrocarbon contamination from leaks from machinery and onsite refuelling. Based on site

observations, the current owner collects and refurbishes vintage cars, which may also result in isolated oil and fuel spills from 2015 until present.

5.2.2 Lot 242 DP1088991:

Observations made during that review (considered relevant to this project), indicated that registered proprietors of the site, since 1900, have included:

> private individuals between 1900 and 2006. Occupations of relevance listed included farmers, sales and services managers;

> a Trustee of the Lebanese Maronite Missionary between 2006 and 2015; and

> Atilol Holdings Pty Ltd 2015 until present.

There were no leases or easements reported for this portion of the site.

The review of historical land titles indicated a potential for land contaminating activities to have been undertaken on the site, specifically:

> Farming activities between 1958 and 1975; and

> Mechanics activities between 2015 until present.

These activities may also have resulted in use of pesticides, heavy metal contamination of soils from poor farming practices and hydrocarbon contamination from leaks from machinery and onsite refuelling.

Further assessment of these identified potential land contaminating activities, in the context of other historical evidence reviewed during this project, and observations made during the site walkover (refer Section 6 of this report), is considered warranted.

A copy of the historical land title search record is presented in **Appendix G**.

5.3 Complaints

There was no evidence provided to CS during the project, regarding historical complaints about the site.

5.4 Incident Reports

There was no evidence provided to CS during the project, regarding historical incidents at the site.

5.5 Previous Contamination Assessments

A copy of a previous investigation report, pertaining partly to the site, was provided to CS for review during this project.

Parsons Brinckerhoff (PB) 2009, 'Phase 1 Environmental Site Assessment, 289 Luddenham Rd, Orchard Hills, NSW', dated September 2009, ref: 2136798A PR_0742

5.5.1 Parsons Brinckerhoff (2009)

The report (PB, 2009) was limited to an investigation of Lot 242 DP 1088991, which includes an area of land to the west, outside the site. The objective was to carry out a Stage 1 Contamination Assessment in order to assess the risk of site contamination for the proposed development of the land into a cemetery.

The scope of work undertaken to address the project objective included the following:

> Review of regional topography, landscape and geology;

> Review of historical aerial photographs, title records, Section 149 information provided directly by Penrith City Council and other publicly available information;

> Walkover assessment of the subject site and its surrounds to identify potentially contaminated areas.

> Preparation of a report presenting the findings and recommendations.

PB (2009) made the following conclusions:

> Historical ownership of the land was predominantly by private proprietors which used the land for cattle and sheep grazing;

> Due to the previous land use, risk of widespread contamination is low;

> Stockpiles were noted in the west (the location was not provided on a figure in then report), which were likely generated from construction of dams;

> Surface rubbish identified in the west (again the location was not provided to CS);

> Hazardous building materials (asbestos, zinc and lead) likely in building structures onsite;

> Isolated hydrocarbon contamination may be present from maintenance of vehicles around buildings and sheds;

> The use of chemicals against termites may be present in soils around buildings;

> Site conditions are unlikely to “present a constraint to the construction of the cemetery”.

PB (2009) made the following recommendation:

> Widespread sampling is not required, however, “limited environmental works” should be carried out prior to redevelopment, including:

  - Hazardous building material surveys of structures prior to demolition;
  - Surface soil sampling around the buildings and analysis of scheduled chemicals, hydrocarbon contamination and residual hazardous building materials; and
  - Classification of materials which require offsite disposal.

5.6 Anecdotal Evidence

Anecdotal evidence and observations suggests:

> the site’s potable water was previously sourced from bore water and currently rainwater;

> Water supply for agricultural feed is sourced from onsite dams and/or bore water;

> Water supply to horse feeds is through polypropylene pipes

> The sewage is treated onsite, most likely in underground septic tanks;

> Previous heavy rainfall and flooding have eroded the roadways and therefore the site owner has recently importing suitable engineering fill to restore the surfaces, where required; and

> The current site owner collects and refurbishes vintage cars.

Hence, the presence of septic tanks and hydrocarbon contamination in soils likely, however, the potential for underground asbestos containing infrastructure is not likely or widespread.

6 Site Condition at Site Walkover

A site walkover/drive over, which involved driving and disembarking at accessible locations for walkover, was undertaken by a suitably experienced environmental consultant from CS, on 28th April 2020. During the walkover, observations were made of land use activities being undertaken on the site, as well as on the properties located immediately adjacent to the site.

6.1 Current Land Use

The land use scenario at the time of the walkover appeared to be rural residential with open space yards and paddocks used for agistment purposes.

6.2 Buildings and Infrastructure

The following buildings and infrastructure were observed during the walkover and key features are provided in **Figure 2**:

> Lot 1 in DP 1099147, on the main entry Luddenham Road, described from east to west is the following:
  - A single storey brick house with surrounding lawn and garden, located at the main entry to the site, on Luddenham Road;
  - West of the house is an asphalt sealed carpark, with adjacent large u-shaped building structure, comprising of living premises, horse stables and caretaker facilities;
  - Further to the west there are two round and one long rectangular shaped structures consisting of horse training facilities;
  - North west of the horse facilities is a large rectangular shaped warehouse located on concrete hardstand, with two round agricultural feed silos located to the south of the warehouse;
  - North of the warehouse is an unoccupied single bedroom cabin with subsurface concrete structure, possibly a septic tank, to the north;
  - Approximately 120m south of the warehouse is above ground diesel tank storage area on concrete bund, with low lying besser block walls;
  - Approximately 100m south of the diesel tanks is a group of shipping containers, converted to residential housing;
  - Rectangular network of fenced yards for horse and sheep agistment throughout.

> Lot 242 DP1088991:
  - A large single storey house with gravel access roadway leading to Luddenham road on the east and subsurface concrete structure, possibly a septic tank, immediately north of the house;
  - Approximately 60m south east of the house is a rectangular asphalt sealed area with above ground 240V power outlets;
  - Approximately 100m east of the asphalt sealed area, along the gravel road towards Luddenham Road is an abandoned old fibro cottage;
  - Approximately 50m south of the fibro cottage is an unknown small metal structure, most likely a redundant chicken pen;
  - Four dams located throughout paddocks;
  - Large rectangular area of open space paddock to the south west, used for cattle grazing.

Image 6.2.1 View of horse stable facilities



Image 6.2.2 View of warehouse on concrete hardstand



Image 6.2.3 View of horse yards



Image 6.2.4 View of the old fibro cottages



Image 6.2.5 View of Dam 1



Image 6.2.6 View of the asphalt sealed area, power outlets and empty containers



Image 6.2.6 View of the cabin



Image 6.2.7 View of the residential building at the entrance to the site, off Luddenham Road



6.3 Site Boundaries

All site boundaries were fenced with timber or wire fences, in sound condition. There were three access points to the site, two on Luddenham Road, the main access gate in the north and one in the south, with an additional access gate on Paton's Lane side boundary, used for heavy vehicle access. All entry points were locked with the exception of the main access gate. This would all help prevent unlawful dumping of materials onsite from surrounding land and road access.

Image 6.3.1 View of eastern site boundary fencing



6.4 Drainage

Based on observations made during the walkover, site drainage mechanisms on site are considered likely to include:

> Infiltration into permeable site soils;

> Overland surface flow following site topography, towards natural drainage lines (including the drainage channel in the north west) and onsite dams; and

> Inflow to downpipes attached to building roofs and gutters, into water storage tanks or directly into the ground.

6.5 Staining and Odours

There was no significant widespread staining observed during the walkover, with the exception of the following localised areas:

> a slight valve leak from an intermediate bulk storage container of engine oil, located on a concrete hardstand north of the warehouse.

> A localised burnt area of ground, most likely used for a bonfire, with residual burnt tree logs and plastics – located approximately 70m east of the residential house in Lot 242 in DP 108899.

There was no olfactory evidence detected of significant or widespread odours at the site.

Image 6.5.1 View of oil stored in IBC, with slight leak



Image 6.5.2 View of bon fire and stained ground



6.6 Chemical Handling and Storage

There was no visual evidence of chemical handling and storage during the site walkover, however, anecdotal and visual evidence suggests the owner restores vintage cars and therefore small quantities of chemical storage within the warehouse cannot be dismissed.

Image 6.6.1 View of vehicle wrecks adjacent to warehouse on concrete hardstand



6.7 Aboveground and Underground Storage Tanks

There was visual evidence observed during the walkover, of two aboveground storage tanks (AST) of diesel located together in a concrete bund, approximately 120m south of the warehouse (refer to Figure 2), most likely used for refuelling purposes.

There was evidence of two possible underground concrete capped septic tanks:

> One subsurface concrete structure located north of the cabin in Lot 1 DP1099147;

> One subsurface concrete structure located north of the residential building in Lot 242 DP1088991.

Main sewer lines could not be found at the site and due to the age of the buildings most likely all raw sewage is captured and treated onsite in septic tanks. The site also contains two other residential tenancies, therefore, it is likely additional underground septic tanks are located onsite.

Image 6.7.1 View of above ground diesel tanks



Image 6.7.2 View of potential underground septic tank adjacent to the cabin



6.8 Wastes

There was visual evidence observed during the walkover, to indicate the storage of wastes on the site, specifically:

> Vehicle wrecks, stored on concrete hardstand around and inside the warehouse,

> a 1000 litre intermediate bulk container (IBC) half filled with waste engine oil;

> household and demolition wastes stockpiled in various yards including timber, metal, plastic, tyres and other material.

Image 6.8.1 View of demolition and household waste, west of the warehouse



Image 6.8.2 View of household waste and timber north of the cabin



6.9 Hazardous Materials

There was visual evidence of potential asbestos containing materials on the surface of the site in the following areas:

> Broken fibro walls of the old fibro cottage; and

> Broken fibro sheeting in a small stack on the surface, located 60m south east of the residential property in Lot 242 in DP 1088991.

A hazardous building materials survey was not within the scope of this project and all building structures will require further investigation due to the Section 10.7 (2) planning certificate identifying the presence of asbestos building materials onsite.

Image 6.9.1 View of broken walls of old fibro cottage



Image 6.9.2 View of potential asbestos containing fibrous cement sheeting



6.10 Stockpiles and Fill Material

There was no visual evidence observed to suggest widespread or significant filling across the site. However, there was localised evidence of filling in the following areas:

> on sections of roadways and surrounding areas, near Paton's Lane access gate in the north. The fill was noted to comprise of brown silty clays and white to grey crushed sandstone. This filling was most likely for surface stabilization and restoration roadways.

> Approximately 150m^2 localised area of filling, 100m west of the residential building in Lot 242 DP1088991. The area was covered in weeds and grasses and consisted of obvious unnatural mounds in the surface with concrete and other anthropogenic materials visible

Seven stockpiles of various sizes were observed across the site (SP1-SP7) comprising of the following characteristics:

> Lot 1 DP1099147:

- Approximately 75m^3 stockpile (SP5) of white to grey crushed sandstone in the north, near Paton's lane entry
- Approximately 5m^3 stockpile (SP1) of white to brown sand with demolition wast inclusions, located on the southern boundary of the Lot 1 DP1099147;
- Three stockpiles (SP2 to SP4), each approximately 5m^3 of brown silty sand and gravel with demolition waste inclusions, located adjacent to the gravel roadways (material is consistent with the gravel roadway material) in the central portion of Lot 1 DP1099147;

> Lot 242 DP1088991:

- Approximately 100m^3 of white to grey crushed sandstone (SP6), located approximately 80m south of the residential building in this area;
- Approximately 75m^3 stockpile (SP7) of grey to brown sand, adjacent to SP6, approximately 80m south of the residential building in this area.

The consultant from CS at the time of the walkover noted various areas of the site were heavily vegetated with grasses, which restricted visual assessment of surface soils and potential fill. The potential for additional stockpiles and filled areas to be present cannot be precluded.

Image 6.10.1 View of crushed sandstone stockpile (SP5)



Image 6.10.2 View of disturbed ground, along roadway, northern area of Lot 1 DP1099147



Image 6.10.3 View of sand stockpile (SP7) in Lot 242 DP1088991



Image 6.10.4 View of sand stockpile with demolition waste inclusions (SP1)



Image 6.10.5 View of stockpiles (SP2 and SP3) containing silt and aggregate with demolition waste inclusions



Image 6.10.6 View of stockpiles (SP4) containing silt and aggregate with demolition waste inclusions



6.11 Phyto-toxicity

There was no visual evidence observed to suggest widespread or significant phytotoxic impact in the form of plant stress and/or dieback in vegetation present on the site. Similar observations were made of vegetation on land immediately beyond the site boundaries.

6.12 Activities on Adjacent Land

Observations made from the site boundary, indicated land use activities on adjacent properties were comprised of the following:

> **North** – Paton's Lane, then predominantly open space rural land, with the exception of a former quarry converted to 'Paton's Lane Landfill', located approximately 500m north west of the Site;

> **East** – Luddenham Road, then low density residential rural properties, South Creek and industrial estate beyond;

> **West** – bushland corridor with drainage channel, Stockdale Road and rural properties beyond; and

> **South** – above ground high pressure water pipe network, extending from the Nepean River in the west to the prospect Reservoir in the east, St Mary's Kennett's Airfield approximately 300m south, open space rural land and low density residential beyond.

7 Emerging Contaminants of Concern and Chemical Control Orders

7.1 Per and Poly-Fluoroalkyl Substances (PFAS)

Per and Poly-Fluoroalkyl Substances (PFAS) are a group of chemicals that are manufactured for their unique properties. There are numerous PFASs that may be present in the environment. Perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA) are two major PFASs, that were originally found as components in products used to provide stain resistance or as firefighting foams.

Some PFASs have been recognised as highly persistent, potentially bio-accumulative and toxic, and have been detected in the environment, wildlife, people and food.

CS uses the decision matrix presented in Table 7-1 (based on EnRisk (2016)), to facilitate an assessment of the potential for PFAS to be present on site.

Table 7-1 PFAS Decision Matrix

Preliminary PFAS Screening Question	Decision
Is there evidence of fire training occurring at the site	No
Is there evidence of fire training occurring, or the presence of an airport or fire station, up-gradient of, or adjacent to, the site	Yes
Is there evidence of fuel[3] fires having occurred on site	No
Is there evidence to suggest PFAS being stored, or used, for manufacturing on site	No

St Mary's Kennett's Airfield located 300m south, up gradient of the site, however, surface water is expected to be captured onsite in retention ponds or flow into natural drainage channel north of the airport which intercepts the direct path to the site. The potential for migration of PFAS impacted groundwater to the site is considered to be low. However, a search of the NSW EPA PFAS investigation programs did not reveal any land under investigation within a 2km radius of the site to have been declared as impacted by PFAS.

CS also considered guidance in the PFAS National Environmental Management Plan (NEMP) 2018 as prepared by HEPA. Section 9 of the NEMP advises that consideration should be given to the presence of primary sources of PFAS, including firefighting training areas, landfills and waste water treatment plants. The Paton's Lane Landfill and Resource Recovery Centre is located approximately 500m north west of the site. The landfill is licensed to accept General Solid Waste (non-putrescible) and various resource recovery materials including demolition wastes and paper. There is the potential for PFAS contamination to be present within the landfill, however, all areas of the landfill are likely to be bunded, there are a number of surface water retention basins and regular monitoring of groundwater is required under the NSW EPA license. Furthermore, if any contamination did migrate offsite it would likely flow into the natural drainage channel to the northwest of the site and flow in an inferred north-easterly direction, away from the site.

The historical records reviewed for this project, and the observations made during the site walkover, did not indicate a potential for PFAS contamination onsite or migration onto site from adjacent lands, which warrants further investigation.

[3] Fuels could include solvents, petrol, diesel and kerosene.

7.2 Chemical Control Orders

Chemical control orders (CCO) are created under Part 3, Division 5 of the Environmentally Hazardous Chemicals Act 1985, and are used to selectively and specifically control particular chemicals or chemical wastes to limit their potential or actual impact on the environment. CS uses the decision matrix presented in Table 7-2 (based on the NSW EPA CCO available at the time of this project), to facilitate an assessment of the potential for those control chemicals to be present on site.

Table 7-2 CCO Decision Matrix

Preliminary CCO Screening Question	Decision
Were aluminium smelter wastes used or stored on site?[4]	No
Were dioxin contaminated wastes generated or stored on site?[5]	No
Were organotin wastes generated or stored on site?[6]	No
Were polychlorinated biphenyls (PCB) used or stored on site?[7]	No
Were scheduled chemicals[8] used, or wastes stored, on site?[9]	Possibly

Due to the history of the site and the previous land use being for farming and the building structures onsite, there is the potential for scheduled chemicals to be used for herbicide and pesticide treatment. However, CS considers any use of these chemicals is unlikely to be widespread and limited to immediate soils surrounding buildings and locations of potential crops, identified in the aerial imagery.

The site walkover did not identify any visual indicators of these chemicals, however, test pits and analysis of pesticides in soils have been targeted in areas where potential contamination may have occurred, with the exception of locations close to buildings.

Further investigation of soils surrounding the buildings should be undertaken following demolition of structures.

[4] SPCC 1986, 'Chemical Control Order In Relation to Aluminium Smelter Wastes Containing Fluoride and/or Cyanide' dated 21 March 1986
[5] NSW EPA 1986, 'Chemical Control Order In Relation to Dioxin-Contaminated Waste Materials' dated 14 March 1986
[6] NSW EPA 1989, 'Chemical Control Order In Relation to Organotin Wastes' dated 11 March 1989
[7] NSW EPA 1997, 'Polychlorinated Biphenyl Chemical Control Order' dated 20 June 1997
[8] Primarily organochlorine pesticide (OCP) compounds, with some industrial by-products
[9] NSW EPA 2004, 'Chemical Control Order in Relation to Scheduled Chemical Wastes

8 Material Import Document Review

CS was provided with the following material classification documents pertaining to stockpiles imported and currently stored on site:

> Douglas Partners (DP) 2019, 'In Situ Waste Classification & ENM Assessment Hordern Oval Cranbrook School, Bellevue Hill', dated 30th October 2009, ref: 84944.02.R.010

> JM Environments (JME) 2019, 'M4-M5 Link Tunnel Spoil Order Assessment, Pyrmont Bridge Road Civil Site', dated 14th October 2019, Ref: JME18057-97.

CS has reviewed these documents and provided a summary of the details, relevant to this project, in the following sections. For details of the reports refer to **Appendix H**.

8.1 Douglas Partners (2019)

The objective of the investigation (DP, 2019) was to provide a classification of in-situ materials, in accordance with the requirements of the excavated natural material order 2014 (the ENM Order). The scope of works included:

> Review previous soil sample results collected from bore holes drilled in 'Hordern Oval' by DP in 2015 (BH2 and BH4) and 2017 (BH101- BH107, and BH111-BH130);

> Undertake sampling from 16 additional test pits (TP01-TP04; TP08-TP18 and TP23) also excavated in Hordern Oval;

> Forward the samples to a NATA accredited laboratory for analysis, in accordance with the ENM Order;

> Preparation of the classification report.

The report made the following conclusions:

> The material was classified as ENM with the exception of samples collected from locations BH2 and BH113, which excluded this material from the classification.

> The material described as ENM consisted of brown silty SAND and silty CLAY, and yellow-brown SAND with cemented sand/coffee rock and silty clay inclusions.

The truck run sheets were also provided to CS for review. The run sheets provide information of registration numbers of trucks which transported the material, dates of import and approximate tonnages of each load of material. The run sheets indicate approximately 680 tonnes of material was imported to the site, including the wider development, from Bellevue Hill. A consignment note has also been provided by the client which confirms this Sand material was sourced from the same location as detailed in the material classification certificate provided by DP (2019).

8.2 JM Environments (2019)

The objective of the investigation (JME, 2019) was to provide a classification of stockpiled material in accordance with the requirements of the M4-M5 Link tunnel spoil order 2019 (the Spoil Order). The scope of works included:

> Collection of five primary samples from one 2,000 tonne stockpile of 'tunnel spoil';

> Forward the samples to a NATA accredited laboratory for analysis, in accordance with the Spoil Order

> Preparation of the classification report.

The report made the following conclusions:

> All five samples reported no detections of BTEX, TRH or PAH and heavy metal results indicated the material has not been contaminated with manufactured chemicals or processed residues.

> The stockpiled material, described as 'crushed light grey to light grey brown to yellow brown fine to medium grained quartzose sandstone', meets the requirements of the Spoil Order NSW EPA resource recovery exemption.

CS has reviewed the laboratory results and confirmed the analyte levels are below the adopted land use criteria for the site.

The truck run sheets were also provided to CS for review. The run sheets provide information of registration numbers of trucks which transported the material, dates of import and approximate tonnages of each load of material. The run sheets indicate approximately 4,900 tonnes of material was imported to the site, including the wider development, from the Pyrmont Bridge Road (PBR) compound. A consignment note has also been provided by the client which confirms this crushed sandstone material was sourced from the same location as detailed in the material classification certificate provided by JME (2019).

8.3 Import Review Summary

CS has reviewed the previous reports and makes the following remarks:

> The material described in DP 2019 is consistent with the stockpile of SAND material observed onsite identified as SP7 (Figure 2);

> The material described in JME 2019 is consistent with the two stockpiles of crushed SANDSTONE material observed onsite, identified as SP5 and SP6 (Figure 2);

> The laboratory results provided in the reports indicate the analyte levels in the materials classified are all below the site investigation criteria of ‘Industrial/Commercial’.

> The run sheets have been provided and a consignment note provided by the client which confirms the material source sites as detailed in the material classification certificates.

Based on the evidence provided and the observations made during the site walkover, CS considers that these stockpiles are unlikely to pose an unacceptable risk to future receptors based on the site’s adopted land use scenario. However, CS understands further material will be required to raise the entire site to specific design levels and therefore a material import protocol may be required.

9 Conceptual Site Model

A Conceptual Site Model (CSM) is a representation of an environmental system and the processes that determine the transport of contaminants from sources through environmental media to human or environmental receptors. The CSM, hereafter, is the assessment of plausible mechanisms by which receptors may be exposed to contamination at the site. For exposure to be considered possible, a given 'source' must exist, as well as a mechanism ('pathway') to an identified 'receptor'. Such complete 'source-pathway-receptor' exposure mechanisms are commonly termed 'SPR linkages'.

The Site desktop review and observations made during the Site walkover, were assessed in the context of the project objectives, in order to develop an initial CSM for the Site. An assessment of complete SPR linkages will be conducted and the CSM further developed based on laboratory results, which will be documented in the report.

9.1 Areas of Environmental Concern

A number of areas of environmental concern (AEC) on the site, and contaminants of potential concern (COPC) associated with those AEC, were identified for the site.

The identified AEC are presented in **Figures 3A and 3B**, and the COPC associated with those AEC are presented in Table 9-1.

Table 9-1 AEC and COPC

ID	AEC Description	Land Use Activity	COPC
AEC01	Imported Fill	Uncontrolled filling	Hydrocarbons, pesticides, metals, asbestos
AEC02	Stained soils and incomplete combustion	Burning off waste	Asbestos, PAH and metals
AEC03	Green house and adjacent crops	Growing crops and demolition of structure	Pesticides, asbestos, PAH and metals
AEC04	Former Crops	Growing crops	Pesticides and metals
AEC05	Previous motor vehicle storage	Storing on unsealed surfaces	Hydrocarbons, metals
AEC06	Soil stockpiles with foreign material inclusions (SP1-SP4)	Unregulated importation and stockpiling	Hydrocarbons, metals, PAH, pesticides, asbestos
AEC07	Soils adjacent to above ground diesel tank	Potential spills when refuelling and location where potential filling has occurred	Hydrocarbons, PAH, asbestos and metals
AEC08	ACM fragments stacked on surface	Hazardous building materials broken – possibly collected from old fibro cottage	Asbestos

ID	AEC Description	Land Use Activity	COPC
AEC09	Oil intermediate bulk container (IBC)	Draining car oil sumps – IBC slight leak on hardstand but area not bunded	Hydrocarbons, PAH and metals
AEC10	Old fibro cottage walls broken	Use of hazardous building materials now deteriorated	Asbestos
AEC11	Household/Demolition surface waste	Incorrect storage of wastes	Asbestos and metals
AEC12	Two underground septic tanks	Onsite capture and treatment of sewage	Coliforms, enterococci, E.coli, metals, OCP

CS identified seven stockpiles onsite (SP1-SP7) during the site walkover, as detailed in Section 6.10. The client has since provided compliance documents for importation of three of the seven stockpiles (SP5-SP7). These documents were reviewed (Section 8) and CS confirmed the stockpiles of crushed sandstone and grey-brown sand were consistent with the material descriptions in the compliance documents. Furthermore, visual or olfactory evidence of contamination were not observed on the surface of the materials during the site walkover assessment. Therefore, further assessment of these stockpiles were considered unwarranted and are therefore not included as an AEC.

CS understands stockpiles SP1-SP4 (**Figure 3A and 3B**) were generated from grading and restoration of the site roadways. However, on inspection the stockpiles contained foreign materials inclusions, which warrants further investigation.

Investigation of AEC08-AEC12 is beyond the scope of this project as there was no indication of potential contamination of immediate surrounding soils, resulting from contamination migrating from these AECs, which warrants soil analysis. Following, appropriate inspection and management, subsequent soil validation sampling may be required at the development phase of the project.

AEC12 is currently considered an aesthetic risk, as the concentrations of COPC listed above, could only potentially pose a risk to human health from ingestion or secondary contact through recreational activities in surrounding water bodies. Furthermore, these septic tanks will likely be removed prior to redevelopment of the site.

CS also notes the presence of buildings onsite which may contain hazardous building materials including asbestos and lead paint. However, a building materials survey is beyond the scope of the current investigation and will be required in the future, prior to demolition. A post demolition contamination assessment of the building footprints will be required to assess contamination status of underlying soils.

9.2 Land Use Scenario

At the time of the development of this SAQP, CS understands the proposed development for the site includes three development areas, identified as Stages 1-3, comprising of large warehouses and industrial units, asphalt sealed roadways for light and heavy vehicle access and minimal in ground designed garden beds for aesthetic purposes. Furthermore, the proposed development details include:

> The site is proposed to be an overall fill site; with fill to be imported and placed above existing soils, to raise the surface to required design levels;

> The proposed development footprint is predominantly hardstand including warehouse footprints consisting of concrete slab directly on ground, asphalt sealed road ways, with only minimal direct soil access in garden beds.

> Stage 1-3 development excludes the north western transmission line easement and E2: environmental conservation zoned area beyond;

9.3 Receptors

There were no fauna or flora of ecological significance listed in the Section10.7 (2) planning certificates and none were observed during the site walkover. However, CS has considered the possibility of transitory wildlife as a future receptor and potential aquatic biota receptors in dams and surrounding ecological ecosystems. The following has been considered for ecological receptors:

> Due to the proposed industrial/commercial land use scenario and development to consist of most surfaces of the site to be capped and sealed with concrete or asphalt, with minimal soil access, CS considers further assessment of impacts to terrestrial ecological receptors unwarranted.

> The proposed development will include filling all dams and importing fill to raise the site to specific design levels. Therefore, onsite aquatic receptors are unlikely;

> Groundwater remains a potential pathway for consideration of migration of contaminants, which may have an impact on surrounding aquatic ecological systems including South Creek and potential biota in drainage lines. Prior to analysis of soil contaminant concentrations, potential migration of contaminants in soils into groundwater is considered a possibility. However, this potential migration will depend on:

- The soil contamination concentrations and characteristics of the contaminants including leachability;
- Depth to groundwater and distance to off-site aquatic ecological receptors.

Assessment of soil laboratory results and field observations during site walkover and test pitting will help determine if there is likely to be unacceptable levels of risk to offsite aquatic receptors.

CS considers human receptors at the site may include construction workers, future tenants and visitors, which are unlikely to include children.

9.4 Exposure Pathways

9.4.1 Human Health – Direct Contact

Site history information and walkover observations indicated a potential for contaminants that may present a direct contact exposure risk, may be present on site. The proposed land use scenario is likely to include sealed hardstands; therefore, direct contact exposure pathway may be complete only for future construction workers, during earthworks and installation of services during the development.

9.4.2 Human Health – Vapour Intrusion / Inhalation

Vapour intrusion / inhalation exposure risks can occur when a primary or secondary vapour source[10] is present.

Site history information and walkover observations indicated a likelihood for oil leaks from motor vehicles, past diesel leaks from onsite above ground storage tanks and uncontrolled filling which may include volatile contaminants. There were no indications of underground storage tanks, which likely contain volatile compounds and pose a vapour risk.

CS considers that:

> the transport, placement and spreading of uncontrolled filling typically includes significant disturbance of soils, which would typically result in the volatilisation of contaminants that might normally present an intrusion / inhalation risk;

> the potential for contaminants to be present in uncontrolled filling at concentrations which could present an intrusion / inhalation risk, is low; and

[10] Primary sources can include underground storage tanks, while secondary sources can include significantly contaminated soil or groundwater.

> The diesel tanks identified onsite appeared empty with little residual diesel remaining. If leaks have occurred into surrounding soils, natural attenuation by micro-organisms and evaporation is likely which may reduce the vapour intrusion potential.

Therefore, significant vapour intrusion / inhalation exposure pathway, associated with the identified sources, is unlikely to be complete. However, further soil analysis is required to increase confidence in this assumption.

9.4.3 Human Health – Asbestos

Bonded asbestos containing materials (ACM) comprises asbestos which is in sound condition, although possibly broken or fragmented, and where the asbestos is bound in a matrix such as cement or resin.

Fibrous asbestos (FA) comprises friable asbestos material and includes severely weathered cement sheet, insulation products and woven asbestos material, which can be broken or crumbled by hand pressure.

Asbestos fines (AF) include free fibres, small fibre bundles and small fragments of bonded ACM that can pass through a 7mm x 7mm sieve.

Asbestos poses a risk to human health when asbestos fibres are made airborne and inhaled. The assessment of sites contaminated with asbestos in soil should aim to describe the nature and quantity of asbestos in soil in sufficient detail to enable a risk management plan to be developed for the proposed land use scenario.

Site history information and walkover observations indicate a potential for uncontrolled filling and degradation of ACM in walls of the old fibro cottage. Additional broken ACM fragments were identified, in good condition, collected and stacked nearby the old cottage, which is likely to be sourced from the broken walls of this building. Therefore, presence of asbestos in the form of FA and AF in selected areas of the site cannot be dismissed.

Hazardous building material inspections is beyond the scope of this investigation, hence, further investigation and assessment is warranted, prior to demolition.

The proposed land use scenario is likely to include limited access to soils. Therefore, an asbestos exposure pathway may be complete only for future construction workers.

9.4.4 Human Health – Aesthetics

Section 3.6.3 of NEPC (2013a) indicates that there are no specific numeric aesthetic guidelines, however site assessment requires balanced consideration of the quantity, type and distribution of foreign material or odours in relation to the specific land use and its sensitivity. For example, higher expectations for soil quality would apply to residential properties with gardens compared with industrial settings.

Site history information and walkover observations indicated a potential for contaminants, which may present an aesthetics exposure risk, may be present on site, including storage of demolition and household wastes, underground septic tanks and isolated burnt areas of former bon fires.

The proposed development will require removal of all surface wastes and subsurface structures which pose a risk to the environment or health. The proposed development will include importation of fill to raise areas of the site and the footprint of the Site will be predominantly capped with hardstand, therefore an aesthetic risk is unlikely, following completion of the development.

However, CS considers an aesthetics exposure pathway may be complete, with the site in its current condition. Appropriate remediation and management is expected during the earthworks stage of development.

9.4.5 Groundwater – Drinking

Site history information and walkover observations did not indicate a potential for contaminants, which may present a drinking water risk on site or potential for migration into deep drinking water sources. Anecdotal evidence suggests the current tenants of the site are using bore water for drinking purposes, however this hasn’t been confirmed.

No registered drinking water extraction bores were located within a 1km radius of the site, furthermore, bore water extraction for drinking purposes is not proposed for the development and is unlikely under the industrial/commercial land use scenario.

A drinking water exposure pathway is unlikely to be complete.

9.4.6 Groundwater – Recreational

Site history information and walkover observations did not indicate a potential for contaminants, which may present a recreational water risk on site or to nearby receiving water bodies.

The nearest receiving surface water bodies include four dams onsite, a drainage line in the north western corner of the site and South Creek, located approximately 500m east of the site. Recreational use of South Creek for fishing and swimming purposes cannot be dismissed. However, it is unlikely for the identified COPC in the AECs to migrate into these receiving water bodies.

CS considers a recreational water exposure pathway is unlikely to be complete.

9.4.7 Groundwater – Agricultural (Irrigation and Stock Watering)

Site history information and walkover observations indicated a potential for contaminants, which may present an agricultural water risk, may be present on site. Four dams located within the site may be currently used for stock irrigation purposes. However, the future development does not include agricultural elements and the dams are proposed to be filled. Further, Section 3.3 of this report did not identify any registered groundwater bores within a 1km radius of the site, authorised for irrigation or stock purposes. There is the potential for South Creek to be used for irrigation purposes, however, CS considers it unlikely for migration of COPC in AECs to migrate to this receptor at this distance.

CS considers an agricultural groundwater exposure pathway is unlikely to be complete.

9.4.8 Groundwater – Aquatic Ecosystems

Site history information and walkover observations indicated a potential for contaminants, which may present a risk to the aquatic ecosystem. The nearest receiving surface water bodies include four dams onsite, a drainage line in the north western corner of the site and South Creek, located approximately 500m east of the site. The dams are proposed to be filled as part of the proposed development plans. However, the other receiving surface water bodies are likely to contain aquatic species.

CS considers an aquatic ecosystems groundwater exposure pathway may be complete. This will be further assessed based on laboratory results and observations obtained from test pits.

9.4.9 Ecological – Terrestrial Ecosystems

Site history information and walkover observations indicated a potential for contaminants, which may present a terrestrial ecological risk.

Section 3.4.2 of NEPC (2013a) indicates that:

> a pragmatic risk-based approach should be taken when assessing ecological risk in residential and commercial / industrial land use settings;

> in existing residential and urban development sites, there are often practical considerations that enable soil properties to be improved by addition of ameliorants with a persistent modifying effect or by the common practice of backfilling or top dressing with clean soil;

> in other cases, all of the site soils will be removed during site development works or relocated for the formation of new land forms;

> sites may also be backfilled with clean soil/fill and the fate of any excavated contaminated soil should be considered in process; and

> commercial and industrial sites may have large building structures and extensive areas covered with concrete, other pavement or hardstand materials and may have limited environmental values requiring consideration while in operational use.

The proposed land use scenario is proposed to include imported fill above existing soils for required design levels and sealed surfaces for building footprints and roadways.

Therefore, CS considers an ecological exposure pathway for terrestrial ecosystems is unlikely to be complete.

9.4.10 Management Limits for Petroleum Hydrocarbons

Section 2.9 of NEPC (2013a) indicates that there are a number of policy considerations which reflect the nature and properties of petroleum hydrocarbons:

> Formation of observable light non-aqueous phase liquids (LNAPL);

> Fire and explosive hazards; and

> Effects on buried infrastructure e.g. penetration of, or damage to, in-ground services by hydrocarbons.

Section 2.9 of NEPC (2013a) notes that CME (2008) includes management limits to avoid or minimise these potential effects. Application of management limits requires consideration of site specific factors such as depth of building basements and services, and depth to groundwater, to determine the maximum depth to which the limits should apply. NEPC (2013a) also states that:

> management limits may have less relevance at operating industrial sites (including mine sites) which have no or limited sensitive receptors in the area of potential impact.

> the presence of site total petroleum hydrocarbon (TPH) contamination at the levels of the management limits does not imply that there is no need for administrative notification or controls in accordance with jurisdiction requirements.

Site history information and walkover observations did not indicate any one of these policy considerations to be associated with relevant identified AEC at the site, in the context of the proposed future land use scenario. Furthermore, the site is proposed to be raised with imported fill and there are no basements proposed for the development.

10 Sampling and Analysis Quality Plan

10.1 Data Quality Objectives

Appendix B in NEPC (2013b) provides guidance on the data quality objective (DQO) process, which is a seven step iterative planning approach that can be used to define the type, quantity and quality of data needed to inform decisions relating to the environmental condition of a site.

10.1.1 Step 1: State the problem

The reasons the project is being undertaken, is set out in Section 1.1 of this report.

The objectives of this project are set out in Section 1.2 of this report.

The project team and technical support experts identified for the project include the CS project director, CS project manager, CS field staff and CS's subcontractors.

The design and undertaking of this project will be constrained by the client's financial and time budgets.

The regulatory authorities associated with this project include NSW EPA and the local Penrith City Council.

10.1.2 Step 2: Identify the decision/goal of the study

The decisions that need to be made during this project, to address the project objectives, include:

> Is the data collected for the project, suitable for assessing land contamination exposure risks?

> Do the detected concentrations of contaminants of potential concern identified in the CSM, present an unacceptable exposure risk to the receptors identified in the CSM, based on the proposed land use scenario?

> Is the site suitable, in the context of land contamination, for the proposed land use scenario?

10.1.3 Step 3: Identify the information inputs

The information inputs required to make the decisions for the project set out in Section 10.1.2, include:

> Data obtained during the site history review and site walkover;

> Compliance documents supplied by the client;

> The proposed development plans for the site;

> Identification of sample media that needs to be collected, as set out in Section 10.2.2;

> Parameters that will be measured in each relevant sample, as set out in Section 10.2.3;

> The analytical methods required for each identified COPC, so that assessment can be made relative to adopted site criteria;

> The basis for decisions to be made from field screening, including photo-ionisation detector (PID) data, and what action is to be taken if a defined concentration is attained, as set out in Section 10.2.2.1; and

> The adopted site investigation criteria for the media of concern. This criteria is set out in Section 10.3 and will be adopted based on the proposed land use scenario[11] and identified receptors.

[11] The land use scenarios in Section 2.2 of NEPC (2013a) will be considered when adopting human health assessment criteria. The land use scenarios in Section 2.5 of NEPC (2013a) will be considered when adopting ecological assessment criteria.

10.1.4 Step 4: Define the boundaries of the study

The geographical and spatial extent of the project will be limited to:

> the site as defined by the boundaries set out in Section 2; and

> physical constraints or existing infrastructure on site that prevents safe and reasonable access by the project team and/or typical industry equipment used for projects of this nature.

The time and budget constraints of the project will be as per those set out in the contract (and subsequent variations) between CS and the client.

The temporal boundaries of the project will include the date of initial walkover on 28th May 2020 until the last day of intrusive works, 7th May 2020. The temporal boundaries may be impacted by:

> Weather conditions including rain, wind, heat and cold, which may adversely affect execution of fieldwork tasks and/or data quality;

> Availability of the site for access to execute fieldwork tasks; and

> Availability of project team members to execute the project.

The lateral and vertical intervals in which contamination distribution is believed to be uniformly distributed, based on the CSM, will be:

> The lateral boundary of the site, as defined in **Figure 2**, based on advice from the client;

> The inferred lateral boundaries of each AEC, including groundwater down gradient of primary / secondary sources (where applicable);

> The inferred vertical extent of each AEC, which is likely to be to the base of fill material,

The scale of the decisions required will be based on the site, as defined by its boundaries.

10.1.5 Step 5: Develop the analytical approach

10.1.5.1 Duplicates and Triplicates

Soil chemical field duplicates and triplicates will be collected at a rate of one set per 20 samples collected (i.e. a duplicate and a triplicate sample set for every 20 samples - an equivalent of minimum 5%). Sample collection will include splitting of one bulk sample across three separate sample containers. Soil samples will not be homogenised, particularly where the COPC are volatile or semi volatile in nature.

Analysis of the duplicate and triplicates will be based on at least one of the analytes that the parent sample is being analysed for (excluding asbestos).

The relative percent difference (RPD) of the detected concentrations in the parent and duplicate, and the parent and triplicate, will be calculated.

10.1.5.2 Trip Blanks and Trip Spikes

One trip blank and trip spike will be used for each day of sampling[12]. A minimum of one trip blank and one trip spike will be scheduled for BTEX analysis, during the project, to provide an indication of the potential loss or transfer of volatiles from samples during storage and transport.

10.1.5.3 Rinsate Blanks

One rinsate and rinsate blank will be collected for each day of sampling[13].

Laboratory analysis of the rinsates will be limited to heavy metals, which will provide a sufficient indication of the quality of the decontamination procedures between sampling.

[12] Where samples being collected on that day are expected to be analysed for BTEX and/or TRH C6-C10.
[13] Where non-disposable sampling equipment is being used on that day.

10.1.5.4 Laboratory Quality Assurance and Quality Control

The quality assurance and quality control (QA/QC) program of the primary analytical laboratory will typically include analysis of method blanks, matrix spikes, surrogate spikes, laboratory control samples and laboratory duplicates. The laboratory will report on whether the QA/QC analysis meets the laboratory's adopted data quality objectives.

10.1.5.5 Data Quality Indicators

Data quality indicators (DQI) will be adopted to facilitate an assessment of the completeness, comparability, representativeness, precision and accuracy (bias) of the field and laboratory data collected. These DQI are set out in Table 10-1.

Table 10-1 Data Quality Indicators

Completeness[14]			
Field Considerations	**Assessment Criteria**	**Laboratory Considerations**	**Assessment Criteria**
Critical locations sampled	95%	Critical samples analysed	95%
Critical samples collected	95%	Analysis addresses COPC	95%
SOPs appropriate	SOPs used	Methods and LORs	Refer Section 10.2.3
Experienced sampler	Experienced CS staff	Sample documentation	SRA and COA supplied
Documentation complete	Logs, calibration, COC	Holding times	Refer Section 0
Comparability			
Field Considerations	**Assessment Criteria**	**Laboratory Considerations**	**Assessment Criteria**
Same SOPs used	SOPs used	Comparable methods	Refer Section 10.2.2.3
Experienced sampler	Experienced CS staff	Comparable LORs	Refer Section 10.2.2.3
Climatic conditions	Sampling not affected by weather	Same laboratories	Primary samples to one lab
Same sample types	Same collection, preservation and handling	Same units of measure	Refer Section 10.2.2.3
Representativeness			
Field Considerations	**Assessment Criteria**	**Laboratory Considerations**	**Assessment Criteria**
Appropriate media sample	Refer Section 10.2.2	Samples analysed	Refer Section 10.2.2.3
Identified media sampled	Refer Section 10.2.2		

[14] Percentage criterion adopted is reflective of the significance level adopted for the decision, e.g. significance level of 0.05 indicates a 95% confidence level that the data is adequate for decision making (Ref: Section 18.3 in NEPC (1999b))

Precision[15]			
Field Considerations	**Assessment Criteria**	**Laboratory Considerations**	**Assessment Criteria**
SOP compliance	SOPs used	Laboratory duplicates	95% pass
Duplicate / triplicate RPD	Minimum 10% duplicates Minimum 5% triplicates No RPD limit <10 times LOR 50% RPD limit 10-20 times LOR 30% RPD limit >20 times LOR		
Accuracy (bias) [16]			
Field Considerations	**Assessment Criteria**	**Laboratory Considerations**	**Assessment Criteria**
Trip blanks	Analytes less than LOR	Method blanks	95% pass
Trip spikes	Recoveries between 60% and 140%	Matrix spikes	95% pass
Rinsate blanks	Analytes less than LOR	Surrogate spikes	95% pass

10.1.5.6 If/Then Statements

1. If field and laboratory analytical dataset is within the DQI assessment parameters, then the data may be considered to be adequately complete, comparable, representative, precise and accurate, for decision making within the objectives of this project.
2. If field and laboratory analytical dataset is outside the DQI assessment parameters, then additional data may be collected to address identified data gaps.

The Site Assessment Criteria, for soil chemical contamination is determined by the following decision rules:

> The 95 % Upper Confidence Limit (UCL) of the arithmetic mean for each contaminant of concern complies with the respective site investigation criteria;

> The individual contaminant concentration should not exceed the adopted site investigation criteria by more than 250%; and

> The standard deviation of individual contaminants should not exceed 50% of the adopted site investigation criteria.

Therefore,

3. If field and laboratory analytical results for soils are below the site investigation criteria, then the site may be considered suitable for the proposed land use scenario.

[15] Percentage criterion adopted is reflective of the significance level adopted for the decision, e.g. significance level of 0.05 indicates a 95% confidence level that the data is adequate for decision making (Ref: Section 18.3 and Section 19.5 in NEPC (1999b))
[16] Percentage criterion adopted is reflective of the significance level adopted for the decision, e.g. significance level of 0.05 indicates a 95% confidence level that the data is adequate for decision making (Ref: Section 18.3 and Section 19.5 in NEPC (1999b))

However, CS notes the sampling density does not intend to meet the requirements for site characterisation as defined in the NSW EPA (1995). Hence, regardless of whether the laboratory results exceed the adopted land use scenario, any elevated chemical detections or identification of asbestos may warrant further investigation to increase statistical confidence in the results.

4. If field and laboratory soil chemical analytical results exceed the site investigation criteria, and further statistical assessment indicates results exceeds the Site Assessment Criteria, then the site may be considered unsuitable for the proposed land use scenario and further site assessment may be warranted.

10.1.6 Step 6: Specify the performance or acceptance criteria

There are two types of decision error:

> sampling errors occur when the sampling program does not adequately detect the variability of a contaminant from point to point across the site. That is, the samples collected are not representative of site conditions (e.g. an appropriate number of representative samples have not been collected from each stratum to account for estimated variability); and

> measurement errors occur during sample collection, handling, preparation, analysis and data reduction.

In the assessment of land contamination, these errors can result in either:

> a **Type I** error, where contamination exposure risks are considered to be acceptable, when they are not; or

> a **Type II** error, where contamination exposure risks are considered to be not acceptable, when they are.

In order for decision rules to be sound, they should be designed to minimise decision errors. The risk of decision error will be mitigated by:

> Increasing the sampling density in locations where elevated chemical contamination is identified;

> Ensuring fieldwork tasks are undertaken by suitably experienced field staff and sub-contractors, with reference to the DQO presented in this report;

> Ensuring laboratory analyses are undertaken by NATA accredited laboratories;

> Ensuring a robust statistical analysis and interpretation of the results, suitable for the proposed Judgmental sampling plan; and

> Ensuring interpretation of data is undertaken by suitably experienced environmental consultants and/or outsourcing interpretation to technical experts (if warranted).

10.1.7 Step 7: Develop the plan for obtaining data

The sampling is conducted based on the feasibility of the investigation agreed by the client, the timeframe given to CS to obtain the results, the proposed less sensitive land use scenario and the physical access to site media for assessment. This was achieved in accordance with the minimum requirements set out in the relevant statutory guidelines to provide a due diligence contamination assessment for the development application.

The DQOs were developed based on a review of existing data, and discussions with the relevant project stakeholders. If information gathered during the assessment process indicates that the objectives of the works are not being met, then this will be communicated to the Client to enable the appropriate steps to be made to rectify the issue, prior to completion of the project.

The following section outlines the sampling methodology and analytical strategy to achieve the DQOs for this investigation.

10.2 Sampling Methodology

The sampling methods are based on a number of factors that are relevant to this project, based on site history, and include:

> The identified COPC;

> The assessed laydown mechanisms for COPC in each AEC;

> The assessed likely lateral and vertical extent of potential contamination in each AEC; and

> Constraints on site which may restrict the use of certain sampling techniques.

Prior to excavation, the subsurface of the site was screened for the presence of underground services by a qualified and experienced cable locator under the supervision of an experienced consultant from CS.

10.2.1 Soil Investigation Procedure

Section 3.1 of NSW EPA (1995) states that judgemental or stratified sampling methods can be used if there is sufficient information about the probable distribution of the contamination. Additionally, Section 6.2.1 in NEPC (2013b) states that judgemental sampling, the selection of samples (number, location and timing, etc.) is based on knowledge of the site and professional judgement. Sampling would be expected to be localised to known or potentially contaminated areas identified from knowledge of the site either from the site history or an earlier phase of site assessment.

The scope of this project has included limited soil sampling from specific locations identified as AECs in the CSM, to supplement the preliminary site investigation. These locations were derived from information obtained from the desktop site history review and site conditions during the site walkover. On that basis, it is considered reasonable to adopt a judgemental sampling pattern to investigate sub-surface contamination issues as a preliminary site assessment for due diligence purposes. CS notes the sampling density does not intend to meet the requirements for site characterisation as defined in the NSW EPA (1995).

Twenty-five test pit locations have been chosen based on the identified AECs to obtain a preliminary understanding of the possible extent of soil contamination. The locations of the in-situ sampling points are presented in **Figure 3A and 3B**.

The four stockpiles of unknown origin (SP1-SP4) will also be investigated with three samples per stockpile to be collected, in accordance with the sampling density specified in the EPA Victoria 2010, Industrial Waste Resource Guidelines, Sampling and Analysis: Soil Sampling and the NEPM (NEPC, 2013b).

10.2.2 Soil Sampling

At each of the 25 sample locations, test pits will be excavated to a minimum of 0.3m into natural ground using a 5.5 tonne excavator. One discrete soil jar sample for chemical analysis and a bulk soil bag sample for asbestos analysis, will be collected from the fill at each test pit location, at a minimum 0.2m below ground level, representative of the subsurface fill. Additional samples may be collected at each test pit location, at vertical depth intervals, if there is additional visual or olfactory evidence of contamination.

At each stockpile a minimum three discrete chemical and asbestos samples will be collected from 0.3m below the surface of the stockpile, at three random sample points, equal distance apart.

Chemical samples will be collected in general accordance with the NEPM (NEPC, 2013) and with the methods specified by the *AS 4482.1-2005 Guide to the Investigation and Sampling of Sites with Potentially Contaminated Soil Part 1: Non-Volatile and Semi-Volatile Compounds* (AS 4482.1-2005). In order to minimise the potential for cross contamination, soil samples will be collected by hand directly from the excavator bucket or from soils stockpiled adjacent to the test pit. All sampling will be conducted by suitably trained field staff wearing protective clothing and disposable nitrile gloves.

Asbestos soil samples will be collected as a grab sample in general accordance with the NEPM (NEPC, 2013). Any ACM or suspect fibrous material identified within the soils will be collected in a separate zip lock bag for analysis.

Note: Groundwater and surface water assessment is beyond the scope of the project and therefore omitted from the SAQP.

10.2.2.1 Field Screening

When identified COPC include volatiles (e.g. BTEX, TRH or VOC), soil samples will be screened for ionisable volatile organic compounds using a photo-ionisation detector (PID). A sub sample from each sample collected at each sampling point will be placed in a zip lock bag, sealed, and shaken. Each zip lock bag will then be pierced with the tip of a PID and the results recorded on the relevant sampling point log.

10.2.2.2 Decontamination

Non-disposable sampling equipment will be decontaminated between sampling points to mitigate potential for cross contamination of samples. The decontamination method to be used will be:

> Wash of the non-disposable sampling equipment with a solution of potable water and phosphate free detergent (e.g. Decon 90), noting that Decon 90 will not be used on equipment used for collection of samples that will be analysed for PFAS compounds;

> Rinse the washed equipment with distilled or de-ionised water; and

> Air dry the rinsed equipment.

10.2.2.3 Sample Identification, Preservation, Handling and Transport

Soil samples will be identified using the CS project number, sampling point identification number and sampling depth interval (e.g. TP01-0.0-1.0), and date the sample was collected.

Chemical samples will be placed in laboratory prepared glass jars and asbestos samples in zip lock bags.

Soil chemical samples will be stored in insulated containers with ice.

Samples will be transported to the analytical laboratory by CS field staff or a third party courier, using the analytical laboratory's chain of custody (COC) documentation.

Samples were transported to NATA accredited laboratories for analysis by CS field staff or a third party courier, using the analytical laboratory's chain of custody (COC) documentation.

10.2.3 Analytical Schedule

Samples collected from test pits scheduled for laboratory analysis will be selected based on:

> The COPC identified for the AEC the sample was collected from;

> Observations made of the sample when collected (including staining, odour and discolouration); and

> The results of PID headspace screening (if applicable).

The proposed laboratory analytical schedule (including upper limiting sample quantities) for test pit samples is set out in Table 10-2.

Table 10-2 Laboratory Analytical Schedule

AEC ID	Location ID	TRH / BTEX	PAH	OCP	OPP	Asbestos	Metals (8)
AEC01	TP01	X	X	X		X	X
	TP02		X			X	X
	TP04		X			X	X
	TP05		X	X		X	X
	TP06		X	X		X	X
	TP07		X			X	X
	TP09		X			X	X

AEC ID	Location ID	TRH / BTEX	PAH	OCP	OPP	Asbestos	Metals (8)
	TP10		X			X	X
	TP11	X	X	X	X	X	X
	TP12		X			X	X
	TP14		X	X	X	X	X
	TP15		X			X	X
	TP18	X	X			X	X
	TP21	X	X			X	X
	TP22		X			X	X
	TP23		X			X	X
	TP24		X			X	X
	TP25	X	X	X		X	X
AEC02	TP03	X	X			X	X
	TP17	X	X			X	X
AEC03	TP13	X	X	X	X	X	X
AEC04	TP19		X	X	X	X	X
	TP20		X	X	X	X	X
AEC05	TP16	X	X			X	X
AEC06	SP1-SP4	X	X	X		X	X
AEC07	TP08	X	X			X	X

X = indicates to be analysed

The samples collected from stockpiles will be forwarded to the laboratory for the following analytical suite:

> Heavy metals (As, Cd, Cr, Cu, Pb, Hg, Ni, Zn);

> Total Recoverable Hydrocarbons (TRH);

> Benzene, Toluene, Ethylbenzene, Xylene;

> Polycyclic Aromatic Hydrocarbons (PAH);

> Pesticides (OCP); and

> Asbestos 500ml samples.

10.2.4 Laboratory Analytical Details

Sample holding times, laboratory analytical methods and limits of reporting applicable to this project, are set out in Table 10-3.

Table 10-3 Laboratory Holding Times, Analytical Methods and Limits of Reporting

Analyte	Holding Time	Method	LOR (mg/kg)	LOR (µg/L)
BTEX and TRH C6-C10	14 days	USEPA 5030, 8260B and 8020	0.2-0.5	1-2 and 50
TRH C10-C40	14 days	USEPA 8015B & C	20-100	50-500
PAH	14 days	USEPA 8270	0.1-0.2	0.5-10
OCP/OPP	14 days	USEPA 8081	0.2	-
Metals	6 months	USEPA 8015B & C	0.05-2	0.1-5
Asbestos ID	No limit	AS4926	Absence / presence	-
Asbestos (WA DoH)	No Limit	In-house	0.001%w/w	-

10.3 Site Investigation Criteria

The following table lists the adopted site investigation criteria, based on the proposed land use scenario, in accordance with the relevant referenced sources

Table 10-4 Adopted Site Investigation Criteria

Exposure Pathway	Land Use Setting[17]	Reference
Human health direct contact	HIL D	Table 1A(1) in NEPC (2013a) Table B4 in Friebel, E & Nadebaum P (2011) Table 2 in DoEE (2018)
Human health (asbestos)	Industrial/Commercial D	Table 7 in NEPC (2013a)[18]
Human health (aesthetics)	All	Characteristics and processes in Section 3.6.2 and 3.6.3 in NEPC (1991a)

10.3.1 Rationale for Criteria

The site investigation criteria outlined above is based on the proposed land use scenario and the identified human receptors. A SPR linkage is considered incomplete for ecological receptors based on the proposed sealed surface and minimal soil access for the site.

[17] Consideration will be given to soil type, soil texture, soil depth, groundwater depth and appropriate species protection levels.
[18] A depth of up to 10cm below ground level is adopted to define 'surface soil'.

11 Results

Intrusive works by test pitting and environmental sampling were undertaken by CS between 4th May and 7th May 2020. These works included:

> Excavation of 25 test pits (TP01 to TP25) a minimum 0.3m into inferred natural soils, using a five tonne tracked hydraulic excavator.

> Inspection and sampling four stockpiles SP1-SP4;

> Samples were collected in general accordance with SAQP outlined in Section 10.

> Soil samples were collected at each sampling point, immediately below the surface or where visual or olfactory evidence of contamination was observed.

> Test pits were backfilled with excavated soils and track rolled (except where suspect ACM material was identified, to prevent potential mobilisation of free asbestos fibres).

> Rinsate samples were only collected following decontamination of re-usable sampling equipment on the first two days of sampling, to provide assessment of the quality of the sampling procedures. As all sampling was conducted consistently using the same methodology and decontamination procedures, this is deemed sufficient for the purposes of the project.

> Duplicate and triplicate samples were collected by splitting the primary sample across three sample containers (without homogenising, to avoid loss of volatiles), to achieve the required density specified in the DQIs.

> Samples were screened using a PID, only where volatile contaminants were of concern. The PID was calibrated by the laboratory prior to field use, refer to **Appendix I**.

Sampling point locations were consistent with the sampling plan locations presented in **Figure 3A and 3B.**

11.1 Test Pit Soil Observations

Observations made of soils encountered during intrusive investigation works were recorded on logs. These logs are presented in **Appendix J.**

A summary of subsurface conditions is presented in Table 11-1**.**

Table 11-1 Summary of Subsurface Conditions

Layer	Description	Depth (m)
Topsoil	Brown to dark brown gravelly SILT, gravelly SAND and silty CLAY (TP1-TP15, TP17, TP19, TP20, TP22-TP25)	0 to 0.4
Fill	Dark brown gravelly SAND at TP16, TP18 and TP21	0.1 to 0.8
Natural	Residual brown to red CLAY, of medium plasticity; Brown sandy CLAY, low plasticity; and Grey silty CLAY of high plasticity.	0.2 to 1.5

Groundwater was not encountered in the test pits.

Soils were noted as moist to wet, which is thought to be due to the light rainfall on the night of 4th May 2020.

Foreign Material, comprising of bricks, metal, plastic, timber and ceramics, was identified in TP20, TP21 and TP25 at 0 – 0.3m bgl.

Suspect asbestos containing material was identified in two fragments of slightly degraded fibro at TP21, 0.3m bgl.

No staining or olfactory evidence was observed in any of the test pits.

The results of the PID screening were indicative of background levels ranging from 0.2 to 4.2 ppm. The results of the PID screening are presented on the logs in **Appendix J.**

Image 11.1.1 View of test pit at sampling point TP01



Image 11.1.2. View of topsoil material 0-0.3m bgl at sampling point TP01



Image 11.1.3 View of ACM encountered at TP21 at 0.3m bgl



Image 11.1.4 View of natural clay at TP21



Image 11.1.5 View of fill material 0-0.3m bgl at TP16



Image 11.1.6 View of completed test pit at TP16



Image 11.1.7 View of completed test pit at location TP25



Image 11.1.8 View of completed test pit at location TP08



11.2 Stockpile Observations

The stockpiles SP1-SP4 were inspected and observed to comprise of the following (volumes are based on a visual estimate):

Stockpile ID	Description	Volume (m^3)
SP1	White to grey fine SAND with ceramic, bricks, glass and metal inclusions	5
SP2 - SP4	Brown to grey sandy SILT with concrete, gravel, metal and ceramic inclusions	5 per stockpile

Stockpiles SP2-SP4 were visually consistent with the material in the adjacent gravel roadways.

No other visual or olfactory evidence of contamination was observed.

Image 11.2.1 View of Stockpile SP1



Image 11.2.2 View of stockpile SP2



Image 11.2.3 View of stockpile SP3



Image 11.2.4 View of stockpile SP4



11.3 Laboratory

The soil samples were transported to the analytical laboratory using chain of custody protocols. All samples were analysed, taking into consideration the laboratory analytical schedule presented in Section 10.2.3 and observations made in the field.

The relevant laboratory analytical results were tabulated and presented in the attached Table LR1 (test pits) and Table LR2 (stockpiles), **Appendix K.**

A copy of the sample receipts and certificates of analysis, is presented in **Appendix L**.

11.3.1 Test Pits

11.3.1.1 Total Recoverable Hydrocarbons and Monocyclic Aromatic Hydrocarbons

The results of the laboratory analysis reported no detections of TRH above the laboratory limit of reporting (LOR) in soil with the exception of one sample (TP16-0-0.2), which reported TRH in the F3 and F4 fraction. The detections were below the adopted investigation criteria.

The results of the laboratory analysis reported no detections of BTEX above the laboratory limit of reporting (LOR) for all samples analysed.

11.3.1.2 Polycyclic Aromatic Hydrocarbons

The results of the laboratory analysis reported no detections of PAH above the laboratory LOR.

11.3.1.3 Pesticides

The results of the laboratory analysis reported no detections of pesticides above the laboratory LOR.

11.3.1.4 Heavy Metals

The results of the laboratory analysis reported heavy metals in soil at concentrations below the adopted investigation criteria.

11.3.1.5 Asbestos

The results of the laboratory analysis reported no detections of asbestos in soil.

The solid fragment sample (TP21-ACM-0.3) reported a positive detection for the presence of asbestos.

11.3.2 Stockpiles

11.3.2.1 Total Recoverable Hydrocarbons and Monocyclic Aromatic Hydrocarbons

The results of the laboratory analysis reported no detections of TRH above LOR in soil with the exception of the following samples:

> SP2-1, SP2-2, SP2-3, SP3-1, SP3-2, SP3-3, SP4-1, SP4-2 and SP4-4 which reported TRH in the F3 and F4 fraction.

All detections were below the adopted health investigation criteria.

The results of the laboratory analysis reported no detections of BTEX above the laboratory limit of reporting (LOR) for all samples analysed.

11.3.2.2 Polycyclic Aromatic Hydrocarbons

The results of the laboratory analysis reported no detections of PAH above LOR, with the exception of one sample (SP4-1), which was at a concentration only slightly above the laboratory LOR and below the adopted investigation criteria.

11.3.2.3 Pesticides

The results of the laboratory analysis reported no detections of pesticides above the laboratory LOR.

11.3.2.4 Heavy Metals

The results of the laboratory analysis reported heavy metals in soil at concentrations below the adopted human health investigation criteria.

11.3.2.5 Asbestos

The results of the laboratory analysis reported no detections of asbestos.

12 Assessment of Data Quality Indicators

An assessment of performance against the data quality indicators (DQI), is presented in Table 12-1 to Table 12-5.

Table 12-1 Completeness DQI

Field Considerations	Target	Actual	Comment
Critical locations sampled	95%	100%	Performance against DQI considered acceptable.
Critical samples collected	95%	100%	Performance against DQI considered acceptable.
SOPs appropriate	SOPs used	SOPs used	Performance against DQI considered acceptable.
Experienced sampler	Experienced CS staff	Nicholas Leong and Beau Dubois	Performance against DQI considered acceptable.
Documentation complete	Logs, calibration, COC	Documentation presented in relevant appendices	Documentation presented in relevant appendices.
Laboratory Considerations	**Target**	**Actual**	**Comment**
Critical samples analysed	95%	100%	Performance against DQI considered acceptable.
Analysis addresses COPC	95%	100%	Performance against DQI considered acceptable.
Methods and LORs	Refer Section 10.2.2.3	Complied	Performance against DQI considered acceptable.
Sample documentation	SRA and COA supplied	Documentation presented in relevant appendices	Performance against DQI considered acceptable.
Holding times	Refer Section 10.2.2.3	Complied	Performance against DQI considered acceptable.

Table 12-2 Comparability DQI

Field Considerations	Target	Actual	Comment
Same SOPs used	SOPs used	Complied	Performance against DQI considered acceptable.
Experienced sampler	Experienced CS staff	Nicholas Leong and Beau Dubois	Performance against DQI considered acceptable.
Climatic conditions	Sampling not affected by weather	Relevant samples stored in insulated containers with ice	Performance against DQI considered acceptable.
Same sample types	Same collection, preservation and handling methods	Complied	Performance against DQI considered acceptable.
Laboratory Considerations	**Target**	**Actual**	**Comment**
Comparable methods	Refer Section 10.2.2.3	Complied	Performance against DQI considered acceptable.
Comparable LORs	Refer Section 10.2.2.3	Complied	Performance against DQI considered acceptable.
Same laboratories	Primary samples to one lab	Samples sent to SGS Environmental	Performance against DQI considered acceptable.
Same units of measure	Refer Section 10.2.2.3	Complied	Performance against DQI considered acceptable.

Table 12-3 Representativeness DQI

Field Considerations	Target	Actual	Comment
Appropriate media sample	Refer Section 10.2	Complied	Performance against DQI considered acceptable.
Identified media sampled	Refer Section 10.2	Complied	Performance against DQI considered acceptable.
Laboratory Considerations	**Target**	**Actual**	**Comment**
Samples analysed	Refer Section 10.2.3	Complied	Performance against DQI considered acceptable.

Table 12-4 Precision DQI

Field Considerations	Target	Actual	Comment
SOP compliance	SOPs used	Complied	Performance against DQI considered acceptable.
Duplicate / triplicate RPD	Minimum 5% duplicates	11% duplicates	Performance against DQI considered acceptable.
Duplicate / triplicate RPD	Minimum 5% triplicates	5% triplicates	Performance against DQI considered acceptable.
Duplicate / triplicate RPD	No RPD limit where concentrations are <10 times LOR	Nil	Performance against DQI considered acceptable.
Duplicate / triplicate RPD	50% RPD limit exceeded where concentrations are 10-20 times LOR	Nil	Performance against DQI considered acceptable.
Duplicate / triplicate RPD	30% RPD limit exceeded where concentrations are >20 times LOR	16	Samples were not homogenised prior to splitting, as volatiles were identified as a COPC. Exceedances likely attributable to heterogeneity in each of the discrete soil samples. As a conservative measure, the samples reporting

Field Considerations	Target	Actual	Comment
			the higher detected concentration of relevant analytes should be used when assessing potential contamination risks on the site. Performance against DQI considered acceptable.
Laboratory Considerations	**Target**	**Actual**	**Comment**
Laboratory duplicates	95% pass	95%	Three exceedances were reported to have exceeded the laboratory acceptance criterion, due to sample heterogeneity. Performance against DQI considered acceptable.

Table 12-5 Accuracy (bias) DQI

Field Considerations	Target	Actual	Comment
Trip blanks	Analytes less than LOR	Analytes less than LOR	Performance against DQI considered acceptable.
Trip spikes	Recoveries between 60% and 140%	Recoveries between 87% and 102%	Performance against DQI considered acceptable.
Rinsate blanks	Analytes less than LOR	Rinsate sample (R-1) reported detections of Arsenic and Cadmium slightly above the laboratory LOR (Lab Ref: 717585)	Due to the increased sensitivity of detections in water samples these detections are considered unlikely to affect the quality of the data. Arsenic and cadmium concentrations in soils did not exceed the site criteria. Performance against DQI considered acceptable.

Laboratory Considerations	Target	Actual	Comment
Method blanks	95% pass	100%	Performance against DQI considered acceptable.
Matrix spikes	95% pass	100%	Performance against DQI considered acceptable.
Surrogate spikes	95% pass	100%	Performance against DQI considered acceptable.
Laboratory control samples	95% pass	95%	Performance against DQI considered acceptable.

13 Discussion

13.1 Human Health – Direct Contact

The detected concentrations of the relevant COPC in the soil samples analysed, were less than the adopted human health direct contact investigation criteria.

Further assessment of direct contact human health exposure risks is considered not warranted.

13.2 Human Health – Vapour Intrusion / Inhalation

There were no detected concentrations of the relevant COPC in the soil samples analysed, which have the potential to pose a vapour intrusion risk to site receptors.

Further assessment of vapour intrusion / inhalation human health exposure risks is considered not warranted.

13.3 Human Health – Asbestos

13.3.1 Bonded Asbestos Containing Materials

Two fragments of bonded ACM greater than 7mm in size were observed during field screening of relevant bulk soil samples at location TP21 at 0.3 m bgl.

Asbestos was identified in one solid sample which was analysed for suspected ACM.

Further assessment of bonded ACM human health exposure risks is considered warranted at this location.

13.3.2 Asbestos Fines/Fibrous Asbestos (AF/FA)

There were no detections of AF/FA in the soil samples analysed. CS notes the soil samples were forwarded to the laboratory for analysis in accordance with AS 4964 (2004), which has a laboratory LOR of 0.01% w/w. Examination of a large sample size (500 ml) may improve the likelihood of detecting asbestos as AF/FA for assessment against the NEPM HSL criteria for AF/FA of 0.001% w/w.

CS notes the broken fibro walls of the old cottage which most likely contain asbestos. Potential AF/FA contamination of surrounding soils cannot be dismissed.

Further assessment of AF/FA human health exposure risks is considered warranted at location TP21 and the footprint of the old fibro cottage.

Furthermore, assessment of soils around other building footprints may also be required, if asbestos is subsequently identified in building materials.

13.4 Aesthetics

The following potential asbestos containing building materials were identified onsite which are currently considered an aesthetic risk:

> Fragments of fibrous cement sheeting were observed on the surface in the vicinity of sampling point TP16, observed to be located on a sealed asphalt surface.

> The walls of the old fibro cottage most likely contain bonded asbestos containing material;

> Various surface demolition waste was identified across the site, which may contain ACM.

Furthermore, due to the age of all buildings onsite, hazardous building materials, including asbestos, lead and zinc may be also present.

Further management of asbestos and other hazardous building materials related to aesthetic risks is considered warranted. This can be conducted during the development phase prior to demolition and earthworks.

The site walkover also revealed potential underground septic tanks at two locations and other septic tanks are considered likely onsite.

The above ground diesel tanks and IBC containing waste engine oil, are also considered to be an aesthetic risk which requires management, prior to earthworks.

The locations of these identified aesthetic risks are presented in **Figure 5A and 5B**.

13.5 Management Limits for Petroleum Hydrocarbons

The detected concentrations of the relevant COPC in the soil samples analysed, were less than the adopted management limits for petroleum hydrocarbon investigation criteria.

Further assessment of petroleum hydrocarbon related risks, in the context of formation of light non-aqueous phase liquids, fire and explosion hazards, or effects on buried infrastructure, is considered not warranted.

14 Revised Conceptual Site Model

Based on CS's assessment of desktop review information, fieldwork observations and laboratory analytical data, in the context of the proposed land use scenario, a revised conceptual site model for the site is presented in Table 14-1.

Table 14-1 Revised Conceptual Site Model

ID	AEC Description	COPC	Exposure Pathway	Receptor	Perceived Risk
AEC01	Imported Fill	Hydrocarbons, pesticides, metals, asbestos	Direct contact	Construction Workers, future residents, visitors	Low – unacceptable contamination risks not detected
			Inhalation (asbestos)		High – ACM detected in location TP21. Asbestos fragments looked slightly degraded, soils may contain AF/FA.
AEC02	Stained soils and incomplete combustion	Asbestos, PAH and metals	Direct contact	Construction Workers	Low – unacceptable contamination risks not detected
AEC03	Green house and adjacent crops	Pesticides, asbestos, PAH and metals	Direct contact Inhalation	Construction Workers	Low – unacceptable contamination risks not detected
AEC04	Former Crops	Pesticides and metals	Direct contact	Construction Workers	Low – unacceptable contamination risks not detected
AEC05	Previous motor vehicle storage	Hydrocarbons, metals	Direct contact Inhalation	Construction Workers	Low – unacceptable contamination risks not detected
AEC06	Soil stockpiles of unknown origin	Hydrocarbons, metals, PAH, pesticides, asbestos	Direct contact Inhalation	Construction Workers	Low – unacceptable contamination risks not detected
AEC07	Soils adjacent to above ground diesel tank	Hydrocarbons, PAH, asbestos and metals	Direct contact Inhalation	Construction Workers	Low – unacceptable contamination risks not detected
AEC08	ACM fragments stacked on surface	Asbestos	Inhalation	Construction Workers	Moderate – ACM stacked on surface observed in good condition

ID	AEC Description	COPC	Exposure Pathway	Receptor	Perceived Risk
AEC09	Oil intermediate bulk container (IBC)	Hydrocarbons, PAH and metals	Direct contact Inhalation	Construction Workers	Aesthetic risk only
AEC10	Old fibro cottage walls broken	Asbestos and metals	Inhalation	Construction Workers	Moderate – ACM observed currently in good condition.
AEC11	Household/Demolition surface waste	Asbestos and metals	Direct contact Inhalation	Construction Workers	Aesthetic risk only
AEC12	Two underground septic tanks	Coliforms, enterococci, E.coli, metals, OCP	Direct contact	Construction Workers	Aesthetic risk only

14.1 Evaluation of SPR Linkages

> **AEC01:** Asbestos contamination was identified in topsoil, at sample location TP21. Inhalation of free fibres in soils during construction may present a risk to future construction workers. Therefore, a SPR linkage cannot be dismissed.

  Laboratory results indicate no detections of asbestos and chemical concentrations are below the adopted investigation criteria at all other AEC01 locations. This indicates a source of contamination is unlikely, hence, a SPR linkage is unlikely to exist.

> **AEC02-AEC07:** Laboratory results indicate no detections of asbestos and chemical concentrations are below the adopted investigation criteria. This indicates a source of contamination is unlikely, hence, a SPR linkage is unlikely to exist.

> **AEC08 and AEC10:** Visual observations during the site walkover have indicated the presence of ACM to be present in the old fibro cottage and broken fragments of fibro sheeting near TP16. CS considers this material to potentially pose a risk of inhalation of asbestos fibres to future construction workers if not managed correctly.

  CS also considers it likely that other buildings located onsite may contain hazardous building materials, including asbestos, lead and zinc. However, a hazardous buildings material survey is beyond the scope of this project.

> **AEC09, AEC11 and AEC12:** The IBC of waste oil, various locations of surface waste observed onsite, and potential underground septic tanks are currently considered aesthetic risks which require management during the proposed development.

14.2 Data Gaps

The following data gaps are noted:

> As stated above, a hazardous building material survey is beyond the scope of this investigation, and should be conducted prior to demolition;

> Building footprints should be investigated to assess contamination status, following their demolition;

> The locations of the test pits have been selected based historical desktop searches and visual observations from one site walkover. CS notes portions of the site are heavily overgrown with grass and

weeds and a visual assessment of surface soils could not be comprehensively undertaken. Topsoil stripping works in the building surrounds should be observed by the environmental consultant;

> Assessment of the locations of all underground septic tanks has not been undertaken. Removal of septic tanks should be observed and validated by the environmental consultant;

> Assessment of potential asbestos containing subsurface infrastructure (such as irrigation pipes) may be present and has not been investigated.

CS considers further assessment of soils can be conducted during the earthworks phase of development and inspections of buildings to be undertaken prior to demolition.

15 Conclusions and Recommendations

Based on CS's assessment of desktop review information, fieldwork observations and laboratory analytical data, in the context of the proposed land use scenario of industrial/commercial, CS makes the following conclusions:

> Bonded asbestos contamination was identified in fill, at sample location TP21. The potential for free asbestos fibres in soils at this location cannot be dismissed, which may present an unacceptable human health exposure risk;

> Bonded asbestos was identified on the surface near TP16 and the old fibro cottage, which may present an unacceptable human health exposure risk and unacceptable aesthetics risk;

> It is likely that other buildings located onsite may contain hazardous building materials, including asbestos, lead and zinc, which may present an unacceptable human health exposure risk and currently pose an aesthetics risk;

> Potential underground septic tanks are considered likely, which may pose an aesthetic risk;

> The above ground diesel tanks, surface household/demolition waste and IBC containing waste engine, may pose an aesthetic risk;

> Potential unexpected finds of underground asbestos containing infrastructure may pose an unacceptable human health exposure risk;

> The proposed development may require importation of material to raise the entire site to specific design levels and therefore an import protocol will be required to validate the importation of material.

> The site could be made suitable for the proposed land use scenario, subject to:

- A hazardous building material survey of all buildings prior to demolition;
- Validation sampling of soils around the footprints of buildings, following demolition;
- Decommissioning of septic tanks and above ground tanks;
- Inspection and removal of all household/demolition waste; and
- Management and/or remediation of the bonded ACM and potential friable asbestos / asbestos fines in soil at TP21; and
- Procedures being detailed for management and/or remediation of unexpected finds of asbestos infrastructure;
- An import protocol be implemented to validate the importation of material.

Based on these conclusions, CS makes the following recommendations:

> Undertake a supplementary assessment of the identified asbestos risks, in order to delineate the lateral and vertical extent of the identified asbestos at TP21;

> A remedial action plan (RAP) should be prepared to include, but not limited to:

- Remediation methodology;
- an unexpected find protocol (UFP) for potential unidentified asbestos contamination or additional contamination found during earthworks;
- supplementary validation of building footprints post-demolition;
- validation inspections of footprints of locations which were identified as an aesthetic risk; and
- Import protocol which will validate material to be imported and guide material tracking.

> A site validation report (SVR) should be prepared at the completion of all management / remedial works, confirming that the site has been made suitable for the proposed land use scenario.

16 References

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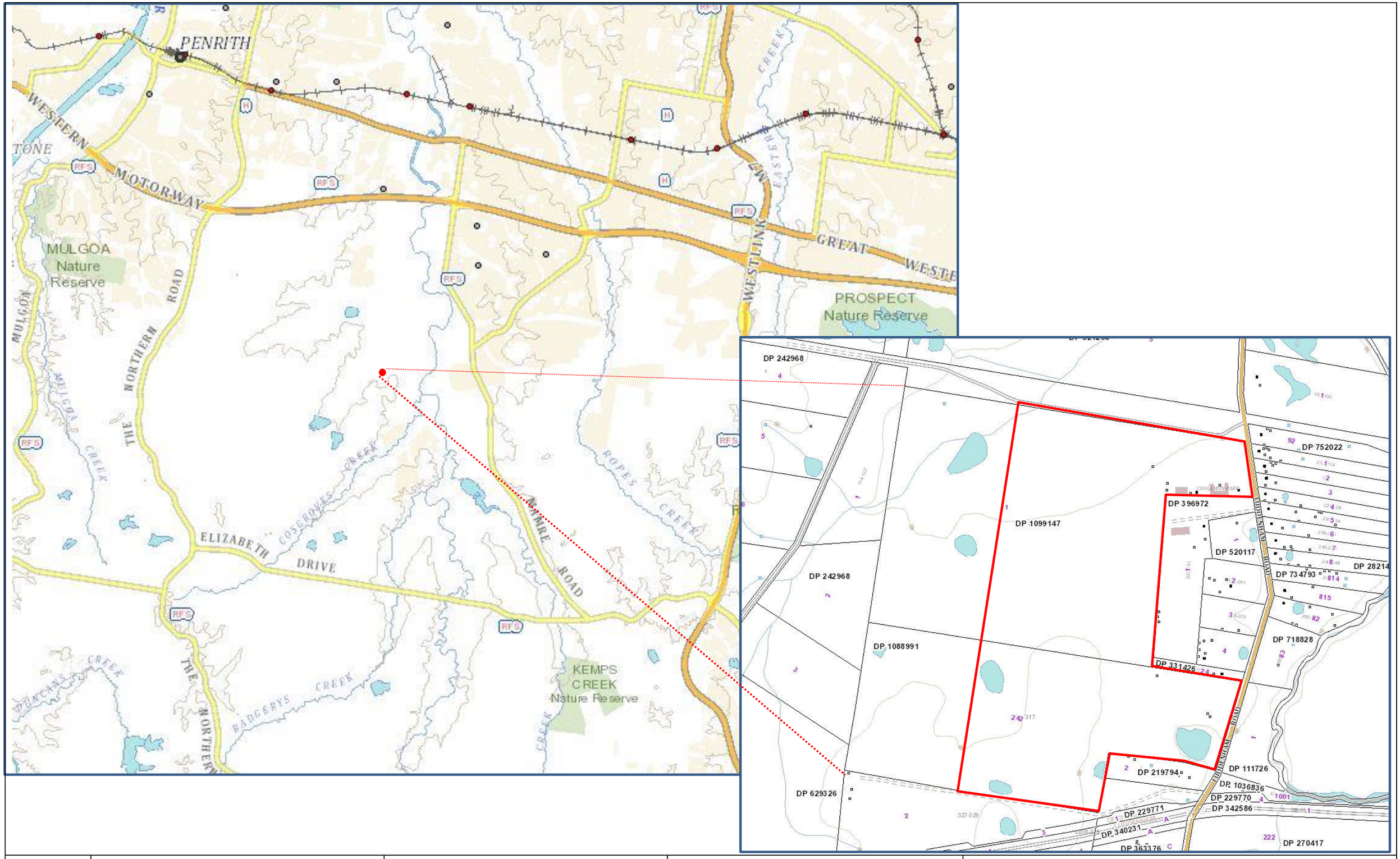
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221-227 and 289-311 Luddenham Road, Orchard Hill, NSW, 2745

Figure 1

SITE LOCATION

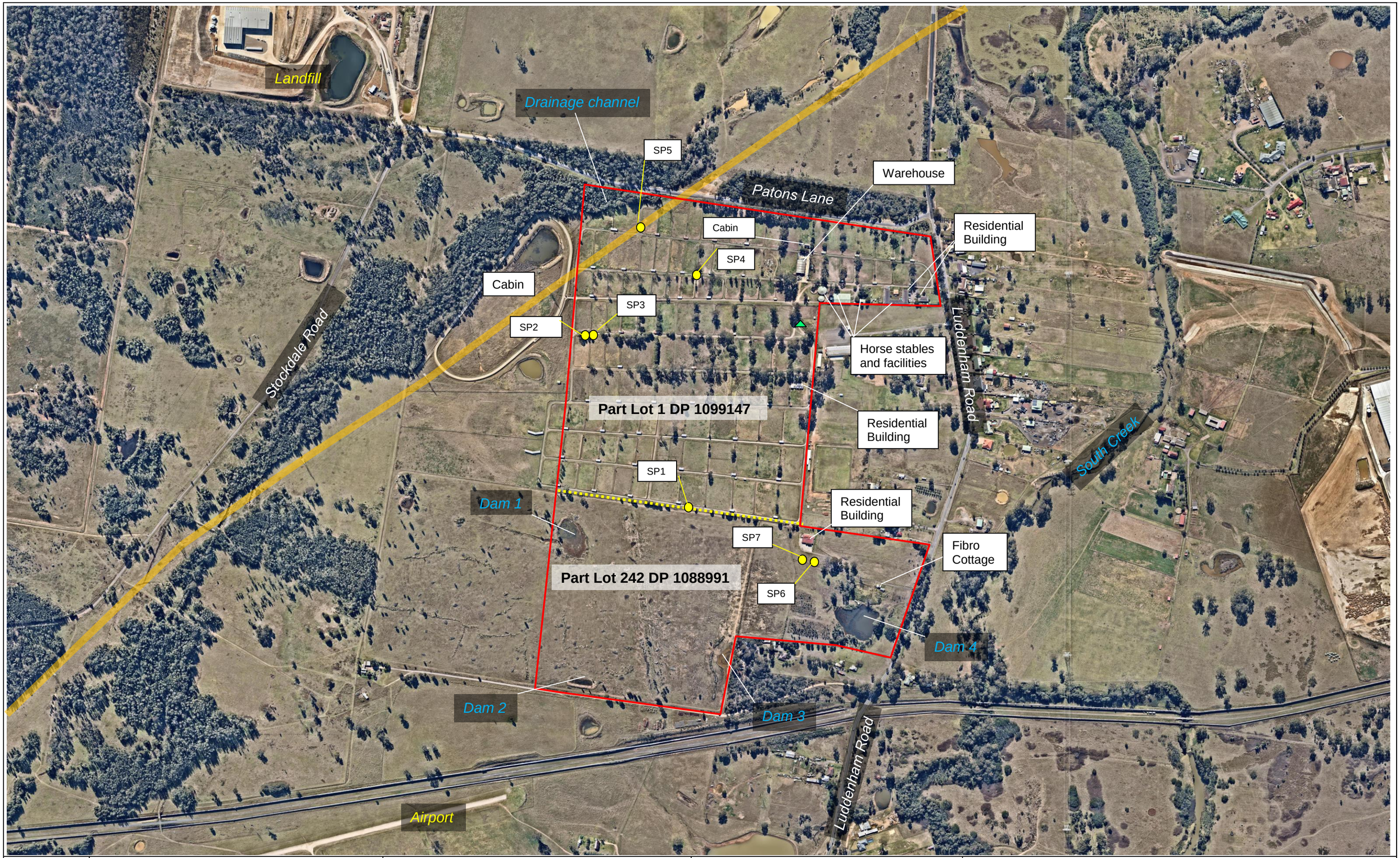


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			Date:22 April 2020	Client HB+B Property Pty Ltd
			Drawn By: Beau Dubois	Location: Part Lot 1 in DP 1099147 and Part Lot 242 in DP 1088991 Address: 221-227 and 289-311 Luddenham Road, Orchard Hills, NSW, 2745
			Drawing No: 5046200067 Figure 1	Sheet: 1 of 1 — **Site Location**

221-227 and 289-311
Luddenham Road,
Orchard Hill, NSW, 2745

Figure 2

SITE LAYOUT



LEGEND:

- Approximate Site Boundary
- Easement for Transmission Line
- Internal Lot Boundary
- Stockpiles
- Diesel Tanks

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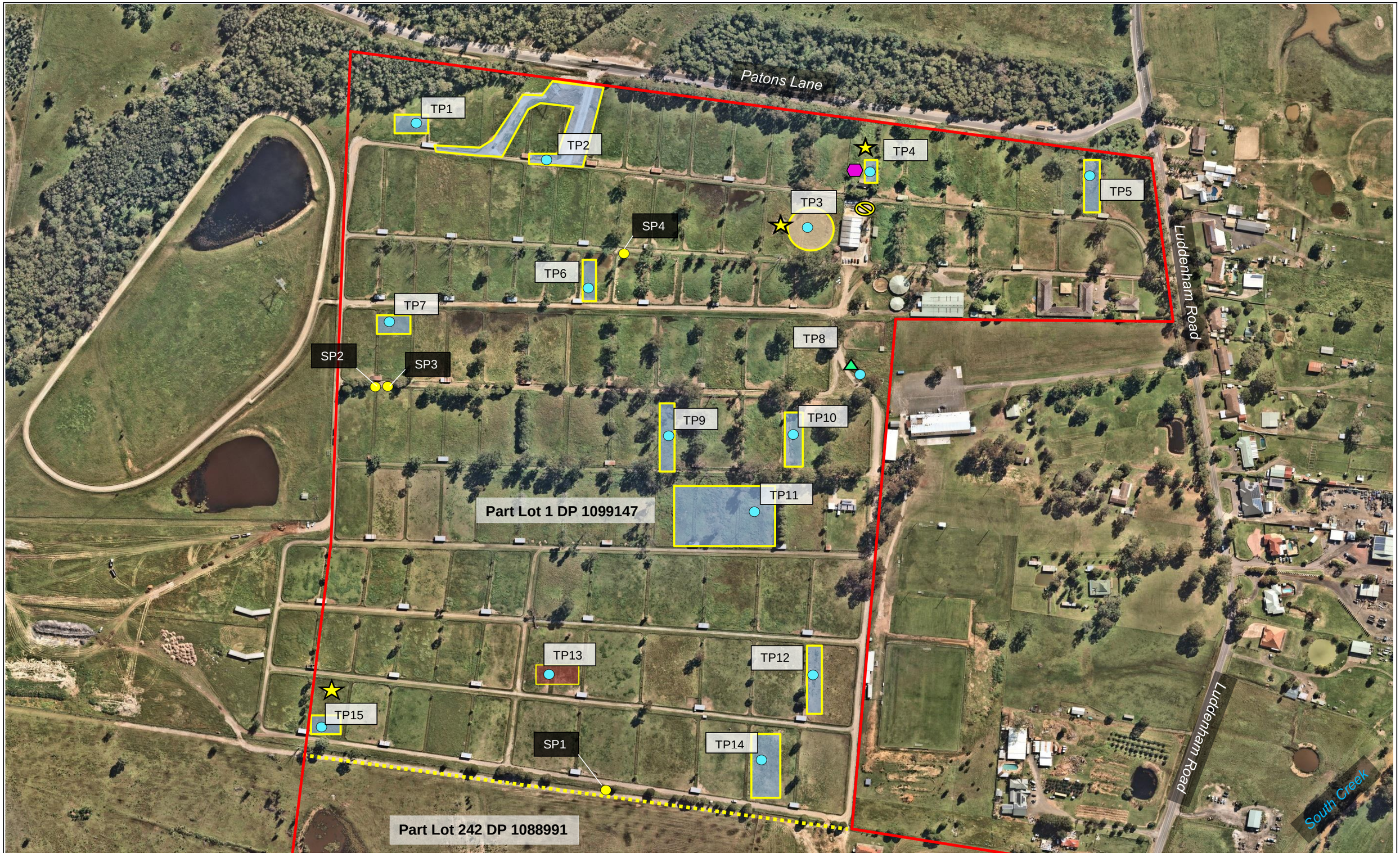
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Drawn By: Beau Dubois	Location: Part Lot 1 in DP 1099147 and Part Lot 242 in DP 1088991 Address: 221-227 and 289-311 Luddenham Road, Orchard Hills, NSW, 2745
Drawing No: **Figure 2**	Sheet: 1 of 1

SITE LAYOUT

221-227 and 289-311 Luddenham Road, Orchard Hill, NSW, 2745

Figure 3A

SAMPLE PLAN A & AREAS OF CONCERN



LEGEND:

- Site Boundary
- Lot Boundary
- Sample Locations
- AEC01
- AEC02
- AEC03
- AEC04
- AEC05
- AEC06
- AEC07
- AEC08
- AEC09
- AEC10
- AEC11
- AEC12

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Date: 22 April 2020

Drawn By: Beau Dubois

Drawing No: **Figure 3A**

Project: 5046200067

Client: HB+B Property Pty Ltd

Location: Part Lot 1 in DP 1099147
Address: 221-227 and 289-311 Luddenham Road, Orchard Hills, NSW, 2745

Sheet: 1 of 2

SAMPLING PLAN A and AREAS OF CONCERN

221-227 and 289-311
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Orchard Hill, NSW, 2745

Figure 3B

SAMPLE PLAN B & AREAS OF CONCERN



N

LEGEND:

- Site Boundary
- Lot Boundary
- Sample Locations
- AEC01
- AEC02
- AEC03
- AEC04
- AEC05
- AEC06
- AEC07
- AEC08
- AEC09
- AEC10
- AEC11
- AEC12

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Scale(m) 0 200 400

Date: 01 May 2020

Drawn By: Beau Dubois

Drawing No: **Figure 3B**

Project: 5046200067

Client: HB+B Property Pty Ltd

Location: Part Lot 242 DP 1088991
Address: 221-227 and 289-311 Luddenham Road, Orchard Hills, NSW, 2745

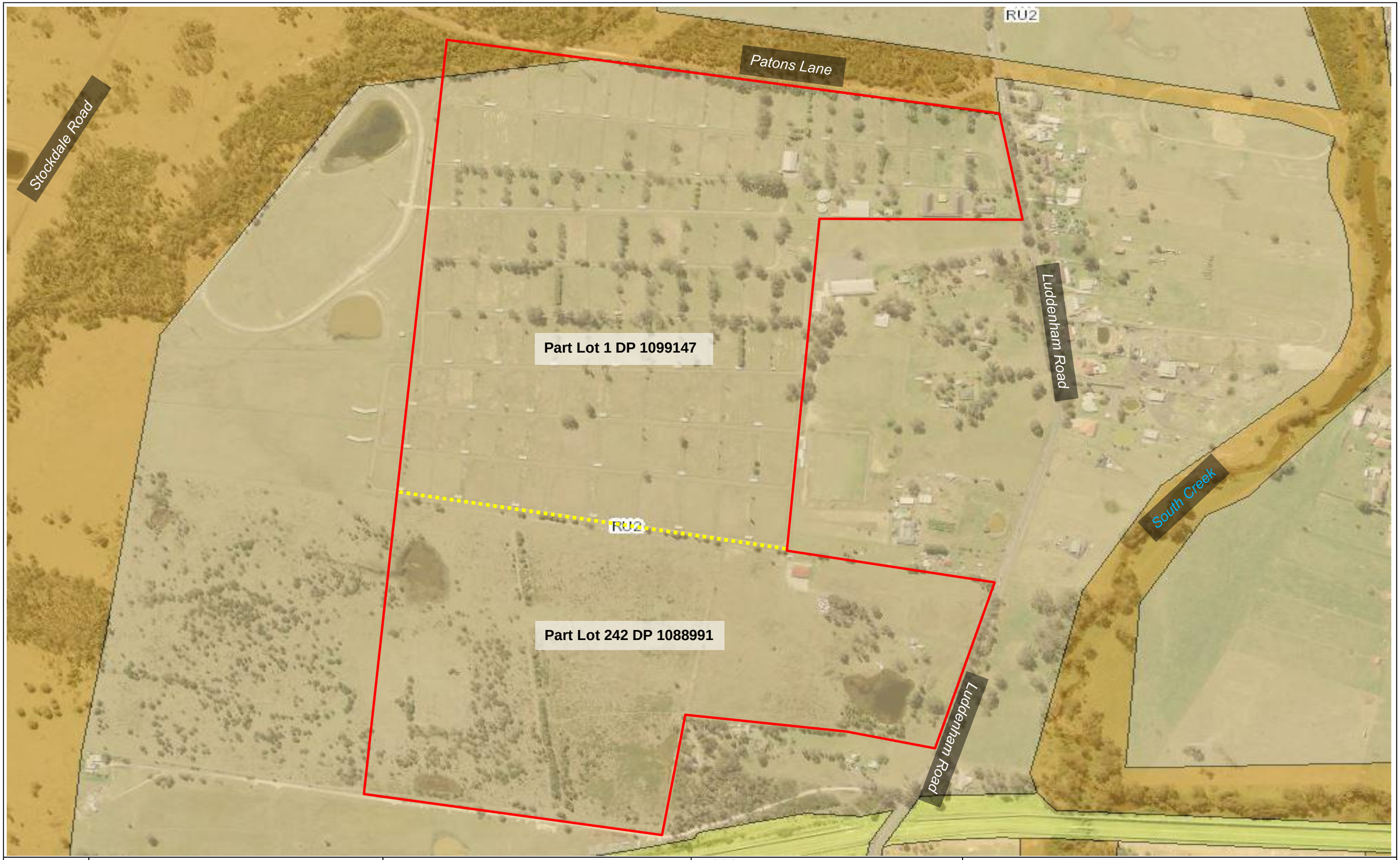
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SAMPLING PLAN B and AREAS OF CONCERN

221-227 and 289-311
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Figure 4

SITE ZONING



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LEGEND:

- **Approximate Site Boundary**
- **Internal Lot Boundary**
- **Zoning: E2 – Environmental Conservation**
- **Zoning: RU2 – Rural Landscape**

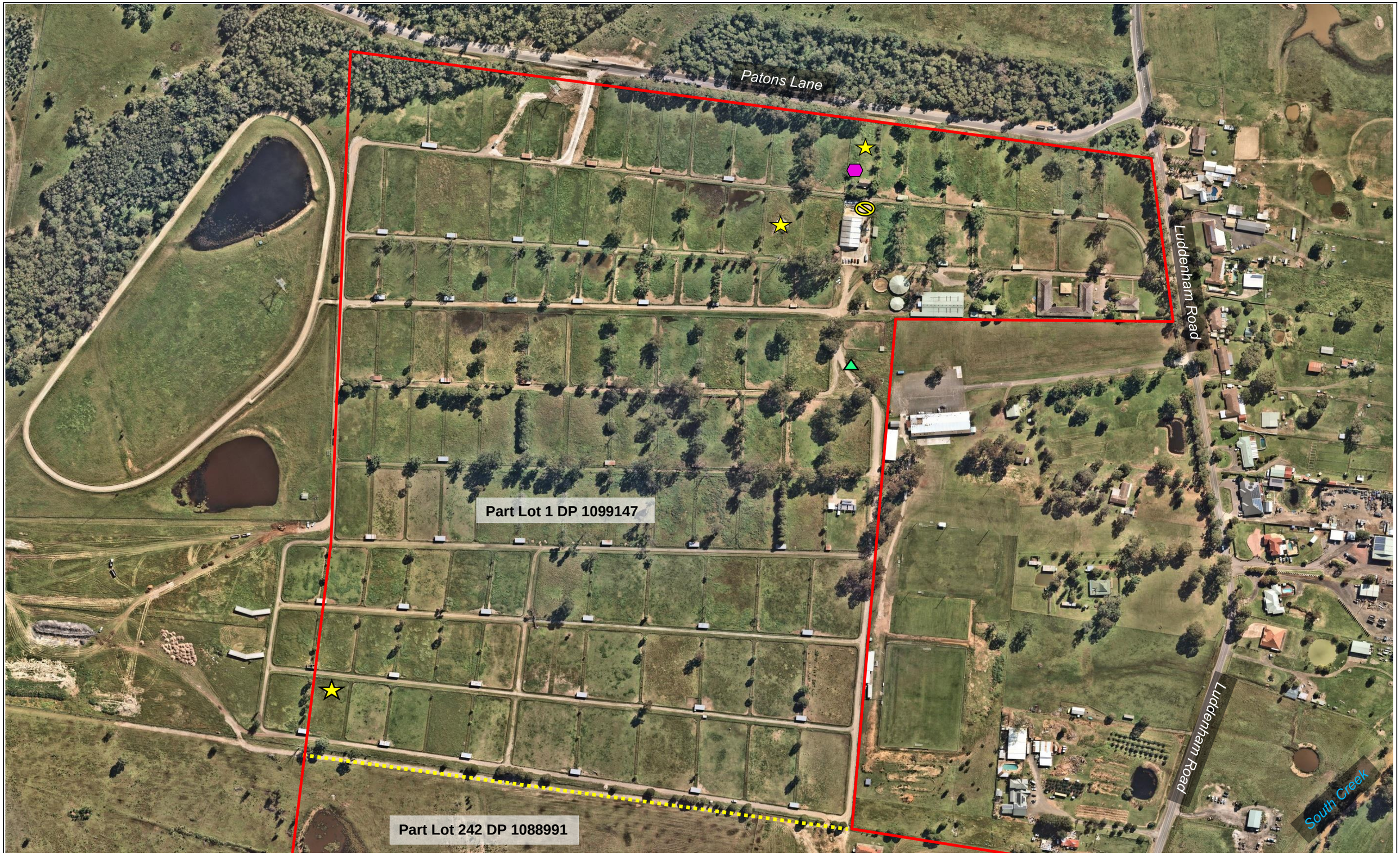
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Scale(m) 0 200 400	Project: 5046200067	
Date: 22 April 2020	Client: HB+B Property Pty Ltd	
Drawn By: Beau Dubois	Location: Part Lot 1 in DP 1099147 and Part Lot 242 in DP 1088991 Address: 221-227 and 289-311 Luddenham Road, Orchard Hills, NSW, 2745	
Drawing No: **Figure 4**	Sheet: 1 of 1	**SITE ZONING**

221-227 and 289-311 Luddenham Road, Orchard Hill, NSW, 2745

Figure 5A

REVISED AREAS OF CONCERN A



N

LEGEND:

- Site Boundary
- Lot Boundary
- AEC01
- AEC07
- AEC08
- AEC09
- AEC10
- AEC11
- AEC12

Construction Sciences

31 Anvil Road
SEVEN HILLS NSW 2147
Tel: (02) 8646 2000
Fax: (02) 8646 2025
Web: www.constructionsciences.net

Scale(m) 0 200 400	Project: 5046200067
Date: 22 May 2020	Client: HB+B Property Pty Ltd
Drawn By: Beau Dubois	Location: Part Lot 1 in DP 1099147 Address: 221-227 and 289-311 Luddenham Road, Orchard Hills, NSW, 2745
Drawing No: **Figure 5A**	Sheet: 1 of 2

REVISED AREAS OF CONCERN

221-227 and 289-311 Luddenham Road, Orchard Hill, NSW, 2745

Figure 5B

REVISED AREAS OF CONCERN B



N

LEGEND:

- Site Boundary
- Lot Boundary
- AEC01
- AEC07
- AEC08
- AEC09
- AEC10
- AEC11
- AEC12

Construction Sciences

31 Anvil Road
SEVEN HILLS NSW 2147
Tel: (02) 8646 2000
Fax: (02) 8646 2025
Web: www.constructionsciences.net

Scale(m) 0 200 400	Project: 5046200067
Date: 22 May 2020	Client: HB+B Property Pty Ltd
Drawn By: Beau Dubois	Location: Part Lot 242 DP 1088991 Address: 221-227 and 289-311 Luddenham Road, Orchard Hills, NSW, 2745
Drawing No: **Figure 5B**	Sheet: 2 of 2 — **REVISED AREAS OF CONCERN B**

221-227 and 289-311
Luddenham Road,
Orchard Hill, NSW, 2748

APPENDIX A

LIMITATIONS AND GENERAL NOTES

Information About This Report

LIMITATIONS

Scope of Services: The report has been prepared in accordance with the scope of services set out in CS's Proposal under CS's Terms of Engagement, or as otherwise agreed with the Client. The scope of services may have been limited and/or amended by a range of factors including time, budget, access and site constraints.

Specific Purpose: The report is provided for the specific development and purpose as described in the report. The report may not contain sufficient information for developments or purposes other than that described in the report.

Currency of Information: The information in this report is considered accurate at the date of issue with regard to the current conditions of the site.

Reliance on Information: In preparing the report CS has necessarily relied upon information provided by the Client and/or their Agents. Such data may include surveys, analyses, designs, maps and plans. CS has not verified the accuracy or completeness of the data except as stated in this report.

Copyright and Reproduction: The contents of this document are and remain the intellectual property of CS. This document should only be used for the purpose for which it was commissioned and should not be used for other projects or by a third party. This report shall not be reproduced either totally or in part without the permission of CS. Where information from this report is to be included in contract documents or engineering specification for the project, the entire report should be included in order to minimise the likelihood of misinterpretation.

Construction Specifications: Unless otherwise stated, the report, or sections of the report, should not be used as part of a specification for a project, without review and agreement by CS.

Report Should Not be Separated: The report must be read in conjunction with the attached Information Sheets and any other explanatory notes and should be kept in its entirety without separation of individual pages or sections.

Review by Others: CS cannot be held responsible for interpretations or conclusions from review by others of this report or test data, which are not otherwise supported by an expressed statement, interpretation, outcome or conclusion stated in this report.

GENERAL NOTES

Geotechnical and Environmental Reporting: Geotechnical and environmental reporting relies on the interpretation of factual information based on judgment and opinion and is far less exact than other engineering or design disciplines. Geotechnical and environmental reports are for a specific purpose, development and site as described in the report and may not contain sufficient information for other purposes, developments or sites (including adjacent sites) other than that described in the report.

Subsurface Conditions: Subsurface conditions can change with time and can vary between test locations. For example, the actual interface between the materials may be far more gradual or abrupt than indicated and contaminant presence may be affected by spatial and temporal patterns. Therefore, actual conditions in areas not sampled may differ from those predicted since no subsurface investigation, no matter how comprehensive, can reveal all subsurface details and anomalies. Construction operations at or adjacent to the site and natural events such as floods, earthquakes or groundwater fluctuations can also affect subsurface conditions and thus the continuing adequacy of a geotechnical report. CS should be kept informed of any such events and should be retained to identify variances, conduct additional tests if required, and recommend solutions to problems encountered on site.

Groundwater: Groundwater levels indicated on borehole and test pit logs are recorded at specific times. Depending on ground permeability, measured levels may or may not reflect actual levels if measured over a longer time period. Also, groundwater levels and seepage inflows may fluctuate with seasonal and environmental variations and construction activities.

Interpretation of Data: Data obtained from nominated discrete locations, subsequent laboratory testing and empirical or external sources are interpreted by trained professionals in order to provide an opinion about overall site conditions, their likely impact with respect to the report purpose and recommended actions in accordance with any relevant industry standards, guidelines or procedures.

Soil and Rock Descriptions: Soil and rock descriptions are based on AS 1726 – 2017, using visual and tactile assessment except at discrete locations where field and / or laboratory tests have been carried out. Refer to the accompanying soil and rock terms sheet for further information.

Further Advice: CS would be pleased to further discuss how any of the above issues could affect a specific project. We would also be pleased to provide further advice or assistance including:

- Assessment of suitability of designs and construction techniques;
- Contract documentation and specification;
- Construction control testing (earthworks, pavement materials, concrete);
- Construction advice (foundation assessments, excavation support).

221-227 and 289-311
Luddenham Road,
Orchard Hill, NSW, 2748

APPENDIX B

BUILDING PLAN

DEVELOPMENT SUMMARY

SITE AREA 1	689,974m²
SITE AREA 2	513,462m²
RMS ORBITAL	360,362m²
NOT DEVELOPABLE (EXCL. EASEMENTS)	53,020m²
WESTERN SYDNEY FREIGHT	6,056m²
ELECTRICAL EASEMENT	23,329m²
VENDOR LOT (LOT 5)	50,000m²
TOTAL DEVELOPMENT AREA	~~760,669m²~~
TOTAL WAREHOUSE GLA	348,600m²
TOTAL OFFICE GLA	18,500m²
TOTAL INDUSTRIAL UNITS	26,200m²
TOTAL BUILDING AREA	**393,300m²**
TOTAL DEVELOPABLE F.S.R.	**0.52:1**

DEVELOPMENT AREAS

STAGE 1

SITE AREA		382,275m²
WAREHOUSE	(4 BUILDINGS)	135,800m²
INDUSTRIAL UNITS	(3 BUILDINGS)	26,200m²
OFFICE (2 STOREY)	(7 OFFICES)	6,700m²
OFFICE - INDUSTRIAL UNITS		1,300m²
TOTAL BUILDING AREA		170,000m²
HEAVY DUTY AREA (TRUCKS)		46,220m²
LIGHT DUTY AREA (CARS)		28,200m²
INDUSTRIAL UNITS (SHARED CAR/TRUCK ZONE)		17,325m²
CAR PARKING REQUIRED		915 SPACES
CAP PARKING PROVIDED		
ROAD RESERVE 20.6m WIDE		30,230m²
SITE COVERAGE (EXCLUDING WAREHOUSE AWNING AREAS)		164,500m² (43.0%)

STAGE 2

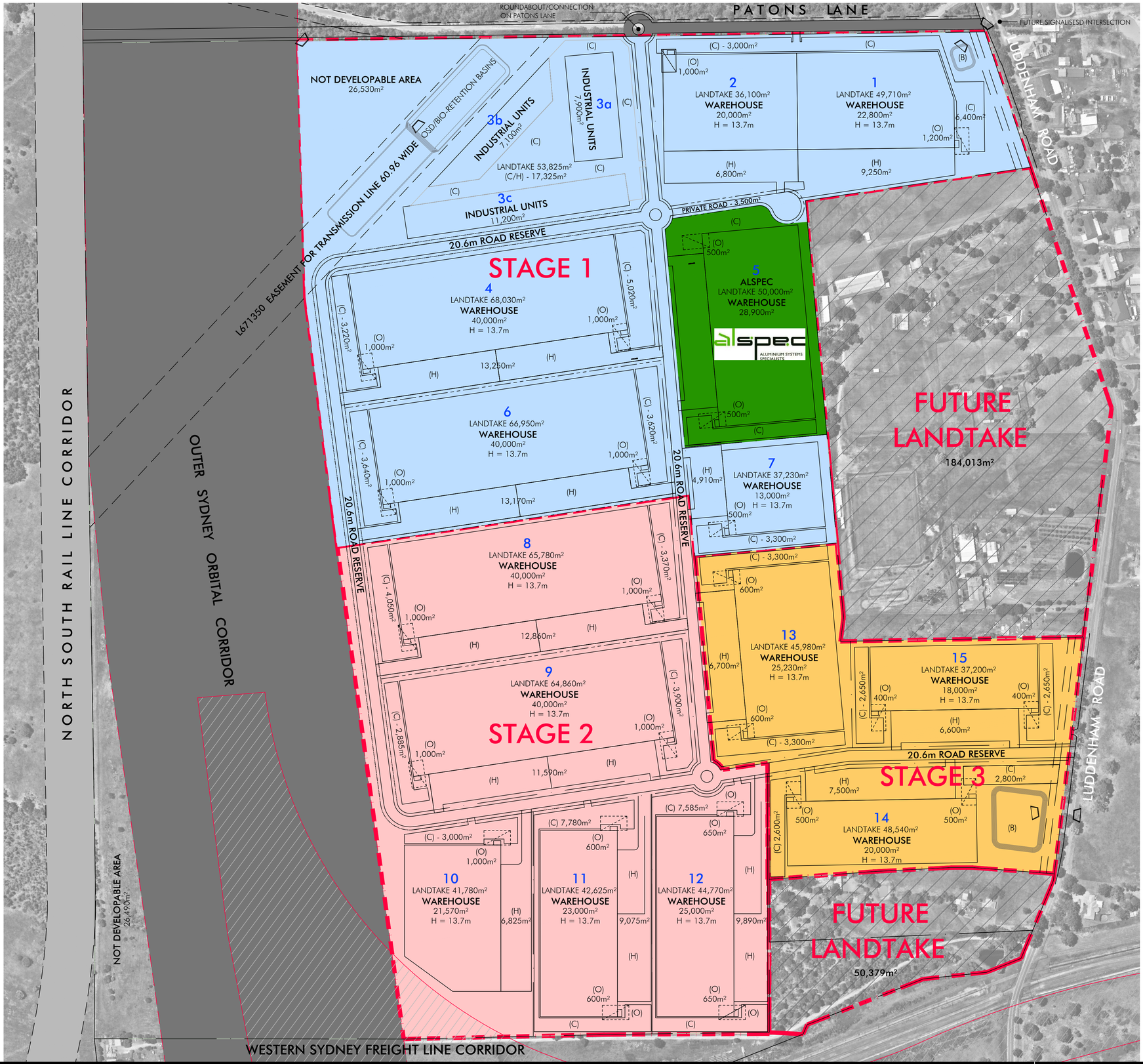
SITE AREA		294,043m²
WAREHOUSE	(5 BUILDINGS)	149,570m²
OFFICE (2 STOREY)	(9 OFFICES)	7,500m²
TOTAL BUILDING AREA		157,070m²
HEAVY DUTY AREA (TRUCKS)		50,240m²
LIGHT DUTY AREA (CARS)		32,570m²
CAR PARKING REQUIRED		684 SPACES
CAP PARKING PROVIDED		
ROAD RESERVE 20.6m WIDE		24,250m²
SITE COVERAGE (EXCLUDING WAREHOUSE AWNING AREAS)		156,150m² (53.1%)

STAGE 3

SITE AREA		139,942m²
WAREHOUSE	(3 BUILDINGS)	63,230m²
OFFICE (2 STOREY)	(6 OFFICES)	3,000m²
TOTAL BUILDING AREA		66,230m²
HEAVY DUTY AREA (TRUCKS)		20,800m²
LIGHT DUTY AREA (CARS)		17,300m²
CAR PARKING REQUIRED		278 SPACES
CAP PARKING PROVIDED		
ROAD RESERVE 20.6m WIDE		7,720m²
SITE COVERAGE (EXCLUDING WAREHOUSE AWNING AREAS)		68,170m² (48.71%)

PRE-RELEASE 1

SITE AREA		50,000m²
WAREHOUSE	(1 BUILDING)	28,900m²
OFFICE (2 STOREY)	(1 OFFICE)	1,000m²
TOTAL BUILDING AREA		29,900m²
HEAVY DUTY AREA (TRUCKS)		7,850m²
LIGHT DUTY AREA (CARS)		5,800m²
CAR PARKING REQUIRED		122 SPACES
CAP PARKING PROVIDED		
SITE COVERAGE (EXCLUDING WAREHOUSE AWNING AREAS)		29,800m² (59.6%)



AutoCAD/11178_SK008[P2].dwg

DRAFT

IDD PROPERTY®

221-227 & 289-317 Luddenham Road

Orchard Hills - NSW

Luddenham Road

master plan - ground

SCALE 1:5000(A3)

DATE OCT 2019 SKETCH NUMBER 11178_SK008[P2]

nettletontribe

221-227 and 289-311 Luddenham Road, Orchard Hill, NSW, 2748

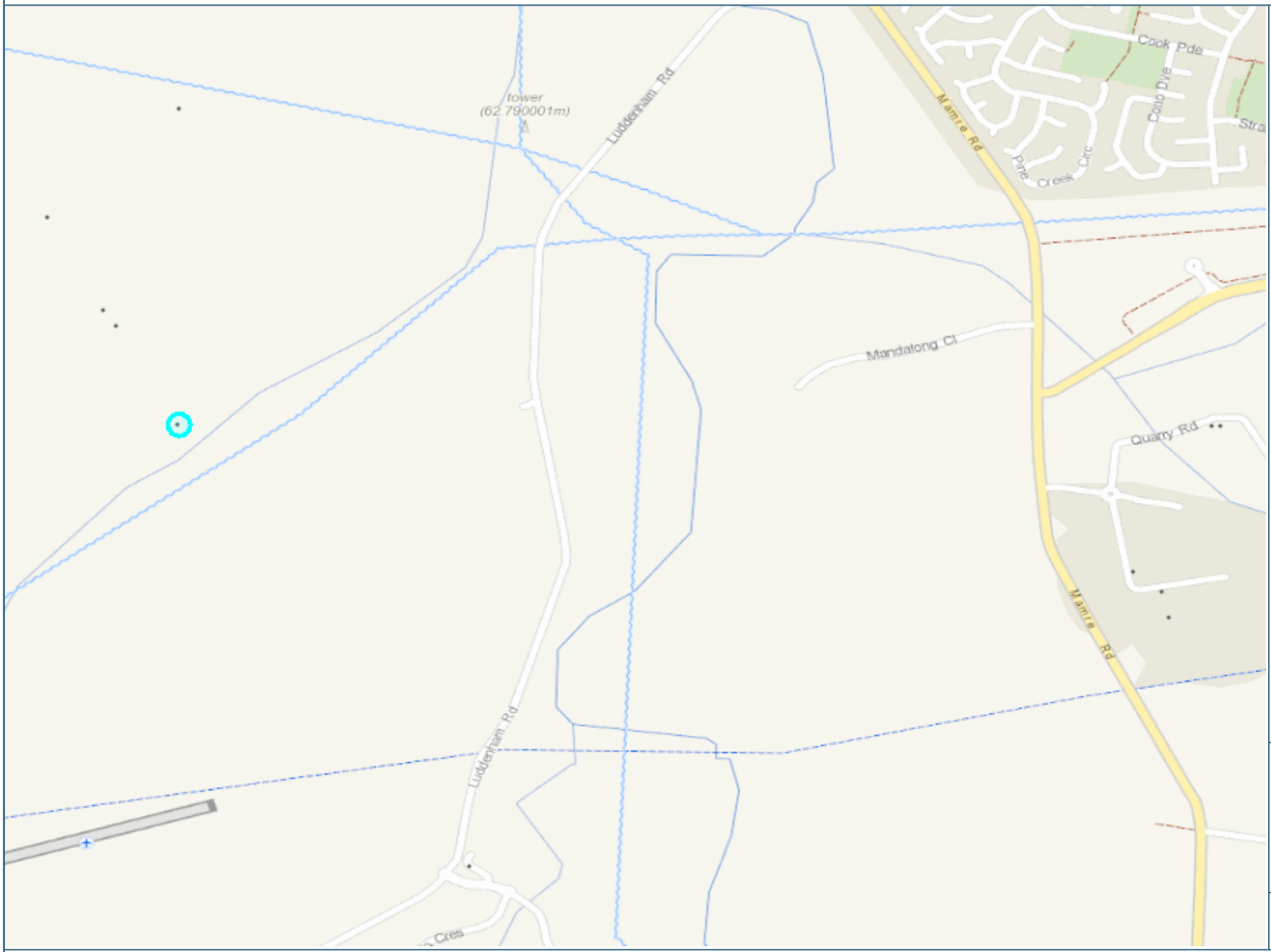
APPENDIX C

GROUNDWATER BORE SEARCH

Australian Government
Bureau of Meteorology

Australian Groundwater Explorer

Bore locations



All bores

Bore

All bores

All bores

Bore density per 25km2

1 - 5

6 - 10

11 - 20

21 - 50

51 - 100

101 - 200

More than 200

Mainland outline

N

1:16,958

Kilometres 0.3 0.5

Data Source: Bureau of Meteorology, Geoscience Australia and State/Territory lead water agencies. Refer to metadata for further information: Click here

Australian Albers GDA94

CC BY

Date: 22 April, 2020

WaterNSW
Work Summary

GW105382

Licence: 10WA109455 **Licence Status:** CURRENT

Authorised Purpose(s): INDUSTRIAL
Intended Purpose(s): INDUSTRIAL

Work Type: Bore
Work Status:
Construct.Method: Rotary
Owner Type:

Commenced Date: **Final Depth:** 252.00 m
Completion Date: 19/04/2004 **Drilled Depth:** 252.00 m

Contractor Name: Ultra Drilling
Driller: Bradley Alan Dodd
Assistant Driller:

Property: OSBOURNE PARK 227 Luddenham Rd ORCHARD HILLS 2748 NSW **Standing Water Level (m):** 24.000
GWMA: - **Salinity Description:**
GW Zone: - **Yield (L/s):** 1.100

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	CUMBERLAND	CLAREMONT	1 1099147
Licensed:	CUMBERLAND	CLAREMONT	Whole Lot 1//1099147

Region: 10 - Sydney South Coast **CMA Map:**
River Basin: - Unknown **Grid Zone:** **Scale:**
Area/District:

Elevation: 0.00 m (A.H.D.) **Northing:** 6255672.000 **Latitude:** 33°49'07.2"S
Elevation Source: Unknown **Easting:** 291651.000 **Longitude:** 150°44'55.9"E

GS Map: - **MGA Zone:** 56 **Coordinate Source:** Unknown

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	90.00	171			Down Hole Hammer
1		Hole	Hole	90.00	252.00	140			Down Hole Hammer
1	1	Casing	Pvc Class 9	0.30	90.00	140			Driven into Hole, Riveted and Glued
1	1	Casing	Steel	0.30	1.00	168			Driven into Hole, Riveted and Glued

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
144.00	145.00	1.00	Unknown		146.00	0.60	146.00	01:00:00	3760.00
180.00	181.00	1.00	Unknown		182.00	0.90	243.00	01:00:00	2760.00
240.00	241.00	1.00	Unknown	24.00	243.00	1.10	243.00	01:00:00	2490.00

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	5.00	5.00	CLAY	Clay	
5.00	80.00	75.00	SHALE	Shale	

80.00	119.00	39.00	SANDSTONE	Sandstone	
119.00	125.00	6.00	SHALE	Shale	
125.00	222.00	97.00	SANDSTONE	Sandstone	
222.00	226.00	4.00	SHALE	Shale	
226.00	240.00	14.00	SANDSTONE	Sandstone	
240.00	252.00	12.00	SANDSTONE	Sandstone	

Remarks

09/11/2005: Previous Lic No: 10BL163876

***** End of GW105382 *****

Warning To Clients: This raw data has been supplied to the WaterNSW by drillers, licensees and other sources. WaterNSW does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

221-227 and 289-311
Luddenham Road,
Orchard Hill, NSW, 2748

APPENDIX D

NSW EPA RECORDS

Search results

Your search for: LGA: PENRITH CITY COUNCIL

Matched 42 notices relating to 8 sites.

Search Again Refine Search

Suburb	Address	Site Name	Notices related to this site
BERKSHIRE PARK	(Northern end of Compartment 5) The Northern ROAD	Castlereagh State Forest	6 former
COLYTON	86-88 Great Western HIGHWAY	Coles Express (former Ampol) Service Station	2 current
JAMISONTOWN	92 Mulgoa ROAD	7-Eleven Service Station	2 current and 3 former
LUDDENHAM	Lot 4 The Northern ROAD	Elura Liquid Waste Disposal Site	1 former
MULGOA	Mulgoa ROAD	Penrith Waste Services	2 former
PENRITH	Castlereagh ROAD	Crane Enfield Metals	1 current and 10 former
ST MARYS	Vallance STREET	Drum Recycler	5 former
ST MARYS	38 LINKS ROAD	Solveco	3 current and 7 former

17 May 2020

POEO Public Register Search Results

27th April 2020

Number	Name	Location	Type	Status	Issued date
1587553		BETWEEN EATON ROAD, LUDDENHAM AND GLENMORE PARKWAY, ORCHARD HILLS, NSW 2748	s.58 Licence Variation	Issued	20-Dec-19
1591079		123 - 129 Patons Lane, ORCHARD HILLS, NSW 2748	s.58 Licence Variation	Pending	28-Jan-20
21189	CPB CONTRACTORS PTY LIMITED	BETWEEN EATON ROAD, LUDDENHAM AND GLENMORE PARKWAY, ORCHARD HILLS, NSW 2748	POEO licence	Issued	4-Feb-19
1580470	CPB CONTRACTORS PTY LIMITED	BETWEEN EATON ROAD, LUDDENHAM AND GLENMORE PARKWAY, ORCHARD HILLS, NSW 2748	s.58 Licence Variation	Issued	3-Jul-19
1052234	ERSKINE PARK QUARRY (NSW) PTY LTD	123-179 PATONS LANE, ORCHARD HILLS, NSW 2748	s.58 Licence Variation	Issued	29-Sep-05
21095	LENDLEASE ENGINEERING PTY LIMITED	2006-2012 THE NORTHERN ROAD, ORCHARD HILLS, NSW 2748	POEO licence	Surrendered	1-Jun-18
1566009	LENDLEASE ENGINEERING PTY LIMITED	2006-2012 THE NORTHERN ROAD, ORCHARD HILLS, NSW 2748	s.58 Licence Variation	Issued	15-Aug-18
1576713	LENDLEASE ENGINEERING PTY LIMITED	2006-2012 THE NORTHERN ROAD, ORCHARD HILLS, NSW 2748	s.58 Licence Variation	Issued	5-Mar-19
1582683	LENDLEASE ENGINEERING PTY LIMITED	2006-2012 THE NORTHERN ROAD, ORCHARD HILLS, NSW 2748	s.80 Surrender of a Licence	Issued	3-Oct-19
4426	MULGOA QUARRIES PTY LTD	LOT 1 BRADLEY STREET, ORCHARD HILLS, NSW 2748	POEO licence	Surrendered	3-May-01
1031567	MULGOA QUARRIES PTY LTD	LOT 1 BRADLEY STREET, ORCHARD HILLS, NSW 2748	s.58 Licence Variation	Issued	20-Nov-03
1046340	MULGOA QUARRIES PTY LTD	LOT 1 BRADLEY STREET, ORCHARD HILLS, NSW 2748	s.80 Surrender of a Licence	Issued	15-Apr-05
11706	ORCHARD HOLDINGS (NSW) PTY LTD (C/- CONDON ASSOCIATES - LIQUIDATORS)	123-179 PATONS LANE, ORCHARD HILLS, NSW 2748	POEO licence	Revoked	18-Sep-03
1075573	ORCHARD HOLDINGS (NSW) PTY LTD (C/- CONDON ASSOCIATES - LIQUIDATORS)	123-179 PATONS LANE, ORCHARD HILLS, NSW 2748	s.58 Licence Variation	Issued	7-Aug-07
1505842	ORCHARD HOLDINGS (NSW) PTY LTD (C/- CONDON ASSOCIATES - LIQUIDATORS)	123-179 PATONS LANE, ORCHARD HILLS, NSW 2748	s.79 Revocation of a Licence	Issued	14-Dec-12
20814	SRC OPERATIONS PTY LIMITED	123 - 129 Patons Lane, ORCHARD HILLS, NSW 2748	POEO licence	Issued	8-Nov-16
1549714	SRC OPERATIONS PTY LIMITED	123 - 129 Patons Lane, ORCHARD HILLS, NSW 2748	s.58 Licence Variation	Issued	20-Mar-17
1566725	SRC OPERATIONS PTY LIMITED	123 - 129 Patons Lane, ORCHARD HILLS, NSW 2748	s.58 Licence Variation	Issued	15-Aug-18
21259	SRC OPERATIONS PTY LIMITED	123 - 129 Patons Lane, ORCHARD HILLS, NSW 2748	POEO licence	Issued	28-Jun-19
1577073	SRC OPERATIONS PTY LIMITED	123 - 129 Patons Lane, ORCHARD HILLS, NSW 2748	s.58 Licence Variation	Issued	20-Aug-19
3173526043	TOP DEMOLITION & EXCAVATION PTY LTD	338/356 Wentworth Rd, ORCHARD HILLS, NSW 2748	Penalty Notice	Issued	27-Jul-18

221-227 and 289-311
Luddenham Road,
Orchard Hill, NSW, 2748

APPENDIX E

PLANNING CERTIFICATES

PENRITH CITY COUNCIL

Civic Centre
601 High Street, Penrith

PO Box 60 Penrith NSW 2751
Telephone: 02 4732 7777
Facsimile: 02 4732 7958
Email: pencit@penrithcity.nsw.gov.au

PLANNING CERTIFICATE UNDER SECTION 10.7

Environmental Planning and Assessment Act, 1979

Property No: 783103
Your Reference: Luddenham, Orchard Hills
Contact No.

Issue Date: 24 April 2020
Certificate No: 20/01826

Issued to: Mr B Dubois
31 Anvil Road
SEVEN HILLS NSW 2147

PRECINCT 2010

DESCRIPTION OF LAND

County: CUMBERLAND **Parish: CLAREMONT**

Location: Coolamon 211-227 Luddenham Road ORCHARD HILLS NSW 2748
Land Description: Lot 1 DP 1099147

- PART 1 PRESCRIBED MATTERS –

In accordance with the provisions of Section 10.7 of the Act the following information is furnished in respect of the abovementioned land:

1 *NAMES OF RELEVANT PLANNING INSTRUMENTS AND DCPs*

1(1) The name of each environmental planning instrument that applies to the carrying out of development on the land:

Penrith Local Environmental Plan 2010, published 22nd September 2010, as amended, applies to the land.

Sydney Regional Environmental Plan No.9 - Extractive Industry (No.2), gazetted 15 September 1995, as amended, applies to the local government area of Penrith.

Sydney Regional Environmental Plan No. 20 - Hawkesbury-Nepean River (No. 2 - 1997), gazetted 7 November 1997, as amended, applies to the local government area of Penrith (except land to which State Environmental Planning Policy (Penrith Lakes Scheme) 1989 applies).

The following State environmental planning policies apply to the land (subject to the exclusions noted below):

State Environmental Planning Policy No.19 - Bushland in Urban Areas. (Note: This policy does not apply to certain land referred to in the National Parks and Wildlife Act 1974 and the Forestry Act 1916.)
State Environmental Planning Policy No.21 - Caravan Parks.
State Environmental Planning Policy No.33 - Hazardous and Offensive Development.
State Environmental Planning Policy No.50 - Canal Estate Development. (Note: This policy does not apply to the land to which State Environmental Planning Policy (Penrith Lakes Scheme) 1989 applies.
State Environmental Planning Policy No.55 - Remediation of Land.

PENRITH CITY COUNCIL

Civic Centre
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State Environmental Planning Policy No.64 - Advertising and Signage.
State Environmental Planning Policy No.65 - Design Quality of Residential Apartment Development.
State Environmental Planning Policy No.70 - Affordable Housing (Revised Schemes).
State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004 (Note: This policy applies to land within New South Wales that is land zoned primarily for urban purposes or land that adjoins land zoned primarily for urban purposes, but only as detailed in clause 4 of the policy.)
State Environmental Planning Policy (Building Sustainability Index: BASIX) 2004.
State Environmental Planning Policy (State Significant Precincts) 2005.
State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2013.
State Environmental Planning Policy (Infrastructure) 2007.
State Environmental Planning Policy (Exempt and Complying Development Codes) 2008.
State Environmental Planning Policy (Affordable Rental Housing) 2009.
State Environmental Planning Policy (State and Regional Development) 2011.
State Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017.
State Environmental Planning Policy (Education Establishments and Child Care Centre Facilities) 2017.
State Environmental Planning Policy (Primary Production and Rural Development) 2019.

1(2) The name of each proposed environmental planning instrument that will apply to the carrying out of development on the land and that is or has been the subject of community consultation or on public exhibition under the Act:

(Information is provided in this section only if a proposed environmental planning instrument that is or has been the subject of community consultation or on public exhibition under the Act will apply to the carrying out of development on the land.)

Draft State Environmental Planning Policy (Western Sydney Corridors) may apply to the land. Further information is available here: https://www.transport.nsw.gov.au/corridors.

On 22 June 2018, the NSW Government announced changes to the recommended alignments for the Western Sydney corridors, including continuing with the previously gazetted 1951 corridor for the Bells Line of Road Castlereagh Connection.

Draft State Environmental Planning Policy (Environment) applies to the land.

Draft State Environmental Planning Policy (Remediation of Land) applies to the land.

Draft State Environmental Planning Policy (Exempt and Complying Development Codes) 2008 applies to the land.

Draft State Environmental Planning Policy (Infrastructure) 2007 applies to the land.

Draft State Environmental Planning Policy (State and Regional Development) 2011 applies to the land.

PENRITH CITY COUNCIL

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PLANNING CERTIFICATE UNDER SECTION 10.7

Environmental Planning and Assessment Act, 1979

1(3) The name of each development control plan that applies to the carrying out of development on the land:

Penrith Development Control Plan 2014 applies to the land.

2 *ZONING AND LAND USE UNDER RELEVANT LEPs*

For each environmental planning instrument or proposed instrument referred to in clause 1 (other than a SEPP or proposed SEPP) that includes the land in any zone (however described):

2(a)-(d) the identity of the zone; the purposes that may be carried out without development consent; the purposes that may not be carried out except with development consent; and the purposes that are prohibited within the zone. Any zone(s) applying to the land is/are listed below and/or in annexures.

(Note: If no zoning appears in this section see section 1(1) for zoning and land use details (under the Sydney Regional Environmental Plan or State Environmental Planning Policy that zones this property).)

Zone E2 Environmental Conservation
(Penrith Local Environmental Plan 2010)

1 Objectives of zone

- To protect, manage and restore areas of high ecological, scientific, cultural or aesthetic values.
- To prevent development that could destroy, damage or otherwise have an adverse effect on those values.
- To protect, manage, restore and enhance the ecology, hydrology and scenic values of riparian corridors and waterways, wetlands, groundwater resources, biodiversity corridors, areas of remnant indigenous vegetation and dependent ecosystems.
- To allow for low impact passive recreational and ancillary land uses that are consistent with the retention of the natural ecological significance.

2 Permitted without consent

Nil

3 Permitted with consent

Environmental facilities; Environmental protection works; Flood mitigation works; Oyster aquaculture; Recreation areas; Roads

4 Prohibited

Business premises; Hotel or motel accommodation; Industries; Multi dwelling housing; Pond-based aquaculture; Recreation facilities (major); Residential flat buildings; Restricted premises; Retail premises; Seniors housing; Service stations; Tank-based aquaculture; Warehouse or distribution centres; Any other development not specified in item 2 or 3

Zone RU2 Rural Landscape
(Penrith Local Environmental Plan 2010)

1 Objectives of zone

- To encourage sustainable primary industry production by maintaining and enhancing the natural resource base.

- To maintain the rural landscape character of the land.
- To provide for a range of compatible land uses, including extensive agriculture.
- To minimise conflict between land uses within the zone and land uses within adjoining zones.
- To preserve and improve natural resources through appropriate land management practices.
- To ensure development is compatible with the environmental capabilities of the land and does not unreasonably increase the demand for public services or public facilities.

2 Permitted without consent

Extensive agriculture; Home occupations

3 Permitted with consent

Agricultural produce industries; Agriculture; Animal boarding or training establishments; Aquaculture; Building identification signs; Business identification signs; Cellar door premises; Cemeteries; Community facilities; Crematoria; Dual occupancies; Dwelling houses; Environmental facilities; Environmental protection works; Farm buildings; Flood mitigation works; Forestry; Funeral homes; Helipads; Home-based child care; Home businesses; Home industries; Information and education facilities; Places of public worship; Public administration buildings; Recreation areas; Recreation facilities (outdoor); Roads; Roadside stalls; Rural supplies; Schools; Secondary dwellings; Stock and sale yards; Tourist and visitor accommodation; Veterinary hospitals

4 Prohibited

Hotel or motel accommodation; Serviced apartments; Any other development not specified in item 2 or 3

Flood planning

All or part of the subject land is identified in Penrith Local Environmental Plan 2010 (PLEP 2010) Clause 7.2 Flood Planning. Development consent is required for any development on land to which Clause 7.2 of PLEP 2010 applies.

Rural subdivision

Under the terms of Clause 4.2 of Penrith Local Environmental Plan 2010 land in Zone RU1 Primary Production, Zone RU2 Rural Landscape, Zone RU4 Primary Production Small Lots or Zone RU6 Transition may, with development consent, be subdivided for the purpose of primary production to create a lot of a size that is less than the minimum size shown on the Penrith Local Environmental Plan 2010 Lot Size Map in relation to that land. Such a lot cannot be created if an existing dwelling would, as a result of the subdivision, be situated on the lot; and a dwelling cannot be erected on such a lot.

Residential development and subdivision prohibited in certain rural, residential and environment protection zones

Under the terms of Clause 4.2A of Penrith Local Environmental Plan 2010 (PLEP 2010) on land within Zone RU1 Primary Production, Zone RU2 Rural Landscape, Zone RU4 Primary Production Small Lots, Zone RU5 Village, Zone R5 Large Lot Residential, Zone E3 Environmental Management or Zone E4 Environmental Living development consent must not be granted for the erection of a dwelling house on a lot resulting from the closure of part or all of a road, whether before or after the commencement of this Plan. This requirement does not apply to a lot created by the consolidation of a lot resulting from a road closure with an adjoining lot that did not result from a road closure.

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PLANNING CERTIFICATE UNDER SECTION 10.7

Environmental Planning and Assessment Act, 1979

Additional information relating to Penrith Local Environmental Plan 2010

Note 1: Under the terms of Clause 2.4 of Penrith Local Environmental Plan 2010 development may be carried out on unzoned land only with development consent.

Note 2: Under the terms of Clause 2.6 of Penrith Local Environmental Plan 2010 land may be subdivided but only with development consent, except for the exclusions detailed in the clause.

Note 3: Under the terms of Clause 2.7 of Penrith Local Environmental Plan 2010 the demolition of a building or work may be carried out only with development consent.

Note 4: A temporary use may be permitted with development consent subject to the requirements of Clause 2.8 of Penrith Local Environmental Plan 2010.

Note 5: Under the terms of Clause 4.1A of Penrith Local Environmental Plan 2010, despite any other provision of this plan, development consent must not be granted for dual occupancy on an internal lot in Zone R2 Low Density Residential.

Note 6: Under the terms of Clause 5.1 of Penrith Local Environmental Plan 2010 development on land acquired by an authority of the State under the owner-initiated acquisition provisions may, before it is used for the purpose for which it is reserved, be carried out, with development consent, for any purpose.

Note 7: Under the terms of Clause 5.3 of Penrith Local Environmental Plan 2010 development consent may be granted to development of certain land for any purpose that may be carried out in an adjoining zone.

Note 8: Clause 5.10 of Penrith Local Environmental Plan 2010 details when development consent is required/not required in relation to heritage conservation.

Note 9: Under the terms of Clause 5.11 of Penrith Local Environmental Plan 2010 bush fire hazard reduction work authorised by the *Rural Fires Act 1997* may be carried out on any land without development consent.

Note 10: Under the terms of Clause 7.1 of Penrith Local Environmental Plan 2010 (PLEP 2010) development consent is required for earthworks unless the work is exempt development under PLEP 2010 or another applicable environmental planning instrument, or the work is ancillary to other development for which development consent has been given.

Note 11: Sex services premises and restricted premises may only be permitted subject to the requirements of Clause 7.23 of Penrith Local Environmental Plan 2010.

2(e) whether any development standards applying to the land fix minimum land dimensions for the erection of a dwelling-house on the land and, if so, the minimum land dimensions so fixed:

(Information is provided in this section only if any development standards applying to the land fix minimum land dimensions for the erection of a dwelling-house on the land and, if so, the minimum land dimensions so fixed.)

2(f) whether the land includes or comprises critical habitat:

(Information is provided in this section only if the land includes or comprises critical habitat.)

2(g) whether the land is in a conservation area (however described):

(Information is provided in this section only if the land is in a conservation area (however described).)

2(h) whether an item of environmental heritage (however described) is situated on the land:

(Information is provided in this section only if an item of environmental heritage (however described) is situated on the land.)

2A ZONING AND LAND USE UNDER STATE ENVIRONMENTAL PLANNING POLICY (SYDNEY REGION GROWTH CENTRES) 2006

(Information is provided in this section only if the land is within any zone under State Environmental Planning Policy (Sydney Region Growth Centres) 2006.)

3 COMPLYING DEVELOPMENT

HOUSING CODE

(The Housing Code only applies if the land is within Zones R1, R2, R3, R4 or RU5 under Penrith Local Environmental Plan 2010 or an equivalent zone in a non standard template planning instrument.)

- The land is affected by environmentally sensitive land identified by an environmental planning instrument. If the land is within the relevant zones complying development under the Housing Code **may not** be carried out on any part of the land identified by an environmental planning instrument as being environmentally sensitive land. Complying development **may** be carried out on any part of the land that is not identified by an environmental planning instrument as being environmentally sensitive land. For the purposes of this section "environmentally sensitive land" means any land that is identified in Schedule 3 of Sydney Regional Environmental Plan No. 9 - Extractive Industry (No. 2); any land defined as "environmentally sensitive areas" in Sydney Regional Environmental Plan No 20 - Hawkesbury-Nepean River (No 2 - 1997); any land zoned Zone E2 Environmental Conservation under State Environmental Planning Policy (Western Sydney Employment Area) 2009; any Natural Resources Sensitive Land under Penrith Local Environmental Plan 2010; and any land zoned either Zone E1 National Parks and Nature Reserves, Zone E2 Environmental Conservation, Zone W1 Natural Waterways or Zone W2 Recreational Waterways under Penrith Local Environmental Plan 2010.

RURAL HOUSING CODE

(The Rural Housing Code only applies if the land is within Zones RU1, RU2, RU3, RU4, RU6 or R5 under Penrith Local Environmental Plan 2010 or an equivalent zone in a non standard template planning instrument.)

- The land is affected by environmentally sensitive land identified by an environmental planning instrument. If the land is within the relevant zones complying development under the Rural Housing Code **may not** be carried out on any part of the land identified by an environmental planning instrument as being environmentally sensitive land. Complying development **may** be carried out on any part of the land that is not identified by an environmental planning instrument as being environmentally sensitive land. For the purposes of this section "environmentally sensitive land" means any land that is identified in Schedule 3 of Sydney Regional Environmental Plan No. 9 - Extractive Industry (No. 2); any land defined as "environmentally sensitive areas" in Sydney Regional Environmental Plan No 20 - Hawkesbury-Nepean River (No 2 - 1997); any land zoned Zone E2 Environmental Conservation under State Environmental Planning Policy (Western Sydney Employment Area) 2009; any Natural Resources Sensitive Land under Penrith Local Environmental Plan 2010; and any land zoned either Zone E1 National Parks and Nature Reserves, Zone E2 Environmental Conservation, Zone W1 Natural Waterways or Zone W2 Recreational Waterways under Penrith Local Environmental Plan 2010.

LOW RISE MEDIUM DENSITY HOUSING CODE

(The Low Rise Medium Density Housing Code only applies if the land is within Zones R1, R2, R3 or RU5 under Penrith Local Environmental Plan 2010 or an equivalent zone in a non standard template planning instrument.)

- The land is affected by environmentally sensitive land identified by an environmental planning instrument. If the land is within the relevant zones complying development under the Low Rise Medium Density Housing Code **may not** be carried out on any part of the land identified by an environmental planning instrument as being environmentally sensitive land. Complying development **may** be carried out on any part of the land that is not identified by an environmental planning instrument as being environmentally sensitive land. For the purposes of this section "environmentally sensitive land" means any land that is identified in Schedule 3 of Sydney Regional Environmental Plan No. 9 - Extractive Industry (No. 2); any land defined as "environmentally sensitive areas" in Sydney Regional Environmental Plan No 20 - Hawkesbury-Nepean River (No 2 - 1997); any land zoned Zone E2 Environmental Conservation under State Environmental Planning Policy (Western Sydney Employment Area) 2009; any Natural Resources Sensitive Land under Penrith Local Environmental Plan 2010; and any land zoned either Zone E1 National Parks and Nature Reserves, Zone E2 Environmental Conservation, Zone W1 Natural Waterways or Zone W2 Recreational Waterways under Penrith Local Environmental Plan 2010.

Please note that Council has been deferred from the application of Part 3B of the Low Rise Medium Density Housing Code until 1 July 2020. That Part will not apply to Penrith Local Government Area during this time.

GREENFIELD HOUSING CODE

(The Greenfield Housing Code only applies if the land is within Zones R1, R2, R3, R4 or RU5 under Penrith Local Environmental Plan 2010 or an equivalent zone in a non standard template planning

instrument, and if the land is identified as a Greenfield Housing Code Area by the Greenfield Housing Code Area Map.)

- The land is affected by environmentally sensitive land identified by an environmental planning instrument. If the land is within the relevant zones, and if the land is identified as a Greenfield Housing Code Area by the Greenfield Housing Code Area Map complying development under the Greenfield Housing Code **may not** be carried out on any part of the land identified by an environmental planning instrument as being environmentally sensitive land. Complying development **may** be carried out on any part of the land that is not identified by an environmental planning instrument as being environmentally sensitive land. For the purposes of this section "environmentally sensitive land" means any land that is identified in Schedule 3 of Sydney Regional Environmental Plan No. 9 - Extractive Industry (No. 2); any land defined as "environmentally sensitive areas" in Sydney Regional Environmental Plan No 20 - Hawkesbury-Nepean River (No 2 - 1997); any land zoned Zone E2 Environmental Conservation under State Environmental Planning Policy (Western Sydney Employment Area) 2009; any Natural Resources Sensitive Land under Penrith Local Environmental Plan 2010; and any land zoned either Zone E1 National Parks and Nature Reserves, Zone E2 Environmental Conservation, Zone W1 Natural Waterways or Zone W2 Recreational Waterways under Penrith Local Environmental Plan 2010.

HOUSING ALTERATIONS CODE

Complying development under the Housing Alterations Code **may** be carried out on the land.

GENERAL DEVELOPMENT CODE

Complying development under the General Development Code **may** be carried out on the land.

COMMERCIAL AND INDUSTRIAL ALTERATIONS CODE

Complying development under the Commercial and Industrial Alterations Code **may** be carried out on the land.

SUBDIVISIONS CODE

Complying development under the Subdivisions Code **may** be carried out on the land.

DEMOLITION CODE

Complying development under the Demolition Code **may** be carried out on the land.

COMMERCIAL AND INDUSTRIAL (NEW BUILDINGS AND ADDITIONS) CODE

(The Commercial and Industrial (New Buildings and Additions) Code only applies if the land is within Zones B1, B2, B3, B4, B5, B6, B7, B8, IN1, IN2, IN3, IN4 or SP3 under Penrith Local Environmental Plan 2010 or an equivalent zone in a non standard template planning instrument.)

- The land is affected by environmentally sensitive land identified by an environmental planning instrument. If the land is within the relevant zones complying development under the Commercial and Industrial (New Buildings and Additions) Code **may not** be carried out on any part of the land identified by an environmental planning instrument as being environmentally sensitive land. Complying development **may** be carried out on any part of the land that is not identified by an environmental planning instrument as being environmentally sensitive land. For the purposes of this section "environmentally sensitive land" means any land that is identified in Schedule 3 of Sydney Regional Environmental Plan No. 9 - Extractive Industry (No. 2); any land defined as "environmentally sensitive areas" in Sydney Regional Environmental Plan No 20 - Hawkesbury-Nepean River (No 2 - 1997); any land zoned Zone E2 Environmental Conservation under State Environmental Planning Policy (Western Sydney Employment Area) 2009; any Natural Resources Sensitive Land under Penrith Local Environmental Plan 2010; and any land zoned either Zone E1 National Parks and Nature Reserves, Zone E2 Environmental Conservation, Zone W1 Natural Waterways or Zone W2 Recreational Waterways under Penrith Local Environmental Plan 2010.

FIRE SAFETY CODE

Complying development under the Fire Safety Code **may** be carried out on the land.

(NOTE: (1) Council has relied on Planning and Infrastructure Circulars and Fact Sheets in the preparation of this information. Applicants should seek their own legal advice in relation to this matter with particular reference to State Environmental Planning Policy (Exempt and Complying Development Codes) 2008.

(2) Penrith Local Environmental Plan 2010 (if it applies to the land) contains additional complying development not specified in State Environmental Planning Policy (Exempt and Complying Development Codes) 2008.)

4 COASTAL PROTECTION

The land is not affected by the operation of sections 38 or 39 of the Coastal Protection Act 1979, to the extent that council has been so notified by the Department of Public Works.

5 MINE SUBSIDENCE

The land is not proclaimed to be a mine subsidence district within the meaning of section 15 of the Mine Subsidence Compensation Act 1961.

6 ROAD WIDENING AND ROAD REALIGNMENT

The land is not affected by any road widening or road realignment under:
(a) Division 2 of Part 3 of the Roads Act 1993, or
(b) an environmental planning instrument, or
(c) a resolution of council.

7 COUNCIL AND OTHER PUBLIC AUTHORITY POLICIES ON HAZARD RISK RESTRICTIONS

(a) Council Policies
The land is affected by the Asbestos Policy adopted by Council.

The land is not affected by any other policy adopted by the council that restricts the development of the land because of the likelihood of land slip, bushfire, tidal inundation, subsidence, acid sulphate soils or any other risk (other than flooding).

(b) Other Public Authority Policies
The Bush Fire Co-ordinating Committee has adopted a Bush Fire Risk Management Plan that covers the local government area of Penrith City Council, and includes public, private and Commonwealth lands.
The land is not affected by a policy adopted by any other public authority and notified to the council for the express purpose of its adoption by that authority being referred to in planning certificates issued by the council, that restricts the development of the land because of the likelihood of land slip, tidal inundation, subsidence, acid sulphate soils or any other risk (other than flooding).

7A FLOOD RELATED DEVELOPMENT CONTROLS INFORMATION

(1) Development on the land or part of the land for the purposes of dwelling houses, dual occupancies, multi dwelling housing or residential flat buildings (not including development for the purposes of group homes or seniors housing) (if such uses are permissible on the land) is subject to flood related development controls.

(2) Development on the land or part of the land for industrial or commercial purposes (if such uses are permissible on the land) is subject to flood related development controls.
Development on the land or part of the land for purposes other than industrial or commercial, or for purposes other than those referred to in (1) above, will be considered on a merits based approach and flood related development controls may apply.

Note: The land is subject to Penrith Development Control Plan 2014 Section C3.5 Flood Planning. On application and payment of the prescribed fee Council may be able to provide in writing a range of advice in regard to the extent of flooding affecting the property.

8 LAND RESERVED FOR ACQUISITION

No environmental planning instrument or proposed environmental planning instrument referred to in clause 1 makes provision in relation to the acquisition of the land by a public authority, as referred to in section 3.15 of the Act.

9 CONTRIBUTIONS PLANS

The Cultural Facilities Development Contributions Plan applies anywhere residential development is permitted within the City of Penrith.

The Penrith City Local Open Space Development Contributions Plan applies anywhere residential development is permitted within the City of Penrith, excluding industrial areas and the release areas identified in Appendix B of the Plan (Penrith Lakes, Cranebrook, Sydney Regional Environmental Plan No. 30 - St Marys, Waterside, Thornton, the WELL Precinct, Glenmore Park and Erskine Park).

The Penrith City District Open Space Facilities Development Contributions Plan applies anywhere residential development is permitted within the City of Penrith, with the exclusion of industrial lands and the Penrith Lakes development site.

9A BIODIVERSITY CERTIFIED LAND

(Information is provided in this section only if the land is biodiversity certified land under Part 8 of the *Biodiversity Conservation Act 2016*.)

10 BIODIVERSITY STEWARDSHIP SITES

(Information is provided in this section only if Council has been notified by the Chief Executive of the Office of Environment and Heritage that the land is land to which a biobanking stewardship agreement under Part 5 of the *Biodiversity Conservation Act 2016* relates.)

10A NATIVE VEGETATION CLEARING SET ASIDES

(Information is provided in this section only if Council has been notified of the existence of a set aside area by Local Land Services or it is registered in the public register under which section 60ZC of the *Local Land Services Act 2013* relates).

11 BUSH FIRE PRONE LAND

Some of the land is identified as bush fire prone land according to Council records. Guidance as to restrictions that may be placed on the land as a result of the land being bush fire prone can be obtained by contacting Council. Such advice would be subject to further requirements of the NSW Rural Fire Services.

12 PROPERTY VEGETATION PLANS

(Information is provided in this section only if Council has been notified that the land is land to which a property vegetation plan approved under the *Native Vegetation Act 2003* applies and continues in force.)

13 ORDERS UNDER TREES (DISPUTES BETWEEN NEIGHBOURS) ACT 2006

(Information is provided in this section only if Council has been notified that an order has been made under the Trees (Disputes Between Neighbours) Act 2006 to carry out work in relation to a tree on the land.)

14 DIRECTIONS UNDER PART 3A

(Information is provided in this section only if there is a direction by the Minister in force under section 75P(2)(c1) of the Act (repealed on 1st October 2011) that a provision of an environmental planning instrument prohibiting or restricting the carrying out of a project or a stage of a project on the land under Part 4 of the Act does not have effect.)

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PLANNING CERTIFICATE UNDER SECTION 10.7

Environmental Planning and Assessment Act, 1979

15 SITE COMPATIBILITY CERTIFICATES AND CONDITIONS AFFECTING SENIORS HOUSING

(Information is provided in this section only if:

(a) there is a current site compatibility certificate (seniors housing), of which the council is aware, issued under State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004 in respect of proposed development on the land; and/or

(b) any terms of a kind referred to in clause 18(2) of State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004 have been imposed as a condition of consent to a development application granted after 11 October 2007 in respect of the land.)

16 SITE COMPATIBILITY CERTIFICATES FOR INFRASTRUCTURE

(Information is provided in this section only if there is a valid site compatibility certificate (infrastructure), of which council is aware, in respect of proposed development on the land.)

17 SITE COMPATIBILITY CERTIFICATES AND CONDITIONS FOR AFFORDABLE RENTAL HOUSING

(Information is provided in this section only if:

(a) there is a current site compatibility certificate (affordable rental housing), of which the council is aware, in respect of proposed development on the land; and/or

(b) any terms of a kind referred to in clause 17(1) or 37(1) of State Environmental Planning Policy (Affordable Rental Housing) 2009 have been imposed as a condition of consent to a development application in respect of the land.)

18 PAPER SUBDIVISION INFORMATION

(Information is provided in this section only if a development plan adopted by a relevant authority applies to the land or is proposed to be subject to a consent ballot, or a subdivision order applies to the land.)

19 SITE VERIFICATION CERTIFICATES

(Information is provided in this section only if there is a current site verification certificate, of which council is aware, in respect of the land.)

NOTE: The following matters are prescribed by section 59(2) of the Contaminated Land Management Act 1997 as additional matters to be specified in a planning certificate

(a) (Information is provided in this section only if, as at the date of this certificate, the land (or part of the land) is significantly contaminated land within the meaning of the Contaminated Land Management Act 1997.)

(b) (Information is provided in this section only if, as at the date of this certificate, the land is subject to a management order within the meaning of the Contaminated Land Management Act 1997.)

(c) (Information is provided in this section only if, as at the date of this certificate, the land is the subject of an approved voluntary management proposal within the meaning of the Contaminated Land Management Act 1997.)

(d) (Information is provided in this section only if, at the date of this certificate, the land subject to an ongoing maintenance order within the meaning of the Contaminated Land Management Act 1997.)

(e) (Information is provided in this section only if the land is the subject of a site audit statement within the meaning of the Contaminated Land Management Act 1997 - a copy of which has been provided to Council.)

Note: Section 10.7(5) information for this property may contain additional information regarding contamination issues.

20 LOOSE FILL ASBESTOS INSULATION

(Information is provided in this section only if there is a residential premises listed on the register of residential premises that contain or have contained loose-fill asbestos insulation (as required by Division 1A of Part 8 of the home Building Act 1989))

21 AFFECTED BUILDING NOTICES AND BUILDING PRODUCT RECTIFICATION ORDERS

(Information is provided in this section only if Council is aware of any "affected building notice" and/or a "building product rectification order" in force for the land).

Note: The Environmental Planning and Assessment Amendment Act 2017 commenced operation on the 1 March 2018. As a consequence of this Act the information contained in this certificate needs to be read in conjunction with the provisions of the Environmental Planning and Assessment (Savings, Transitional and Other Provisions) Regulation 2017, and Environmental Planning and Assessment Regulation 2000.

Information is provided only to the extent that Council has been notified by the relevant government departments.

Note:
The following section of this certificate is set aside under section 10.7(5) of the Act for the inclusion of information about other matters affecting the land of which the Council may be aware. The Council is not required under the Act to include any information in this section. Please be aware that the inclusion of information about a matter does not indicate that there are no other matters affecting the land of which the Council may be aware. Upon payment by an applicant of the required fee the Council may, pursuant to section 10.7(5) of the Act, provide further advice on other relevant matters affecting the subject land of which it may be aware.

* Western Sydney Airport
The Australian Government announced on 15 April 2014 that Badgerys Creek will be the site for a new airport for Western Sydney. On 12 December 2016, the Government announced the approval of the Airport Plan, authorising Stage 1 of the Western Sydney Airport. Stage 1 comprises a single runway and facilities to cater for up to 10 million passengers a year. This approval follows an assessment of the Airport Plan and its Environmental Impact Statement by the Environment Minister. Enquiries regarding the Western Sydney

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PLANNING CERTIFICATE UNDER SECTION 10.7

Environmental Planning and Assessment Act, 1979

Airport should be made with the Department of Infrastructure and Regional Development. (Website: http://westernsydneyairport.gov.au).

Note: This is a certificate under section 10.7 of the Environmental Planning and Assessment Act,1979 and is only provided in accordance with that section of the Act.
Further information relating to the subject property can be provided under section 10.7(5) of the Act. If such further information is required Council indicates that a full certificate under sections 10.7(2) **and** 10.7(5) should be applied for. Contact Council for details as to obtaining the additional information.

Warwick Winn
General Manager

per

Please note:
Certain amendments to the Environmental Planning and Assessment Act 1979 No 203 (Act) commenced on 1 March 2018.
The Environmental Planning and Assessment (Amendment) Act 2017 No 60 makes structural changes to the Act and, as a consequence, the Act has been renumbered in a decimal format. For example, Section 149 Planning Certificates have become Section 10.7 Certificates. Some of the information in this certificate may refer to the previous version of the Act.
Council is committed to updating all relevant documents in a timely manner. This will include planning instruments, applications, approvals, orders, certificates, forms and other associated documents in both printed and electronic versions. Council is required to implement these changes and regrets any inconvenience caused to the local business, industry and the community.

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PLANNING CERTIFICATE UNDER SECTION 10.7

Environmental Planning and Assessment Act, 1979

Property No: 782097
Your Reference: Luddenham, Orchard Hills-2
Contact No.

Issue Date: 24 April 2020
Certificate No: 20/01827

Issued to: Mr B Dubois
31 Anvil Road
SEVEN HILLS NSW 2147

PRECINCT 2010

DESCRIPTION OF LAND

County: CUMBERLAND **Parish: CLAREMONT**

Location: 289-317 Luddenham Road ORCHARD HILLS NSW 2748
Land Description: Lot 242 DP 1088991

- PART 1 PRESCRIBED MATTERS –

In accordance with the provisions of Section 10.7 of the Act the following information is furnished in respect of the abovementioned land:

1 *NAMES OF RELEVANT PLANNING INSTRUMENTS AND DCPs*

1(1) The name of each environmental planning instrument that applies to the carrying out of development on the land:

Penrith Local Environmental Plan 2010, published 22nd September 2010, as amended, applies to the land.

Sydney Regional Environmental Plan No.9 - Extractive Industry (No.2), gazetted 15 September 1995, as amended, applies to the local government area of Penrith.

Sydney Regional Environmental Plan No. 20 - Hawkesbury-Nepean River (No. 2 - 1997), gazetted 7 November 1997, as amended, applies to the local government area of Penrith (except land to which State Environmental Planning Policy (Penrith Lakes Scheme) 1989 applies).

The following State environmental planning policies apply to the land (subject to the exclusions noted below):

State Environmental Planning Policy No.19 - Bushland in Urban Areas. (Note: This policy does not apply to certain land referred to in the National Parks and Wildlife Act 1974 and the Forestry Act 1916.)
State Environmental Planning Policy No.21 - Caravan Parks.
State Environmental Planning Policy No.33 - Hazardous and Offensive Development.
State Environmental Planning Policy No.50 - Canal Estate Development. (Note: This policy does not apply to the land to which State Environmental Planning Policy (Penrith Lakes Scheme) 1989 applies.
State Environmental Planning Policy No.55 - Remediation of Land.
State Environmental Planning Policy No.64 - Advertising and Signage.

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PLANNING CERTIFICATE UNDER SECTION 10.7

Environmental Planning and Assessment Act, 1979

State Environmental Planning Policy No.65 - Design Quality of Residential Apartment Development.
State Environmental Planning Policy No.70 - Affordable Housing (Revised Schemes).
State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004 (Note: This policy applies to land within New South Wales that is land zoned primarily for urban purposes or land that adjoins land zoned primarily for urban purposes, but only as detailed in clause 4 of the policy.)
State Environmental Planning Policy (Building Sustainability Index: BASIX) 2004.
State Environmental Planning Policy (State Significant Precincts) 2005.
State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2013.
State Environmental Planning Policy (Infrastructure) 2007.
State Environmental Planning Policy (Exempt and Complying Development Codes) 2008.
State Environmental Planning Policy (Affordable Rental Housing) 2009.
State Environmental Planning Policy (State and Regional Development) 2011.
State Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017.
State Environmental Planning Policy (Education Establishments and Child Care Centre Facilities) 2017.
State Environmental Planning Policy (Primary Production and Rural Development) 2019.

1(2) The name of each proposed environmental planning instrument that will apply to the carrying out of development on the land and that is or has been the subject of community consultation or on public exhibition under the Act:

(Information is provided in this section only if a proposed environmental planning instrument that is or has been the subject of community consultation or on public exhibition under the Act will apply to the carrying out of development on the land.)

Draft State Environmental Planning Policy (Western Sydney Corridors) may apply to the land. Further information is available here: https://www.transport.nsw.gov.au/corridors.

On 22 June 2018, the NSW Government announced changes to the recommended alignments for the Western Sydney corridors, including continuing with the previously gazetted 1951 corridor for the Bells Line of Road Castlereagh Connection.

Draft State Environmental Planning Policy (Environment) applies to the land.

Draft State Environmental Planning Policy (Remediation of Land) applies to the land.

Draft State Environmental Planning Policy (Exempt and Complying Development Codes) 2008 applies to the land.

Draft State Environmental Planning Policy (Infrastructure) 2007 applies to the land.

Draft State Environmental Planning Policy (State and Regional Development) 2011 applies to the land.

1(3) The name of each development control plan that applies to the carrying out of development on the land:

Penrith Development Control Plan 2014 applies to the land.

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PLANNING CERTIFICATE UNDER SECTION 10.7

Environmental Planning and Assessment Act, 1979

2 *ZONING AND LAND USE UNDER RELEVANT LEPs*

For each environmental planning instrument or proposed instrument referred to in clause 1 (other than a SEPP or proposed SEPP) that includes the land in any zone (however described):

2(a)-(d) the identity of the zone; the purposes that may be carried out without development consent; the purposes that may not be carried out except with development consent; and the purposes that are prohibited within the zone. Any zone(s) applying to the land is/are listed below and/or in annexures.

(Note: If no zoning appears in this section see section 1(1) for zoning and land use details (under the Sydney Regional Environmental Plan or State Environmental Planning Policy that zones this property).)

Zone RU2 Rural Landscape
(Penrith Local Environmental Plan 2010)

1 Objectives of zone

- To encourage sustainable primary industry production by maintaining and enhancing the natural resource base.
- To maintain the rural landscape character of the land.
- To provide for a range of compatible land uses, including extensive agriculture.
- To minimise conflict between land uses within the zone and land uses within adjoining zones.
- To preserve and improve natural resources through appropriate land management practices.
- To ensure development is compatible with the environmental capabilities of the land and does not unreasonably increase the demand for public services or public facilities.

2 Permitted without consent

Extensive agriculture; Home occupations

3 Permitted with consent

Agricultural produce industries; Agriculture; Animal boarding or training establishments; Aquaculture; Building identification signs; Business identification signs; Cellar door premises; Cemeteries; Community facilities; Crematoria; Dual occupancies; Dwelling houses; Environmental facilities; Environmental protection works; Farm buildings; Flood mitigation works; Forestry; Funeral homes; Helipads; Home-based child care; Home businesses; Home industries; Information and education facilities; Places of public worship; Public administration buildings; Recreation areas; Recreation facilities (outdoor); Roads; Roadside stalls; Rural supplies; Schools; Secondary dwellings; Stock and sale yards; Tourist and visitor accommodation; Veterinary hospitals

4 Prohibited

Hotel or motel accommodation; Serviced apartments; Any other development not specified in item 2 or 3

Flood planning

All or part of the subject land is identified in Penrith Local Environmental Plan 2010 (PLEP 2010) Clause 7.2 Flood Planning. Development consent is required for any development on land to which Clause 7.2 of PLEP 2010 applies.

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PLANNING CERTIFICATE UNDER SECTION 10.7

Environmental Planning and Assessment Act, 1979

Rural subdivision

Under the terms of Clause 4.2 of Penrith Local Environmental Plan 2010 land in Zone RU1 Primary Production, Zone RU2 Rural Landscape, Zone RU4 Primary Production Small Lots or Zone RU6 Transition may, with development consent, be subdivided for the purpose of primary production to create a lot of a size that is less than the minimum size shown on the Penrith Local Environmental Plan 2010 Lot Size Map in relation to that land. Such a lot cannot be created if an existing dwelling would, as a result of the subdivision, be situated on the lot; and a dwelling cannot be erected on such a lot.

Residential development and subdivision prohibited in certain rural, residential and environment protection zones

Under the terms of Clause 4.2A of Penrith Local Environmental Plan 2010 (PLEP 2010) on land within Zone RU1 Primary Production, Zone RU2 Rural Landscape, Zone RU4 Primary Production Small Lots, Zone RU5 Village, Zone R5 Large Lot Residential, Zone E3 Environmental Management or Zone E4 Environmental Living development consent must not be granted for the erection of a dwelling house on a lot resulting from the closure of part or all of a road, whether before or after the commencement of this Plan. This requirement does not apply to a lot created by the consolidation of a lot resulting from a road closure with an adjoining lot that did not result from a road closure.

Additional information relating to Penrith Local Environmental Plan 2010

Note 1: Under the terms of Clause 2.4 of Penrith Local Environmental Plan 2010 development may be carried out on unzoned land only with development consent.

Note 2: Under the terms of Clause 2.6 of Penrith Local Environmental Plan 2010 land may be subdivided but only with development consent, except for the exclusions detailed in the clause.

Note 3: Under the terms of Clause 2.7 of Penrith Local Environmental Plan 2010 the demolition of a building or work may be carried out only with development consent.

Note 4: A temporary use may be permitted with development consent subject to the requirements of Clause 2.8 of Penrith Local Environmental Plan 2010.

Note 5: Under the terms of Clause 4.1A of Penrith Local Environmental Plan 2010, despite any other provision of this plan, development consent must not be granted for dual occupancy on an internal lot in Zone R2 Low Density Residential.

Note 6: Under the terms of Clause 5.1 of Penrith Local Environmental Plan 2010 development on land acquired by an authority of the State under the owner-initiated acquisition provisions may, before it is used for the purpose for which it is reserved, be carried out, with development consent, for any purpose.

Note 7: Under the terms of Clause 5.3 of Penrith Local Environmental Plan 2010 development consent may be granted to development of certain land for any purpose that may be carried out in an adjoining zone.

Note 8: Clause 5.10 of Penrith Local Environmental Plan 2010 details when development consent is required/not required in relation to heritage conservation.

Note 9: Under the terms of Clause 5.11 of Penrith Local Environmental Plan 2010 bush fire hazard reduction work authorised by the *Rural Fires Act 1997* may be carried out on any land without development consent.

Note 10: Under the terms of Clause 7.1 of Penrith Local Environmental Plan 2010 (PLEP 2010) development consent is required for earthworks unless the work is exempt development under PLEP 2010 or another applicable environmental planning instrument, or the work is ancillary to other development for which development consent has been given.

Note 11: Sex services premises and restricted premises may only be permitted subject to the requirements of Clause 7.23 of Penrith Local Environmental Plan 2010.

2(e) whether any development standards applying to the land fix minimum land dimensions for the erection of a dwelling-house on the land and, if so, the minimum land dimensions so fixed:

(Information is provided in this section only if any development standards applying to the land fix minimum land dimensions for the erection of a dwelling-house on the land and, if so, the minimum land dimensions so fixed.)

2(f) whether the land includes or comprises critical habitat:

(Information is provided in this section only if the land includes or comprises critical habitat.)

2(g) whether the land is in a conservation area (however described):

(Information is provided in this section only if the land is in a conservation area (however described).)

2(h) whether an item of environmental heritage (however described) is situated on the land:

(Information is provided in this section only if an item of environmental heritage (however described) is situated on the land.)

2A ZONING AND LAND USE UNDER STATE ENVIRONMENTAL PLANNING POLICY (SYDNEY REGION GROWTH CENTRES) 2006

(Information is provided in this section only if the land is within any zone under State Environmental Planning Policy (Sydney Region Growth Centres) 2006.)

3 COMPLYING DEVELOPMENT

HOUSING CODE

(The Housing Code only applies if the land is within Zones R1, R2, R3, R4 or RU5 under Penrith Local Environmental Plan 2010 or an equivalent zone in a non standard template planning instrument.)

- The land is affected by environmentally sensitive land identified by an environmental planning instrument. If the land is within the relevant zones complying development under the Housing Code **may not** be carried out on any part of the land identified by an environmental planning instrument as being environmentally sensitive land. Complying development **may** be carried out on any part of the land that is not identified by an environmental planning instrument as being environmentally sensitive land. For the purposes of this section "environmentally sensitive land" means any land that is identified in Schedule 3 of Sydney Regional Environmental Plan No. 9 - Extractive Industry (No. 2); any land defined as "environmentally sensitive areas" in Sydney Regional Environmental Plan No 20 - Hawkesbury-Nepean River (No 2 - 1997); any land zoned Zone E2 Environmental Conservation under State Environmental Planning Policy (Western Sydney Employment Area) 2009; any Natural Resources Sensitive Land under Penrith Local Environmental Plan 2010; and any land zoned either Zone E1 National Parks and Nature Reserves, Zone E2 Environmental Conservation, Zone W1 Natural Waterways or Zone W2 Recreational Waterways under Penrith Local Environmental Plan 2010.

RURAL HOUSING CODE

(The Rural Housing Code only applies if the land is within Zones RU1, RU2, RU3, RU4, RU6 or R5 under Penrith Local Environmental Plan 2010 or an equivalent zone in a non standard template planning instrument.)

- The land is affected by environmentally sensitive land identified by an environmental planning instrument. If the land is within the relevant zones complying development under the Rural Housing Code **may not** be carried out on any part of the land identified by an environmental planning instrument as being environmentally sensitive land. Complying development **may** be carried out on any part of the land that is not identified by an environmental planning instrument as being environmentally sensitive land. For the purposes of this section "environmentally sensitive land" means any land that is identified in Schedule 3 of Sydney Regional Environmental Plan No. 9 - Extractive Industry (No. 2); any land defined as "environmentally sensitive areas" in Sydney Regional Environmental Plan No 20 - Hawkesbury-Nepean River (No 2 - 1997); any land zoned Zone E2 Environmental Conservation under State Environmental Planning Policy (Western Sydney Employment Area) 2009; any Natural Resources Sensitive Land under Penrith Local Environmental Plan 2010; and any land zoned either Zone E1 National Parks and Nature Reserves, Zone E2 Environmental Conservation, Zone W1 Natural Waterways or Zone W2 Recreational Waterways under Penrith Local Environmental Plan 2010.

LOW RISE MEDIUM DENSITY HOUSING CODE

(The Low Rise Medium Density Housing Code only applies if the land is within Zones R1, R2, R3 or RU5 under Penrith Local Environmental Plan 2010 or an equivalent zone in a non standard template planning instrument.)

- The land is affected by environmentally sensitive land identified by an environmental planning instrument. If the land is within the relevant zones complying development under the Low Rise Medium Density Housing Code **may not** be carried out on any part of the land identified by an environmental planning instrument as being environmentally sensitive land. Complying

development **may** be carried out on any part of the land that is not identified by an environmental planning instrument as being environmentally sensitive land. For the purposes of this section "environmentally sensitive land" means any land that is identified in Schedule 3 of Sydney Regional Environmental Plan No. 9 - Extractive Industry (No. 2); any land defined as "environmentally sensitive areas" in Sydney Regional Environmental Plan No 20 - Hawkesbury-Nepean River (No 2 - 1997); any land zoned Zone E2 Environmental Conservation under State Environmental Planning Policy (Western Sydney Employment Area) 2009; any Natural Resources Sensitive Land under Penrith Local Environmental Plan 2010; and any land zoned either Zone E1 National Parks and Nature Reserves, Zone E2 Environmental Conservation, Zone W1 Natural Waterways or Zone W2 Recreational Waterways under Penrith Local Environmental Plan 2010.

Please note that Council has been deferred from the application of Part 3B of the Low Rise Medium Density Housing Code until 1 July 2020. That Part will not apply to Penrith Local Government Area during this time.

GREENFIELD HOUSING CODE

(The Greenfield Housing Code only applies if the land is within Zones R1, R2, R3, R4 or RU5 under Penrith Local Environmental Plan 2010 or an equivalent zone in a non standard template planning instrument, and if the land is identified as a Greenfield Housing Code Area by the Greenfield Housing Code Area Map.)

- The land is affected by environmentally sensitive land identified by an environmental planning instrument. If the land is within the relevant zones, and if the land is identified as a Greenfield Housing Code Area by the Greenfield Housing Code Area Map complying development under the Greenfield Housing Code **may not** be carried out on any part of the land identified by an environmental planning instrument as being environmentally sensitive land. Complying development **may** be carried out on any part of the land that is not identified by an environmental planning instrument as being environmentally sensitive land. For the purposes of this section "environmentally sensitive land" means any land that is identified in Schedule 3 of Sydney Regional Environmental Plan No. 9 - Extractive Industry (No. 2); any land defined as "environmentally sensitive areas" in Sydney Regional Environmental Plan No 20 - Hawkesbury-Nepean River (No 2 - 1997); any land zoned Zone E2 Environmental Conservation under State Environmental Planning Policy (Western Sydney Employment Area) 2009; any Natural Resources Sensitive Land under Penrith Local Environmental Plan 2010; and any land zoned either Zone E1 National Parks and Nature Reserves, Zone E2 Environmental Conservation, Zone W1 Natural Waterways or Zone W2 Recreational Waterways under Penrith Local Environmental Plan 2010.

HOUSING ALTERATIONS CODE

Complying development under the Housing Alterations Code **may** be carried out on the land.

GENERAL DEVELOPMENT CODE

Complying development under the General Development Code **may** be carried out on the land.

COMMERCIAL AND INDUSTRIAL ALTERATIONS CODE

Complying development under the Commercial and Industrial Alterations Code **may** be carried out on the land.

SUBDIVISIONS CODE

Complying development under the Subdivisions Code **may** be carried out on the land.

DEMOLITION CODE

Complying development under the Demolition Code **may** be carried out on the land.

COMMERCIAL AND INDUSTRIAL (NEW BUILDINGS AND ADDITIONS) CODE

(The Commercial and Industrial (New Buildings and Additions) Code only applies if the land is within Zones B1, B2, B3, B4, B5, B6, B7, B8, IN1, IN2, IN3, IN4 or SP3 under Penrith Local Environmental Plan 2010 or an equivalent zone in a non standard template planning instrument.)

- The land is affected by environmentally sensitive land identified by an environmental planning instrument. If the land is within the relevant zones complying development under the Commercial and Industrial (New Buildings and Additions) Code **may not** be carried out on any part of the land identified by an environmental planning instrument as being environmentally sensitive land. Complying development **may** be carried out on any part of the land that is not identified by an environmental planning instrument as being environmentally sensitive land. For the purposes of this section "environmentally sensitive land" means any land that is identified in Schedule 3 of Sydney Regional Environmental Plan No. 9 - Extractive Industry (No. 2); any land defined as "environmentally sensitive areas" in Sydney Regional Environmental Plan No 20 - Hawkesbury-Nepean River (No 2 - 1997); any land zoned Zone E2 Environmental Conservation under State Environmental Planning Policy (Western Sydney Employment Area) 2009; any Natural Resources Sensitive Land under Penrith Local Environmental Plan 2010; and any land zoned either Zone E1 National Parks and Nature Reserves, Zone E2 Environmental Conservation, Zone W1 Natural Waterways or Zone W2 Recreational Waterways under Penrith Local Environmental Plan 2010.

FIRE SAFETY CODE

Complying development under the Fire Safety Code **may** be carried out on the land.

(NOTE: (1) Council has relied on Planning and Infrastructure Circulars and Fact Sheets in the preparation of this information. Applicants should seek their own legal advice in relation to this matter with particular reference to State Environmental Planning Policy (Exempt and Complying Development Codes) 2008.

(2) Penrith Local Environmental Plan 2010 (if it applies to the land) contains additional complying development not specified in State Environmental Planning Policy (Exempt and Complying Development Codes) 2008.)

4 COASTAL PROTECTION

The land is not affected by the operation of sections 38 or 39 of the Coastal Protection Act 1979, to the extent that council has been so notified by the Department of Public Works.

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5 MINE SUBSIDENCE

The land is not proclaimed to be a mine subsidence district within the meaning of section 15 of the Mine Subsidence Compensation Act 1961.

6 ROAD WIDENING AND ROAD REALIGNMENT

The land is not affected by any road widening or road realignment under:
(a) Division 2 of Part 3 of the Roads Act 1993, or
(b) an environmental planning instrument, or
(c) a resolution of council.

7 COUNCIL AND OTHER PUBLIC AUTHORITY POLICIES ON HAZARD RISK RESTRICTIONS

(a) Council Policies
The land is affected by the Asbestos Policy adopted by Council.
The land is not affected by any other policy adopted by the council that restricts the development of the land because of the likelihood of land slip, bushfire, tidal inundation, subsidence, acid sulphate soils or any other risk (other than flooding).

(b) Other Public Authority Policies
The Bush Fire Co-ordinating Committee has adopted a Bush Fire Risk Management Plan that covers the local government area of Penrith City Council, and includes public, private and Commonwealth lands.
The land is not affected by a policy adopted by any other public authority and notified to the council for the express purpose of its adoption by that authority being referred to in planning certificates issued by the council, that restricts the development of the land because of the likelihood of land slip, tidal inundation, subsidence, acid sulphate soils or any other risk (other than flooding).

7A FLOOD RELATED DEVELOPMENT CONTROLS INFORMATION

(1) Development on the land or part of the land for the purposes of dwelling houses, dual occupancies, multi dwelling housing or residential flat buildings (not including development for the purposes of group homes or seniors housing) (if such uses are permissible on the land) is subject to flood related development controls.

(2) Development on the land or part of the land for industrial or commercial purposes (if such uses are permissible on the land) is subject to flood related development controls.
Development on the land or part of the land for purposes other than industrial or commercial, or for purposes other than those referred to in (1) above, will be considered on a merits based approach and flood related development controls may apply.

Note: The land is subject to Penrith Development Control Plan 2014 Section C3.5 Flood Planning. On application and payment of the prescribed fee Council may be able to provide in writing a range of advice in regard to the extent of flooding affecting the property.

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8 LAND RESERVED FOR ACQUISITION

No environmental planning instrument or proposed environmental planning instrument referred to in clause 1 makes provision in relation to the acquisition of the land by a public authority, as referred to in section 3.15 of the Act.

9 CONTRIBUTIONS PLANS

The Cultural Facilities Development Contributions Plan applies anywhere residential development is permitted within the City of Penrith.

The Penrith City Local Open Space Development Contributions Plan applies anywhere residential development is permitted within the City of Penrith, excluding industrial areas and the release areas identified in Appendix B of the Plan (Penrith Lakes, Cranebrook, Sydney Regional Environmental Plan No. 30 - St Marys, Waterside, Thornton, the WELL Precinct, Glenmore Park and Erskine Park).

The Penrith City District Open Space Facilities Development Contributions Plan applies anywhere residential development is permitted within the City of Penrith, with the exclusion of industrial lands and the Penrith Lakes development site.

9A BIODIVERSITY CERTIFIED LAND

(Information is provided in this section only if the land is biodiversity certified land under Part 8 of the *Biodiversity Conservation Act 2016*.)

10 BIODIVERSITY STEWARDSHIP SITES

(Information is provided in this section only if Council has been notified by the Chief Executive of the Office of Environment and Heritage that the land is land to which a biobanking stewardship agreement under Part 5 of the *Biodiversity Conservation Act 2016* relates.)

10A NATIVE VEGETATION CLEARING SET ASIDES

(Information is provided in this section only if Council has been notified of the existence of a set aside area by Local Land Services or it is registered in the public register under which section 60ZC of the *Local Land Services Act 2013* relates).

11 BUSH FIRE PRONE LAND

All of the land is identified as bush fire prone land according to Council records. Guidance as to restrictions that may be placed on the land as a result of the land being bush fire prone can be obtained by contacting Council. Such advice would be subject to further requirements of the NSW Rural Fire Services.

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PLANNING CERTIFICATE UNDER SECTION 10.7

Environmental Planning and Assessment Act, 1979

12 PROPERTY VEGETATION PLANS

(Information is provided in this section only if Council has been notified that the land is land to which a property vegetation plan approved under the *Native Vegetation Act 2003* applies and continues in force.)

13 ORDERS UNDER TREES (DISPUTES BETWEEN NEIGHBOURS) ACT 2006

(Information is provided in this section only if Council has been notified that an order has been made under the Trees (Disputes Between Neighbours) Act 2006 to carry out work in relation to a tree on the land.)

14 DIRECTIONS UNDER PART 3A

(Information is provided in this section only if there is a direction by the Minister in force under section 75P(2)(c1) of the Act (repealed on 1st October 2011) that a provision of an environmental planning instrument prohibiting or restricting the carrying out of a project or a stage of a project on the land under Part 4 of the Act does not have effect.)

15 SITE COMPATIBILITY CERTIFICATES AND CONDITIONS AFFECTING SENIORS HOUSING

(Information is provided in this section only if:

(a) there is a current site compatibility certificate (seniors housing), of which the council is aware, issued under State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004 in respect of proposed development on the land; and/or

(b) any terms of a kind referred to in clause 18(2) of State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004 have been imposed as a condition of consent to a development application granted after 11 October 2007 in respect of the land.)

16 SITE COMPATIBILITY CERTIFICATES FOR INFRASTRUCTURE

(Information is provided in this section only if there is a valid site compatibility certificate (infrastructure), of which council is aware, in respect of proposed development on the land.)

17 SITE COMPATIBILITY CERTIFICATES AND CONDITIONS FOR AFFORDABLE RENTAL HOUSING

(Information is provided in this section only if:

(a) there is a current site compatibility certificate (affordable rental housing), of which the council is aware, in respect of proposed development on the land; and/or

(b) any terms of a kind referred to in clause 17(1) or 37(1) of State Environmental Planning Policy (Affordable Rental Housing) 2009 have been imposed as a condition of consent to a development application in respect of the land.)

18 PAPER SUBDIVISION INFORMATION

(Information is provided in this section only if a development plan adopted by a relevant authority applies to the land or is proposed to be subject to a consent ballot, or a subdivision order applies to the land.)

19 SITE VERIFICATION CERTIFICATES

(Information is provided in this section only if there is a current site verification certificate, of which council is aware, in respect of the land.)

NOTE: The following matters are prescribed by section 59(2) of the Contaminated Land Management Act 1997 as additional matters to be specified in a planning certificate

(a) (Information is provided in this section only if, as at the date of this certificate, the land (or part of the land) is significantly contaminated land within the meaning of the Contaminated Land Management Act 1997.)

(b) (Information is provided in this section only if, as at the date of this certificate, the land is subject to a management order within the meaning of the Contaminated Land Management Act 1997.)

(c) (Information is provided in this section only if, as at the date of this certificate, the land is the subject of an approved voluntary management proposal within the meaning of the Contaminated Land Management Act 1997.)

(d) (Information is provided in this section only if, at the date of this certificate, the land subject to an ongoing maintenance order within the meaning of the Contaminated Land Management Act 1997.)

(e) (Information is provided in this section only if the land is the subject of a site audit statement within the meaning of the Contaminated Land Management Act 1997 - a copy of which has been provided to Council.)

Note: Section 10.7(5) information for this property may contain additional information regarding contamination issues.

20 LOOSE FILL ASBESTOS INSULATION

(Information is provided in this section only if there is a residential premises listed on the register of residential premises that contain or have contained loose-fill asbestos insulation (as required by Division 1A of Part 8 of the home Building Act 1989))

21 AFFECTED BUILDING NOTICES AND BUILDING PRODUCT RECTIFICATION ORDERS

(Information is provided in this section only if Council is aware of any "affected building notice" and/or a "building product rectification order" in force for the land).

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PLANNING CERTIFICATE UNDER SECTION 10.7

Environmental Planning and Assessment Act, 1979

Note: The Environmental Planning and Assessment Amendment Act 2017 commenced operation on the 1 March 2018. As a consequence of this Act the information contained in this certificate needs to be read in conjunction with the provisions of the Environmental Planning and Assessment (Savings, Transitional and Other Provisions) Regulation 2017, and Environmental Planning and Assessment Regulation 2000.

Information is provided only to the extent that Council has been notified by the relevant government departments.

Note:
The following section of this certificate is set aside under section 10.7(5) of the Act for the inclusion of information about other matters affecting the land of which the Council may be aware. The Council is not required under the Act to include any information in this section. Please be aware that the inclusion of information about a matter does not indicate that there are no other matters affecting the land of which the Council may be aware. Upon payment by an applicant of the required fee the Council may, pursuant to section 10.7(5) of the Act, provide further advice on other relevant matters affecting the subject land of which it may be aware.

* Western Sydney Airport

The Australian Government announced on 15 April 2014 that Badgerys Creek will be the site for a new airport for Western Sydney. On 12 December 2016, the Government announced the approval of the Airport Plan, authorising Stage 1 of the Western Sydney Airport. Stage 1 comprises a single runway and facilities to cater for up to 10 million passengers a year. This approval follows an assessment of the Airport Plan and its Environmental Impact Statement by the Environment Minister. Enquiries regarding the Western Sydney Airport should be made with the Department of Infrastructure and Regional Development. (Website: http://westernsydneyairport.gov.au).

Note: This is a certificate under section 10.7 of the Environmental Planning and Assessment Act,1979 and is only provided in accordance with that section of the Act.
Further information relating to the subject property can be provided under section 10.7(5) of the Act. If such further information is required Council indicates that a full certificate under sections 10.7(2) **and** 10.7(5) should be applied for. Contact Council for details as to obtaining the additional information.

Warwick Winn
General Manager

per

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PLANNING CERTIFICATE UNDER SECTION 10.7

Environmental Planning and Assessment Act, 1979

Please note:

Certain amendments to the Environmental Planning and Assessment Act 1979 No 203 (Act) commenced on 1 March 2018.

The Environmental Planning and Assessment (Amendment) Act 2017 No 60 makes structural changes to the Act and, as a consequence, the Act has been renumbered in a decimal format. For example, Section 149 Planning Certificates have become Section 10.7 Certificates. Some of the information in this certificate may refer to the previous version of the Act.

Council is committed to updating all relevant documents in a timely manner. This will include planning instruments, applications, approvals, orders, certificates, forms and other associated documents in both printed and electronic versions. Council is required to implement these changes and regrets any inconvenience caused to the local business, industry and the community.

221-227 and 289-311
Luddenham Road,
Orchard Hill, NSW, 2748

APPENDIX F

AERIALS

LOTSEARCH

LOTSEARCH AERIALS

Date: 24 Apr 2020

Reference: LS012108 EA

Address: 221-227 and 289-311 Luddenham Road, Orchard Hills, NSW 2745

Aerial Imagery 2019

221-227 and 289-311 Luddenham Road, Orchard Hills, NSW 2745

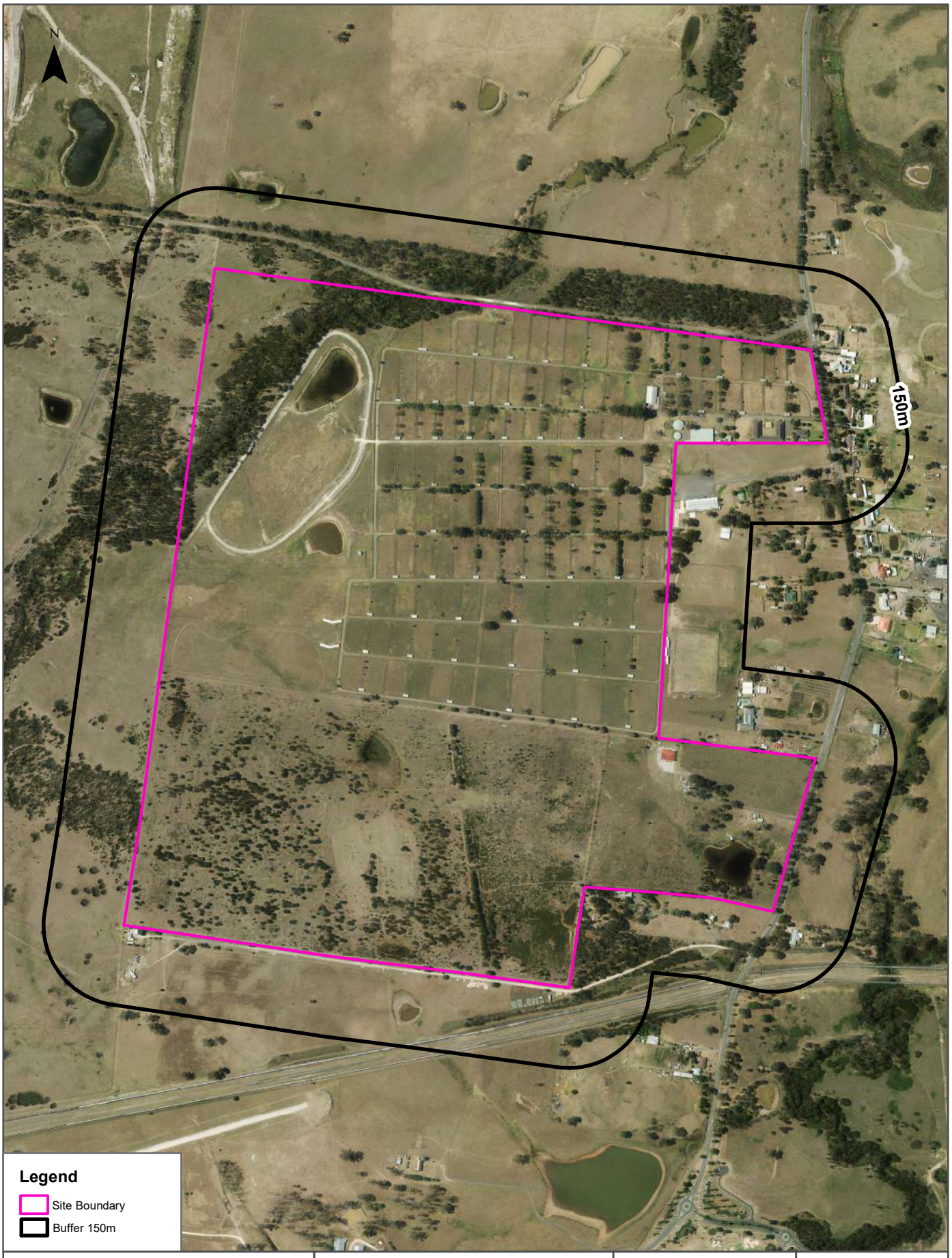


Scale:	Data Sources: Aerial Imagery © Aerometrex Pty Ltd	Coordinate System: GDA 1994 MGA Zone 56	Date: 24 April 2020

0 110 220 330 440
Meters

Aerial Imagery 2014

221-227 and 289-311 Luddenham Road, Orchard Hills, NSW 2745



Scale:	Data Sources: Aerial Imagery © Aerometrex Pty Ltd	Coordinate System: GDA 1994 MGA Zone 56	Date: 24 April 2020

0 110 220 330 440
Meters

Aerial Imagery 2007

221-227 and 289-311 Luddenham Road, Orchard Hills, NSW 2745

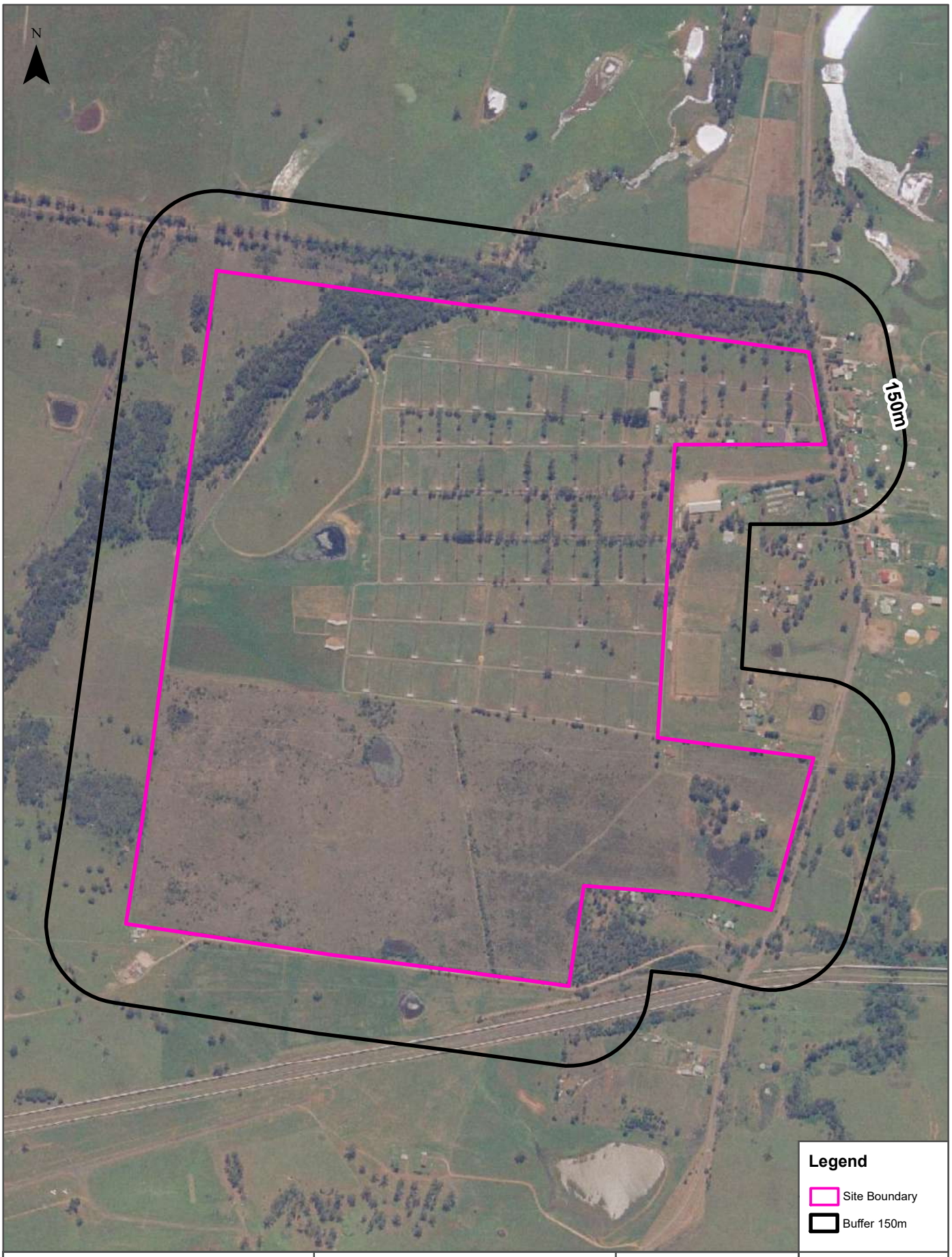


Scale:	Data Sources: Aerial Imagery © Aerometrex Pty Ltd	Coordinate System: GDA 1994 MGA Zone 56	Date: 24 April 2020

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Meters

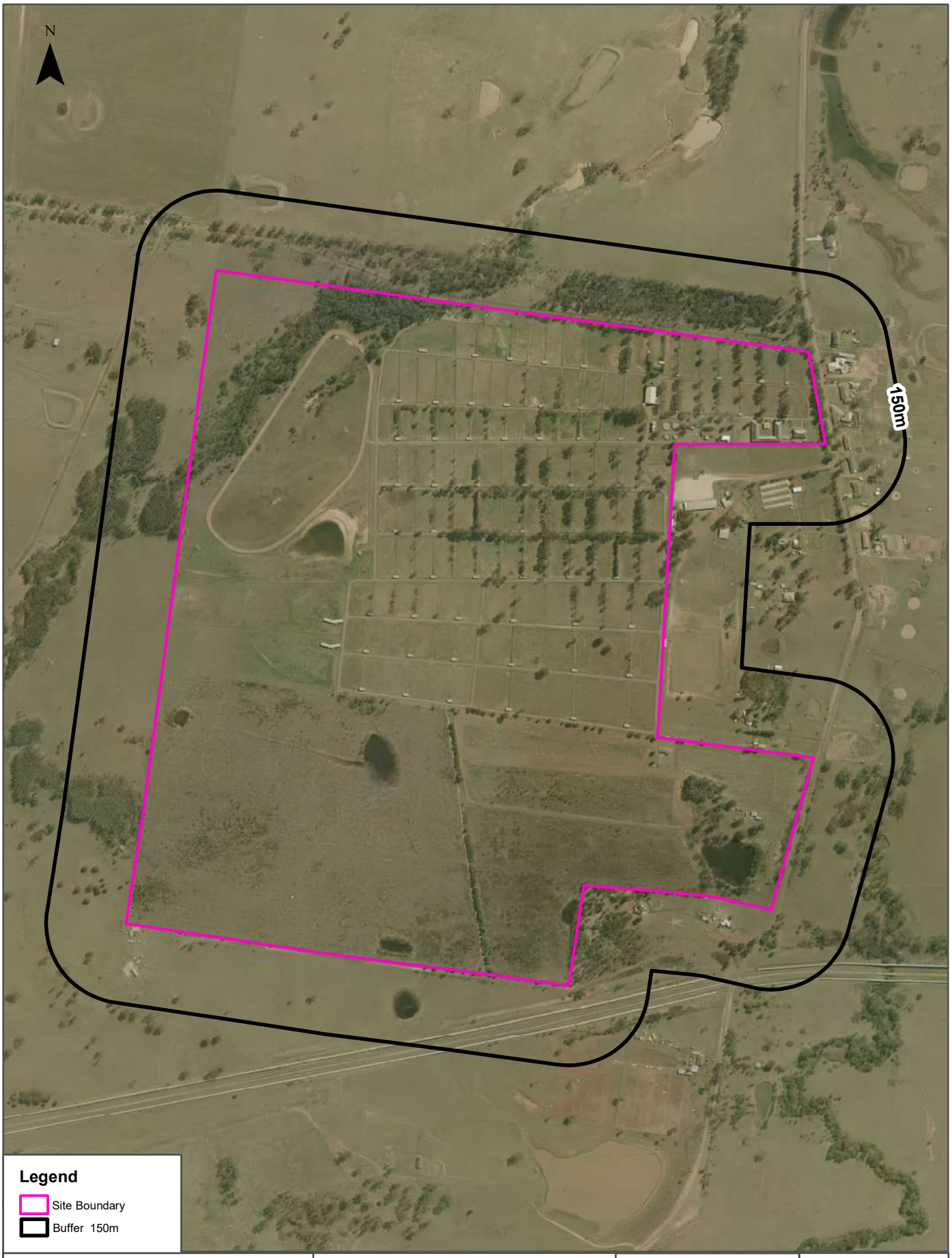
Aerial Imagery 1998

221-227 and 289-311 Luddenham Road, Orchard Hills, NSW 2745



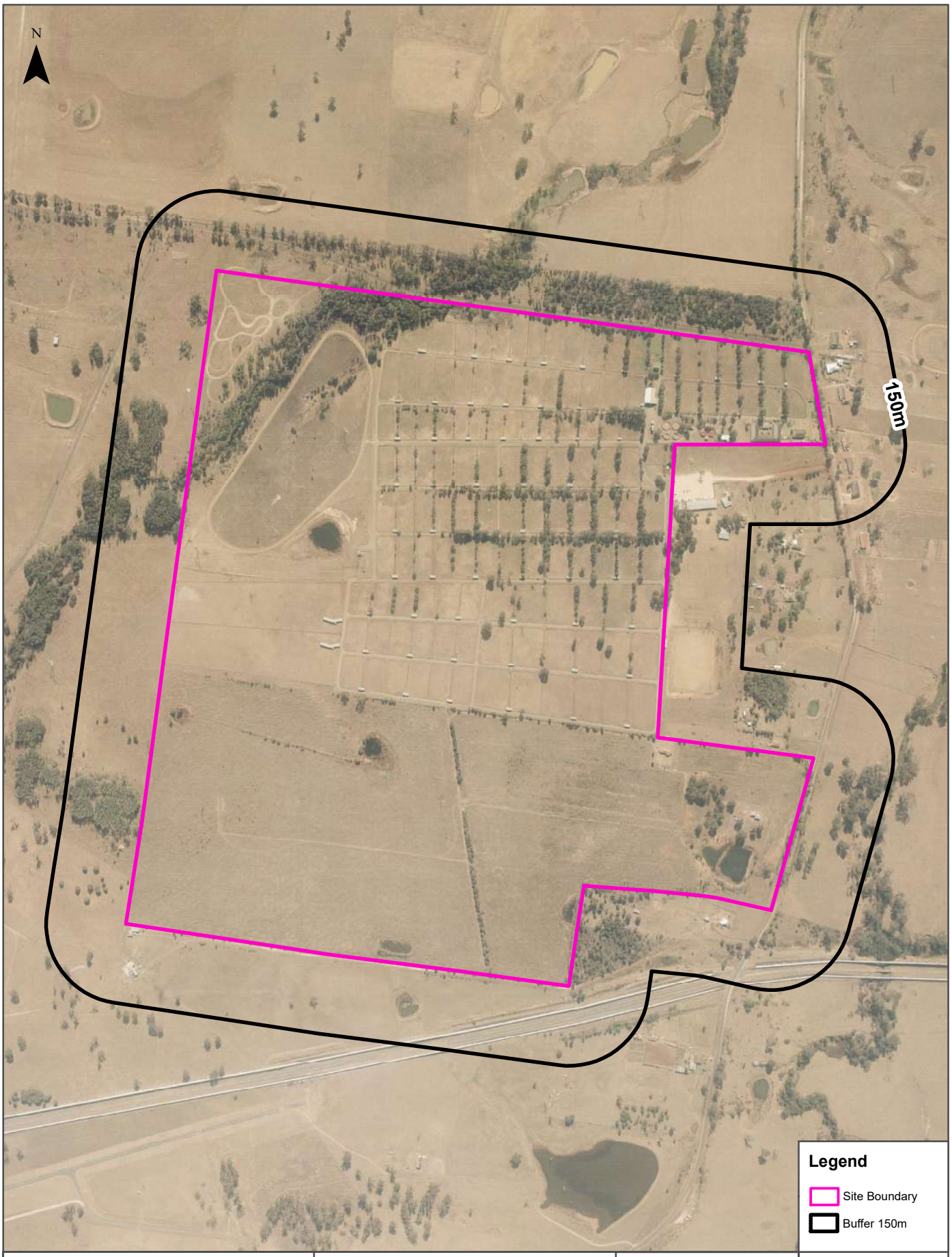
Aerial Imagery 1991

221-227 and 289-311 Luddenham Road, Orchard Hills, NSW 2745



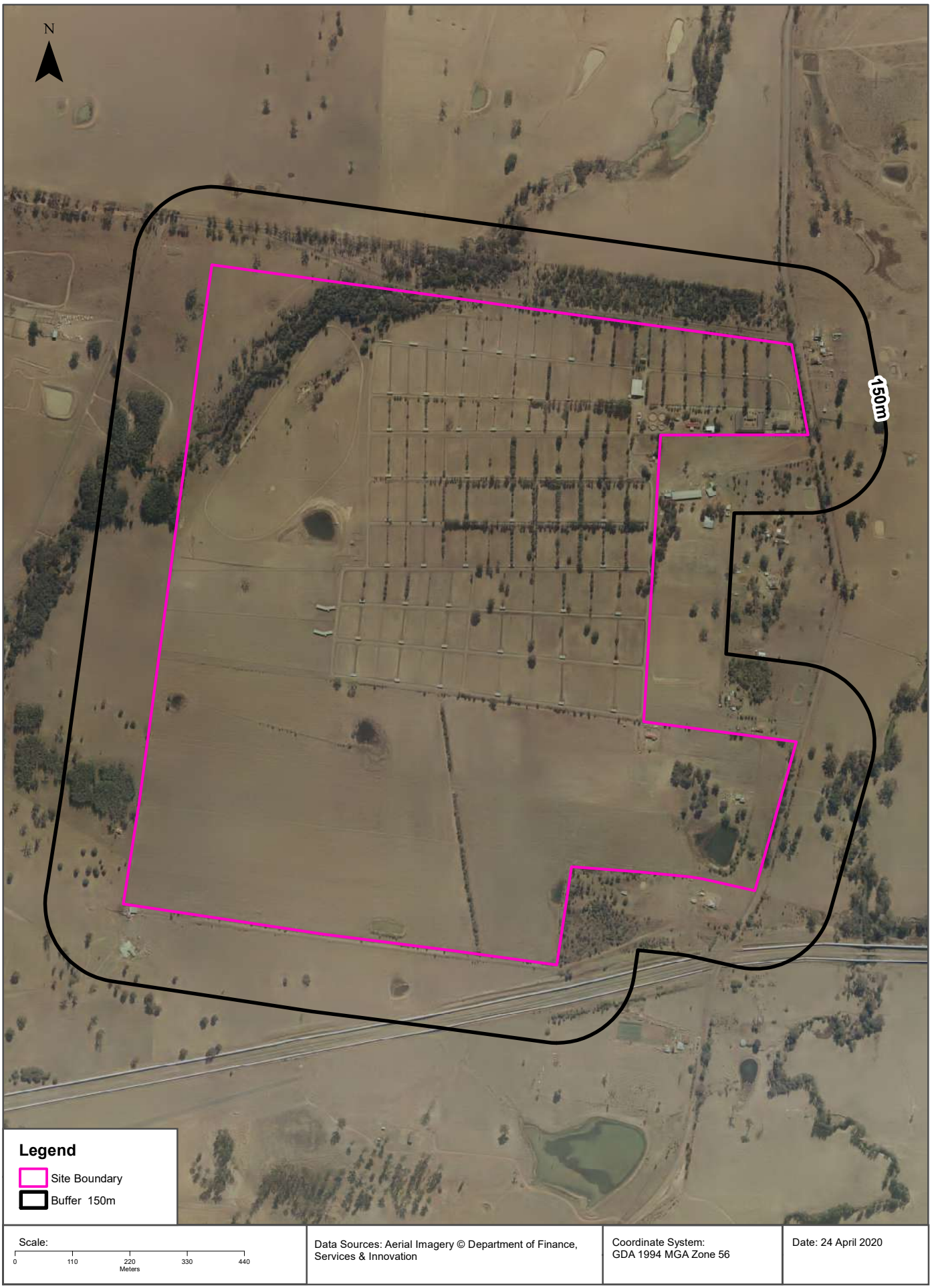
Aerial Imagery 1986

221-227 and 289-311 Luddenham Road, Orchard Hills, NSW 2745



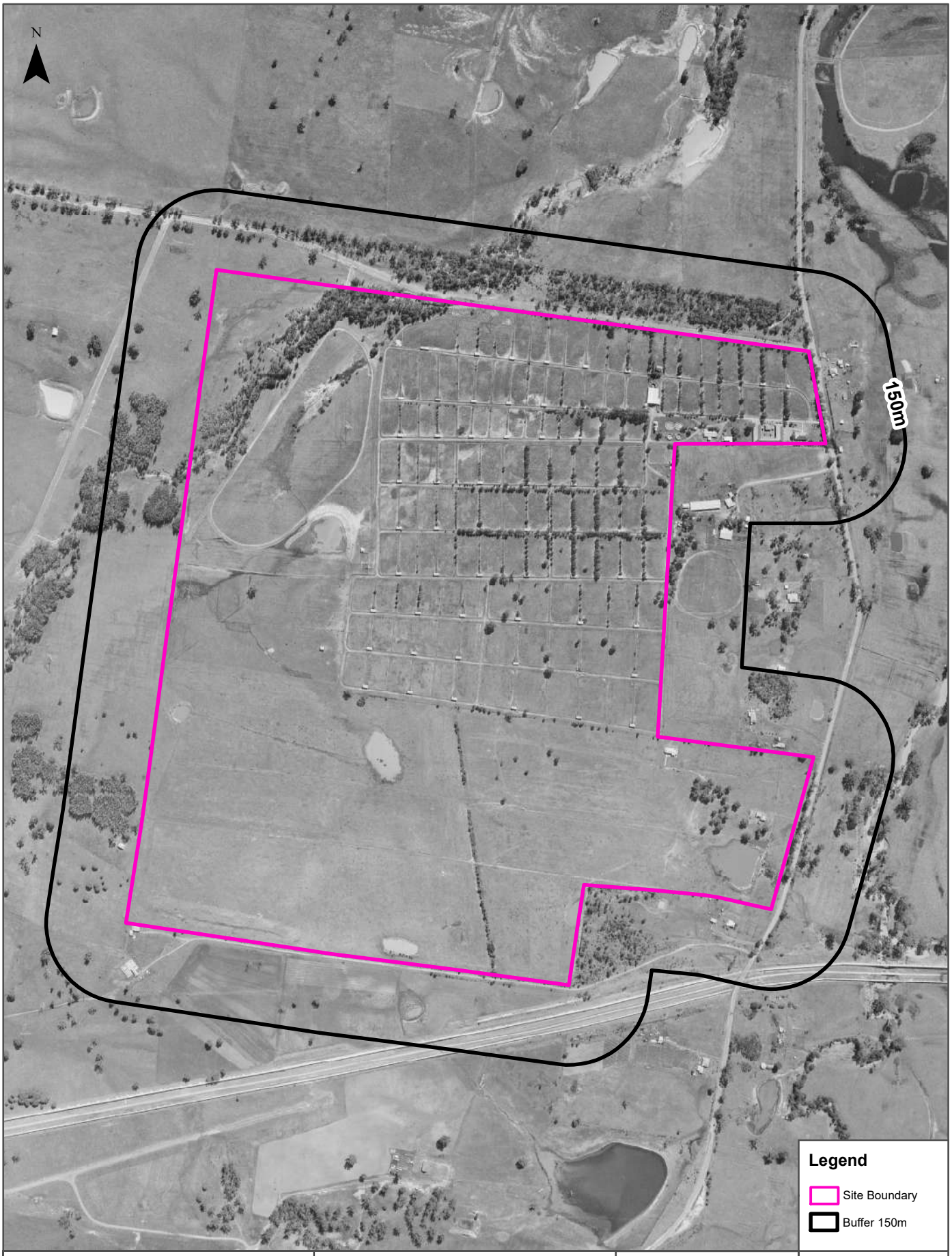
Aerial Imagery 1982

221-227 and 289-311 Luddenham Road, Orchard Hills, NSW 2745



Aerial Imagery 1978

221-227 and 289-311 Luddenham Road, Orchard Hills, NSW 2745



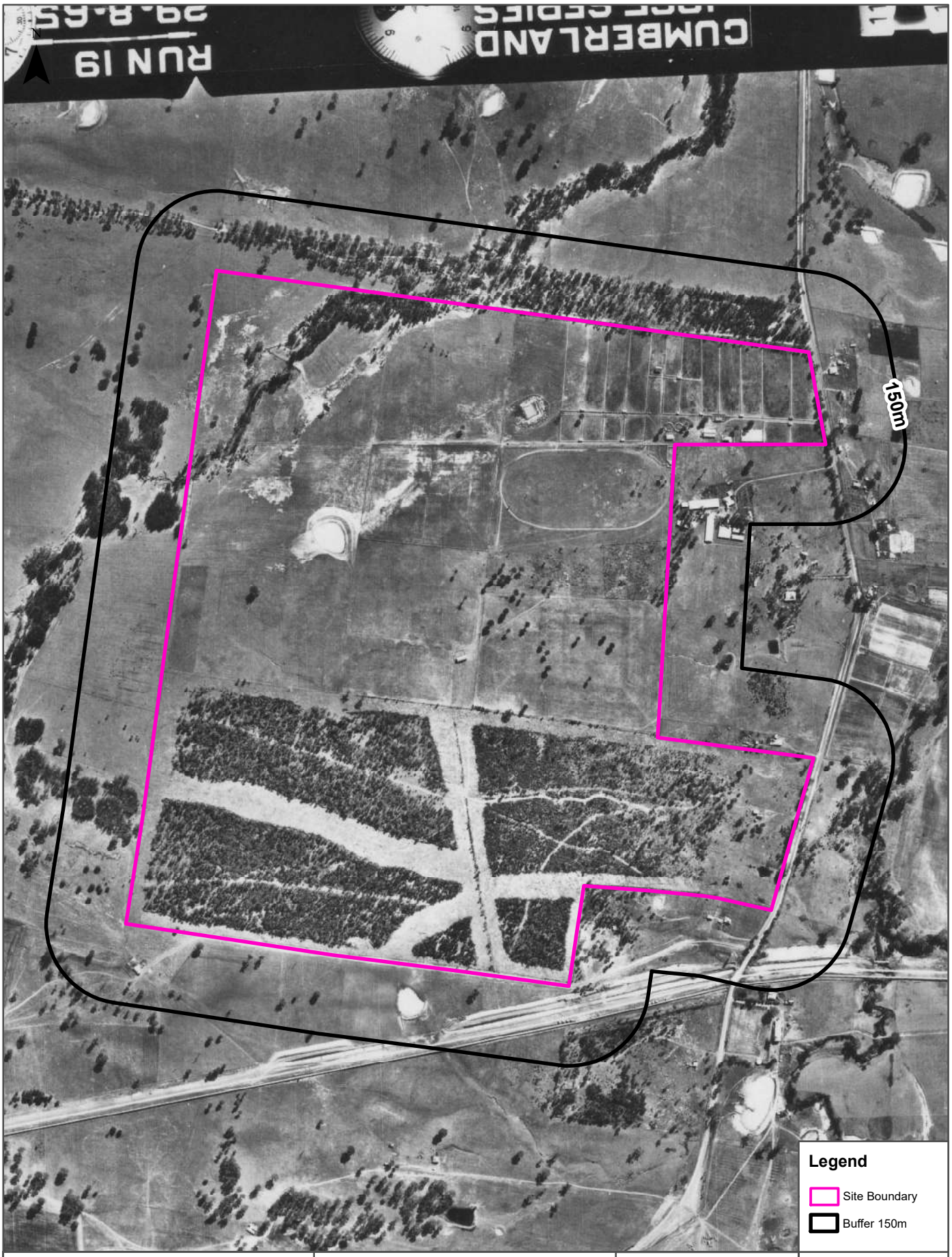
Aerial Imagery 1970

221-227 and 289-311 Luddenham Road, Orchard Hills, NSW 2745



Aerial Imagery 1965

221-227 and 289-311 Luddenham Road, Orchard Hills, NSW 2745



Aerial Imagery 1961

221-227 and 289-311 Luddenham Road, Orchard Hills, NSW 2745



Aerial Imagery 1956

221-227 and 289-311 Luddenham Road, Orchard Hills, NSW 2745



Aerial Imagery 1947

221-227 and 289-311 Luddenham Road, Orchard Hills, NSW 2745



Legend

- Site Boundary
- Buffer 150m

Scale: 0 110 220 330 440 Meters

Data Source Aerial Imagery:
© NSW Department of Finance, Services & Innovation

Coordinate System:
GDA 1994 MGA Zone 56

Date: 24 April 2020

USE OF REPORT - APPLICABLE TERMS

The following terms apply to any person (End User) who is given the Report by the person who purchased the Report from Lotsearch Pty Ltd (ABN: 89 600 168 018) (Lotsearch) or who otherwise has access to the Report (Terms). The contract terms that apply between Lotsearch and the purchaser of the Report are specified in the order form pursuant to which the Report was ordered and the terms set out below are of no effect as between Lotsearch and the purchaser of the Report.

1. End User acknowledges and agrees that:
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   (i) the Report should not be used or taken to indicate or exclude actual fitness or unfitness of Land or Property for any particular purpose
   (j) the Report should not be relied upon for determining saleability or value or making any other decisions in relation to the Property and in particular should not be taken to be a rating or assessment of the desirability or market value of the property or its features; and
   (k) the End User should undertake its own inspections of the Land or Property to satisfy itself that there are no defects or failures
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Report or these Terms;

(b) waives any right it may have to claim against Third Party Content Supplier in connection with the Report, or the negotiation of, entry into, performance of, or termination of these Terms; and

(c) releases each Third Party Content Supplier from any claim it may have otherwise had in connection with the Report, or the negotiation of, entry into, performance of, or termination of these Terms.

5. The End User acknowledges that any Third Party Supplier shall be entitled to plead the benefits conferred on it under clause 4, despite not being a party to these terms.
6. End User must not remove any copyright notices, trade marks, digital rights management information, other embedded information, disclaimers or limitations from the Report or authorise any person to do so.
7. End User acknowledges and agrees that Lotsearch and Third Party Content Suppliers retain ownership of all copyright, patent, design right (registered or unregistered), trade marks (registered or unregistered), database right or other data right, moral right or know how or any other intellectual property right in any Report or any other item, information or data included in or provided as part of a Report.
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    (b) any loss of profit, loss of revenue, loss of interest, loss of data, loss of goodwill or loss of business opportunities, business interruption arising directly or indirectly out of or in relation to the Report or these Terms,

    irrespective of how that liability arises including in contract or tort, liability under indemnity or for any other common law, equitable or statutory cause of action or otherwise.
12. These Terms are subject to New South Wales law.

221-227 and 289-311
Luddenham Road,
Orchard Hill, NSW, 2748

APPENDIX G

TITLE RECORDS

ABN: 36 092 724 251
Ph: 02 9099 7400
(Ph: 0412 199 304)

Level 14, 135 King Street, Sydney
Sydney 2000
GPO Box 4103 Sydney NSW 2001
DX 967 Sydney

Summary of Owners Report

Address: - 221 to 227 Luddenham Road, Orchard Hills

Description: - Lot 1 D.P. 1099147

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available	Reference to Title at Acquisition and sale
22.07.1925 (1925 to 1926)	Marshall Mounter (Farmer)	Vol 3055 Fol 90
20.12.1926 (1926 to 1935)	Albert Ernest James (Farmer)	Vol 3055 Fol 90 Now Vol 4708 Fol 193
10.12.1935 (1935 to 1939)	Mary Abdullah Simon (Married Woman)	Vol 4708 Fol 193
04.09.1939 (1939 to 1941)	Leonard Guest (Grazier)	Vol 4708 Fol 193
30.06.1941 (1941 to 1943)	William Joseph Hammond (Merchant)	Vol 4708 Fol 193
18.11.1943 (1943 to 1946)	Ross Bruce King Stewart (Grazier)	Vol 4708 Fol 193
04.07.1946 (1946 to 1954)	John Frederick Moore (Hotel Proprietor)	Vol 4708 Fol 193 Now Vol 5679 Fol 208
17.05.1954 (1954 to 1955)	Kenneth Stanley Baker (Farmer)	Vol 5679 Fol 208
30.05.1955 & 08.06.1955 (1955 to 1958)	John Frederick Howard (Engineer) Allan Gregory Toohey (Company Director)	Vol 5679 Fol 208 Now Vol 7397 Fol's 162 & 163
26.03.1958 (1958 to 1966)	John William Gardiner Muir (Bookmaker)	Vol 7397 Fol's 162 & 163 Now Vol 7515 Fol 35
29.07.1966 (1966 to 1998)	S & M Fox Investments Pty Limited	Vol 7515 Fol 35
29.05.1998 (1998 to 2008)	Ingham Enterprises Pty Limited Now Inghams Enterprises Pty Limited	Vol 7515 Fol 35 Now 1/1099147
03.06.2008 (2008 to 2016)	Darley Australia Pty Limited	1/1099147
31.05.2016 (2016 to date)	# Atilol Holdings Pty Ltd	1/1099147

 # Denotes current registered proprietor

ABN: 36 092 724 251
Ph: 02 9099 7400
(Ph: 0412 199 304)

Level 14, 135 King Street, Sydney
Sydney 2000
GPO Box 4103 Sydney NSW 2001
DX 967 Sydney

Leases: - NIL

Easements: -

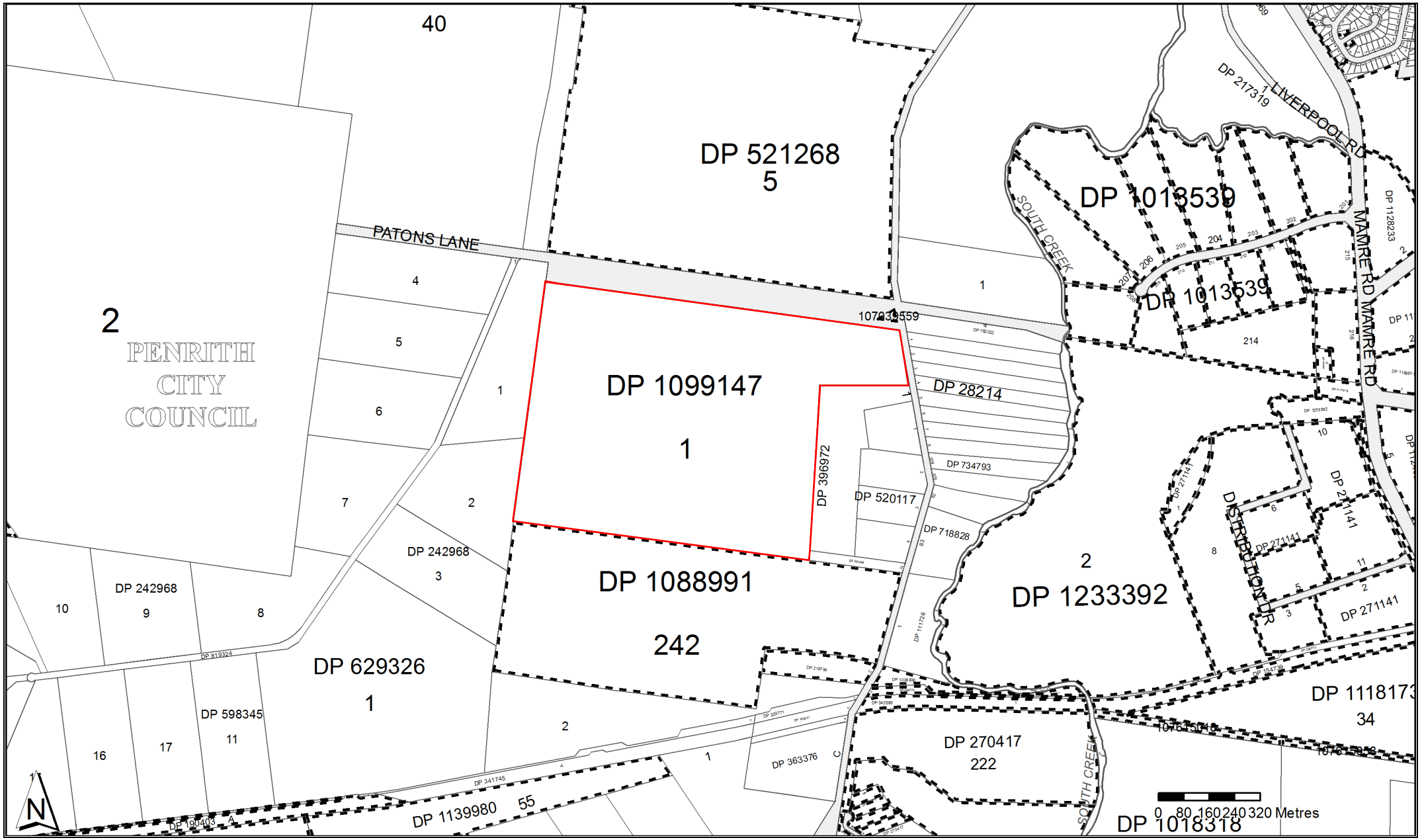
- 20.06.1956 (G 544279) Easement for Water Pipes (over all existing water pipes – See also D.P. 396972)
- 26.11.1969 (L 671350) Easement for Transmission Line 200 feet wide

Yours Sincerely
Mark Groll
23 April 2020

Cadastral Records Enquiry Report : Lot 1 DP 1099147

Ref : Orchard Hills 221-227 Luddenham Rd

Locality : ORCHARD HILLS
Parish : CLAREMONT
LGA : PENRITH
County : CUMBERLAND



Report Generated 6:34:43 AM, 23 April, 2020

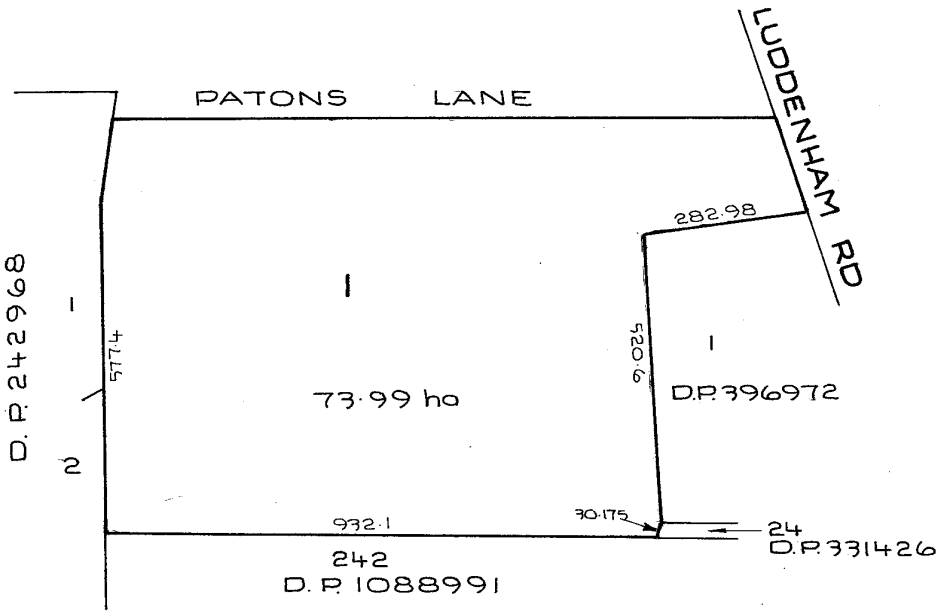
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This information is provided as a searching aid only.Whilst every endeavour is made to ensure that current map, plan and titling information is accurately reflected, the Registrar General cannot guarantee the information provided. For ALL ACTIVITY PRIOR TO SEPTEMBER 2002 you must refer to the RGs Charting and Reference Maps

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Full dimensions and/or area(s) are not available for all lots. Any division of the lands herein may necessitate the lodgement of a plan of survey.



DP 1099147

Registered : 14.6.2006

Title System : TORRENS

Purpose : DEPARTMENTAL

Ref. Map : U7352-5

Last Plan : D.P.962393

PLAN OF PART PORTIONS 23 & 24 COMPRISED IN VOL.7515 FOL.35

Lengths are in metres. Reduction Ratio - NTS

LPI Ref. : TCB 48

Sheet 1 of 1 sheets

L.G.A. : PENRITH

LOCALITY: ORCHARD HILLS

PARISH: CLAREMONT

COUNTY: CUMBERLAND

LOT	PRIOR IDENTITY

THIS PLAN HAS BEEN PREPARED TO PROVIDE AN UNIQUE IDENTITY FOR THE LAND IN THE CERTIFICATE OF TITLE REFERRED TO ABOVE.

IT IS NOT A CURRENT PLAN IN THE TERMS OF 7A OF THE CONVEYANCING ACT, 1919.

Persons are cautioned against altering or adding to this



The land designated..

Area: 182 ac 3rd 13¼ per exclusive of the area of the road coloured brown.
Scale: 20 Chains to one inch.

G925384

NOTIFICATION REFERRED TO

Req:R963385 /Doc:DL G544279 /Rev:19-Mar-1997 /NSW LRS /Pgs:ALL /Prt:23-Apr-2020 10:36 /Seq:1 of 2
© Office of the Registrar-General /Src:INFOTRACK /Ref:Orchard Hills 221-227 Luddenham Rd

REGISTRAR-GENERAL NEW SOUTH WALES

R.P. 13. No. G 544279

New South Wales

MEMORANDUM OF TRANSFER

(REAL PROPERTY ACT, 1900.)

Fees:— £ s. d.
Lodgment
Endorsement
Certificate

NEW SOUTH WALES SEVEN SHILLINGS SIX PENCE STAMP DUTY

(Names must not be disclosed in the Transfer.)

Typing or handwriting in this instrument should not extend into any margin. Handwriting should be clear and legible and in permanent black non-copying ink.

If a new estate, strike out "is" and interline the required alteration.

Full postal address of transferee must be shown.

If to two or more, state whether "as joint tenants" or "as tenants in common."

If all the references cannot be conveniently inserted, a form of annexure (obtainable at L.T.O.) may be added. Any annexure must be signed by the parties and their signatures witnessed.

If part only of the land comprised in a Certificate or Certificates of Title is to be transferred add "and being lot &c. D.P. " or "being the land shown in the plan annexed hereto," or "being the residue of the land in certificate (or grant) registered Vol. Fol. " Where the consent of the local council is required to a subdivision the certificate and plan mentioned in the L.G. Act, 1919, should accompany the transfer.

‡ Strike out if unnecessary, or suitably adjust
(i) if any easements are to be created or any exceptions to be made,
(ii) if the statutory covenants implied by the Act are intended to be varied or modified.
Covenants should comply with the provisions of Section 88 of the Conveyancing Act, 1919-1954.

§ A very short note will suffice.

Execution in New South Wales may be proved if this instrument is signed or acknowledged before the Registrar-General, or Deputy Registrar-General, or a Notary Public, a J.P., or Commissioner for Affidavits, to whom the Transferor is known, otherwise the attesting witness should appear before one of the above functionaries who having questioned the witness should sign the certificate on the back of this form.
As to instruments executed elsewhere, see back of form.

‖ Repeat attestation if necessary.

If the Transferor or Transferee signs by a mark, the attestation must state "that the instrument was read over and explained to him, and that he appeared fully to understand the same."

NOT TO BE ALTERED BY ERASURE—See Foot Notes.

I, JOHN FREDERICK HOWARD of Sydney Engineer and ALLAN GREGORY TOOHEY of Sydney Solicitor

(herein called transferor) being registered as the proprietor of an estate in *fee simple* in the land hereinafter described, subject, however, to such encumbrances, liens and interests as are notified hereunder, in consideration of FOUR THOUSAND POUNDS

(£4,000.0.0) (the receipt whereof is hereby acknowledged) paid to us by JOHN KEITH ORR Company Director and MARGARET RICHARDSON ORR Spinster both of 47 Bundarra Avenue Wahroonga

(herein called transferee) do hereby transfer to the said transferee* as joint tenants ALL such our Estate and Interest in ALL THE land mentioned in the schedule following:—

County.	Parish.	Reference to Title (d) Whole or Part.	Vol.	Fol.	Description of Land (if part only).
CUMBERLAND	CLAREMONT	PART PART	7122 7029	197 57	being the land shown on the plan annexed hereto marked A

~~And the transferee covenants with the transferor~~ together with the easement for water pipes over the residue of the land comprised in the said Certificates of Title in respect of all existing water pipes serving the property hereby transferred and for the purposes of the Conveyancing Act 1919 as amended IT IS HEREBY AGREED AND DECLARED:-

(a) the land to which the benefit of the said easement is annexed is the land hereby transferred;
(b) the land which is to be subject to the burden of the said easement is the residue of the land in the said Certificates of Title;
(c) the persons by whom or with whose consent the said easement may be released varied or modified are the proprietors for the time being of the ~~residue of the~~ land ~~in the said Certificates of Title~~ hereby transferred

ENCUMBRANCES, &c., REFERRED TO.*

N i l.

PLAN DEALT WITH BY PLAN NUMBERED AS F.P. 396972

Signed at Sydney the 20 day of June 1956.

‖Signed in my presence by the transferor WHO IS PERSONALLY KNOWN TO ME

J.F. Howard
Transferor.*

‖Signed

Allan G. Toohey

† Accepted, and I hereby certify this Transfer to be correct for the purposes of the Real Property Act.

John K. Orr
Margaret R Orr
Transferee(s).

Signed in my presence by the transferee WHO IS PERSONALLY KNOWN TO ME

Solicitor, Sydney

* If signed by virtue of any power of attorney, the original power must be registered in the Miscellaneous Register, and produced with each dealing, and the memorandum of non-revocation on back of form signed by the attorney before a witness.

† N.B.—Section 117 requires that the above Certificate be signed by each Transferee or his Solicitor or Conveyancer, and renders any person falsely or negligently certifying liable to a penalty of £50; also to damages recoverable by parties injured. Acceptance by the Solicitor or Conveyancer (who must sign his own name, and not that of his firm) is permitted only when the signature of the Transferee cannot be obtained without difficulty, and when the instrument does not impose a liability on the party taking under it. When the instrument contains some special covenant by the Transferee or is subject to a mortgage, encumbrance or lease, the Transferee must accept personally.

No alterations should be made by erasure. The words rejected should be scored through with the pen, and those substituted written over them, the alteration

Req:R963385 /Doc:DL G544279 /Rev:19-Mar-1997 /NSW LRS /Pgs:ALL /Prt:23-Apr-2020 10:36 /Seq:2 of 2
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No. G 544279

LODGED BY SOLICITORS, &c. ANDREW T GIBLIN, SOMERSET HOUSE, 9 MARTIN PLACE, SYDNEY.

CONSENT OF MORTGAGEE.[j]

(N.B.- Before execution read marginal note.)

I,

mortgagee under Mortgage No.

release and discharge the land comprised in the within transfer from such mortgage and all claims thereunder but without prejudice to my rights and remedies as regards the balance of the land comprised in such mortgage.

Dated at this day of 19 .

Signed in my presence by

who is personally known to me.

Mortgagee.

[j] This consent is appropriate to a transfer of part of the land in the Mortgage. The mortgagee should execute a formal discharge where the land transferred is the whole of or the residue of the land in the Certificate of Title or Crown Grant or is the whole of the land in the mortgage.

MEMORANDUM AS TO NON-REVOCATION OF POWER OF ATTORNEY.

(To be signed at the time of executing the within instrument.)

Memorandum whereby the undersigned states that he has no notice of the revocation of the Power of Attorney registered No. Miscellaneous Register under the authority of which he has just executed the within transfer.[k]

Signed at the day of 19 .

Signed in the presence of—

[k] Strike out unnecessary words. Add any other matter necessary to show that the power is effective.

CERTIFICATE OF J.P., &c., TAKING DECLARATION OF ATTESTING WITNESS.[l]

Appeared before me at , the day of , one thousand nine hundred and the attesting witness to this instrument and declared that he personally knew the person signing the same, and whose signature thereto he has attested; and that the name purporting to be such signature of the said is own handwriting, and that he was of sound mind and freely and voluntarily signed the same.

[l] To be signed by Registrar-General, Deputy Registrar-General, a Notary Public, J.P., Commissioner for Affidavits, or other functionary before whom the attesting witness appears. Not required if the instrument itself be signed or acknowledged before one of these parties.

LEAVE THESE SPACES FOR DEPARTMENTAL USE.

INDEXED

MEMORANDUM OF TRANSFER

Together with Easement for Water Pipes.

Checked by

Particulars entered in Register Book,

Volume 7122 Folio 197

" 7029 " 57

Passed (in S.D.B.) by

the 27th day of February 1957 at 50 minutes past 10 o'clock in the fore noon.

Signed by

J. Wells

Registrar-General.

DOCUMENTS LODGED HEREWITH.

To be filled in by person lodging dealing.

1		4	Received Docs. Nos.
2		5	Receiving Clerk.
3		6	

EXECUTION OUTSIDE NEW SOUTH WALES.

Execution may be proved where the parties are resident:—

(a) *in any part of the British dominions outside the State of New South Wales* by signing or acknowledging before the Registrar General or Recorder of Titles of such Possession, or before any Judge, Notary Public, Justice of the Peace for New South Wales, or Commissioner for taking affidavits for New South Wales, or Mayor or Chief Officer of any municipal or local government corporation of such part, or Justice of the Peace for such part, or the Governor, Government Resident, or Chief Secretary of such part or such other person as the Chief Justice of New South Wales may appoint.

(b) *In the United Kingdom* by signing or acknowledging before the Mayor or Chief Officer of any corporation or a Notary Public.

(c) *in any foreign place* by signing or acknowledging before (i) a British Consular Officer (which includes a British Ambassador, Envoy, Minister, Chargé d'Affaires, Secretary of Embassy or Legation, Consul-General, Acting Consul-General, Consul, Acting Consul, Vice-Consul, Acting Vice-Consul, Pro-Consul, Consular Agent and Acting Consular Agent). (ii) an Australian Consular Officer (which includes an Ambassador, High Commissioner, Minister, Head of Mission, Commissioner, Chargé d'Affaires, Counsellor or Secretary at an Embassy, High Commissioner's Office or Legation, Consul-General, Consul, Vice-Consul, Trade Commissioner and Consular Agent), who should affix his seal of office, or the attesting witness may make a declaration of the due execution thereof before one of such persons (who should sign and affix his seal to such declaration), or such other person as the said Chief Justice may appoint.

The fees are:—Upon lodgment (a) £2-0-0, if accompanied by the relevant title or evidence of production thereof, (b) £3-2-0 otherwise. This fee includes endorsement on the first Certificate. In addition the following fees are payable:—(a) 5/- for each additional Certificate included in the Transfer, (b) £2-10-0 for each new Certificate of Title issued, (c) 10/- where the Transfer contains covenant purporting to affect the user of any land, (d) 10/- where the Transfer is expressed to be made together with an easement or expressed to reserve an easement or in any way creates an easement, (e) 10/- where partial discharge of a mortgage is endorsed on the Transfer, (f) 5/- for each additional folio where the Certificate exceeds fifteen folios, (g) as approved, in cases involving more than one simple diagram or any diagram other than a simple diagram.

Tenants in common must receive separate Certificates.

If part only of the land is transferred a new Certificate must issue for that part, and the old Certificate will be retained in the Office. A new Certificate may be taken out for the residue if desired.

M.P.D. PLANS RECORD.

	Initials.	Date.
Sent to Survey Branch		
Received from Records		
Draft written ...	Red	19/10/56
Draft examined ...	Chas	18.2.57
Diagram prepared ...	A.C.H.	18.2.57
Diagram examined ...	[illegible]	21/2
Draft forwarded ...	[illegible]	[illegible]
Supt. of Engrossers ...	[illegible]	[illegible]
Cancellation Clerk ...	[illegible]	[illegible]

Vol. 7252 Fol. 14

Kyles 81 137—W

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G544279

G 544279

SIGNATIVE PREPARED

Plan Form No 6A (for transfers, leases, etc)

Municipality of St Marys
Shire of

F.P.396972

38889

6

PLAN

of part of the land in Certificate of Title Vol 5679 Fol 208

Parish of Claremont County of Cumberland

Scale 200 feet to an Inch.

Certificate No. 129/55.

Plan of Subdivision certified approved by the Council of the Municipality of Penrith, the requirements of the Local Government Act, 1919 (other than the requirements for the registration of plans) having been complied with.

Approved by the Council on the 14th. day of December 1955.

Town Clerk

ROAD 66' WIDE

"COOLAMON"

FENCE 928' 5¼"

N 81° 52' 30" E

FENCE

WIRE FENCE

ROAD 66 FEET WIDE

Cert. of Title Vol 5679 Fol 208

Cert. of Title

R.D. Appn 15433

PLAN IN

"GIDLEY PARK"

D517073

23 PH

Pond

355 ± 10' 05"

175 ± 20

170 8' 0"

21A 1R. 13¼ P.

Vol 5679 Fol 209

1.

MODERN WIRE FENCE VERY OLD FENCE

PLAN IN C357079

Misc. Plan of Subdn. (R.P.)
Regd. No. 96972.

Approved by Council and covered by Council Clerks Certificate

No. ..... of .....

Council Clerk

Datum Line of Azimuth "XY"

I, KALCYON THOMAS KINNIMONT

of 14 MARTIN PLACE SYDNEY

a surveyor registered under the Surveyors Act, 1929-1946, hereby certify that the survey represented in this plan is accurate and has been made * (1) by me (2) under my immediate supervision in accordance with the Survey Practice Regulations, 1933, and was completed on † 24th October 1955

(Signature) .....

Surveyor registered under the Surveyors Act, 1929-46.

*Strike out either (1) or (2). †Insert date of Survey.

This is the plan marked "A" referred to in [illegible] Dated 2nd [illegible]

CONVERSION TABLE ADDED IN DEPARTMENT OF LANDS

DP 396972

FEET	INCHES	METRES
-	3 1/2	0.089
-	5 1/2	0.140
-	8 3/4	0.222
-	9	0.229
1	-	0.305
1	2	0.356
1	5 1/4	0.438
1	6	0.457
1	8	0.508
10	4 1/2	3.162
16	-	4.877
41	-	12.497
52	7 3/4	16.046
66	-	20.117
79	7 1/4	24.263
79	7 1/2	24.270
87	9 3/4	26.765
89	-	27.127
99	-	30.175
101	6	30.937
163	6 3/4	49.854
208	1 1/4	63.430
400	-	121.920
466	-	142.037
510	8 3/4	155.670
526	1 3/4	160.369
577	0 1/2	175.882
845	2 3/4	257.626
878	1 1/2	267.653
928	5 1/4	282.988
990	-	301.752
1108	1 1/2	337.757
1708	-	520.598
1708	8	520.802
4000	-	1219.200
4660	-	1420.368
6600	-	2011.680

AC	RD	P	HA
21	1	13 1/4	8.633

Copy of plan filed as 38889 13/9/56 1382/58

I, Bruce Richard Davies, Registrar General for New South Wales, certify that this negative is a photograph made as a permanent record of a document in my custody this 9th day of May, 1979

Historical Title

NEW SOUTH WALES LAND REGISTRY SERVICES - HISTORICAL SEARCH

SEARCH DATE
23/4/2020 6:35AM

FOLIO: 1/1099147

First Title(s): OLD SYSTEM
Prior Title(s): VOL 7515 FOL 35

Recorded	Number	Type of Instrument	C.T. Issue
14/6/2006	DP1099147	DEPOSITED PLAN	FOLIO CREATED CT NOT ISSUED
1/5/2008	AD922324	CAVEAT	
3/6/2008	AD983614	DISCHARGE OF MORTGAGE	
3/6/2008	AD983621	TRANSFER	EDITION 1
25/6/2008	AE43923	DEPARTMENTAL DEALING	
8/9/2015	AJ787084	CAVEAT	
31/5/2016	AK457194	TRANSFER	EDITION 2
8/11/2016	AK902428	MORTGAGE	EDITION 3
2/9/2018	AN678864	DEPARTMENTAL DEALING	EDITION 4 CORD ISSUED

*** END OF SEARCH ***

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Received: 23/04/2020 06:35:09

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Form: 01T
Licence: 01-10-073
Licencee: Initio Pty Ltd
Firm Name: DLA Phillips Fox

TRANSFER

New South Wales
Real Property Act 1900

AD983621C

PRIVACY NOTE: Section 31B of the Real Property Act 1900 (RP 1900) authorises the Registrar General to collect the information required by this form for the establishment and maintenance of the Real Property Act Register. Section 96B RP Act requires that the Register is made available to any person for search upon payment of a fee, if any. 0004987637-003

STAMP DUTY Office of State Revenue use only

SECTION 18(2)
DUTY $ **********2.00

(A) TORRENS TITLE SEE ANNEXURE A

(B) LODGED BY

Document Collection Box	Name, Address or DX, Telephone, LLPN if any	CODE
602T	DLA PHILLIPS FOX DX 107 SYDNEY LLPN 123441E Reference (optional) CLF 0446685/001 REY	T TW (Sheriff)

(C) TRANSFEROR INGHAMS ENTERPRISES PTY. LIMITED (ACN 008 447 345)

(D) CONSIDERATION The transferor acknowledges receipt of the consideration of $93,270,000.00 ✓ and as regards. ✓
paid on Transfer of same date

(E) ESTATE the land specified above transfers to the transferee an estate in fee simple

(F) SHARE TRANSFERRED

(G) Encumbrances (if applicable):

(H) TRANSFEREE DARLEY AUSTRALIA PTY LIMITED (ACN 093 921 021)

(I) ~~TENANCY:~~

(J) DATE

Certified correct for the purposes of the Real Property Act 1900 and executed on behalf of the corporation named below by the authorised person(s) whose signature(s) appear(s) below pursuant to the authority specified

Corporation: INGHAMS ENTERPRISES PTY. LIMITED (ACN 008 447 345)
Authority: section 127 of the Corporations Act 2001

Signature of authorised person:
Name of authorised person: JOHN RICHARD HORTON
Office held: Director

Signature of authorised person:
Name of authorised person: ROBERT WALTER INGHAM
Office held: Director

Certified correct for the purposes of the Real Property Act 1900 by the person whose signature appears below.

Signature:
Signatory's name: RAYMOND YEUNG
Signatory's capacity: Transferee's solicitor

All handwriting must be in block capitals
Upd0906

A set of instructions for completing this form is available from the Department of Lands Land and Property Information division

CT SIGHTED CANC. & RET. 2/6 ~

Caveat AD 922328 to lapse on Reg ~

Req:R962116 /Doc:DL AD983621 /Rev:04-Jun-2008 /NSW LRS /Pgs:ALL /Prt:23-Apr-2020 06:35 /Seq:2 of 2
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Annexure A to TRANSFER

Parties:

INGHAMS ENTERPRISES PTY. LIMITED (ACN 008 447 345)
DARLEY AUSTRALIA PTY LIMITED (ACN 093 921 021)

Dated:

Folio Identifiers

6/703300 (being Lot 6 in Deposited Plan 703300)
7/703300 (being Lot 7 in Deposited Plan 703300)
8/703300 (being Lot 8 in Deposited Plan 703300)
14/703300 (being Lot 14 in Deposited Plan 703300)

1/1099147 (being Lot 1 in Deposited Plan 1099147)

190/753601 (being Lot 190 in Deposited Plan 753601)
1/561423 (being Lot 1 in Deposited Plan 561423)
1/652115 (being Lot 1 in Deposited Plan 652115)
Auto Consol: 11279-240 (being Lot 1 in DP538912 and Lot 143 in DP753601)
Auto Consol: 10269-43 (being Lot 376 in DP753601 and Lots 378 -384 in DP753601)
Auto Consol: 6066-74 (being Lots 1 – 4 in DP133749, Lot 146 in DP753601, Lot 155-156 in DP753601 and Lot 240 in DP 753601)
Auto Consol: 8003-138 (being Lot 137 in DP 753601, Lot 239 in DP 753601 and Lot 1 in DP 1076884)

100/749717 (being Lot 100 in Deposited Plan 749717)
101/749717 (being Lot 101 in Deposited Plan 749717)
102/749717 (being Lot 102 in Deposited Plan 749717)
1/45652 (being Lot 1 in Deposited Plan 45652)
8/10/758620 (being Lot 8 of Section 10 in Deposited Plan 758620)

6/207834 (being Lot 6 in Deposited Plan 207834)

INGHAMS ENTERPRISES PTY. LIMITED
Common Seal
A.C.N.
008 447 345

Transferor	Transferor	Transferee's Solicitor
JOHN RICHARD HEXTON	ROBERT NAYLOR INGHAM	RAYMOND YEUNG

All handwriting must be in block capitals
Upd0906

A set of instructions for completing this form is available from the Department of Lands Land and Property Information division

Title Search

NEW SOUTH WALES LAND REGISTRY SERVICES - TITLE SEARCH

FOLIO: 1/1099147

SEARCH DATE	TIME	EDITION NO	DATE
23/4/2020	6:34 AM	4	2/9/2018

NO CERTIFICATE OF TITLE HAS ISSUED FOR THE CURRENT EDITION OF THIS FOLIO.
CONTROL OF THE RIGHT TO DEAL IS HELD BY COMMONWEALTH BANK OF AUSTRALIA.

LAND

LOT 1 IN DEPOSITED PLAN 1099147
AT ORCHARD HILLS
LOCAL GOVERNMENT AREA PENRITH
PARISH OF CLAREMONT COUNTY OF CUMBERLAND
TITLE DIAGRAM DP1099147

FIRST SCHEDULE

ATILOL HOLDINGS PTY LTD (T AK457194)

SECOND SCHEDULE (4 NOTIFICATIONS)

1 RESERVATIONS AND CONDITIONS IN THE CROWN GRANT(S)
2 G544279 EASEMENT FOR WATER PIPES AFFECTING THE LAND ABOVE DESCRIBED
3 L671350 EASEMENT FOR TRANSMISSION LINE 60.96 WIDE AFFECTING THE PART SHOWN IN PLAN WITH L671350
3396233 EASEMENT NOW VESTED IN THE NEW SOUTH WALES ELECTRICITY TRANSMISSION AUTHORITY
4 AK902428 MORTGAGE TO COMMONWEALTH BANK OF AUSTRALIA

NOTATIONS

NOTE: THIS FOLIO MAY BE ASSOCIATED WITH A CROWN TENURE WHICH IS SUBJECT TO PAYMENT OF AN ANNUAL RENT. FOR FURTHER DETAILS CONTACT THE LOCAL CROWN LANDS OFFICE AT METROPOLITAN

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

* Any entries preceded by an asterisk do not appear on the current edition of the Certificate of Title. Warning: the information appearing under notations has not been formally recorded in the Register. InfoTrack an approved NSW Information Broker hereby certifies that the information contained in this document has been provided electronically by the Registrar General in accordance with Section 96B(2) of the Real Property Act 1900.

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ABN: 36 092 724 251
Ph: 02 9099 7400
(Ph: 0412 199 304)

Level 14, 135 King Street, Sydney
Sydney 2000
GPO Box 4103 Sydney NSW 2001
DX 967 Sydney

Summary of Owners Report

Address: - 289 to 311 Luddenham Road, Orchard Hills

Description: - Lot 242 D.P. 1088991

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available	Reference to Title at Acquisition and sale
17.06.1900 (1900 to 1951)	Robert Stewart (or Stuart) Hamilton (Terms of Deed Book 679 No. 482)	Book 679 No. 482
30.07.1951 (1951 to 1958)	Walter George Bass (Municipal Council Overseer)	Book 2184 No. 891 (Book 2464 No. 107 – Confirmation)
20.11.1958 (1958 to 1975)	Anthony Peter Baynie (Farmer) John Joseph Baynie (Farmer) Peter Anthony Baynie (Farmer)	Book 2484 No. 411
19.11.1975 (1975 to 1996)	John Joseph Baynie (Sales and Service Manager) Peter Anthony Baynie (Farmer) Mary Margaret Brown (Married Woman)	Book 3210 No. 806
29.03.1996 (1996 to 2003)	John Joseph Baynie Peter Anthony Baynie	Book 4129 No. 832 Now 241/998459
11.06.2003 (2003 to 2006)	John Joseph Baynie	241/998459
04.07.2003 (2003 to 2006)	John Joseph Baynie (Executor of the Will of Peter Anthony Baynie)	241/998459 Now 242/1088991
16.01.2006 (2006 to 2006)	John Joseph Baynie	242/1088991
05.05.2006 (2006 to 2015)	Trustees of the Lebanese Maronite Missionary	242/1088991
02.12.2015 (2015 to date)	# Atilol Holdings Pty Ltd	242/1088991

 # Denotes current registered proprietor

Leases and Easements: - NIL

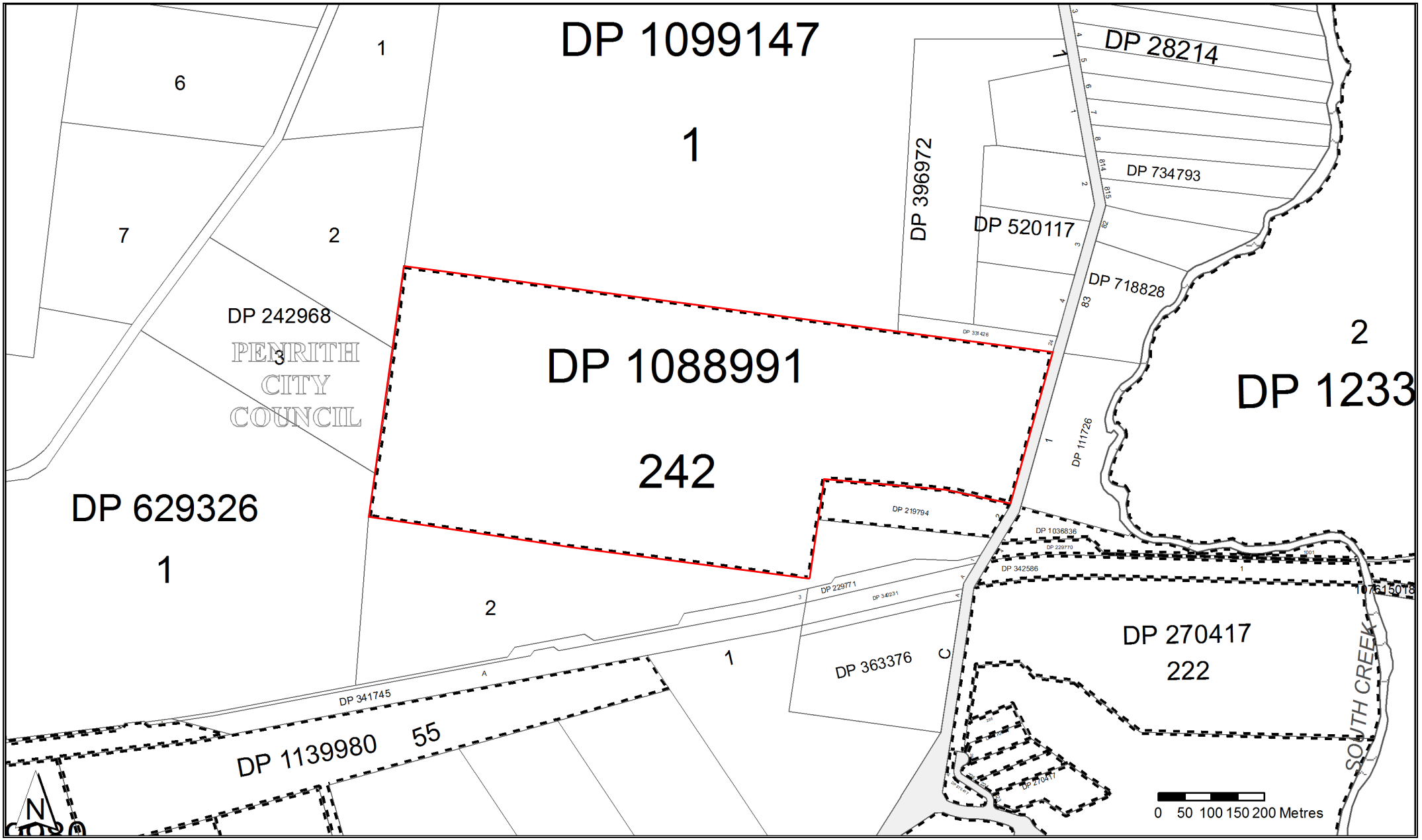
Yours Sincerely
Mark Groll
23 April 2020

LAND REGISTRY SERVICES

Cadastral Records Enquiry Report : Lot 242 DP 1088991

Ref : Orchard Hills 289-311 Luddenham Rd

Locality : ORCHARD HILLS
Parish : CLAREMONT
LGA : PENRITH
County : CUMBERLAND



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This information is provided as a searching aid only.Whilst every endeavour is made to ensure that current map, plan and titling information is accurately reflected, the Registrar General cannot guarantee the information provided. For ALL ACTIVITY PRIOR TO SEPTEMBER 2002 you must refer to the RGs Charting and Reference Maps

InfoTrack

Historical Title

NEW SOUTH WALES LAND REGISTRY SERVICES - HISTORICAL SEARCH

SEARCH DATE
23/4/2020 6:37AM

FOLIO: 241/998459

First Title(s): OLD SYSTEM
Prior Title(s): CA59876

Recorded	Number	Type of Instrument	C.T. Issue
4/4/1996	CA59876	CONVERSION ACTION	FOLIO CREATED EDITION 1
21/5/1999	5843865	DEPARTMENTAL DEALING	
11/6/2003	9687328	NOTICE OF DEATH	EDITION 2
4/7/2003	9758497	TRANSMISSION APPLICATION	EDITION 3
21/10/2005	DP1088991	DEPOSITED PLAN	FOLIO CANCELLED

*** END OF SEARCH ***

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Received: 23/04/2020 06:37:11

Req:R962809 /Doc:DL 9687328 /Rev:13-Jun-2003 /NSW LRS /Pgs:ALL /Prt:23-Apr-2020 09:33 /Seq:1 of 1
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Form: 02ND
Licence: 01-05-050
Licensee: Miller Noyce

NOTICE OF DEATH

New South Wales
Section 101 Real Property Act 1900

9687328B

PRIVACY NOTE: this information is legally required and will b

(A) **LAND**

Torrens Title
Certificate of Title Folio Identifier 241/998459

(B) **REGISTERED DEALING**

Number	Torrens Title

(C) **LODGED BY**

Delivery Box	Name, Address or DX and Telephone	CODE
5971H	Miller Noyce Reference (optional): J-22465	ND

(D) **DECEASED JOINT TENANT**

PETER ANTHONY BAYNIE

(E) **SURVIVING JOINT TENANT**

JOHN JOSEPH BAYNIE

(F) I, **JOHN JOSEPH BAYNIE**, the surviving joint tenant, apply to be registered as proprietor of the interest of the deceased joint tenant in the land specified above.

(G) **STATUTORY DECLARATION**

I, **JOHN JOSEPH BAYNIE**, solemnly and sincerely declare that the deceased joint tenant –

1. died on 06/04/03 ; and
2. is identical with the deceased named in the certified copy of death certificate No. 11238//2003 accompanying this application.

I make this solemn declaration conscientiously believing the same to be true and by virtue of the Oaths Act 1900 and I certify this application correct for the purposes of the Real Property Act 1900.

Made and subscribed at Hornsby in the state of NSW South Wales
on 5th June 2003 in the presence of-

Signature of witness: Signature of surviving joint tenant:

Name of witness: Douglas John Spencer

Address of witness: 45 Hunter St Hornsby

Qualification of witness: Solicitor

All handwriting must be in block capitals.
Office use only—
Evidence sighted/sighted and returned:

L.P. Advised TA also to be lodged

Req:R962120 /Doc:DL 9758497 /Rev:07-Jul-2003 /NSW LRS /Pgs:ALL /Prt:23-Apr-2020 06:37 /Seq:1 of 1
© Office of the Registrar-General /Src:INFOTRACK /Ref:Orchard Hills 289-311 Luddenham Rd

Form: 03TA
Licence: 01-05-051
Licensee: Miller Noyce

TRANSMISSION APPLICATION

New South Wales
Section 93 Real Property Act 1900

9758497H

PRIVACY NOTE: this information is legally required and will become part of the public record

STAMP DUTY — Office of State Revenue use only

(A) **LAND** — Torrens Title: **Certificate of Title Folio Identifier 241/998459**

(B) **REGISTERED DEALING** — Number: | Torrens Title:

(C) **LODGED BY** — Delivery Box: 597H | Name, Address or DX and Telephone: Miller Noyce | Reference (optional): J-22465 | CODE: TA

(D) **DECEASED REGISTERED PROPRIETOR** — **PETER ANTHONY BAYNIE**

(E) **APPLICANT** — **JOHN JOSEPH BAYNIE**

(F) I, the applicant, being entitled as executor of the will/estate of the deceased registered proprietor, Peter Anthony Baynie, (who died on 06/04/03) pursuant to probate/~~letters of administration~~ No. 108837/02 granted on 20.6.2003 to myself (which is lodged herewith/ a certified copy of which is lodged herewith) apply to be registered as proprietor of the estate or interest of the deceased registered proprietor in the land/registered dealing specified above.

DATE 3 / 7 / 2003
dd mm yyyy

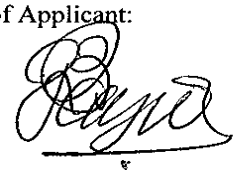
(G) I certify that the person(s) signing opposite, with whom I am personally acquainted or as to whose identity I am otherwise satisfied, signed this instrument in my presence.

Signature of witness:

Name of witness: DOUGLAS DEAN SPENCER
Address of witness: 45 HUNTER ST HORNSBY

Certified correct for the purposes of the Real Property Act 1900 by the Applicant.

Signature of Applicant:



(H) **CONSENT OF EXECUTOR, ADMINISTRATOR OR TRUSTEE**

I,

executor of the will/administrator of the estate/trustee of the estate of the deceased registered proprietor, consent to this application.

Signature of witness:

Signature of executor/administrator/trustee:

Name of witness:

Address of witness:

All handwriting must be in block capitals.
Office use only—
Evidence sighted/sighted and returned: Probate 108837/02 POA 6/4/03

Historical Title

NEW SOUTH WALES LAND REGISTRY SERVICES - HISTORICAL SEARCH

SEARCH DATE
23/4/2020 6:37AM

FOLIO: 242/1088991

First Title(s): OLD SYSTEM
Prior Title(s): 241/998459

Recorded	Number	Type of Instrument	C.T. Issue
21/10/2005	DP1088991	DEPOSITED PLAN	FOLIO CREATED CT NOT ISSUED
16/1/2006	AB824518	TRANSFER	EDITION 1
5/5/2006	AC285047	TRANSFER	
5/5/2006	AC285048	REQUEST	
5/5/2006	AC285049	MORTGAGE	EDITION 2
8/6/2011	AG287684	CAVEAT	
17/4/2015	AJ337508	APPLICATION FOR PREPARATION OF LAPSING NOTICE	
16/9/2015	AJ816242	CAVEAT	
2/12/2015	AK29985	WITHDRAWAL OF CAVEAT	
2/12/2015	AK29986	DISCHARGE OF MORTGAGE	
2/12/2015	AK29987	TRANSFER	
2/12/2015	AK29988	MORTGAGE	EDITION 3
21/11/2016	AK902401	DISCHARGE OF MORTGAGE	
21/11/2016	AK902402	MORTGAGE	EDITION 4
2/9/2018	AN678864	DEPARTMENTAL DEALING	EDITION 5 CORD ISSUED

*** END OF SEARCH ***

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Form: 01T
Licence: 01-05-025
Licensee: Miller Noyce

TRANSFER

New South Wales
Real Property Act 1900

AB824518L

PRIVACY NOTE: Section 31B of the Real Property Act 1900 (RP Act) authorises the R required by this form for the establishment and maintenance of the Real Property Ac Register is made available to any person for search upon payment of a fee, if any.

STAMP DUTY Office of State Revenue use only

NEW SOUTH WALES DUTY
29-09-2005 0002991372-001
SECTION 63(A)
DUTY $ **********10.00

(A) **TORRENS TITLE** If appropriate, specify the part transferred
Certificate of Title Folio Identifer 241/998459

LODGED
(B) **LODGED BY**
09 DEC 2005
TIME: 11-30

Delivery Box	Name, Address or DX and Telephone	CODES
124E	LLPN : 123820V Legalink Pty Ltd Level 8, 170 Phillip Street SYDNEY 2000 Ph: (02) 9230 6900 Reference (optional): J-MIL-670898-22465	T TW (Sheriff)

(C) **TRANSFEROR** JOHN JOSEPH BAYNIE

(D) **CONSIDERATION** ~~The transferor acknowledges receipt of the consideration of and as regards~~
Pursuant to the provisions of the Will dated 12/04/89 of the late Peter Anthony Baynie the transferor transfers to the transferee

(E) **ESTATE** THE LAND SPECIFIED ABOVE TRANSFERS TO THE TRANSFEREE AN ESTATE IN ~~The land specified above transfers to the transferee an estate in fee simple~~ FEE SIMPLE

(F) **SHARE TRANSFERRED** 100 % of the one third share transmitted to John Joseph Baynie as the Executors of Estate late Peter Anthony Baynie pursuant to Transmission Application 9758497.

(G) Encumbrances (if applicable):

(H) **TRANSFEREE** JOHN JOSEPH BAYNIE

(I) **TENANCY:**

DATE 26-9-2005

(J) I certify that the person(s) signing opposite, with whom I am personally acquainted or as to whose identity I am otherwise satisfied, signed this instrument in my presence.

Signature of witness:

Name of witness: DOUGLAS DEAN SPENCER
Address of witness: 45 HUNTER ST HORNSBY

Certified correct for the purposes of the Real Property Act 1900 by the transferor.

Signature of transferor:

I certify that the person(s) signing opposite, with whom I am personally acquainted or as to whose identity I am otherwise satisfied, signed this instrument in my presence.

Signature of witness:

Name of witness: DOUGLAS DEAN SPENCER
Address of witness: 45 HUNTER ST HORNSBY

Certified correct for the purposes of the Real Property Act 1900 by the transferee.

Signature of transferee:

DP 1088991

ALL HANDWRITING MUST BE IN BLOCK CAPITALS

Req:R962119 /Doc:DL AC285047 /Rev:08-May-2006 /NSW LRS /Pgs:ALL /Prt:23-Apr-2020 06:37 /Seq:1 of 1
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Form: 01T
Release: 3.0
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TRANSFER

New South Wales
Real Property Act 1900

AC285047B

PRIVACY NOTE: Section 31B of the Real Property Act 1900 (RP Act) authorises the R[illegible] by this form for the establishment and maintenance of the Real Property Act Register. Section 96B RP Act requires that the Register is made available to any person for search upon payment of a fee, if any.

STAMP DUTY Office of State Revenue use only

NEW SOUTH WALES DUTY
18-01-2006 0003221657-001
SECTION 275-TRANSFER
NO DUTY PAYABLE

(A) **TORRENS TITLE** FOLIO IDENTIFIER 242/1088991

(B) **LODGED BY**

Document Collection Box	Name, Address or DX and Telephone	CODES
985K	Shads 128705K	T
	Reference: H: 70717	TW (Sheriff)

(C) **TRANSFEROR** JOHN JOSEPH BAYNIE

(D) **CONSIDERATION** The transferor acknowledges receipt of the consideration of $ 3,750,000.00 and as regards

(E) **ESTATE** the land specified above transfers to the transferee an estate in fee simple

(F) **SHARE TRANSFERRED**

(G) Encumbrances (if applicable):

(H) **TRANSFEREE** THE TRUSTEES OF THE LEBANESE MARONITE MISSIONARY ABN 90 233 549 241

S

(I) **TENANCY:**

DATE

(J) I certify that the person(s) signing opposite, with whom I am personally acquainted or as to whose identity I am otherwise satisfied, signed this instrument in my presence.

Signature of witness:

Name of witness: Douglas Dean Spencer
Address of witness: 45 Hunter St
Hornsby

Certified correct for the purposes of the Real Property Act 1900 by the transferor.

Signature of transferor:

Certified correct for the purposes of the Real Property Act 1900 by the person whose signature appears below.

Signature:

Signatory's name: PETER BOUZANIS
Signatory's capacity: transferee's solicitor

Title Search

NEW SOUTH WALES LAND REGISTRY SERVICES - TITLE SEARCH

FOLIO: 242/1088991

SEARCH DATE	TIME	EDITION NO	DATE
23/4/2020	6:36 AM	5	2/9/2018

NO CERTIFICATE OF TITLE HAS ISSUED FOR THE CURRENT EDITION OF THIS FOLIO.
CONTROL OF THE RIGHT TO DEAL IS HELD BY COMMONWEALTH BANK OF AUSTRALIA.

LAND

LOT 242 IN DEPOSITED PLAN 1088991
AT ORCHARD HILLS
LOCAL GOVERNMENT AREA PENRITH
PARISH OF CLAREMONT COUNTY OF CUMBERLAND
TITLE DIAGRAM DP1088991

FIRST SCHEDULE

ATILOL HOLDINGS PTY LTD (T AK29987)

SECOND SCHEDULE (2 NOTIFICATIONS)

1 RESERVATIONS AND CONDITIONS IN THE CROWN GRANT(S)
2 AK902402 MORTGAGE TO COMMONWEALTH BANK OF AUSTRALIA

NOTATIONS

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

* Any entries preceded by an asterisk do not appear on the current edition of the Certificate of Title. Warning: the information appearing under notations has not been formally recorded in the Register. InfoTrack an approved NSW Information Broker hereby certifies that the information contained in this document has been provided electronically by the Registrar General in accordance with Section 96B(2) of the Real Property Act 1900.

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Received: 23/04/2020 06:36:26

221-227 and 289-311
Luddenham Road,
Orchard Hill, NSW, 2748

APPENDIX H

IMPORT DOCUMENT

From: George Henien <ghenien@hbbproperty.com.au>
Sent: Tuesday, 30 June 2020 6:54 PM
To: Beau Dubois <beau.dubois@constructionsciences.net>
Cc: Nalin De Silva <nalin.desilva@constructionsciences.net>; Vipul Desilva <vipul.desilva@constructionsciences.net>
Subject: RE: Luddenham Road Orchard Hills - Enviro Report

Hi Beau,

As discussed, the haulage company Load & Go was unable to provide a deceleration advising the material on site has come from the three source locations. I can confirm being verbally advised by Load & Go the source sites where the material was imported from are as per the issued environmental testing reports.
Could you please finalise the environmental report and provide at your earliest.

Kind regards

George Henien
Infrastructure Manager

PROPERTY®
M 0419 535 103

Please ensure all invoices are sent to invoices@hbbproperty.com.au

Douglas Partners Pty Ltd
ABN 75 053 980 117
www.douglaspartners.com.au
96 Hermitage Road
West Ryde NSW 2114
PO Box 472
West Ryde NSW 1685
Phone (02) 9809 0666
Fax (02) 9809 4095

84944.02.R.010.Rev0
30 October 2019
PMO

Cranbrook School
c/- epm Projects
Level 2, 146 Arthur Street
NORTH SYDNEY NSW 2060

Attention: Mr Todd Ewart

Dear Sirs

In Situ Waste Classification & ENM Assessment
Hordern Oval
Cranbrook School, Bellevue Hill

1. Executive Summary

This report describes the methodology and results of an In Situ Waste Classification and Excavated Natural Material (ENM) Assessment undertaken by Douglas Partners Pty Ltd (DP) on Hordern Oval, Cranbrook School, Bellevue Hill. The intention of the assessment was to cover the materials that are to be removed during excavation works for proposed Aquatic and Fitness Centre (AFC). The results are summarised in Tables 1 and 2 which refer to the attached Drawing C1.

Table 1: Summary of Waste Classification Assessment for Yellow Shaded Areas on Drawing C1

In Situ Location	Fill materials that are above natural soil/rock in the yellow shaded areas on Drawing C1
Material Description	Silty sand fill and sand fill as described on the attached borehole logs for BH2 and BH113
Classification	General Solid Waste (non-putrescible) based on CT1 criteria
References	NSW EPA *Waste Classification Guidelines* (2014)

Table 2: Summary of Waste Classification Assessment for Non-Shaded Area on Drawing C1

In Situ Location	Fill materials that are above natural soil/rock in all areas within the excavation footprint except for the yellow shaded areas on Drawing C1
Material Description	Silty sand and silty clay topsoil, and sand fill (including cemented sand/coffee rock) as described on the attached borehole logs
Classification	General Solid Waste (non-putrescible) based on CT1 criteria and Excavated Natural Material (ENM)
References	NSW EPA *Waste Classification Guidelines* (2014) The excavated natural material order/exemption 2014

Reference should be made to the following sections of the report for information on the materials and their location which are subject to this assessment, the sampling and testing methodology, guidelines used, analytical results, and the conditions and limitations associated with this assessment.

2. Introduction

This In Situ Waste Classification & ENM Assessment was commissioned by Cranbrook School to provide information in relation to disposal options for materials that will be removed from Hordern Oval. These materials are likely to include bulk excavation spoil, pile spoil and spoil from ancillary works. The attached Drawing C1 shows the location of the assessment area.

The assessment was undertaken in accordance with the requirements of *The excavated natural material order 2014* issued by the NSW EPA under Part 9, Clause 93 of the *Protection of the Environment Operations (Waste) Regulation 2014*. Where the ENM requirements were not met, the materials were classified in accordance with *Waste Classification Guidelines* (NSW EPA, 2014).

3. Scope of Works

The scope of works for the waste classification was as follows:

- Review the results of previous contamination testing undertaken on the site by Douglas Partners in 2015 and in 2017;
- Undertake additional sampling from 16 test pits excavated by the project archaeologist in October 2019 to gain further information on the contaminant concentrations on the site;
- Collect discrete soil samples from various depths within the boreholes/test pits in general accordance with the ENM Order;
- Dispatch the soil samples to a NATA accredited laboratory (Envirolab Services Pty Ltd) for quantitative analysis for the suite of contaminants outlined in the ENM Order;
- Preparation of this In Situ Waste Classification & ENM Assessment report.

4. Site Information and Potential for Contamination

Cranbrook School opened in 1918 and presumably the oval has been in use since this time. The southern portion of the oval is below a batter slope and the northern portion is supported by a retaining wall. As such, it appears likely that material was excavated from a natural hill in the south and deposited in the lower area to the north to create a large level playing area. To our knowledge, no obviously contaminating activities have been undertaken in this area of the site.

The suite of contaminants required to be assessed under the *ENM Order* is as follows:

- Eight priority metals: arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc;
- Total petroleum hydrocarbons (TPH);
- Benzene, toluene, ethylbenzene and xylenes (BTEX);
- Polycyclic aromatic hydrocarbons (PAH);
- pH;
- Electrical conductivity; and
- Foreign materials.

In addition to these analytes, the following suite was also assessed in accordance with the *Waste Classification Guidelines*:

- Organochlorine pesticides (OCP);
- Organophosphorus pesticides (OPP);
- Polychlorinated biphenyls (PCB);
- Phenol; and
- Asbestos.

5. Field Work Rationale and Methodology

The area of the assessment is shown on Drawing C1 which is attached to this report. The area has been assessed to be approximately 15,000 m^2 and therefore 25 sampling locations are required on the basis of the *ENM Order* and *Sampling Design Guidelines* (NSW EPA, 1995). Samples were obtained from 30 locations which exceeds the minimum number required.

The environmental sampling for the current assessment was performed by Douglas Partners on 23 October 2019, with reference to standard operating procedures outlined in the DP *Field Procedures Manual*. All sampling data was recorded on DP chain-of-custody sheets. The general sampling procedure comprised:

- Collection of representative soil samples from within the boreholes/test pits in general accordance with the requirements of the ENM Order;
- The use of decontaminated equipment for each sampling event;
- Transfer of samples into laboratory-prepared glass jars, capping immediately, minimising the headspace within the sample jar;
- Collection of replicate soil samples in zip-lock bags for asbestos screening purposes;
- Labelling of sample containers with individual and unique identification, including project number, sample location and sample depth;

- Placing the glass jars into a cooled, insulated and sealed container for transport to the laboratories; and
- Use of chain of custody documentation ensuring that sample tracking and custody could be cross-checked at any point in the transfer of samples from the field to the laboratory. Copies of completed chain of custody forms are attached.

6. Field Work and Laboratory Test Results

The materials encountered during the various stages of the field work are described in the borehole and test pit logs attached to this report. A summary of the laboratory test results is provided in Tables 3 and 4, also attached, along with the detailed laboratory result reports. The foreign materials results were all below the laboratory detection limits.

7. Waste Classification Assessment

The *Waste Classification Guidelines* include the following six-step process for waste classification:

- Establish if the waste is 'special waste'
- Establish if the waste is 'liquid waste'
- Establish if the waste is 'pre-classified' by the EPA
- Establish if the waste possesses hazardous characteristics
- Determine the contaminant concentrations of the waste
- Establish if the waste is putrescible

Visual inspection and the laboratory analysis indicated that asbestos was not present in the soil samples tested. The soil samples did not contain clinical waste or tyres and therefore the soils on the site are not classified as special waste.

The samples analysed were not in liquid form and therefore could not be described as liquid waste.

The EPA has pre-classified glass, plastic, rubber, bricks, concrete, building and demolition waste, and asphalt waste as General Solid Waste (non-putrescible). The materials within the samples were typically soil and therefore not pre-classified.

The samples analysed did not possess any obvious hazardous characteristics and could not be described as hazardous waste prior to chemical analysis. All samples analysed were assessed on a visual and tactile basis as being incapable of significant biological transformation and are therefore considered to be non-putrescible.

Due to the number of samples used for this assessment, the sample mean, sample standard deviation and 95% UCL concentrations were used to compare the contaminant concentrations with the contaminant threshold (CT) criteria provided in the guidelines. All sample mean, sample standard deviation and 95% UCL concentrations were within the CT1 criteria.

On this basis, all samples of fill would be classified as General Solid Waste (non-putrescible) and would need to be disposed of at a site that is licenced to receive this category of waste. Any materials encountered on the site that are different to those described herein may have a different classification.

The natural soils and, where encountered, rock below the fill should be able to be described as virgin excavated natural material (VENM) upon excavation, providing they are not cross-contaminated during excavation/piling works. Validation of this status will be required once the overburden has been removed from the site. VENM can usually be transported to a site for use as fill rather than requiring disposal at landfill.

8. ENM Assessment

The excavated natural material order 2014 defines ENM as naturally occurring rock and soil that has:

- been excavated from the ground; and
- contains at least 98% (by weight) natural material; and
- does not meet the definition of Virgin Excavated Natural Material.

Further, ENM does not include material located in a hotspot, material that has been processed, or material that contains asbestos, acid sulphate soils (actual and potential) or sulfidic ores. The *ENM Order* also describes sampling frequency, contaminants to be analysed and test methods to be used.

The testing described in this report was carried out in general accordance with the requirements for in situ assessment as outlined in the ENM Order. The laboratory test results, sample receipt and chain-of-custody documentation are attached to this report. A summary of the results of the testing, as well as the ENM criteria for the various analytes, are provided in Tables 3 to 5 which are attached to this report.

All sample analysis was conducted by Envirolab Services Pty Ltd in accordance with the chain-of-custody prepared by DP. Based on a review of the laboratory reported QC results, it is considered that the laboratory test data obtained are reliable and useable for this assessment.

As shown in Tables 3 to 5, the majority of the samples analysed met the requirements of the *ENM Order*. Only the samples from previous boreholes BH2 and BH113 did not due to slightly elevated concentrations of Arsenic or Benzo(a)pyrene. These areas have been delineated in yellow shading in the attached Drawing C1.

Based on the observations at the time of sampling and the reported analytical results, the materials outside the areas of yellow shading can be described as *Excavated Natural Material* (ENM) upon excavation and can be disposed of at a site that is licenced to receive this type of material.

9. Additional Comments

Division 4, Section 45, of *The Protection of the Environment Operations (Waste) Regulation 2014* states that it is an offence for waste to be transported to a place that cannot lawfully be used as a facility to accept that waste. It is the duty of the owner and transporter of the waste to ensure that the waste is disposed of appropriately. DP does not accept liability for the unlawful disposal of waste materials from any site. DP accepts no responsibility for the material tracking, loading, management, transport or disposal of waste from the site. Before disposal of the material to a licensed landfill is undertaken, the waste producer will be required to obtain prior consent from the landfill.

The requirements of the ENM Order and ENM Exemption must be followed if any material is disposed of as ENM, and these documents are attached to this report for information.

Both the receiving site and the site disposing of the material should satisfy the requirements of the licence before disposal of the material is undertaken. Note that appropriate prior arrangement with the receiving site/relevant authorities should be obtained prior to the disposal of any material off site. The receiving site should check to ensure that the material received matches the description provided in this report and contains no cross contamination.

The results provided in the report are indicative of the sub-surface conditions only at the specific sampling locations, and then only to the depths investigated and at the time the work was carried out. Sub-surface conditions can change as a result of human influences, and such changes may occur after DP's field testing has been completed. Furthermore, fill is by its nature heterogeneous and therefore some parts of the fill may not be represented by the visual and analytical results reported herein.

10. Limitations

Douglas Partners (DP) has prepared this report for this project at Cranbrook School, Bellevue Hill, in accordance with instructions from Cranbrook School. This report is provided for the use of Cranbrook School for this project only and for the purposes as described in the report. It should not be used for other projects or by a third party. Any party so relying upon this report beyond its exclusive use and purpose as stated above, and without the express written consent of DP, does so entirely at its own risk and without recourse to DP for any loss or damage. In preparing this report DP has necessarily relied upon information provided by the client and/or their agents.

This report must be read in conjunction with all of the attached and should be kept in its entirety without separation of individual pages or sections. DP cannot be held responsible for interpretations or conclusions made by others unless they are supported by an expressed statement, interpretation, outcome or conclusion stated in this report.

This report, or sections from this report, should not be used as part of a specification for a project, without review and agreement by DP. This is because this report has been written as advice and opinion rather than instructions for construction.

Please contact the writer for clarification of the above as necessary.

Yours faithfully
Douglas Partners Pty Ltd

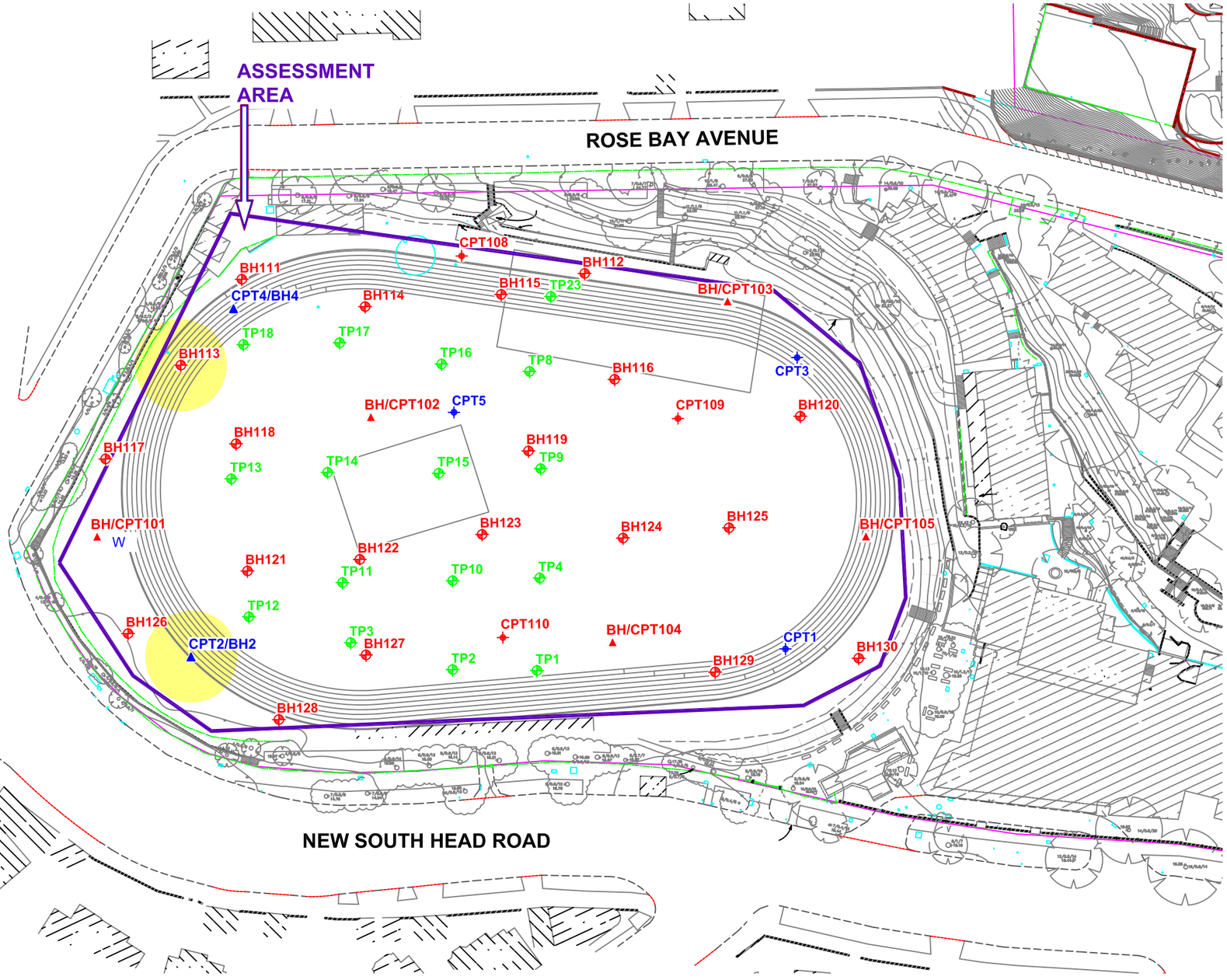
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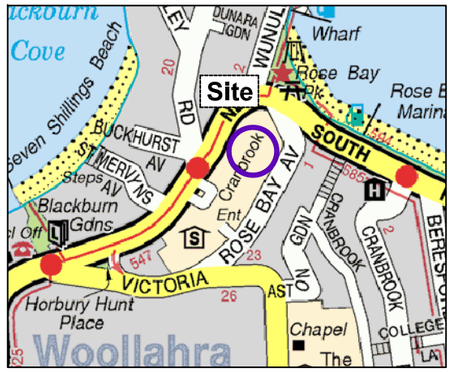
Peter Oitmaa
Principal

pp **J M Nash**
Principal

Attachments: Drawing C1
Summary of Laboratory Test Results
Current and Previous Borehole/Test Pit Logs
NATA Laboratory Certificates, Chain-of-Custody Documentation & Sample Receipt Advice
ENM Order and ENM Exemption
Notes About this Report

Drawing C1





Locality Plan

LEGEND

- Previous borehole 2015
- Previous CPT 2015
- Previous borehole & CPT 2015
- Previous borehole & CPT 2017
- Previous CPT 2017
- Previous borehole 2017
- W Groundwater well
- Current test pit location
- Area of GSW (not ENM)

NOTE:
1. Base drawing from Hill & Blume Pty Ltd (Ref. 41104, dated 14.5.2010)

0 10 20 30 40 50 75 100m
1:1000 @ A3

Douglas Partners
Geotechnics / Environment / Groundwater

CLIENT: Cranbrook School		TITLE: **Locations of Tests - Hordern Oval** **In Situ Waste Classification & ENM Assessment** **Cranbrook School, BELLEVUE HILL**
OFFICE: Sydney	DRAWN BY: PSCH	
SCALE: 1:1000 @A3	DATE: 30.10.2019	

PROJECT No: 84944.02
DRAWING No: C1
REVISION: 0

Summary of Laboratory Test Results

Table 3: Contaminant Concentrations in Filling

Sample/ Depth (m)	B	T	E	X	TRH_{6-9}	TRH_{10-36}	+PAH	B(a)P	+OCP	+PCB	Phenol	Asbestos	As	Cd	Cr	Cu	Pb	Hg	Ni	Zn	pH	EC
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	(Y/N)	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	units	dS/m
Filling (2015)																						
BH2/1.0	<0.2	<0.5	<1	<3	<25	<250	NIL	<0.05	NIL	NIL	<5	N	41	<0.4	3	5	3	<0.1	<1	36	6.3	0.021
BH2/2.0	<0.2	<0.5	<1	<3	<25	<250	NIL	<0.05	NIL	NIL	<5	N	<4	<0.4	2	1	3	<0.1	<1	3	6.5	0.013
BH2/3.0	<0.2	<0.5	<1	<3	<25	<250	NIL	<0.05	NIL	NIL	<5	N	<4	<0.4	1	<1	1	<0.1	<1	1	6.5	0.013
BH2/4.0	<0.2	<0.5	<1	<3	<25	<250	NIL	<0.05	NIL	NIL	<5	N	<4	<0.4	2	<1	1	<0.1	<1	<1	5.8	0.014
BH4/1.0	<0.2	<0.5	<1	<3	<25	<250	5.8	0.3	NIL	NIL	<5	N	<4	<0.4	2	2	5	<0.1	<1	3	6.3	0.014
BH4/2.0	<0.2	<0.5	<1	<3	<25	<250	NIL	<0.05	NIL	NIL	<5	N	<4	<0.4	1	1	9	<0.1	<1	3	6.1	0.012
BH4/3.0	<0.2	<0.5	<1	<3	<25	<250	NIL	<0.05	NIL	NIL	<5	N	<4	<0.4	1	<1	4	<0.1	<1	2	6.0	0.011
BH4/4.0	<0.2	<0.5	<1	<3	<25	<250	NIL	<0.05	NIL	NIL	<5	N	<4	<0.4	2	1	14	<0.1	<1	4	6.2	0.014
Filling (2017)																						
BH101/0.5	<0.2	<0.5	<1	<3	<25	<250	3.0	0.3	NIL	NIL	<5	N	6	<0.4	2	18	22	<0.1	1	12	6.4	0.022
BH102/0.5	<0.2	<0.5	<1	<3	<25	<250	1.2	0.2	NIL	NIL	<5	N	11	<0.4	7	18	28	0.3	3	24	6.2	0.027
BH103/0.1	<0.2	<0.5	<1	<3	<25	<250	NIL	<0.05	NIL	NIL	<5	N	<4	<0.4	42	15	14	<0.1	21	24	5.3	0.200
BH111/0.45-0.5	<0.2	<0.5	<1	<3	<25	<250	NIL	<0.05	NIL	NIL	<5	N	<4	<0.4	<1	<1	1	<0.1	<1	1	6.3	0.012
BH113/1.0-1.05	<0.2	<0.5	<1	<3	<25	<250	NIL	<0.05	NIL	NIL	<5	N	41	<0.4	1	2	2	<0.1	<1	4	6.1	0.012
BH115/0.1	<0.2	<0.5	<1	<3	<25	<250	NIL	<0.05	NIL	NIL	<5	N	14	<0.4	5	5	6	<0.1	3	16	6.1	0.032
BH117/1.95-2.0	<0.2	<0.5	<1	<3	<25	<250	0.2	<0.05	NIL	NIL	<5	N	<4	<0.4	1	3	7	<0.1	<1	6	6.1	0.014
BH118/0.1-0.15	<0.2	<0.5	<1	<3	<25	<250	0.78	0.06	NIL	NIL	<5	N	5	<0.4	4	5	11	0.2	2	9	5.8	0.027
BH124/0.1	<0.2	<0.5	<1	<3	<25	<250	0.59	0.1	NIL	NIL	<5	N	5	<0.4	4	5	12	0.2	2	13	6.2	0.028
BH126/2.0	<0.2	<0.5	<1	<3	<25	<250	NIL	<0.05	NIL	NIL	<5	N	<4	<0.4	<1	1	2	<0.1	<1	3	6.4	0.008
BH128/1.0	<0.2	<0.5	<1	<3	<25	<250	NIL	<0.05	NIL	NIL	<5	N	<4	<0.4	1	2	1	<0.1	<1	5	6.2	0.011
BH130/0.1	<0.2	<0.5	<1	<3	<25	<250	2.3	0.2	NIL	NIL	<5	N	19	0.5	9	19	50	<0.1	4	42	5.7	0.025
Filling (2019)																						
TP1/0-0.3	<0.2	<0.5	<1	<3	<25	<250	0.05	0.05	NIL	NIL	<5	NT	9	<0.4	2	4	5	<0.1	1	9	5.9	0.032
TP2/0.4-0.5	<0.2	<0.5	<1	<3	<25	<250	<0.05	<0.05	NT	NT	NT	N	7	<0.4	2	3	4	<0.1	1	7	6.5	0.022
TP3/0.4-0.5	<0.2	<0.5	<1	<3	<25	<250	1.0	0.1	NIL	NIL	<5	NT	<4	<0.4	3	2	6	<0.1	2	5	6.0	0.014
TP4/0.4-0.5	<0.2	<0.5	<1	<3	<25	<250	<0.05	<0.05	NIL	NIL	<5	N	<4	<0.4	2	3	6	<0.1	<1	7	6.4	0.016
TP8/1.6-1.8	<0.2	<0.5	<1	<3	<25	<250	<0.05	<0.05	NT	NT	NT	N	6	<0.4	1	<1	1	<0.1	<1	2	6.3	0.009
TP8/4.6-4.8	<0.2	<0.5	<1	<3	<25	<250	<0.05	<0.05	NT	NT	NT	NT	<4	<0.4	1	<1	1	<0.1	<1	3	5.9	0.011
TP9/0-0.3	<0.2	<0.5	<1	<3	<25	<250	0.92	0.2	NIL	NIL	<5	N	<4	<0.4	4	6	10	<0.1	2	13	6.2	0.016

Table 3: Contaminant Concentrations in Filling (Continued)

Sample/ Depth (m)	B	T	E	X	TRH_{6-9}	TRH_{10-36}	+PAH	B(a)P	+OCP	+PCB	Phenol	Asbestos	As	Cd	Cr	Cu	Pb	Hg	Ni	Zn	pH	EC
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	(Y/N)	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	units	dS/m
TP10/0-0.3	<0.2	<0.5	<1	<3	<25	<250	<0.05	<0.05	NIL	NIL	<5	NT	6	<0.4	4	5	10	0.1	2	14	6.6	0.016
TP11/0-0.3	<0.2	<0.5	<1	<3	<25	<250	1.8	0.2	NIL	NIL	<5	NT	8	<0.4	4	9	20	0.1	2	12	5.9	0.023
TP11/0.8-1.0	<0.2	<0.5	<1	<3	<25	<250	<0.05	<0.05	NT	NT	NT	N	<4	<0.4	1	2	<1	<0.1	<1	14	5.6	0.008
TP12/1.6-1.8	<0.2	<0.5	<1	<3	<25	<250	<0.05	<0.05	NT	NT	NT	NT	8	<0.4	<1	<1	1	<0.1	<1	2	6.1	0.010
TP12/3.6-3.8	<0.2	<0.5	<1	<3	<25	<250	<0.05	<0.05	NT	NT	NT	NT	<4	<0.4	2	<1	1	<0.1	<1	<1	5.8	0.012
TP13/0-0.3	<0.2	<0.5	<1	<3	<25	<250	1.4	0.2	NIL	NIL	<5	N	7	<0.4	3	7	17	0.1	2	13	5.9	0.020
TP13/2.8-3.0	<0.2	<0.5	<1	<3	<25	<250	<0.05	<0.05	NT	NT	NT	NT	<4	<0.4	<1	<1	<1	<0.1	<1	<1	5.5	0.012
TP14/0.4-0.5	<0.2	<0.5	<1	<3	<25	<250	<0.05	<0.05	NIL	NIL	<5	NT	6	<0.4	2	4	6	<0.1	<1	4	6.1	0.012
TP15/0.4-0.6	<0.2	<0.5	<1	<3	<25	<250	0.05	0.05	NIL	NIL	<5	N	<4	<0.4	2	4	8	<0.1	1	5	6.4	0.031
TP16/0.4-0.6	<0.2	<0.5	<1	<3	<25	<250	<0.05	<0.05	NT	NT	NT	NT	<4	<0.4	1	2	3	<0.1	<1	4	6.3	0.012
TP17/0-0.3	<0.2	<0.5	<1	<3	<25	<250	0.05	0.05	NIL	NIL	<5	N	5	<0.4	7	6	12	0.1	2	13	5.8	0.025
TP17/0.4-0.5	<0.2	<0.5	<1	<3	<25	<250	0.3	0.08	NT	NT	NT	N	6	<0.4	3	9	11	0.2	1	11	6.0	0.010
TP18/0.4-0.5	<0.2	<0.5	<1	<3	<25	<250	0.05	0.05	NT	NT	NT	NT	5	<0.4	<1	7	12	<0.1	<1	4	6.4	0.011
TP23/0-0.3	<0.2	<0.5	<1	<3	<25	<250	0.2	0.06	NIL	NIL	<5	N	10	<0.4	5	8	17	0.2	2	19	6.7	0.020
TP23/0.4-0.6	<0.2	<0.5	<1	<3	<25	<250	<0.05	<0.05	NT	NT	NT	NT	4	<0.4	1	<1	3	<0.1	<1	2	6.4	0.013
Statistical Analysis of Contaminant Concentrations in Filling (mg/kg)																						
Maximum	NA	NA	NA	NA	NA	NA	29	1.6	NA	NA	NA	NA	41	0.5	42	22	50	0.3	21	42	9.9	0.200
Minimum	NA	NA	NA	NA	NA	NA	NIL	<0.05	NA	NA	NA	NA	<4	<0.4	<1	<1	<1	<0.1	<1	<1	5.3	0.008
Average	NA	NA	NA	NA	NA	NA	1.1	0.09	NA	NA	NA	NA	5.3	NA	3.3	4.8	8.4	NA	1.3	8.9	6.2	0.023
Std. Deviation	NA	NA	NA	NA	NA	NA	4.5	0.25	NA	NA	NA	NA	9.2	NA	6.4	5.7	9.2	NA	3.3	9.1	0.7	0.031
95% UCL	NA	NA	NA	NA	NA	NA	4.1	0.26	NA	NA	NA	NA	11.4	NA	7.5	8.6	14.5	NA	3.4	15.0	6.4	0.043

Notes: B = Benzene; T = Toluene; E = Ethylbenzene; X = Xylene; TRH = total recoverable hydrocarbons; +PAH = Positive polycyclic aromatic hydrocarbons; B(a)P = Benzo(a)pyrene; OCP = Organochlorine pesticides; PCB = Polychlorinated biphenyls; As = Arsenic; Cd = Cadmium; Cr = Chromium; Cu = Copper; Pb = Lead; Hg = Mercury; Ni = Nickel; Zn = Zinc; EC = electrical conductivity; NT = Not tested; NA = not applicable

YELLOW shading refers to an exceedance as shown in Table 5

Table 4: Contaminant Concentrations in Natural Soil

Sample/ Depth (m)	B	T	E	X	TRH_{6-9}	TRH_{10-36}	+PAH	B(a)P	+OCP	+PCB	Phenol	Asbestos	As	Cd	Cr	Cu	Pb	Hg	Ni	Zn	pH	EC
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	(Y/N)	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	units	dS/m
Natural Soil (2017)																						
BH101/4.0	<0.2	<0.5	<1	<3	<25	<250	NIL	<0.05	NIL	NIL	<5	N	<4	<0.4	1	2	<1	<0.1	<1	2	6.1	0.008
BH102/2.0	<0.2	<0.5	<1	<3	<25	<250	NIL	<0.05	NIL	NIL	<5	N	<4	<0.4	1	2	3	<0.1	<1	3	6.0	0.009
BH103/1.0	<0.2	<0.5	<1	<3	<25	<250	NIL	<0.05	NIL	NIL	<5	N	<4	<0.4	<1	2	<1	<0.1	<1	3	5.7	0.031
BH104/1.0	<0.2	<0.5	<1	<3	<25	<250	NIL	<0.05	NIL	NIL	<5	N	<4	<0.4	1	<1	2	<0.1	<1	4	5.8	0.011
BH105/1.0	<0.2	<0.5	<1	<3	<25	<250	NIL	<0.05	NIL	NIL	<5	N	<4	<0.4	1	3	3	<0.1	<1	4	6.5	0.018
BH111/2.9-3.0	<0.2	<0.5	<1	<3	<25	<250	NIL	<0.05	NIL	NIL	<5	N	<4	<0.4	1	<1	3	<0.1	<1	2	6.1	0.010
BH112/0.5	<0.2	<0.5	<1	<3	<25	<250	NIL	<0.05	NIL	NIL	<5	N	<4	<0.4	4	4	10	<0.1	2	11	5.6	0.064
BH114/1.0	<0.2	<0.5	<1	<3	<25	<250	NIL	<0.05	NIL	NIL	<5	N	<4	<0.4	2	1	3	<0.1	<1	4	6.0	0.013
BH116/1.0	<0.2	<0.5	<1	<3	<25	<250	NIL	<0.05	NIL	NIL	<5	N	<4	0.6	<1	1	7	<0.1	<1	3	6.4	0.014
BH119/0.5	<0.2	<0.5	<1	<3	<25	<250	NIL	<0.05	NIL	NIL	<5	N	<4	<0.4	<1	2	2	<0.1	<1	5	5.8	0.012
BH120/0.5	<0.2	<0.5	<1	<3	<25	<250	NIL	<0.05	NIL	NIL	<5	N	9	<0.4	8	7	16	0.1	3	17	8.0	0.130
BH121/1.0	<0.2	<0.5	<1	<3	<25	<250	NIL	<0.05	NIL	NIL	<5	N	<4	<0.4	1	2	3	<0.1	<1	7	6.6	0.012
BH122/1.0	<0.2	<0.5	<1	<3	<25	<250	NIL	<0.05	NIL	NIL	<5	N	<4	<0.4	8	4	6	<0.1	8	7	6.6	0.018
BH123/0.5	<0.2	<0.5	<1	<3	<25	<250	NIL	<0.05	NIL	NIL	<5	N	<4	<0.4	<1	1	3	<0.1	<1	2	6.4	0.015
BH125/0.5	<0.2	<0.5	<1	<3	<25	<250	NIL	<0.05	NIL	NIL	<5	N	<4	<0.4	2	7	4	<0.1	2	9	6.1	0.017
BH127/0.5	<0.2	<0.5	<1	<3	<25	<250	NIL	<0.05	NIL	NIL	<5	N	<4	<0.4	1	2	3	<0.1	1	13	5.9	0.013
BH129/0.5	<0.2	<0.5	<1	<3	<25	<250	NIL	<0.05	NIL	NIL	<5	N	<4	<0.4	2	2	2	<0.1	1	12	6.0	0.016
BH129/2.0	<0.2	<0.5	<1	<3	<25	<250	NIL	<0.05	NIL	NIL	<5	N	<4	<0.4	2	<1	1	<0.1	<1	1	6.1	0.015
Statistical Analysis of Contaminant Concentrations in Natural Soil (mg/kg)																						
Maximum	NA	NA	NA	NA	NA	NA	0.1	NA	NA	NA	NA	NA	9	0.6	8	7	16	0.1	8	17	8.0	0.130
Minimum	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<4	<0.4	<1	<1	<1	<0.1	<1	1	5.6	0.008
Average	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.9	2.3	3.9	NA	0.9	6.1	6.2	23.7
Std. Deviation	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.4	2.1	3.9	NA	2.0	4.6	0.5	29.4
95% UCL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	4.4	4.4	7.9	NA	3.0	8.7	6.4	53.9

Notes: B = Benzene; T = Toluene; E = Ethylbenzene; X = Xylene; TRH = total recoverable hydrocarbons; +PAH = Positive polycyclic aromatic hydrocarbons; B(a)P = Benzo(a)pyrene; OCP = Organochlorine pesticides; PCB = Polychlorinated biphenyls; As = Arsenic; Cd = Cadmium; Cr = Chromium; Cu = Copper; Pb = Lead; Hg = Mercury; Ni = Nickel; Zn = Zinc; EC = electrical conductivity; NT = Not tested; NA = not applicable

Table 5: Comparative Criteria

Description	B	T	E	X	TRH_{6-9}	TRH_{10-36}	+PAH	B(a)P	+OCP	+PCB	Phenol	Asbestos	As	Cd	Cr	Cu	Pb	Hg	Ni	Zn	pH	EC
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	(Y/N)	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	units	dS/m
Waste Classification Guidelines (2014)																						
CT1	10	288	600	1000	650	10000	200	0.8	Various	50	288	N	100	20	100	NA	100	4	40	NA		
ENM Order (2014)																						
Max. Average	NA	NA	NA	NA	NA	250	20	0.5	NA	NA	NA	N	20	0.5	75	100	50	0.5	30	150	5-9	1.5
Absolute Max.	0.5	65	25	15	NA	500	40	1.0	NA	NA	NA	N	40	1	150	200	100	1	60	300	4.5-10	3

Current and Previous Borehole Logs

TEST PIT LOG

CLIENT: Cranbrook School
PROJECT: In Situ Waste Classification & ENM Assessment
LOCATION: Cranbrook School, Bellevue Hill

SURFACE LEVEL: --
EASTING:
NORTHING:

PIT No: TP01
PROJECT No: 84944.02
DATE: 23/10/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
	0.0	FILL/Silty SAND SM: fine to medium grained, brown, trace rootlets, dry to moist		E/B	0.0				
	0.3	FILL/SAND SW: fine to medium grained, yellow-brown mottled grey sand, trace brown-yellow clayey sand (crushed coffee rock), moist		E/B	0.3 0.4 0.5				
	0.6	Pit discontinued at 0.6m; Limit of investigation							

RIG: 15t Excavator

LOGGED: JJH

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Cranbrook School
PROJECT: In Situ Waste Classification & ENM Assessment
LOCATION: Cranbrook School, Bellevue Hill

SURFACE LEVEL: --
EASTING:
NORTHING:

PIT No: TP02
PROJECT No: 84944.02
DATE: 23/10/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
	0.0	FILL/Silty SAND SM: fine to medium grained, brown, trace rootlets, dry to moist		E/B	0.3				
	0.4	FILL/SAND SW: fine to medium grained, yellow-brown mottled grey sand, trace brown-yellow clayey sand (crushed coffee rock), moist		E/B	0.4 0.6				
	1.0	Pit discontinued at 1.0m; Limit of investigation							

RIG: 15t Excavator

LOGGED: JJH

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Cranbrook School
PROJECT: In Situ Waste Classification & ENM Assessment
LOCATION: Cranbrook School, Bellevue Hill

SURFACE LEVEL: --
EASTING:
NORTHING:

PIT No: TP03
PROJECT No: 84944.02
DATE: 23/10/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
	0.0	FILL/Silty SAND SM: fine to medium grained, brown, trace rootlets, dry to moist		E/B	0.0				
	0.3	FILL/SAND SW: fine to medium grained, yellow-brown mottled grey sand, trace brown-yellow clayey sand (crushed coffee rock), moist		E/B	0.3 0.4 0.5				
	1.0	Pit discontinued at 1.0m; Limit of investigation							

Dynamic Penetrometer Test (blows per mm): 5, 10, 15, 20

RIG: 15t Excavator

LOGGED: JJH

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Cranbrook School
PROJECT: In Situ Waste Classification & ENM Assessment
LOCATION: Cranbrook School, Bellevue Hill

SURFACE LEVEL: --
EASTING:
NORTHING:

PIT No: TP04
PROJECT No: 84944.02
DATE: 23/10/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
	0.0	FILL/Silty SAND SM: fine to medium grained, brown, trace rootlets, dry to moist		E/B					
	0.3	FILL/SAND SW: fine to medium grained, yellow-brown mottled grey sand, trace brown-yellow clayey sand (crushed coffee rock), moist		E/B	0.3 0.4 0.5				
	0.7	Pit discontinued at 0.7m; Limit of investigation							

RIG: 15t Excavator

LOGGED: JJH

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Cranbrook School
PROJECT: In Situ Waste Classification & ENM Assessment
LOCATION: Cranbrook School, Bellevue Hill

SURFACE LEVEL: --
EASTING:
NORTHING:

PIT No: TP08
PROJECT No: 84944.02
DATE: 23/10/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
	0.3	FILL/Silty SAND SM: fine to medium grained, brown, trace rootlets, dry to moist							
		FILL/SAND SW: fine to medium grained, yellow-brown mottled grey sand, trace brown-yellow clayey sand (crushed coffee rock), moist		E/B*	0.6 0.8				
				E/B	1.6 1.8				
				E/B	2.6 2.8				
				E/B	3.6 3.8				
				E/B	4.6 4.8				
	6.0	SAND SW: fine to medium grained, grey to dark grey, moist, aeolian		E/B	6.4				
	6.5	Pit discontinued at 6.5m; Limit of investigation			6.5				

Dynamic Penetrometer Test (blows per mm): 5, 10, 15, 20

RIG: 15t Excavator

LOGGED: JJH

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed

REMARKS: * BD1/20191023 taken at 0.6-0.8m

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Cranbrook School
PROJECT: In Situ Waste Classification & ENM Assessment
LOCATION: Cranbrook School, Bellevue Hill

SURFACE LEVEL: --
EASTING:
NORTHING:

PIT No: TP09
PROJECT No: 84944.02
DATE: 23/10/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
	0.0	FILL/Silty SAND SM: fine to medium grained, brown, trace rootlets, dry to moist		E/B	0.3				
	0.4	FILL/SAND SW: fine to medium grained, yellow-brown mottled grey sand, trace brown-yellow clayey sand (crushed coffee rock), moist		E/B	0.8 1.0				
	1.5	Pit discontinued at 1.5m; Limit of investigation							

RIG: 15t Excavator

LOGGED: JJH

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Cranbrook School
PROJECT: In Situ Waste Classification & ENM Assessment
LOCATION: Cranbrook School, Bellevue Hill

SURFACE LEVEL: --
EASTING:
NORTHING:

PIT No: TP10
PROJECT No: 84944.02
DATE: 23/10/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
		FILL/Silty SAND SM: fine to medium grained, brown, trace rootlets, dry to moist		E/B	0.0		*BD2/20191024 taken at 0-0.3m		
	0.4	Pit discontinued at 0.4m; Limit of investigation			0.3				

RIG: 15t Excavator

LOGGED: JJH

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Cranbrook School
PROJECT: In Situ Waste Classification & ENM Assessment
LOCATION: Cranbrook School, Bellevue Hill

SURFACE LEVEL: --
EASTING:
NORTHING:

PIT No: TP11
PROJECT No: 84944.02
DATE: 23/10/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
	0.0	FILL/Silty SAND SM: fine to medium grained, brown, trace rootlets, dry to moist		E/B	0.0				
	0.3	FILL/SAND SW: fine to medium grained, yellow-brown mottled grey sand, trace brown-yellow clayey sand (crushed coffee rock), moist			0.3				
				E/B	0.8				
	1.0	Pit discontinued at 1.0m; Limit of investigation			1.0				

Dynamic Penetrometer Test (blows per mm): 5, 10, 15, 20

RIG: 15t Excavator

LOGGED: JJH

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Cranbrook School
PROJECT: In Situ Waste Classification & ENM Assessment
LOCATION: Cranbrook School, Bellevue Hill

SURFACE LEVEL: --
EASTING:
NORTHING:

PIT No: TP12
PROJECT No: 84944.02
DATE: 23/10/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
	0.3	FILL/Silty SAND SM: fine to medium grained, brown, trace rootlets, dry to moist							
		FILL/SAND SW: fine to medium grained, yellow-brown mottled grey sand, trace brown-yellow clayey sand (crushed coffee rock), moist		E/B	0.6 - 0.8				
				E/B	1.6 - 1.8				
				E/B	2.6 - 2.8				
				E/B	3.6 - 3.8				
	4.6	SAND SW:fine to medium grained, yellow, moist, aeolian		E/B	4.6 - 4.8				
	5.0	Pit discontinued at 5.0m; Limit of investigation							

Dynamic Penetrometer Test (blows per mm): 5, 10, 15, 20

RIG: 15t Excavator

LOGGED: JJH

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Cranbrook School
PROJECT: In Situ Waste Classification & ENM Assessment
LOCATION: Cranbrook School, Bellevue Hill

SURFACE LEVEL: --
EASTING:
NORTHING:

PIT No: TP13
PROJECT No: 84944.02
DATE: 23/10/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
	0.0	FILL/Silty SAND SM: fine to medium grained, brown, trace rootlets, dry to moist		E/B	0.0				
	0.3	FILL/SAND SW: fine to medium grained, yellow-brown mottled grey sand, trace brown-yellow clayey sand (crushed coffee rock), moist			0.3				
				E/B	0.8				
	1				1.0				
	2								
				E/B	2.8				
	3				3.0				
	3.2	Pit discontinued at 3.2m; Limit of investigation							
	4								
	5								
	6								
	7								

Dynamic Penetrometer Test (blows per mm): 5, 10, 15, 20

RIG: 15t Excavator
LOGGED: JJH
SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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Geotechnics / Environment / Groundwater

TEST PIT LOG

CLIENT: Cranbrook School
PROJECT: In Situ Waste Classification & ENM Assessment
LOCATION: Cranbrook School, Bellevue Hill

SURFACE LEVEL: --
EASTING:
NORTHING:

PIT No: TP14
PROJECT No: 84944.02
DATE: 23/10/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
	0.0	FILL/Silty SAND SM: fine to medium grained, brown, trace rootlets, dry to moist		E/B	0.0				
	0.3	FILL/SAND SW: fine to medium grained, yellow-brown mottled grey sand, trace brown-yellow clayey sand (crushed coffee rock), moist		E/B	0.3 0.4 0.5				
	0.8	Pit discontinued at 0.8m; Limit of investigation							

RIG: 15t Excavator

LOGGED: JJH

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Cranbrook School
PROJECT: In Situ Waste Classification & ENM Assessment
LOCATION: Cranbrook School, Bellevue Hill

SURFACE LEVEL: --
EASTING:
NORTHING:

PIT No: TP15
PROJECT No: 84944.02
DATE: 23/10/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
		FILL/Silty SAND SM: fine to medium grained, brown, with clay, trace rootlets, dry to moist		E/B	0.0 0.3				
	0.4	FILL/SAND SW: fine to medium grained, yellow-brown mottled grey sand, trace brown-yellow clayey sand (crushed coffee rock), moist		E/B	0.4		Irrigation pipe trench with fine to medium igenous gravel fill at 0.4.6m		
	0.6	Pit discontinued at 0.6m; Limit of investigation			0.6				

Dynamic Penetrometer Test (blows per mm): 5, 10, 15, 20

RIG: 15t Excavator

LOGGED: JJH

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

TEST PIT LOG

CLIENT: Cranbrook School
PROJECT: In Situ Waste Classification & ENM Assessment
LOCATION: Cranbrook School, Bellevue Hill

SURFACE LEVEL: --
EASTING:
NORTHING:

PIT No: TP16
PROJECT No: 84944.02
DATE: 23/10/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
	0.0	FILL/Silty SAND SM: fine to medium grained, brown, trace rootlets, dry to moist		E/B	0.0 - 0.3				
	0.4	FILL/SAND SW: fine to medium grained, yellow-brown mottled grey sand, trace brown-yellow clayey sand (crushed coffee rock), moist		E/B	0.4 - 0.5				
	0.6	Pit discontinued at 0.6m; Limit of investigation							

RIG: 15t Excavator

LOGGED: JJH

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

TEST PIT LOG

CLIENT: Cranbrook School
PROJECT: In Situ Waste Classification & ENM Assessment
LOCATION: Cranbrook School, Bellevue Hill

SURFACE LEVEL: --
EASTING:
NORTHING:

PIT No: TP17
PROJECT No: 84944.02
DATE: 23/10/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
	0.0	FILL/Silty SAND SM: fine to medium grained, brown, trace rootlets, dry to moist		E/B	0.0				
	0.3	FILL/SAND SW: fine to medium grained, yellow-brown mottled grey sand, trace brown-yellow clayey sand (crushed coffee rock), moist		E/B	0.3 0.4 0.5				
	0.6	Pit discontinued at 0.6m; Limit of investigation							

RIG: 15t Excavator

LOGGED: JJH

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Cranbrook School
PROJECT: In Situ Waste Classification & ENM Assessment
LOCATION: Cranbrook School, Bellevue Hill

SURFACE LEVEL: --
EASTING:
NORTHING:

PIT No: TP18
PROJECT No: 84944.02
DATE: 23/10/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
	0.0	FILL/Silty SAND SM: fine to medium grained, brown, trace rootlets, dry to moist		E/B	0.0				
	0.3	FILL/SAND SW: fine to medium grained, yellow-brown mottled grey sand, trace brown-yellow clayey sand (crushed coffee rock), moist		E/B	0.3 0.4				
	0.5	Pit discontinued at 0.5m; Limit of investigation			0.5				

RIG: 15t Excavator

LOGGED: JJH

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Cranbrook School
PROJECT: In Situ Waste Classification & ENM Assessment
LOCATION: Cranbrook School, Bellevue Hill

SURFACE LEVEL: --
EASTING:
NORTHING:

PIT No: TP23
PROJECT No: 84944.02
DATE: 23/10/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
	0.0	FILL/Silty SAND SM: fine to medium grained, brown, trace rootlets, dry to moist		E/B	0.3				
	0.4	FILL/SAND SW: fine to medium grained, yellow-brown mottled grey sand, trace brown-yellow clayey sand (crushed coffee rock), moist		E/B	0.6				
	0.8	SAND SW: fine to medium grained, grey, moist, aeolian		E/B	1.0				
	1.5	Pit discontinued at 1.5m; Limit of investigation							

RIG: 15t Excavator

LOGGED: JJH

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Cranbrook School
PROJECT: Cranbrook School ECI
LOCATION: New South Head Road, Bellevue Hill

SURFACE LEVEL: 16.13 AHD
EASTING: 338378.84
NORTHING: 6250846.18
DIP/AZIMUTH: 90°/--

BORE No: BH101
PROJECT No: 84944.01
DATE: 12/4/2017
SHEET 1 OF 2

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low / Very Low / Low / Medium / High / Very High / Ex High)	Water	Fracture Spacing (m) (0.01 / 0.05 / 0.10 / 0.50 / 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
16	0	TOPSOIL - dark brown, fine to medium silty sand topsoil, moist							A/E			
	0.4	FILLING - yellow-brown, fine to medium sand filling, dry to moist							A/E			
15	1	0.7m: as above, grey-brown and yellow-brown							A			
		1.5m: as above, grey-brown and yellow brown mottled dark brown										
14	2								A/E			
13	3								A/E			
	3.2	SAND - yellow-brown, fine to medium sand, dry to moist										
12	4								A/E			
11	5											
10	6											
9	7											
8	8											
7	9											

RIG: Scout 2 **DRILLER:** JS **LOGGED:** SI/RW **CASING:** HW to 5.4m

TYPE OF BORING: Solid flight auger to 5.5m; Rotary to 14.35m; NMLC-Coring to 17.4m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: Standpipe installed to 13.7m (screen 10.7-13.7m; gravel 9.7-13.7m; bentonite 8.7-9.7m; backfill to 0.1m below ground level; grass over gatic cover)

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Cranbrook School
PROJECT: Cranbrook School ECI
LOCATION: New South Head Road, Bellevue Hill

SURFACE LEVEL: 16.13 AHD
EASTING: 338378.84
NORTHING: 6250846.18
DIP/AZIMUTH: 90°/--

BORE No: BH101
PROJECT No: 84944.01
DATE: 12/4/2017
SHEET 2 OF 2

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
		SAND - yellow-brown, fine to medium sand, dry to moist *(continued)*						Note: Unless otherwise stated, rock is fractured along rough planar bedding dipping 0°- 10°				
	14.35	SANDSTONE - medium and high strength, moderately weathered, slightly fractured and unbroken, red-brown and brown, medium to coarse grained sandstone						14.7m: B0°, fe 15.2m: B10°, cly vn, ti 15.72 & 15.75m: Cs	C	100	99	PL(A) = 4.14 PL(A) = 0.66 PL(A) = 1.52 PL(A) = 0.91
	17.4	Bore discontinued at 17.4m										

RIG: Scout 2 **DRILLER:** JS **LOGGED:** SI/RW **CASING:** HW to 5.4m

TYPE OF BORING: Solid flight auger to 5.5m; Rotary to 14.35m; NMLC-Coring to 17.4m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: Standpipe installed to 13.7m (screen 10.7-13.7m; gravel 9.7-13.7m; bentonite 8.7-9.7m; backfill to 0.1m below ground level; grass over gatic cover)

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Cranbrook School
PROJECT: Cranbrook School ECI
LOCATION: New South Head Road, Bellevue Hill

SURFACE LEVEL: 16.28 AHD
EASTING: 338374.19
NORTHING: 6250784.3
DIP/AZIMUTH: 90°/--

BORE No: BH102
PROJECT No: 84944.01
DATE: 12/4/2017
SHEET 1 OF 2

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low / Very Low / Low / Medium / High / Very High / Ex High)	Water	Fracture Spacing (m) (0.01 / 0.05 / 0.10 / 0.50 / 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
16	0.2	TOPSOIL - dark brown, fine to medium silty sand topsoil, dry to moist							A/E			
	0.6	FILLING - dark brown, fine to medium sand filling with clay, dry							A/E			
15	1.1	SAND - dark brown, fine to medium sand, dry to moist (possibly filling)							A/E			
		SAND - grey fine to medium sand, dry to moist 1.4m: as above but becoming yellow-brown 1.8m: as above but grey-brown							A/E			
14	2											
13	3											
12	4											
11	5											
10	6											
9	7											
8	8											
7	9											

RIG: Scout 2 **DRILLER:** JS **LOGGED:** SI/RW **CASING:** HW 11.6m

TYPE OF BORING: Solid flight auger (TC-bit) to 5.5m; Rotary to 11.6m; NMLC-Coring to 17.45m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Cranbrook School
PROJECT: Cranbrook School ECI
LOCATION: New South Head Road, Bellevue Hill

SURFACE LEVEL: 16.28 AHD
EASTING: 338374.19
NORTHING: 6250784.3
DIP/AZIMUTH: 90°/--

BORE No: BH102
PROJECT No: 84944.01
DATE: 12/4/2017
SHEET 2 OF 2

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Type	Core Rec. %	RQD %	Test Results & Comments
		SAND - grey fine to medium sand, dry to moist *(continued)*						Note: Unless otherwise stated, rock is fractured along rough planar bedding dipping 0°- 10°				
	11	11.35m: yellow brown, fine to medium grained clayey sand										
	11.6	SANDSTONE - medium strength, highly weathered, slightly fractured, brown, coarse grained sandstone with some quartz gravel						11.86m: CORE LOSS: 140mm	C	86	50	PL(A) = 0.82
	12 12.0							12.4-12.6M: dS				
	12.4	SANDSTONE - very low and low strength, highly to moderately weathered, slightly fractured, light grey and red-brown, fine to medium grained sandstone with some extremely low strength bands						12.8m: J60°, pl, ro, cln 12.85m: B0°, cly				PL(A) = 0.23
	13							13.52-13.58m: Ds 13.65m: J60°- 70°, cu, ro, fe	C	100	92	PL(A) = 0.22
	14											
	14.4	SANDSTONE - medium and medium to high strength, moderately weathered, slightly fractured, brown to red-brown, medium grained sandstone						14.35m: B0°, cly, 10mm 14.4-14.45m: Cs 14.5-14.62m: B (x3) 0°-5°, fe, cly co				PL(A) = 0.83
	15							15.4m: J30°, he				PL(A) = 0.55
	16								C	100	92	
								16.15 & 16.42m: B (x2) 5°, fe				PL(A) = 2.87
	17							16.9m: B5°, fe, cly, 10mm				PL(A) = 0.84
	17.45	Bore discontinued at 17.45m										
	18											
	19											

RIG: Scout 2 **DRILLER:** JS **LOGGED:** SI/RW **CASING:** HW 11.6m

TYPE OF BORING: Solid flight auger (TC-bit) to 5.5m; Rotary to 11.6m; NMLC-Coring to 17.45m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Cranbrook School
PROJECT: Cranbrook School ECI
LOCATION: New South Head Road, Bellevue Hill

SURFACE LEVEL: 16.75 AHD
EASTING: 338361.5
NORTHING: 6250706.3
DIP/AZIMUTH: 90°/--

BORE No: BH103
PROJECT No: 84944.01
DATE: 11/4/2017
SHEET 1 OF 2

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low / Very Low / Low / Medium / High / Very High / Ex High)	Water	Fracture Spacing (m) (0.01 / 0.05 / 0.10 / 0.50 / 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
16	0.0	TOPSOIL - dark brown, silty clay topsoil with rootlets, dry							A/E			
	0.5	SAND - yellow-brown mottled dark brown, iron indurated, fine to medium sand, dry to moist							A			
15	1								A/E			
	1.3	SAND - yellow-brown, fine to medium sand, dry to moist										
14	2								A/E			
13	3											
12	4											
11	5											
10	6											
9	7							Note: Unless otherwise stated, rock is fractured along rough planar bedding dipping 0°- 10°				
8	8											
	8.5	SANDSTONE - medium strength, slightly weathered then fresh stained, fractured and slightly fractured, light grey, medium grained sandstone with some extremely low and very low strength bands and traces of carbonaceous laminations						8.96m: B0°- 5°, un, ro, fe stn 9.45m: J20°, pl, ro, fe stn 9.6m: Cs, 50mm 9.65m: CORE LOSS:	C	93	89	PL(A) = 0.55 PL(A) = 0.43
8	9											
7	9.85											

RIG: Scout 2 **DRILLER:** JS **LOGGED:** RW/JN **CASING:** HQ to 8.5m

TYPE OF BORING: Solid flight auger (TC-bit) to 8.5m; NMLC-Coring to 14.4m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Cranbrook School
PROJECT: Cranbrook School ECI
LOCATION: New South Head Road, Bellevue Hill

SURFACE LEVEL: 16.75 AHD
EASTING: 338361.5
NORTHING: 6250706.3
DIP/AZIMUTH: 90°/--

BORE No: BH103
PROJECT No: 84944.01
DATE: 11/4/2017
SHEET 2 OF 2

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low / Very Low / Low / Medium / High / Very High / Ex High)	Water	Fracture Spacing (m) (0.01 / 0.05 / 0.10 / 0.50 / 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Type	Core Rec. %	RQD %	Test Results & Comments
6	11	SANDSTONE - medium strength, slightly weathered then fresh stained, fractured and slightly fractured, light grey, medium grained sandstone with some extremely low and very low strength bands and traces of carbonaceous laminations *(continued)*						200mm 10.10, 10.15m: J45°, un, ro, cln 10.13m: J70°, un, ro, cln 10.26m: Ds, 20mm	C	93	89	PL(A) = 0.7
5	12							11.66m: B0°- 5°, un, ro, cbs, st 11.68m: J0°- 30°, cu, ro, cbs, st 11.97m: J0°- 30°, cu, ro, fe stn				PL(A) = 0.36 PL(A) = 0.31
4	12.52							12.52m: J30°, pl, ro, cln CORE LOSS: 450mm	C	85	75	
3	13 12.97											PL(A) = 0.54
2	14							13.68m: Cs, 10mm 13.72, 13.76m: J30°, pl, ro, cln 13.8m: Ds, 50mm 13.88m: Cs, 30mm 14.12m: Cs, 80mm				PL(A) = 0.47
1	14.4	Bore discontinued at 14.4m - target depth reached										
0	15											
-1	16											
-2	17											
-3	18											
	19											

RIG: Scout 2 **DRILLER:** JS **LOGGED:** RW/JN **CASING:** HQ to 8.5m

TYPE OF BORING: Solid flight auger (TC-bit) to 8.5m; NMLC-Coring to 14.4m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Cranbrook School
PROJECT: Cranbrook School ECI
LOCATION: New South Head Road, Bellevue Hill

SURFACE LEVEL: 16.34 AHD
EASTING: 338308.87
NORTHING: 6250760.78
DIP/AZIMUTH: 90°/--

BORE No: BH104
PROJECT No: 84944.01
DATE: 12/4/2017
SHEET 1 OF 2

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low / Very Low / Low / Medium / High / Very High / Ex High)	Water	Fracture Spacing (m) (0.01 / 0.05 / 0.10 / 0.50 / 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
16	0.2	TOPSOIL - dark brown, fine to medium silty sand topsoil, moist							A/E			
		SAND - dark brown mottled brown, iron indurated, fine to medium sand, moist (possibly filling)							A/E			
15	1	0.8m: as above but brown and grey-brown mottled dark brown							A/E			
	1.3	SAND - yellow brown mottled brown and dark brown, grey fine to medium sand, moist										
14	2								A/E			
13	3											
12	4											
11	5					▼						
10	6							Note: Unless otherwise stated, rock is fractured along rough planar bedding dipping 0°- 10°				
9	6.8 / 6.9	SANDSTONE - medium strength, moderately weathered, fractured and slightly fractured, light grey and red-brown, medium grained sandstone						6.8m: CORE LOSS: 100mm 7.3-7.45m: B (x3) 0°, cly co, 1-2mm 7.9 & 7.95m: B0°, fe				PL(A) = 0.71 PL(A) = 0.36
8	8.0	SANDSTONE - high strength, fresh, slightly fractured and unbroken, light grey, medium grained sandstone							C	97	90	PL(A) = 1.19
7	9							9.4m: B0°, cly, 5mm	C	100	100	PL(A) = 1.2

RIG: DT100 **DRILLER:** SS **LOGGED:** RW/SI **CASING:** HW to 6.8m

TYPE OF BORING: Solid flight auger (TC-bit) to 5.5m; Rotary to 6.8m; NMLC-Coring to 12.4m

WATER OBSERVATIONS: Free groundwater observed at 5.0m whilst augering

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Cranbrook School
PROJECT: Cranbrook School ECI
LOCATION: New South Head Road, Bellevue Hill

SURFACE LEVEL: 16.34 AHD
EASTING: 338308.87
NORTHING: 6250760.78
DIP/AZIMUTH: 90°/--

BORE No: BH104
PROJECT No: 84944.01
DATE: 12/4/2017
SHEET 2 OF 2

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low / Very Low / Low / Medium / High / Very High / Ex High)	Water	Fracture Spacing (m) (0.01 / 0.05 / 0.10 / 0.50 / 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
		SANDSTONE - high strength, fresh, slightly fractured and unbroken, light grey, medium grained sandstone *(continued)*										PL(A) = 1.17
	11								C	100	100	
												PL(A) = 1.01
	12							11.9m: B0°, cly, 10mm				
												PL(A) = 1.08
	12.4	Bore discontinued at 12.4m										
	13											
	14											
	15											
	16											
	17											
	18											
	19											

RIG: DT100 **DRILLER:** SS **LOGGED:** RW/SI **CASING:** HW to 6.8m

TYPE OF BORING: Solid flight auger (TC-bit) to 5.5m; Rotary to 6.8m; NMLC-Coring to 12.4m

WATER OBSERVATIONS: Free groundwater observed at 5.0m whilst augering

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Cranbrook School
PROJECT: Cranbrook School ECI
LOCATION: New South Head Road, Bellevue Hill

SURFACE LEVEL: 16.54 AHD
EASTING: 338303.82
NORTHING: 6250703.09
DIP/AZIMUTH: 90°/--

BORE No: BH105
PROJECT No: 84944.01
DATE: 10/4/2017
SHEET 1 OF 2

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low / Very Low / Low / Medium / High / Very High / Ex High)	Water	Fracture Spacing (m) (0.01 / 0.05 / 0.10 / 0.50 / 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Type	Core Rec. %	RQD %	Test Results & Comments
16	0.0	TOPSOIL - dark brown, silty sand topsoil filling with some rootlets, damp							A/E			
	0.6	SAND - grey-brown medium sand with some coarse graining, moist (possible filling)				▽			A/E			
15	1.5	SAND - brown to dark brown medium sand, damp (possible filling)							A/E			
14	2.7	SAND - light brown to orange-brown medium sand, damp						Note: Unless otherwise stated, rock is fractured along rough planar bedding dipping 0°- 10°	A/E			
13	4.1	4.1m: becoming extremely weathered sandstone										
12	4.15	SANDSTONE - medium strength, moderately to slightly weathered, slightly fractured, light grey-brown to red-brown, medium grained sandstone						4.1m: CORE LOSS: 50mm 4.15-4.3m: Cs 4.35m: J35°, he 4.4m: B20°, pl, ro, cln 4.93, 5.05 & 5.18m: B (x3) 0°- 5°, fe 5.28m: J70°, un, ro, fe 5.44, 5,81, 5.86m: B (x3) 0°- 5°, fe, cly 5.93m: J60° & 85°, st, ro, fe 6.63m: J (x2) 70°, un, ro, fe, partially he 6.75-6.77m: Cs	C	98	84	PL(A) = 0.5 PL(A) = 0.49 PL(A) = 0.31
11	6.75	SANDSTONE - medium and high strength, moderately to slightly weathered and fresh, slightly fractured, light grey-brown, medium grained sandstone						7.16m: J70°, he 7.82m: B0°, cly, 5mm 8.12m: J30°, pl, sm, cln 8.6m: J20°, pl, ro, cln 9.35m: B5°, fe, cly, 5mm 9.45m: J25°, pl, ro, fe 9.85-10.10m: Cs	C	100	91	PL(A) = 1.31 PL(A) = 0.61 PL(A) = 0.49
10												
9												
8												
7												

RIG: Scout 2 **DRILLER:** JS **LOGGED:** RM/SI **CASING:** HQ to 4.1m

TYPE OF BORING: Solid flight auger (TC-bit) to 4.1m; NMLC-Coring to 15.48m

WATER OBSERVATIONS: Some seepage from 0.5m

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Cranbrook School
PROJECT: Cranbrook School ECI
LOCATION: New South Head Road, Bellevue Hill

SURFACE LEVEL: 16.54 AHD
EASTING: 338303.82
NORTHING: 6250703.09
DIP/AZIMUTH: 90°/--

BORE No: BH105
PROJECT No: 84944.01
DATE: 10/4/2017
SHEET 2 OF 2

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Type	Core Rec. %	RQD %	Test Results & Comments
6		SANDSTONE - medium and high strength, moderately to slightly weathered and fresh, slightly fractured, light grey-brown, medium grained sandstone *(continued)*							C	100	91	PL(A) = 0.65
5		10.35-10.66m: very low strength						10.45-10.47m: Ds				PL(A) = 0.1
11	10.96	10.66-10.96m: extremely low strength						10.66-10.96m: Ds				
4		SANDSTONE - high then medium strength, slightly weathered and fresh, slightly fractured and unbroken, light grey to light grey-brown, medium grained sandstone with some extremely low to very low strength bands						11.7m: J25°, ,pl, ro, cln	C	100	72	PL(A) = 1.26
12								12.15m: J30°, pl, ro, fe, cly				
								12.22-12.36m: Cs				
								12.4-12.48m: Cs				PL(A) = 1.06
13								12.6m: J70°, pl, ro, cln				
3												PL(A) = 1.26
14								13.86m: B5°, cly, 10mm				
								14.15m: B5°, cbs co	C	100	88	
2												PL(A) = 1.03
15								14.75-14.9m: Cs				
												PL(A) = 0.92
1	15.48	Bore discontinued at 15.48m										
16												
0												
17												
-1												
18												
-2												
19												
-3												

RIG: Scout 2 **DRILLER:** JS **LOGGED:** RM/SI **CASING:** HQ to 4.1m

TYPE OF BORING: Solid flight auger (TC-bit) to 4.1m; NMLC-Coring to 15.48m

WATER OBSERVATIONS: Some seepage from 0.5m

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Cranbrook School
PROJECT: Cranbrook School ECI
LOCATION: New South Head Road, Bellevue Hill

SURFACE LEVEL: 38.47 AHD
EASTING: 338318.63
NORTHING: 6250640.39
DIP/AZIMUTH: 90°/--

BORE No: BH106
PROJECT No: 84944.01
DATE: 12/4/2017
SHEET 1 OF 2

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low / Very Low / Low / Medium / High / Very High / Ex High)	Water	Fracture Spacing (m) (0.01 / 0.05 / 0.10 / 0.50 / 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
38	0.08	FILLING - brick pavers							A			
	0.3	FILLING - brown silty sand filling with some fine to medium grained sandstone gravel, moist							A			
	0.65	FILLING - sandstone boulder filling							A			
	0.8	FILLING - concrete slab										
37	1	SAND - very loose, light grey medium grained sand, moist							S			1,1,1 N = 2
36	2								S			1,1,2 N = 3
35	3											
34	4								S			4,5,5 N = 10
33	4.0	SAND - loose, pale yellow medium grained sand, moist										
	5											
	5.5	SAND - dense, yellow medium grained sand, moist							S			2,3,3 N = 6
32	6											
31	7								S			5,10,10 N = 20
30	8								S			6,11,15 N = 26
29	9											

RIG: Bobcat **DRILLER:** GM **LOGGED:** JN **CASING:** HW to 8.5m; HQ to 12.45m

TYPE OF BORING: Solid flight auger (TC-bit) to 8.5m; Rotary (mud) to 12.45m; NMLC-Coring to 15.55m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: Standpipe installed to 12.5m (screen 9.5-12.5m; gravel 8.5-12.5m; backfill to GL with gatic cover)

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Cranbrook School
PROJECT: Cranbrook School ECI
LOCATION: New South Head Road, Bellevue Hill

SURFACE LEVEL: 38.47 AHD
EASTING: 338318.63
NORTHING: 6250640.39
DIP/AZIMUTH: 90°/--

BORE No: BH106
PROJECT No: 84944.01
DATE: 12/4/2017
SHEET 2 OF 2

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
28	11	SAND - dense, yellow medium grained sand, moist *(continued)* 10.0m: becoming wet							S			10,17,19 N = 36
27	12							Note: Unless otherwise stated, rock is fractured along rough planar bedding dipping 0°- 10°	S			10,14,18 N = 32
26	12.45	SANDSTONE - medium then low strength, slightly weathered then fresh stained, slightly fractured then unbroken, orange and light grey medium grained sandstone with traces of very low strength bands										PL(A) = 0.63
25	13							12.85-13.08m: J60°-90°, un, ro, cln, partially he 13.08m: Ds, 20mm				PL(A) = 0.56
24	14							13.5, 13.9, 14.06m: B0°-5°, pl, ro, cly, 1mm	C	100	99	PL(A) = 0.53
23	15							14.5m: B5°, pl, ro, fe stn				PL(A) = 0.28
	15.55	Bore discontinued at 15.55m - target depth reached										
22	16											
21	17											
20	18											
19	19											

RIG: Bobcat **DRILLER:** GM **LOGGED:** JN **CASING:** HW to 8.5m; HQ to 12.45m

TYPE OF BORING: Solid flight auger (TC-bit) to 8.5m; Rotary (mud) to 12.45m; NMLC-Coring to 15.55m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: Standpipe installed to 12.5m (screen 9.5-12.5m; gravel 8.5-12.5m; backfill to GL with gatic cover)

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Cranbrook School
PROJECT: Cranbrook School ECI
LOCATION: New South Head Road, Bellevue Hill

SURFACE LEVEL: 39.22 AHD
EASTING: 338301.69
NORTHING: 6250640.1
DIP/AZIMUTH: 90°/--

BORE No: BH107
PROJECT No: 84944.01
DATE: 13/4/2017
SHEET 1 OF 2

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low / Very Low / Low / Medium / High / Very High / Ex High)	Water	Fracture Spacing (m) (0.01 / 0.05 / 0.10 / 0.50 / 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Type	Core Rec. %	RQD %	Test Results & Comments
39	0.05	FILLING - brick pavers							A			
		FILLING - brown silty sand filling with some fine to medium sandstone gravel, moist							A			
									A			
38	1.0	SAND - very loose then loose, light grey medium grained sand, moist							S			1,1,1 N = 2
37	2											
									S			1,1,1 N = 2
36	3											
35	4							Note: Unless otherwise stated, rock is fractured along rough planar bedding dipping 0°- 10°	S			2,3,5 N = 8
									S			10/149mm refusal
34	4.9	SANDSTONE - medium strength, slightly weathered, slightly fractured, orange and light grey medium grained sandstone						5.3m: CORE LOSS: 410mm	C	58	56	PL(A) = 0.48
	5.71							5.73m: CORE LOSS: 180mm				
33	5.91							5.91m: J45°, pl, ro, cln 6.2m: J20°, un, ro, cln				PL(A) = 0.54
32	7							6.8m: J30°, pl, ro, cly, 5mm 6.88m: J45°- 60°, un, ro, cln				
31	8							7.57, 7.64m: J20°, pl, ro, cly, 2mm 8.03-8.35m: J70°, un, ro, fe stn, partially he	C	100	92	PL(A) = 0.46 PL(A) = 0.45
30	9.05	SANDSTONE - medium strength, fresh, slightly fractured then unbroken, light grey medium grained sandstone with traces of carbonaceous laminations						8.93, 8.94m: B10°, pl, ro, cly, 1mm	C	100	100	PL(A) = 0.48

RIG: Bobcat **DRILLER:** GM **LOGGED:** JN **CASING:** HW to 4.9m; HQ to 4.9m

TYPE OF BORING: Solid flight auger (TC-bit) to 4.9m; NMLC-Coring to 14.0m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Cranbrook School
PROJECT: Cranbrook School ECI
LOCATION: New South Head Road, Bellevue Hill

SURFACE LEVEL: 39.22 AHD
EASTING: 338301.69
NORTHING: 6250640.1
DIP/AZIMUTH: 90°/--

BORE No: BH107
PROJECT No: 84944.01
DATE: 13/4/2017
SHEET 2 OF 2

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low / Very Low / Low / Medium / High / Very High / Ex High)	Water	Fracture Spacing (m) (0.01 / 0.05 / 0.10 / 0.50 / 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
29		SANDSTONE - medium strength, fresh, slightly fractured then unbroken, light grey medium grained sandstone with traces of carbonaceous laminations *(continued)*						10.4m: B0°, pl, ro, cly, 1mm 10.54m: Cs, 10mm				PL(A) = 0.5
28	11								C	100	100	
								11.37m: B5°, pl, ro, cly, 2mm				
27	12							11.87m: B5°, pl, ro, fe stn				PL(A) = 0.64
												PL(A) = 0.49
26	13								C	100	100	
												PL(A) = 0.71
	14 14.0	Bore discontinued at 14.0m - target depth reached										
25	15											
24	16											
23	17											
22	18											
21	19											
20												

RIG: Bobcat **DRILLER:** GM **LOGGED:** JN **CASING:** HW to 4.9m; HQ to 4.9m

TYPE OF BORING: Solid flight auger (TC-bit) to 4.9m; NMLC-Coring to 14.0m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Cranbrook School
PROJECT: Cranbrook School ECI
LOCATION: New South Head Road, Bellevue Hill

SURFACE LEVEL: 16.28 AHD
EASTING: 338412.68
NORTHING: 6250794.55
DIP/AZIMUTH: 90°/--

BORE No: BH111
PROJECT No: 84944.01
DATE: 13/4/2017
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
16	0.3	TOPSOIL - brown medium sand filling with trace red-brown clay and rootlets		A/E	0.1 0.15				
		FILLING - dark brown medium sand filling (possibly natural)		A/E	0.45 0.5				
	0.8	FILLING - pale brown mottled dark brown, medium sand filling (possibly natural)		A/E	1.0 1.05				
15	1								1
				A/E	1.9 2.0				
14	2								2
	2.6	SAND - pale brown and yellow, medium sand, moist		A/E	2.9 3.0				
	3								3
	3.1	Bore discontinued at 3.1m - target depth reached							
13	4								4
12	5								5
11	6								6
10	7								7
9	8								8
8	9								9

RIG: DT100 **DRILLER:** SS **LOGGED:** AT **CASING:** Uncased

TYPE OF BORING: Auger to 3.1m

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Cranbrook School
PROJECT: Cranbrook School ECI
LOCATION: New South Head Road, Bellevue Hill

SURFACE LEVEL: 16.61 AHD
EASTING: 338380.55
NORTHING: 6250730.19
DIP/AZIMUTH: 90°/--

BORE No: BH112
PROJECT No: 84944.01
DATE: 11/4/2017
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
16	0.4	TOPSOIL - dark brown, silty clay topsoil with rootlets, dry		A/E	0.1				
		SAND - dark brown mottled yellow-brown, fine to medium grained sand, dry to moist (possibly filling)		A	0.5				
15	1.0	SAND - yellow-brown mottled dark brown, fine to medium sand, dry to moist 1.5m: as above but yellow-brown		A/E	1.0				
14	2.0	Bore discontinued at 2.0m - target depth reached		A/E	2.0				
13	3								
12	4								
11	5								
10	6								
9	7								
8	8								
7	9								

RIG: DT100 **DRILLER:** SS **LOGGED:** RW **CASING:** Uncased

TYPE OF BORING: Auger to 2.0m

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Cranbrook School
PROJECT: Cranbrook School ECI
LOCATION: New South Head Road, Bellevue Hill

SURFACE LEVEL: 16.22 AHD
EASTING: 338402.54
NORTHING: 6250814
DIP/AZIMUTH: 90°/--

BORE No: BH113
PROJECT No: 84944.01
DATE: 13/4/2017
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
16	0.2	FILLING - brown, medium grained sand filling (topsoil) with some red-brown clay, traces of rootlets		A/E	0.1 0.15				
		FILLING - dark brown, medium sand filling		A/E	0.5 0.55				
	0.7	FILLING - pale brown mottled dark brown, medium sand filling		A/E	1.0 1.05				
15	1								1
				A/E	1.95 2.0				
14	2								2
	2.3	SAND - pale brown and yellow, medium sand, moist							
13	3			A/E	3.0				3
	3.0	Bore discontinued at 3.0m - target depth reached							
12	4								4
11	5								5
10	6								6
9	7								7
8	8								8
7	9								9

RIG: DT100 **DRILLER:** SS **LOGGED:** AT **CASING:** Uncased

TYPE OF BORING: Auger to 3.0m

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Cranbrook School
PROJECT: Cranbrook School ECI
LOCATION: New South Head Road, Bellevue Hill

SURFACE LEVEL: 16.40 AHD
EASTING: 338395.64
NORTHING: 6250774.08
DIP/AZIMUTH: 90°/--

BORE No: BH114
PROJECT No: 84944.01
DATE: 11/4/2017
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
16	0.2	TOPSOIL - dark brown, fine to medium silty sand topsoil, moist		A/E	0.1				
		SAND - dark brown mottled-brown, fine to medium sand, moist (possibly filling)		A/E	0.5				
15	1			A/E	1.0				
	1.8	SAND - dark brown mottled yellow-brown, fine to medium sand with iron indurated pockets, moist		A/E	2.0				
14	2								
	3.0	Bore discontinued at 3.0m - target depth reached		A/E	3.0				
13	3								
12	4								
11	5								
10	6								
9	7								
8	8								
7	9								

RIG: Scout 2 **DRILLER:** JS **LOGGED:** RW **CASING:** Uncased

TYPE OF BORING: Auger to 3.0m

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Cranbrook School
PROJECT: Cranbrook School ECI
LOCATION: New South Head Road, Bellevue Hill

SURFACE LEVEL: 16.43 AHD
EASTING: 338384.73
NORTHING: 6250747.66
DIP/AZIMUTH: 90°/--

BORE No: BH115
PROJECT No: 84944.01
DATE: 11/4/2017
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
16	0.3	TOPSOIL - dark brown, fine to medium silty sand topsoil, dry to moist		A/E	0.1				
		SAND - grey-brown, fine to medium sand, dry to moist (possibly filling)		A/E	0.5				
	1	0.8m: as above but becoming dark brown and grey-brown		A/E	1.0				1
15	1.1	SAND - pale grey, fine to medium sand, dry to moist							
	2	2.0 Bore discontinued at 2.0m - target depth reached		A/E	2.0				2
14	3								3
13	4								4
12	5								5
11	6								6
10	7								7
9	8								8
8	9								9
7									

RIG: DT100 **DRILLER:** SS **LOGGED:** RW **CASING:** Uncased

TYPE OF BORING: Auger to 2.0m

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Cranbrook School
PROJECT: Cranbrook School ECI
LOCATION: New South Head Road, Bellevue Hill

SURFACE LEVEL: 16.45 AHD
EASTING: 338357.98
NORTHING: 6250734.72
DIP/AZIMUTH: 90°/--

BORE No: BH116
PROJECT No: 84944.01
DATE: 11/4/2017
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
16	0.3	TOPSOIL - dark brown, fine to medium silty sand topsoil, dry to moist		A/E	0.1				
		SAND - dark brown and yellow-brown, fine to medium sand, dry to moist (possibly filling)		A/E	0.5				
	0.7	SAND - dark grey, fine to medium sand, moist		A/E	1.0				
15	1	1.5m: as above but becoming pale grey							
	2			A/E	2.0				
14	2.2	SAND - dark brown mottled brown, fine to medium sand, iron indurated, dry to moist							
	3			A/E	3.0				
	3.0	Bore discontinued at 3.0m - target depth reached							
13	4								
12	5								
11	6								
10	7								
9	8								
8	9								
7									

RIG: DT100 **DRILLER:** SS **LOGGED:** RW **CASING:** Uncased

TYPE OF BORING: Auger to 3.0m

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Cranbrook School
PROJECT: Cranbrook School ECI
LOCATION: New South Head Road, Bellevue Hill

SURFACE LEVEL: 16.04 AHD
EASTING: 338392.47
NORTHING: 6250837.21
DIP/AZIMUTH: 90°/--

BORE No: BH117
PROJECT No: 84944.01
DATE: 13/4/2017
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
16	0.2	TOPSOIL - grey and dark brown, silty sand filling (topsoil), traces of rootlets		A/E	0.1 0.15				
		FILLING - dark brown, medium sand filling		A/E	0.45 0.5				
15	1			A/E	0.95 1.0				
14	2			A/E	1.95 2.0				
	2.5	FILLING - pale grey and dark brown, medium sand filling							
13	3			A/E	2.95 3.0				
	3.2	SAND - pale grey, brown and brown, medium sand (possibly filling)							
12	4								
	4.0	Bore discontinued at 4.0m - target depth reached							
11	5								
10	6								
9	7								
8	8								
7	9								

RIG: Scout 2 **DRILLER:** JS **LOGGED:** AT **CASING:** Uncased

TYPE OF BORING: Auger to 4.0m

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Cranbrook School
PROJECT: Cranbrook School ECI
LOCATION: New South Head Road, Bellevue Hill

SURFACE LEVEL: 16.14 AHD
EASTING: 338382.59
NORTHING: 6250811.43
DIP/AZIMUTH: 90°/--

BORE No: BH118
PROJECT No: 84944.01
DATE: 13/4/2017
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
16	0.2	TOPSOIL - grey-brown, medium silty sand (topsoil), traces of rootlets, organic odour		A/E	0.1 0.15				
		FILLING - dark brown medium sand filling, traces of silt		A/E	0.45 0.5				
	0.7	SAND - pale brown and yellow, medium sand, moist		A/E	0.95 1.0				
15	1								1
	1.8	SAND - pale brown and brown, medium sand, moist		A/E	1.95 2.0				
14	2								2
	2.5	Bore discontinued at 2.5m - target depth reached							
13	3								3
12	4								4
11	5								5
10	6								6
9	7								7
8	8								8
7	9								9

RIG: DT100 **DRILLER:** SS **LOGGED:** AT **CASING:** Uncased

TYPE OF BORING: Auger to 2.5m

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Cranbrook School
PROJECT: Cranbrook School ECI
LOCATION: New South Head Road, Bellevue Hill

SURFACE LEVEL: 16.38 AHD
EASTING: 338353.07
NORTHING: 6250757.73
DIP/AZIMUTH: 90°/--

BORE No: BH119
PROJECT No: 84944.01
DATE: 10/4/2017
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
16	0.2	TOPSOIL - dark brown, fine to medium silty sand topsoil, dry to moist		A/E	0.1				
	0.6	SAND - grey-brown, fine to medium sand, dry to moist (possibly filling)		A/E	0.5				
	1	SAND - yellow, fine to medium sand, dry to moist 1.0m: as above but dark brown		A/E	1.0				
15		1.5m: as above but grey-brown mottled yellow-brown							
	2	1.9m: as above but dark grey		A/E	2.0				
	2.0	Bore discontinued at 2.0m - target depth reached							
14	3								
13	4								
12	5								
11	6								
10	7								
9	8								
8	9								
7									

RIG: DT100 **DRILLER:** SS **LOGGED:** RW **CASING:** Uncased

TYPE OF BORING: Auger to 2.0m

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Cranbrook School
PROJECT: Cranbrook School ECI
LOCATION: New South Head Road, Bellevue Hill

SURFACE LEVEL: 16.70 AHD
EASTING: 338333.04
NORTHING: 6250703.65
DIP/AZIMUTH: 90°/--

BORE No: BH120
PROJECT No: 84944.01
DATE: 11/4/2017
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
16	0.2	TOPSOIL - dark brown, fine to medium silty sand topsoil, dry to moist		A	0.1				
		SAND - brown-yellow, fine to medium sand, dry to moist (possibly filling)		A	0.5				
	0.7	SAND - dark brown and yellow-brown, fine to medium sand, iron indurated, dry to moist		A	1.0				
15	1			E	1.5				
	2.0	Bore discontinued at 2.0m - target depth reached		A/E	2.0				
14	3								
13	4								
12	5								
11	6								
10	7								
9	8								
8	9								
7									

RIG: Scout 2 **DRILLER:** JS **LOGGED:** RW **CASING:** Uncased

TYPE OF BORING: Auger to 2.0m

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Cranbrook School
PROJECT: Cranbrook School ECI
LOCATION: New South Head Road, Bellevue Hill

SURFACE LEVEL: 16.11 AHD
EASTING: 338357.75
NORTHING: 6250821.77
DIP/AZIMUTH: 90°/--

BORE No: BH121
PROJECT No: 84944.01
DATE: 12/4/2017
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
16	0.2	TOPSOIL - dark brown, fine to medium silty sand topsoil, dry to moist		A/E	0.1				
		FILLING - yellow-brown fine to medium sand filling, dry to moist		A/E	0.5				
	0.75	SAND - yellow-brown and grey-brown mottled dark brown, fine to medium sand, dry to moist (possibly filling)		A/E	1.0				
15	1								1
14	2			A/E	2.0				2
	2.2	SAND - yellow-brown, fine to medium sand, dry to moist							
13	3			A/E	3.0				3
	3.0	Bore discontinued at 3.0m - target depth reached							
12	4								4
11	5								5
10	6								6
9	7								7
8	8								8
7	9								9

RIG: DT100 **DRILLER:** SS **LOGGED:** RW **CASING:** Uncased

TYPE OF BORING: Auger to 3.0m

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Cranbrook School
PROJECT: Cranbrook School ECI
LOCATION: New South Head Road, Bellevue Hill

SURFACE LEVEL: 16.22 AHD
EASTING: 338349.17
NORTHING: 6250799.56
DIP/AZIMUTH: 90°/--

BORE No: BH122
PROJECT No: 84944.01
DATE: 11/4/2017
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
16	0.3	FILLING - dark brown, fine to medium silty sand filling, dry to moist		A/E	0.1				
		SAND - dark brown mottled grey, fine to medium sand, dry to moist (possibly filling)		A/E	0.5				
15	1.2	SAND - yellow-brown, fine to medium sand, dry to moist		A/E	1.0				
14	2.0	Bore discontinued at 2.0m - target depth reached		A/E	2.0				

RIG: DT100 **DRILLER:** SS **LOGGED:** RW **CASING:** Uncased

TYPE OF BORING: Auger to 2.0m

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Cranbrook School
PROJECT: Cranbrook School ECI
LOCATION: New South Head Road, Bellevue Hill

SURFACE LEVEL: 16.31 AHD
EASTING: 338341.92
NORTHING: 6250774.57
DIP/AZIMUTH: 90°/--

BORE No: BH123
PROJECT No: 84944.01
DATE: 11/4/2017
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
16	0.2	TOPSOIL - dark brown, fine to medium silty sand topsoil, dry to moist		A/E	0.1				
		SAND - grey-brown, fine to medium sand, dry to moist (possibly filling)		A/E	0.5				
	0.7	SAND - dark brown, fine to medium sand, iron indurated, dry to moist		A/E	1.0				
15	1.5	SAND - yellow-brown, fine to medium sand, dry to moist							
14	2.0	Bore discontinued at 2.0m - target depth reached		A/E	2.0				
13									
12									
11									
10									
9									
8									
7									

RIG: DT100 **DRILLER:** SS **LOGGED:** RW **CASING:** Uncased

TYPE OF BORING: Auger to 2.0m

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Cranbrook School
PROJECT: Cranbrook School ECI
LOCATION: New South Head Road, Bellevue Hill

SURFACE LEVEL: 16.51 AHD
EASTING: 338327.48
NORTHING: 6250748.48
DIP/AZIMUTH: 90°/--

BORE No: BH124
PROJECT No: 84944.01
DATE: 10/4/2017
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
16	0.3	TOPSOIL - dark brown, fine to medium silty sand topsoil, dry to moist		A	0.1				
		SAND - grey-brown, fine to medium sand, dry to moist (possible filling)		A/E	0.5				
	0.75	SAND - grey-brown mottled yellow-brown, fine to medium sand with occasional dark brown pockets of iron indurated sand, dry to moist		A	1.0				
15	2.0	Bore discontinued at 2.0m - target depth reached		A/E	2.0				
14									
13									
12									
11									
10									
9									
8									
7									

RIG: DT100 **DRILLER:** SS **LOGGED:** RW **CASING:** Uncased

TYPE OF BORING: Auger to 2.0m

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Cranbrook School
PROJECT: Cranbrook School ECI
LOCATION: New South Head Road, Bellevue Hill

SURFACE LEVEL: 16.50 AHD
EASTING: 338319.11
NORTHING: 6250727.97
DIP/AZIMUTH: 90°/--

BORE No: BH125
PROJECT No: 84944.01
DATE: 10/4/2017
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
16	0.2	TOPSOIL - dark brown, fine to medium silty sand topsoil, dry to moist		A	0.1				
		SAND - dark brown and grey-brown, fine to medium sand, dry to moist (possibly filling)		A	0.5				
	0.7	SAND - grey mottled yellow-brown, fine to medium sand, dry to moist		A/E	1.0				
15	1	1.2m: as above but yellow-brown mottled brown							
	2 2.0	Bore discontinued at 2.0m - target depth reached		A/E	2.0				
14	3								
13	4								
12	5								
11	6								
10	7								
9	8								
8	9								
7									

RIG: DT100 **DRILLER:** SS **LOGGED:** RW **CASING:** Uncased

TYPE OF BORING: Auger to 2.0m

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Cranbrook School
PROJECT: Cranbrook School ECI
LOCATION: New South Head Road, Bellevue Hill

SURFACE LEVEL: 16.10 AHD
EASTING: 338357.72
NORTHING: 6250849.98
DIP/AZIMUTH: 90°/--

BORE No: BH126
PROJECT No: 84944.01
DATE: 12/4/2017
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
16	0.3	TOPSOIL - dark brown, fine to medium silty sand topsoil, trace gravel, dry to moist		A/E	0.1				
		FILLING - yellow brown, fine to medium sand filling, dry to moist		A/E	0.5				
15	1	1.3m: as above but grey-brown		A/E	1.0				1
14	2	2.4m: as above but becoming grey-brown and dark brown		A/E	2.0				2
13	3			A/E	3.0				3
	3.4	SAND - yellow-brown, fine to medium sand, moist							
12	4	4.0 Bore discontinued at 4.0m - target depth reached		A	4.0				4
11	5								5
10	6								6
9	7								7
8	8								8
7	9								9

RIG: DT100 **DRILLER:** SS **LOGGED:** RW **CASING:** Uncased

TYPE OF BORING: Auger to 4.0m

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Cranbrook School
PROJECT: Cranbrook School ECI
LOCATION: New South Head Road, Bellevue Hill

SURFACE LEVEL: 16.07 AHD
EASTING: 338330.67
NORTHING: 6250807.63
DIP/AZIMUTH: 90°/--

BORE No: BH127
PROJECT No: 84944.01
DATE: 11/4/2017
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
16	0.3	TOPSOIL - dark brown, fine to medium silty sand topsoil, dry to moist		A/E	0.1				
		SAND - dark brown mottled yellow-brown, fine to medium sand with iron indurated pockets, dry to moist (possibly filling)		A/E	0.5				
15	1			A/E	1.0				1
	1.2	SAND - yellow-brown, fine to medium sand, moist							
14	2	2.0 Bore discontinued at 2.0m - target depth reached		A/E	2.0				2
13	3								3
12	4								4
11	5								5
10	6								6
9	7								7
8	8								8
7	9								9

RIG: DT100 **DRILLER:** SS **LOGGED:** RW **CASING:** Uncased

TYPE OF BORING: Auger to 2.0m

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Cranbrook School
PROJECT: Cranbrook School ECI
LOCATION: New South Head Road, Bellevue Hill

SURFACE LEVEL: 15.95 AHD
EASTING: 338327.14
NORTHING: 6250830.2
DIP/AZIMUTH: 90°/--

BORE No: BH128
PROJECT No: 84944.01
DATE: 12/4/2017
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
15	0.3	TOPSOIL - dark brown, fine to medium silty sand topsoil, moist		A/E	0.1				
		FILLING - yellow-brown mottled dark brown, fine to medium sand filling, dry to moist		A/E	0.5				
	1			A/E	1.0				1
14	1.4	SAND - mottled yellow-brown, dark brown and grey-brown, fine to medium sand, dry to moist (possibly filling)							
	2			A/E	2.0				2
13	2.2	SAND - yellow-brown, fine to medium grained sand, dry to moist							
	3			A/E	3.0				3
	3.0	Bore discontinued at 3.0m - target depth reached							
12	4								4
11	5								5
10	6								6
9	7								7
8	8								8
7	9								9

RIG: DT100 **DRILLER:** SS **LOGGED:** RW **CASING:** Uncased

TYPE OF BORING: Auger to 3.0m

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Cranbrook School
PROJECT: Cranbrook School ECI
LOCATION: New South Head Road, Bellevue Hill

SURFACE LEVEL: 16.35 AHD
EASTING: 338293.77
NORTHING: 6250744.3
DIP/AZIMUTH: 90°/--

BORE No: BH129
PROJECT No: 84944.01
DATE: 10/4/2017
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
16	0.3	TOPSOIL - dark brown, fine to medium silty sand topsoil, dry to moist		A/E	0.1				
		SAND - grey-dark brown, fine to medium sand, dry to moist (possibly filling)		A/E	0.5				
	1			A/E	1.0				1
15	1.2	SAND - mottled grey-brown and yellow-brown sand with pockets of iron induration, moist							
	2			A/E	2.0				2
14		2.5m: as above but grey-brown							
	3			A	3.0				3
13	3.5	SAND - yellow-brown, fine to medium sand with clay, wet							
		3.9m: as above but pale-grey							
12	4	4.0 Bore discontinued at 4.0m - target depth reached		A	4.0				4
11	5								5
10	6								6
9	7								7
8	8								8
7	9								9

RIG: DT100 **DRILLER:** SS **LOGGED:** RW **CASING:** Uncased

TYPE OF BORING: Auger to 4.0m

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Cranbrook School
PROJECT: Cranbrook School ECI
LOCATION: New South Head Road, Bellevue Hill

SURFACE LEVEL: 16.44 AHD
EASTING: 338282.32
NORTHING: 6250716.51
DIP/AZIMUTH: 90°/--

BORE No: BH130
PROJECT No: 84944.01
DATE: 10/4/2017
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
16	0.2	TOPSOIL - dark brown, fine to medium silty sand topsoil, dry to moist		A/E	0.1				
		SAND - yellow-brown mottled dark brown, fine to medium sand, dry to moist (possible filling)		A	0.5				
	1	1.0m: as above but dark brown		A/E	1.0				
15	1.3	SAND - yellow-brown and grey-brown, fine to medium sand with clay, wet							
	2	2.0 Bore discontinued at 2.0m - target depth reached		A/E	2.0				
14	3								
13	4								
12	5								
11	6								
10	7								
9	8								
8	9								
7									

RIG: DT100 **DRILLER:** SS **LOGGED:** RW **CASING:** Uncased

TYPE OF BORING: Auger to 2.0m

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Cranbrook School
PROJECT: Stage 1 Development
LOCATION: Victoria Road, Bellevue Hill

SURFACE LEVEL: 16.10 AHD
EASTING:
NORTHING:
DIP/AZIMUTH: 90°/--

BORE No: 2
PROJECT No: 84944
DATE: 7/7/2015
SHEET 1 OF 2

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
16	0.15	TOPSOIL - dark brown, silty sand topsoil with trace rootlets, damp										
		FILLING - poorly compacted, dark brown and light grey-brown mottled, silty sand, damp							E			
15	1								S			1,0,1 N = 1
									E			
14	2											
									S			0,0,1 N = 1
13	3								E			
									E			
12	4								S			1,1,1 N = 2
	4.85	SAND - light yellow-brown, medium grained sand, damp							E			
11	5											
10	6											
9	7											
8	8											
7	9											

RIG: Bobcat **DRILLER:** SY **LOGGED:** MP/SI **CASING:** HQ to 9.5m

TYPE OF BORING: Solid flight auger to 9.5m; Rotary to 11.25m; NMLC-Coring to 14.3m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Cranbrook School
PROJECT: Stage 1 Development
LOCATION: Victoria Road, Bellevue Hill

SURFACE LEVEL: 16.10 AHD
EASTING:
NORTHING:
DIP/AZIMUTH: 90°/--

BORE No: 2
PROJECT No: 84944
DATE: 7/7/2015
SHEET 2 OF 2

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
6		SAND - light yellow-brown, medium grained sand, damp *(continued)*						Note: Unless otherwise stated, rock is fractured along rough planar bedding dipping 0°- 10°				
5	10.85	SILTY CLAY - light grey, silty clay										
4	11.25	SANDSTONE - medium and medium to high strength, moderately weathered then fresh, slightly fractured and unbroken, red-brown then light grey-brown, medium grained sandstone with some very low strength bands						12.34-12.37m: Cs 12.58-12.60m: fg	C	100	86	PL(A) = 0.5 PL(A) = 0.7 PL(A) = 1.2
2	14	13.85-14.15m: very low strength siltstone bands						13.83m: J65°, un, ro, cly 14.1m: B5°, cly co 14.15m: J30°, pl, sm, cly				PL(A) = 0.4
1	14.3	Bore discontinued at 14.3m										
0	15											
-1	16											
-2	17											
-3	18											
	19											

RIG: Bobcat **DRILLER:** SY **LOGGED:** MP/SI **CASING:** HQ to 9.5m

TYPE OF BORING: Solid flight auger to 9.5m; Rotary to 11.25m; NMLC-Coring to 14.3m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Cranbrook School
PROJECT: Stage 1 Development
LOCATION: Victoria Road, Bellevue Hill

SURFACE LEVEL: 16.35 AHD
EASTING:
NORTHING:
DIP/AZIMUTH: 90°/--

BORE No: 4
PROJECT No: 84944
DATE: 3/7/2015
SHEET 1 OF 3

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
16		TOPSOIL - dark brown, silty sand topsoil with trace rootlets, damp							E			
	0.6	FILLING - dark brown and grey-brown, silty sand filling, damp										
15	1								S			2,2,3 N = 5
14	2	- becoming slightly silty and yellow-brown mottled below 2.0m							E			
									S			3,4,4 N = 8
13	3								E			
12	4	4.0-4.5m: trace organic material							E			
	4.5	SILTY SAND - brown and brown-grey, fine to medium grained sand, damp							S			1,2,3 N = 5
11	5											
10	6											
9	7											
	7.0	SAND - yellow-brown, medium grained sand, damp										
8	8											
7	9											

RIG: Bobcat **DRILLER:** SY **LOGGED:** MP/SI **CASING:** HW to 11.5m

TYPE OF BORING: Solid flight auger to 9.5m; Rotary to 18.0m; NMLC-Coring to 21.1m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Cranbrook School
PROJECT: Stage 1 Development
LOCATION: Victoria Road, Bellevue Hill

SURFACE LEVEL: 16.35 AHD
EASTING:
NORTHING:
DIP/AZIMUTH: 90°/--

BORE No: 4
PROJECT No: 84944
DATE: 3/7/2015
SHEET 2 OF 3

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
		SAND - yellow-brown, medium grained sand, damp *(continued)*										
	16.8	SILTY CLAY - light grey, silty clay						Note: Unless otherwise stated, rock is fractured along rough planar bedding dipping 0°- 10°				
	17.9 18.0	SANDSTONE - very low strength, light grey-brown, fine to medium grained sandstone										
		SANDSTONE - low and medium strength, highly to moderately then slightly weathered, slightly fractured, red-brown then light brown, medium grained sandstone with some very low strength bands						18.27 & 18.46m: B (x2) 5°- 10°, cly vn, ti 19.2m: B10°, fe, cly 19.5-19.55m: Cs	C	100	91	PL(A) = 0.5 PL(A) = 0.2

RIG: Bobcat **DRILLER:** SY **LOGGED:** MP/SI **CASING:** HW to 11.5m

TYPE OF BORING: Solid flight auger to 9.5m; Rotary to 18.0m; NMLC-Coring to 21.1m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Cranbrook School
PROJECT: Stage 1 Development
LOCATION: Victoria Road, Bellevue Hill

SURFACE LEVEL: 16.35 AHD
EASTING:
NORTHING:
DIP/AZIMUTH: 90°/--

BORE No: 4
PROJECT No: 84944
DATE: 3/7/2015
SHEET 3 OF 3

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Type	Core Rec. %	RQD %	Test Results & Comments
-4	21	SANDSTONE - low and medium strength, highly to moderately then slightly weathered, slightly fractured, red-brown then light brown, medium grained sandstone with some very low strength bands *(continued)*						20.2m: B10°, cly vn, ti 20.45m: J70°, pl, ro, fe, cly 20.82m: B0°, cly	C	100	91	PL(A) = 0.5 PL(A) = 0.4
-5	21.1	Bore discontinued at 21.1m										
-6	22											
-7	23											
-8	24											
-9	25											
-10	26											
-11	27											
-12	28											
-13	29											

RIG: Bobcat **DRILLER:** SY **LOGGED:** MP/SI **CASING:** HW to 11.5m

TYPE OF BORING: Solid flight auger to 9.5m; Rotary to 18.0m; NMLC-Coring to 21.1m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

Current and Previous Laboratory Test Results

Envirolab Services Pty Ltd
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12 Ashley St Chatswood NSW 2067
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CERTIFICATE OF ANALYSIS 229219

Client Details

Client	Douglas Partners Pty Ltd
Attention	Joel James-Hall, Peter Oitmaa
Address	96 Hermitage Rd, West Ryde, NSW, 2114

Sample Details

Your Reference	**84944.02, Cranbrook School In-Situ Assessment**
Number of Samples	26 Soil
Date samples received	24/10/2019
Date completed instructions received	24/10/2019

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	29/10/2019
Date of Issue	29/10/2019

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Asbestos Approved By
Analysed by Asbestos Approved Identifier: Aida Marner
Authorised by Asbestos Approved Signatory: Lucy Zhu

Results Approved By
Diego Bigolin, Team Leader, Inorganics
Josh Williams, Chemist
Loren Bardwell, Senior Chemist
Lucy Zhu, Senior Asbestos Analyst
Priya Samarawickrama, Senior Chemist
Steven Luong, Organics Supervisor

Authorised By



Nancy Zhang, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		229219-1	229219-2	229219-3	229219-4	229219-5
Your Reference	UNITS	TP1/0-0.3	TP2/0.4-0.5	TP3/0.4-0.5	TP4/0.4-0.5	TP8/1.6-1.8
Date Sampled		23/10/2019	23/10/2019	23/10/2019	23/10/2019	23/10/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	28/10/2019	28/10/2019	28/10/2019	28/10/2019	28/10/2019
Date analysed	-	29/10/2019	29/10/2019	29/10/2019	29/10/2019	29/10/2019
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<3	<3	<3	<3	<3
Surrogate aaa-Trifluorotoluene	%	77	71	82	86	81

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		229219-6	229219-7	229219-8	229219-9	229219-10
Your Reference	UNITS	TP8/4.6-4.8	TP9/0-0.3	TP10/0-0.3	TP11/0-0.3	TP11/1.8-1.0
Date Sampled		23/10/2019	23/10/2019	23/10/2019	23/10/2019	23/10/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	28/10/2019	28/10/2019	28/10/2019	28/10/2019	28/10/2019
Date analysed	-	29/10/2019	29/10/2019	29/10/2019	29/10/2019	29/10/2019
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<3	<3	<3	<3	<3
Surrogate aaa-Trifluorotoluene	%	73	84	72	70	88

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		229219-11	229219-12	229219-13	229219-14	229219-15
Your Reference	UNITS	TP12/1.6-1.8	TP12/3.6-3.8	TP13/0-0.3	TP13/2.8-3.0	TP14/0.4-0.5
Date Sampled		23/10/2019	23/10/2019	23/10/2019	23/10/2019	23/10/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	28/10/2019	28/10/2019	28/10/2019	28/10/2019	28/10/2019
Date analysed	-	29/10/2019	29/10/2019	29/10/2019	29/10/2019	29/10/2019
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<3	<3	<3	<3	<3
Surrogate aaa-Trifluorotoluene	%	67	86	88	65	85

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		229219-16	229219-17	229219-18	229219-19	229219-20
Your Reference	UNITS	TP15/0.4-0.6	TP16/0.4-0.6	TP17/0-0.3	TP17/0.4-0.5	TP18/0.4-0.5
Date Sampled		23/10/2019	23/10/2019	23/10/2019	23/10/2019	23/10/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	28/10/2019	28/10/2019	28/10/2019	28/10/2019	28/10/2019
Date analysed	-	29/10/2019	29/10/2019	29/10/2019	29/10/2019	29/10/2019
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<3	<3	<3	<3	<3
Surrogate aaa-Trifluorotoluene	%	77	83	87	87	89

vTRH(C6-C10)/BTEXN in Soil					
Our Reference		229219-21	229219-22	229219-23	229219-24
Your Reference	UNITS	TP23/0-0.3	TP23/0.4-0.6	BD1/20191023	BD2/20191023
Date Sampled		23/10/2019	23/10/2019	23/10/2019	23/10/2019
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	28/10/2019	28/10/2019	28/10/2019	28/10/2019
Date analysed	-	29/10/2019	29/10/2019	29/10/2019	29/10/2019
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<3	<3	<3	<3
Surrogate aaa-Trifluorotoluene	%	76	87	86	80

svTRH (C10-C40) in Soil						
Our Reference		229219-1	229219-2	229219-3	229219-4	229219-5
Your Reference	UNITS	TP1/0-0.3	TP2/0.4-0.5	TP3/0.4-0.5	TP4/0.4-0.5	TP8/1.6-1.8
Date Sampled		23/10/2019	23/10/2019	23/10/2019	23/10/2019	23/10/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	28/10/2019	28/10/2019	28/10/2019	28/10/2019	28/10/2019
Date analysed	-	28/10/2019	28/10/2019	28/10/2019	28/10/2019	28/10/2019
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100	<100
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	<100	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	101	99	98	99	96

svTRH (C10-C40) in Soil						
Our Reference		229219-6	229219-7	229219-8	229219-9	229219-10
Your Reference	UNITS	TP8/4.6-4.8	TP9/0-0.3	TP10/0-0.3	TP11/0-0.3	TP11/1.8-1.0
Date Sampled		23/10/2019	23/10/2019	23/10/2019	23/10/2019	23/10/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	28/10/2019	28/10/2019	28/10/2019	28/10/2019	28/10/2019
Date analysed	-	28/10/2019	28/10/2019	28/10/2019	28/10/2019	28/10/2019
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100	<100
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	<100	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	98	103	118	98	97

svTRH (C10-C40) in Soil						
Our Reference		229219-11	229219-12	229219-13	229219-14	229219-15
Your Reference	UNITS	TP12/1.6-1.8	TP12/3.6-3.8	TP13/0-0.3	TP13/2.8-3.0	TP14/0.4-0.5
Date Sampled		23/10/2019	23/10/2019	23/10/2019	23/10/2019	23/10/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	28/10/2019	28/10/2019	28/10/2019	28/10/2019	28/10/2019
Date analysed	-	28/10/2019	28/10/2019	28/10/2019	28/10/2019	28/10/2019
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100	<100
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	<100	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	97	96	99	112	97

svTRH (C10-C40) in Soil						
Our Reference		229219-16	229219-17	229219-18	229219-19	229219-20
Your Reference	UNITS	TP15/0.4-0.6	TP16/0.4-0.6	TP17/0-0.3	TP17/0.4-0.5	TP18/0.4-0.5
Date Sampled		23/10/2019	23/10/2019	23/10/2019	23/10/2019	23/10/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	28/10/2019	28/10/2019	28/10/2019	28/10/2019	28/10/2019
Date analysed	-	28/10/2019	28/10/2019	29/10/2019	29/10/2019	29/10/2019
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100	<100
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	<100	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	98	97	100	99	98

svTRH (C10-C40) in Soil					
Our Reference		229219-21	229219-22	229219-23	229219-24
Your Reference	UNITS	TP23/0-0.3	TP23/0.4-0.6	BD1/20191023	BD2/20191023
Date Sampled		23/10/2019	23/10/2019	23/10/2019	23/10/2019
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	28/10/2019	28/10/2019	28/10/2019	28/10/2019
Date analysed	-	29/10/2019	29/10/2019	29/10/2019	29/10/2019
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50
Surrogate o-Terphenyl	%	112	96	99	97

PAHs in Soil						
Our Reference		229219-1	229219-2	229219-3	229219-4	229219-5
Your Reference	UNITS	TP1/0-0.3	TP2/0.4-0.5	TP3/0.4-0.5	TP4/0.4-0.5	TP8/1.6-1.8
Date Sampled		23/10/2019	23/10/2019	23/10/2019	23/10/2019	23/10/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	28/10/2019	28/10/2019	28/10/2019	28/10/2019	28/10/2019
Date analysed	-	29/10/2019	29/10/2019	29/10/2019	29/10/2019	29/10/2019
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	0.2	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	0.2	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	0.2	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	0.05	<0.05	0.1	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	0.05	<0.05	1.0	<0.05	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	122	123	121	118	110

PAHs in Soil						
Our Reference		229219-6	229219-7	229219-8	229219-9	229219-10
Your Reference	UNITS	TP8/4.6-4.8	TP9/0-0.3	TP10/0-0.3	TP11/0-0.3	TP11/1.8-1.0
Date Sampled		23/10/2019	23/10/2019	23/10/2019	23/10/2019	23/10/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	28/10/2019	28/10/2019	28/10/2019	28/10/2019	28/10/2019
Date analysed	-	29/10/2019	29/10/2019	29/10/2019	29/10/2019	29/10/2019
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	0.2	<0.1	0.3	<0.1
Pyrene	mg/kg	<0.1	0.2	<0.1	0.3	<0.1
Benzo(a)anthracene	mg/kg	<0.1	0.1	<0.1	0.1	<0.1
Chrysene	mg/kg	<0.1	0.1	<0.1	0.2	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	0.2	<0.05	0.2	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	0.1	<0.1	0.2	<0.1
Total +ve PAH's	mg/kg	<0.05	0.92	<0.05	1.8	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	119	116	100	128	110

PAHs in Soil						
Our Reference		229219-11	229219-12	229219-13	229219-14	229219-15
Your Reference	UNITS	TP12/1.6-1.8	TP12/3.6-3.8	TP13/0-0.3	TP13/2.8-3.0	TP14/0.4-0.5
Date Sampled		23/10/2019	23/10/2019	23/10/2019	23/10/2019	23/10/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	28/10/2019	28/10/2019	28/10/2019	28/10/2019	28/10/2019
Date analysed	-	29/10/2019	29/10/2019	29/10/2019	29/10/2019	29/10/2019
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	0.3	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	0.3	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	0.2	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	0.2	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	0.2	<0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	<0.05	1.4	<0.05	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	115	110	105	118	123

PAHs in Soil						
Our Reference		229219-16	229219-17	229219-18	229219-19	229219-20
Your Reference	UNITS	TP15/0.4-0.6	TP16/0.4-0.6	TP17/0-0.3	TP17/0.4-0.5	TP18/0.4-0.5
Date Sampled		23/10/2019	23/10/2019	23/10/2019	23/10/2019	23/10/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	28/10/2019	28/10/2019	28/10/2019	28/10/2019	28/10/2019
Date analysed	-	29/10/2019	29/10/2019	29/10/2019	29/10/2019	29/10/2019
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	0.05	<0.05	0.05	0.08	0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	0.05	<0.05	0.05	0.3	0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	94	97	97	100	124

PAHs in Soil					
Our Reference		229219-21	229219-22	229219-23	229219-24
Your Reference	UNITS	TP23/0-0.3	TP23/0.4-0.6	BD1/20191023	BD2/20191023
Date Sampled		23/10/2019	23/10/2019	23/10/2019	23/10/2019
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	28/10/2019	28/10/2019	28/10/2019	28/10/2019
Date analysed	-	29/10/2019	29/10/2019	29/10/2019	29/10/2019
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	0.1
Pyrene	mg/kg	0.1	<0.1	<0.1	0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	0.06	<0.05	<0.05	0.08
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	0.2	<0.05	<0.05	0.3
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	114	118	117	117

Organochlorine Pesticides in soil						
Our Reference		229219-1	229219-3	229219-4	229219-7	229219-8
Your Reference	UNITS	TP1/0-0.3	TP3/0.4-0.5	TP4/0.4-0.5	TP9/0-0.3	TP10/0-0.3
Date Sampled		23/10/2019	23/10/2019	23/10/2019	23/10/2019	23/10/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	28/10/2019	28/10/2019	28/10/2019	28/10/2019	28/10/2019
Date analysed	-	29/10/2019	29/10/2019	29/10/2019	29/10/2019	29/10/2019
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	111	116	108	106	116

Organochlorine Pesticides in soil						
Our Reference		229219-9	229219-13	229219-15	229219-16	229219-18
Your Reference	UNITS	TP11/0-0.3	TP13/0-0.3	TP14/0.4-0.5	TP15/0.4-0.6	TP17/0-0.3
Date Sampled		23/10/2019	23/10/2019	23/10/2019	23/10/2019	23/10/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	28/10/2019	28/10/2019	28/10/2019	28/10/2019	28/10/2019
Date analysed	-	29/10/2019	29/10/2019	29/10/2019	29/10/2019	29/10/2019
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	130	117	122	118	112

Organochlorine Pesticides in soil		
Our Reference		229219-21
Your Reference	UNITS	TP23/0-0.3
Date Sampled		23/10/2019
Type of sample		Soil
Date extracted	-	28/10/2019
Date analysed	-	29/10/2019
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
Total +ve DDT+DDD+DDE	mg/kg	<0.1
Surrogate TCMX	%	107

Organophosphorus Pesticides in Soil						
Our Reference		229219-1	229219-3	229219-4	229219-7	229219-8
Your Reference	UNITS	TP1/0-0.3	TP3/0.4-0.5	TP4/0.4-0.5	TP9/0-0.3	TP10/0-0.3
Date Sampled		23/10/2019	23/10/2019	23/10/2019	23/10/2019	23/10/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	28/10/2019	28/10/2019	28/10/2019	28/10/2019	28/10/2019
Date analysed	-	29/10/2019	29/10/2019	29/10/2019	29/10/2019	29/10/2019
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	111	116	108	106	116

Organophosphorus Pesticides in Soil						
Our Reference		229219-9	229219-13	229219-15	229219-16	229219-18
Your Reference	UNITS	TP11/0-0.3	TP13/0-0.3	TP14/0.4-0.5	TP15/0.4-0.6	TP17/0-0.3
Date Sampled		23/10/2019	23/10/2019	23/10/2019	23/10/2019	23/10/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	28/10/2019	28/10/2019	28/10/2019	28/10/2019	28/10/2019
Date analysed	-	29/10/2019	29/10/2019	29/10/2019	29/10/2019	29/10/2019
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	130	117	122	118	112

Organophosphorus Pesticides in Soil		
Our Reference		229219-21
Your Reference	UNITS	TP23/0-0.3
Date Sampled		23/10/2019
Type of sample		Soil
Date extracted	-	28/10/2019
Date analysed	-	29/10/2019
Dichlorvos	mg/kg	<0.1
Dimethoate	mg/kg	<0.1
Diazinon	mg/kg	<0.1
Chlorpyriphos-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
Parathion	mg/kg	<0.1
Bromophos-ethyl	mg/kg	<0.1
Ethion	mg/kg	<0.1
Azinphos-methyl (Guthion)	mg/kg	<0.1
Surrogate TCMX	%	107

PCBs in Soil						
Our Reference		229219-1	229219-3	229219-4	229219-7	229219-8
Your Reference	UNITS	TP1/0-0.3	TP3/0.4-0.5	TP4/0.4-0.5	TP9/0-0.3	TP10/0-0.3
Date Sampled		23/10/2019	23/10/2019	23/10/2019	23/10/2019	23/10/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	28/10/2019	28/10/2019	28/10/2019	28/10/2019	28/10/2019
Date analysed	-	29/10/2019	29/10/2019	29/10/2019	29/10/2019	29/10/2019
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	111	116	108	106	116

PCBs in Soil						
Our Reference		229219-9	229219-13	229219-15	229219-16	229219-18
Your Reference	UNITS	TP11/0-0.3	TP13/0-0.3	TP14/0.4-0.5	TP15/0.4-0.6	TP17/0-0.3
Date Sampled		23/10/2019	23/10/2019	23/10/2019	23/10/2019	23/10/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	28/10/2019	28/10/2019	28/10/2019	28/10/2019	28/10/2019
Date analysed	-	29/10/2019	29/10/2019	29/10/2019	29/10/2019	29/10/2019
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	130	117	122	118	112

PCBs in Soil		
Our Reference		229219-21
Your Reference	UNITS	TP23/0-0.3
Date Sampled		23/10/2019
Type of sample		Soil
Date extracted	-	28/10/2019
Date analysed	-	29/10/2019
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 TCMX	%	107

Acid Extractable metals in soil						
Our Reference		229219-1	229219-2	229219-3	229219-4	229219-5
Your Reference	UNITS	TP1/0-0.3	TP2/0.4-0.5	TP3/0.4-0.5	TP4/0.4-0.5	TP8/1.6-1.8
Date Sampled		23/10/2019	23/10/2019	23/10/2019	23/10/2019	23/10/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	28/10/2019	28/10/2019	28/10/2019	28/10/2019	28/10/2019
Date analysed	-	28/10/2019	28/10/2019	28/10/2019	28/10/2019	28/10/2019
Arsenic	mg/kg	9	7	<4	<4	6
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	2	2	3	2	1
Copper	mg/kg	4	3	2	3	<1
Lead	mg/kg	5	4	6	6	1
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	1	1	2	<1	<1
Zinc	mg/kg	9	7	5	7	2

Acid Extractable metals in soil						
Our Reference		229219-6	229219-7	229219-8	229219-9	229219-10
Your Reference	UNITS	TP8/4.6-4.8	TP9/0-0.3	TP10/0-0.3	TP11/0-0.3	TP11/1.8-1.0
Date Sampled		23/10/2019	23/10/2019	23/10/2019	23/10/2019	23/10/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	28/10/2019	28/10/2019	28/10/2019	28/10/2019	28/10/2019
Date analysed	-	28/10/2019	28/10/2019	28/10/2019	28/10/2019	28/10/2019
Arsenic	mg/kg	<4	<4	6	8	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	1	4	4	4	1
Copper	mg/kg	<1	6	5	9	2
Lead	mg/kg	1	10	10	20	<1
Mercury	mg/kg	<0.1	<0.1	0.1	0.1	<0.1
Nickel	mg/kg	<1	2	2	2	<1
Zinc	mg/kg	3	13	14	12	14

Acid Extractable metals in soil						
Our Reference		229219-11	229219-12	229219-13	229219-14	229219-15
Your Reference	UNITS	TP12/1.6-1.8	TP12/3.6-3.8	TP13/0-0.3	TP13/2.8-3.0	TP14/0.4-0.5
Date Sampled		23/10/2019	23/10/2019	23/10/2019	23/10/2019	23/10/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	28/10/2019	28/10/2019	28/10/2019	28/10/2019	28/10/2019
Date analysed	-	28/10/2019	28/10/2019	28/10/2019	28/10/2019	28/10/2019
Arsenic	mg/kg	8	<4	7	<4	6
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	<1	2	3	<1	2
Copper	mg/kg	<1	<1	7	<1	4
Lead	mg/kg	1	1	17	<1	6
Mercury	mg/kg	<0.1	<0.1	0.1	<0.1	<0.1
Nickel	mg/kg	<1	<1	2	<1	<1
Zinc	mg/kg	2	<1	13	<1	4

Acid Extractable metals in soil						
Our Reference		229219-16	229219-17	229219-18	229219-19	229219-20
Your Reference	UNITS	TP15/0.4-0.6	TP16/0.4-0.6	TP17/0-0.3	TP17/0.4-0.5	TP18/0.4-0.5
Date Sampled		23/10/2019	23/10/2019	23/10/2019	23/10/2019	23/10/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	28/10/2019	28/10/2019	28/10/2019	28/10/2019	28/10/2019
Date analysed	-	28/10/2019	28/10/2019	28/10/2019	28/10/2019	28/10/2019
Arsenic	mg/kg	<4	<4	5	6	5
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	2	1	7	3	<1
Copper	mg/kg	4	2	6	9	7
Lead	mg/kg	8	3	12	11	12
Mercury	mg/kg	<0.1	<0.1	0.1	0.2	<0.1
Nickel	mg/kg	1	<1	2	1	<1
Zinc	mg/kg	5	4	13	11	4

Acid Extractable metals in soil					
Our Reference		229219-21	229219-22	229219-23	229219-24
Your Reference	UNITS	TP23/0-0.3	TP23/0.4-0.6	BD1/20191023	BD2/20191023
Date Sampled		23/10/2019	23/10/2019	23/10/2019	23/10/2019
Type of sample		Soil	Soil	Soil	Soil
Date prepared	-	28/10/2019	28/10/2019	28/10/2019	28/10/2019
Date analysed	-	28/10/2019	28/10/2019	28/10/2019	28/10/2019
Arsenic	mg/kg	10	4	<4	8
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	5	1	4	4
Copper	mg/kg	8	<1	6	7
Lead	mg/kg	17	3	10	15
Mercury	mg/kg	0.2	<0.1	<0.1	0.1
Nickel	mg/kg	2	<1	2	2
Zinc	mg/kg	19	2	14	15

Misc Soil - Inorg						
Our Reference		229219-1	229219-3	229219-4	229219-7	229219-8
Your Reference	UNITS	TP1/0-0.3	TP3/0.4-0.5	TP4/0.4-0.5	TP9/0-0.3	TP10/0-0.3
Date Sampled		23/10/2019	23/10/2019	23/10/2019	23/10/2019	23/10/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	28/10/2019	28/10/2019	28/10/2019	28/10/2019	28/10/2019
Date analysed	-	28/10/2019	28/10/2019	28/10/2019	28/10/2019	28/10/2019
Total Phenolics (as Phenol)	mg/kg	<5	<5	<5	<5	<5

Misc Soil - Inorg						
Our Reference		229219-9	229219-13	229219-15	229219-16	229219-18
Your Reference	UNITS	TP11/0-0.3	TP13/0-0.3	TP14/0.4-0.5	TP15/0.4-0.6	TP17/0-0.3
Date Sampled		23/10/2019	23/10/2019	23/10/2019	23/10/2019	23/10/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	28/10/2019	28/10/2019	28/10/2019	28/10/2019	28/10/2019
Date analysed	-	28/10/2019	28/10/2019	28/10/2019	28/10/2019	28/10/2019
Total Phenolics (as Phenol)	mg/kg	<5	<5	<5	<5	<5

Misc Soil - Inorg		
Our Reference		229219-21
Your Reference	UNITS	TP23/0-0.3
Date Sampled		23/10/2019
Type of sample		Soil
Date prepared	-	28/10/2019
Date analysed	-	28/10/2019
Total Phenolics (as Phenol)	mg/kg	<5

Misc Inorg - Soil						
Our Reference		229219-1	229219-2	229219-3	229219-4	229219-5
Your Reference	UNITS	TP1/0-0.3	TP2/0.4-0.5	TP3/0.4-0.5	TP4/0.4-0.5	TP8/1.6-1.8
Date Sampled		23/10/2019	23/10/2019	23/10/2019	23/10/2019	23/10/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	28/10/2019	28/10/2019	28/10/2019	28/10/2019	28/10/2019
Date analysed	-	28/10/2019	28/10/2019	28/10/2019	28/10/2019	28/10/2019
pH 1:5 soil:water	pH Units	5.9	6.5	6.0	6.4	6.3
Electrical Conductivity 1:5 soil:water	µS/cm	32	22	14	16	9

Misc Inorg - Soil						
Our Reference		229219-6	229219-7	229219-8	229219-9	229219-10
Your Reference	UNITS	TP8/4.6-4.8	TP9/0-0.3	TP10/0-0.3	TP11/0-0.3	TP11/1.8-1.0
Date Sampled		23/10/2019	23/10/2019	23/10/2019	23/10/2019	23/10/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	28/10/2019	28/10/2019	28/10/2019	28/10/2019	28/10/2019
Date analysed	-	28/10/2019	28/10/2019	28/10/2019	28/10/2019	28/10/2019
pH 1:5 soil:water	pH Units	5.9	6.2	6.6	5.9	5.6
Electrical Conductivity 1:5 soil:water	µS/cm	11	16	16	23	8

Misc Inorg - Soil						
Our Reference		229219-11	229219-12	229219-13	229219-14	229219-15
Your Reference	UNITS	TP12/1.6-1.8	TP12/3.6-3.8	TP13/0-0.3	TP13/2.8-3.0	TP14/0.4-0.5
Date Sampled		23/10/2019	23/10/2019	23/10/2019	23/10/2019	23/10/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	28/10/2019	28/10/2019	28/10/2019	28/10/2019	28/10/2019
Date analysed	-	28/10/2019	28/10/2019	28/10/2019	28/10/2019	28/10/2019
pH 1:5 soil:water	pH Units	6.1	5.8	5.9	5.5	6.1
Electrical Conductivity 1:5 soil:water	µS/cm	10	12	20	12	12

Misc Inorg - Soil						
Our Reference		229219-16	229219-17	229219-18	229219-19	229219-20
Your Reference	UNITS	TP15/0.4-0.6	TP16/0.4-0.6	TP17/0-0.3	TP17/0.4-0.5	TP18/0.4-0.5
Date Sampled		23/10/2019	23/10/2019	23/10/2019	23/10/2019	23/10/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	28/10/2019	28/10/2019	28/10/2019	28/10/2019	28/10/2019
Date analysed	-	28/10/2019	28/10/2019	28/10/2019	28/10/2019	28/10/2019
pH 1:5 soil:water	pH Units	6.4	6.3	5.8	6.0	6.4
Electrical Conductivity 1:5 soil:water	µS/cm	31	12	25	10	11

Misc Inorg - Soil			
Our Reference		229219-21	229219-22
Your Reference	UNITS	TP23/0-0.3	TP23/0.4-0.6
Date Sampled		23/10/2019	23/10/2019
Type of sample		Soil	Soil
Date prepared	-	28/10/2019	28/10/2019
Date analysed	-	28/10/2019	28/10/2019
pH 1:5 soil:water	pH Units	6.7	6.4
Electrical Conductivity 1:5 soil:water	µS/cm	20	13

Moisture						
Our Reference		229219-1	229219-2	229219-3	229219-4	229219-5
Your Reference	UNITS	TP1/0-0.3	TP2/0.4-0.5	TP3/0.4-0.5	TP4/0.4-0.5	TP8/1.6-1.8
Date Sampled		23/10/2019	23/10/2019	23/10/2019	23/10/2019	23/10/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	28/10/2019	28/10/2019	28/10/2019	28/10/2019	28/10/2019
Date analysed	-	29/10/2019	29/10/2019	29/10/2019	29/10/2019	29/10/2019
Moisture	%	0.2	6.2	0.2	0.5	3.8

Moisture						
Our Reference		229219-6	229219-7	229219-8	229219-9	229219-10
Your Reference	UNITS	TP8/4.6-4.8	TP9/0-0.3	TP10/0-0.3	TP11/0-0.3	TP11/1.8-1.0
Date Sampled		23/10/2019	23/10/2019	23/10/2019	23/10/2019	23/10/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	28/10/2019	28/10/2019	28/10/2019	28/10/2019	28/10/2019
Date analysed	-	29/10/2019	29/10/2019	29/10/2019	29/10/2019	29/10/2019
Moisture	%	3.7	0.6	1.3	5.6	0.6

Moisture						
Our Reference		229219-11	229219-12	229219-13	229219-14	229219-15
Your Reference	UNITS	TP12/1.6-1.8	TP12/3.6-3.8	TP13/0-0.3	TP13/2.8-3.0	TP14/0.4-0.5
Date Sampled		23/10/2019	23/10/2019	23/10/2019	23/10/2019	23/10/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	28/10/2019	28/10/2019	28/10/2019	28/10/2019	28/10/2019
Date analysed	-	29/10/2019	29/10/2019	29/10/2019	29/10/2019	29/10/2019
Moisture	%	3.4	4.1	1.6	0.6	0.1

Moisture						
Our Reference		229219-16	229219-17	229219-18	229219-19	229219-20
Your Reference	UNITS	TP15/0.4-0.6	TP16/0.4-0.6	TP17/0-0.3	TP17/0.4-0.5	TP18/0.4-0.5
Date Sampled		23/10/2019	23/10/2019	23/10/2019	23/10/2019	23/10/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	28/10/2019	28/10/2019	28/10/2019	28/10/2019	28/10/2019
Date analysed	-	29/10/2019	29/10/2019	29/10/2019	29/10/2019	29/10/2019
Moisture	%	2.7	0.3	0.7	0.3	<0.1

Moisture			
Our Reference		229219-21	229219-22
Your Reference	UNITS	TP23/0-0.3	TP23/0.4-0.6
Date Sampled		23/10/2019	23/10/2019
Type of sample		Soil	Soil
Date prepared	-	28/10/2019	28/10/2019
Date analysed	-	29/10/2019	29/10/2019
Moisture	%	5.6	2.0

Asbestos ID - soils NEPM						
Our Reference		229219-4	229219-5	229219-7	229219-10	229219-13
Your Reference	UNITS	TP4/0.4-0.5	TP8/1.6-1.8	TP9/0-0.3	TP11/1.8-1.0	TP13/0-0.3
Date Sampled		23/10/2019	23/10/2019	23/10/2019	23/10/2019	23/10/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	28/10/2019	28/10/2019	28/10/2019	28/10/2019	28/10/2019
Sample mass tested	g	1,477.34	1,466.87	1,404.91	1,571.3	1,320.09
Sample Description	-	Brown sandy soil & rocks	Brown sandy soil & rocks	Brown sandy soil & rocks	Brown sandy soil & rocks	Brown sandy soil & rocks
Asbestos ID in soil (AS4964) >0.1g/kg	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected
Total Asbestos[#1]	g/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected
ACM >7mm Estimation*	g	–	–	–	–	–
FA and AF Estimation*	g	–	–	–	–	–
FA and AF Estimation*#2	%(w/w)	<0.001	<0.001	<0.001	<0.001	<0.001

Asbestos ID - soils NEPM						
Our Reference		229219-16	229219-18	229219-19	229219-21	229219-25
Your Reference	UNITS	TP15/0.4-0.6	TP17/0-0.3	TP17/0.4-0.5	TP23/0-0.3	TP2/0-0.3
Date Sampled		23/10/2019	23/10/2019	23/10/2019	23/10/2019	23/10/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	28/10/2019	28/10/2019	28/10/2019	28/10/2019	28/10/2019
Sample mass tested	g	1,442.2	1,456.99	1,474.9	1,435.79	1,512.9
Sample Description	-	Grey rocks	Brown sandy soil & rocks	Brown sandy soil & rocks	Brown sandy soil & rocks	Brown sandy soil & rocks
Asbestos ID in soil (AS4964) >0.1g/kg	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected
Total Asbestos[#1]	g/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected
ACM >7mm Estimation*	g	–	–	–	–	–
FA and AF Estimation*	g	–	–	–	–	–
FA and AF Estimation*#2	%(w/w)	<0.001	<0.001	<0.001	<0.001	<0.001

RTA276 ENM* Foreign Material						
Our Reference		229219-1	229219-2	229219-3	229219-4	229219-5
Your Reference	UNITS	TP1/0-0.3	TP2/0.4-0.5	TP3/0.4-0.5	TP4/0.4-0.5	TP8/1.6-1.8
Date Sampled		23/10/2019	23/10/2019	23/10/2019	23/10/2019	23/10/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	28/10/2019	28/10/2019	28/10/2019	28/10/2019	28/10/2019
Date analysed	-	28/10/2019	28/10/2019	28/10/2019	28/10/2019	28/10/2019
Sample Mass Tested	g	4,900	6,400	3,800	4,500	3,000
Foreign Material	%	<0.05	<0.05	<0.05	<0.05	<0.05

RTA276 ENM* Foreign Material						
Our Reference		229219-6	229219-7	229219-8	229219-9	229219-10
Your Reference	UNITS	TP8/4.6-4.8	TP9/0-0.3	TP10/0-0.3	TP11/0-0.3	TP11/1.8-1.0
Date Sampled		23/10/2019	23/10/2019	23/10/2019	23/10/2019	23/10/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	28/10/2019	28/10/2019	28/10/2019	28/10/2019	28/10/2019
Date analysed	-	28/10/2019	28/10/2019	28/10/2019	28/10/2019	28/10/2019
Sample Mass Tested	g	5,000	5,600	6,100	3,500	4,500
Foreign Material	%	<0.05	<0.05	<0.05	<0.05	<0.05

RTA276 ENM* Foreign Material						
Our Reference		229219-11	229219-12	229219-13	229219-14	229219-15
Your Reference	UNITS	TP12/1.6-1.8	TP12/3.6-3.8	TP13/0-0.3	TP13/2.8-3.0	TP14/0.4-0.5
Date Sampled		23/10/2019	23/10/2019	23/10/2019	23/10/2019	23/10/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	28/10/2019	28/10/2019	28/10/2019	28/10/2019	28/10/2019
Date analysed	-	28/10/2019	28/10/2019	28/10/2019	28/10/2019	28/10/2019
Sample Mass Tested	g	5,100	5,900	4,700	5,400	5,200
Foreign Material	%	<0.05	<0.05	<0.05	<0.05	<0.05

RTA276 ENM* Foreign Material						
Our Reference		229219-16	229219-17	229219-18	229219-19	229219-20
Your Reference	UNITS	TP15/0.4-0.6	TP16/0.4-0.6	TP17/0-0.3	TP17/0.4-0.5	TP18/0.4-0.5
Date Sampled		23/10/2019	23/10/2019	23/10/2019	23/10/2019	23/10/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	28/10/2019	28/10/2019	28/10/2019	28/10/2019	28/10/2019
Date analysed	-	28/10/2019	28/10/2019	28/10/2019	28/10/2019	28/10/2019
Sample Mass Tested	g	4,300	6,800	5,600	4,200	5,500
Foreign Material	%	<0.05	<0.05	<0.05	<0.05	<0.05

RTA276 ENM* Foreign Material			
Our Reference		229219-21	229219-22
Your Reference	UNITS	TP23/0-0.3	TP23/0.4-0.6
Date Sampled		23/10/2019	23/10/2019
Type of sample		Soil	Soil
Date prepared	-	28/10/2019	28/10/2019
Date analysed	-	28/10/2019	28/10/2019
Sample Mass Tested	g	5,800	6,000
Foreign Material	%	<0.05	<0.05

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.
ASB-001	Asbestos ID - Identification of asbestos in soil samples using Polarised Light Microscopy and Dispersion Staining Techniques. Minimum 500mL soil sample was analysed as recommended by "National Environment Protection (Assessment of site contamination) Measure, Schedule B1 and "The Guidelines from the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia - May 2009" with a reporting limit of 0.1g/kg (0.01% w/w) as per Australian Standard AS4964-2004. Results reported denoted with * are outside our scope of NATA accreditation. **NOTE** #1 Total Asbestos g/kg was analysed and reported as per Australian Standard AS4964 (This is the sum of ACM >7mm, <7mm and FA/AF) **NOTE** #2 The screening level of 0.001% w/w asbestos in soil for FA and AF only applies where the FA and AF are able to be quantified by gravimetric procedures. This screening level is not applicable to free fibres. Estimation = Estimated asbestos weight Results reported with "--" is equivalent to no visible asbestos identified using Polarised Light microscopy and Dispersion Staining Techniques.
AT-008	Determination of VOCs sampled onto coconut shell charcoal sorbent tubes, that can be desorbed using carbon disulphide, and analysed by GC-MS.
Inorg-001	pH - Measured using pH meter and electrode in accordance with APHA latest edition, 4500-H+. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
Inorg-002	Conductivity and Salinity - measured using a conductivity cell at 25°C in accordance with APHA latest edition 2510 and Rayment & Lyons.
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Inorg-031	Total Phenolics by segmented flow analyser (in line distillation with colourimetric finish). Solids are extracted in a caustic media prior to analysis.
Inorg-080 ENM	This method is based on RTA T276 and as per NSW DECC Resource Recovery Exemption Guidelines and correspondence. It includes rubber, plastic, bitumen, paper, cloth, paint and wood (Note wood is construction timber only, naturally occuring wood/twigs/roots are excluded). RTA T276 requires at least 6kg of sample for this test.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.

Method ID	Methodology Summary
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD. 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-012/017	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS and/or GC-MS/MS.
Org-012/017	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-MS and/or GC-MS/MS. Note, the Total +ve reported DDD+DDE+DDT PQL is reflective of the lowest individual PQL and is therefore simply a sum of the positive individually report DDD+DDE+DDT.
Org-012/017	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-014	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.

Method ID	Methodology Summary
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX 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.
RTA276	RTA 276 - Modified to Environmental Operations (Waste) - 2005 General Exemption under Part 6, Clause 51A.

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	229219-3
Date extracted	-			28/10/2019	1	28/10/2019	28/10/2019		28/10/2019	28/10/2019
Date analysed	-			29/10/2019	1	29/10/2019	29/10/2019		29/10/2019	29/10/2019
TRH C_6 - C_9	mg/kg	25	Org-016	<25	1	<25	<25	0	73	84
TRH C_6 - C_{10}	mg/kg	25	Org-016	<25	1	<25	<25	0	73	84
Benzene	mg/kg	0.2	Org-016	<0.2	1	<0.2	<0.2	0	72	84
Toluene	mg/kg	0.5	Org-016	<0.5	1	<0.5	<0.5	0	75	73
Ethylbenzene	mg/kg	1	Org-016	<1	1	<1	<1	0	74	88
m+p-xylene	mg/kg	2	Org-016	<2	1	<2	<2	0	73	87
o-Xylene	mg/kg	1	Org-016	<1	1	<1	<1	0	72	87
naphthalene	mg/kg	1	Org-014	<1	1	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	85	1	77	70	10	80	78

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	229219-22
Date extracted	-			[NT]	13	28/10/2019	28/10/2019		28/10/2019	28/10/2019
Date analysed	-			[NT]	13	29/10/2019	29/10/2019		29/10/2019	29/10/2019
TRH C_6 - C_9	mg/kg	25	Org-016	[NT]	13	<25	<25	0	80	80
TRH C_6 - C_{10}	mg/kg	25	Org-016	[NT]	13	<25	<25	0	80	80
Benzene	mg/kg	0.2	Org-016	[NT]	13	<0.2	<0.2	0	80	78
Toluene	mg/kg	0.5	Org-016	[NT]	13	<0.5	<0.5	0	84	94
Ethylbenzene	mg/kg	1	Org-016	[NT]	13	<1	<1	0	80	77
m+p-xylene	mg/kg	2	Org-016	[NT]	13	<2	<2	0	78	75
o-Xylene	mg/kg	1	Org-016	[NT]	13	<1	<1	0	78	76
naphthalene	mg/kg	1	Org-014	[NT]	13	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	[NT]	13	88	89	1	89	85

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	21	28/10/2019	28/10/2019		[NT]	[NT]
Date analysed	-			[NT]	21	29/10/2019	29/10/2019		[NT]	[NT]
TRH C_6 - C_9	mg/kg	25	Org-016	[NT]	21	<25	<25	0	[NT]	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-016	[NT]	21	<25	<25	0	[NT]	[NT]
Benzene	mg/kg	0.2	Org-016	[NT]	21	<0.2	<0.2	0	[NT]	[NT]
Toluene	mg/kg	0.5	Org-016	[NT]	21	<0.5	<0.5	0	[NT]	[NT]
Ethylbenzene	mg/kg	1	Org-016	[NT]	21	<1	<1	0	[NT]	[NT]
m+p-xylene	mg/kg	2	Org-016	[NT]	21	<2	<2	0	[NT]	[NT]
o-Xylene	mg/kg	1	Org-016	[NT]	21	<1	<1	0	[NT]	[NT]
naphthalene	mg/kg	1	Org-014	[NT]	21	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	[NT]	21	76	91	18	[NT]	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	229219-3
Date extracted	-			28/10/2019	1	28/10/2019	28/10/2019		28/10/2019	28/10/2019
Date analysed	-			29/10/2019	1	28/10/2019	28/10/2019		28/10/2019	28/10/2019
TRH C_{10} - C_{14}	mg/kg	50	Org-003	<50	1	<50	<50	0	107	124
TRH C_{15} - C_{28}	mg/kg	100	Org-003	<100	1	<100	<100	0	112	130
TRH C_{29} - C_{36}	mg/kg	100	Org-003	<100	1	<100	<100	0	121	107
TRH >C_{10} -C_{16}	mg/kg	50	Org-003	<50	1	<50	<50	0	107	124
TRH >C_{16} -C_{34}	mg/kg	100	Org-003	<100	1	<100	<100	0	112	130
TRH >C_{34} -C_{40}	mg/kg	100	Org-003	<100	1	<100	<100	0	121	107
Surrogate o-Terphenyl	%		Org-003	98	1	101	104	3	107	120

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	229219-22
Date extracted	-			[NT]	13	28/10/2019	28/10/2019		28/10/2019	28/10/2019
Date analysed	-			[NT]	13	28/10/2019	28/10/2019		29/10/2019	29/10/2019
TRH C_{10} - C_{14}	mg/kg	50	Org-003	[NT]	13	<50	<50	0	108	110
TRH C_{15} - C_{28}	mg/kg	100	Org-003	[NT]	13	<100	<100	0	113	116
TRH C_{29} - C_{36}	mg/kg	100	Org-003	[NT]	13	<100	<100	0	106	99
TRH >C_{10} -C_{16}	mg/kg	50	Org-003	[NT]	13	<50	<50	0	108	110
TRH >C_{16} -C_{34}	mg/kg	100	Org-003	[NT]	13	<100	<100	0	113	116
TRH >C_{34} -C_{40}	mg/kg	100	Org-003	[NT]	13	<100	<100	0	106	99
Surrogate o-Terphenyl	%		Org-003	[NT]	13	99	98	1	106	96

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	21	28/10/2019	28/10/2019		[NT]	[NT]
Date analysed	-			[NT]	21	29/10/2019	29/10/2019		[NT]	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-003	[NT]	21	<50	<50	0	[NT]	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-003	[NT]	21	<100	<100	0	[NT]	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-003	[NT]	21	<100	<100	0	[NT]	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-003	[NT]	21	<50	<50	0	[NT]	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-003	[NT]	21	<100	<100	0	[NT]	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-003	[NT]	21	<100	<100	0	[NT]	[NT]
Surrogate o-Terphenyl	%		Org-003	[NT]	21	112	98	13	[NT]	[NT]

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	229219-3
Date extracted	-			28/10/2019	1	28/10/2019	28/10/2019		28/10/2019	28/10/2019
Date analysed	-			29/10/2019	1	29/10/2019	29/10/2019		29/10/2019	29/10/2019
Naphthalene	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	110	112
Acenaphthylene	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	102	104
Phenanthrene	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	102	122
Anthracene	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	98	121
Pyrene	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	100	119
Benzo(a)anthracene	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	104	114
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-012/017	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012/017	<0.05	1	0.05	0.05	0	106	112
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012/017	121	1	122	114	7	106	104

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	229219-22
Date extracted	-			[NT]	13	28/10/2019	28/10/2019		28/10/2019	28/10/2019
Date analysed	-			[NT]	13	29/10/2019	29/10/2019		29/10/2019	29/10/2019
Naphthalene	mg/kg	0.1	Org-012/017	[NT]	13	<0.1	<0.1	0	122	101
Acenaphthylene	mg/kg	0.1	Org-012/017	[NT]	13	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-012/017	[NT]	13	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012/017	[NT]	13	<0.1	<0.1	0	86	81
Phenanthrene	mg/kg	0.1	Org-012/017	[NT]	13	<0.1	<0.1	0	110	95
Anthracene	mg/kg	0.1	Org-012/017	[NT]	13	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012/017	[NT]	13	0.3	0.3	0	104	89
Pyrene	mg/kg	0.1	Org-012/017	[NT]	13	0.3	0.3	0	108	93
Benzo(a)anthracene	mg/kg	0.1	Org-012/017	[NT]	13	0.1	0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012/017	[NT]	13	0.2	0.2	0	112	97
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-012/017	[NT]	13	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012/017	[NT]	13	0.2	0.2	0	116	105
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012/017	[NT]	13	0.1	0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012/017	[NT]	13	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012/017	[NT]	13	0.2	0.2	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012/017	[NT]	13	105	121	14	114	100

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	21	28/10/2019	28/10/2019		[NT]	[NT]
Date analysed	-			[NT]	21	29/10/2019	29/10/2019		[NT]	[NT]
Naphthalene	mg/kg	0.1	Org-012/017	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Acenaphthylene	mg/kg	0.1	Org-012/017	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-012/017	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012/017	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Phenanthrene	mg/kg	0.1	Org-012/017	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Anthracene	mg/kg	0.1	Org-012/017	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012/017	[NT]	21	<0.1	0.1	0	[NT]	[NT]
Pyrene	mg/kg	0.1	Org-012/017	[NT]	21	0.1	0.1	0	[NT]	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-012/017	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012/017	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-012/017	[NT]	21	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012/017	[NT]	21	0.06	0.1	50	[NT]	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012/017	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012/017	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012/017	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012/017	[NT]	21	114	120	5	[NT]	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	229219-3
Date extracted	-			28/10/2019	1	28/10/2019	28/10/2019		28/10/2019	28/10/2019
Date analysed	-			29/10/2019	1	29/10/2019	29/10/2019		29/10/2019	29/10/2019
alpha-BHC	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	106	97
HCB	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	94	79
gamma-BHC	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	88	85
delta-BHC	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	106	112
Heptachlor Epoxide	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	100	97
gamma-Chlordane	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	102	99
Dieldrin	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	120	112
Endrin	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	106	102
Endosulfan II	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	100	93
Endrin Aldehyde	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	96	74
Methoxychlor	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-012/017	114	1	111	114	3	99	103

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	[NT]
Date extracted	-			[NT]	13	28/10/2019	28/10/2019		28/10/2019	[NT]
Date analysed	-			[NT]	13	29/10/2019	29/10/2019		29/10/2019	[NT]
alpha-BHC	mg/kg	0.1	Org-012/017	[NT]	13	<0.1	<0.1	0	94	[NT]
HCB	mg/kg	0.1	Org-012/017	[NT]	13	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-012/017	[NT]	13	<0.1	<0.1	0	82	[NT]
gamma-BHC	mg/kg	0.1	Org-012/017	[NT]	13	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-012/017	[NT]	13	<0.1	<0.1	0	90	[NT]
delta-BHC	mg/kg	0.1	Org-012/017	[NT]	13	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-012/017	[NT]	13	<0.1	<0.1	0	114	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-012/017	[NT]	13	<0.1	<0.1	0	106	[NT]
gamma-Chlordane	mg/kg	0.1	Org-012/017	[NT]	13	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-012/017	[NT]	13	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-012/017	[NT]	13	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-012/017	[NT]	13	<0.1	<0.1	0	112	[NT]
Dieldrin	mg/kg	0.1	Org-012/017	[NT]	13	<0.1	<0.1	0	116	[NT]
Endrin	mg/kg	0.1	Org-012/017	[NT]	13	<0.1	<0.1	0	76	[NT]
Endosulfan II	mg/kg	0.1	Org-012/017	[NT]	13	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-012/017	[NT]	13	<0.1	<0.1	0	104	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-012/017	[NT]	13	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-012/017	[NT]	13	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-012/017	[NT]	13	<0.1	<0.1	0	100	[NT]
Methoxychlor	mg/kg	0.1	Org-012/017	[NT]	13	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-012/017	[NT]	13	117	114	3	101	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	21	28/10/2019	28/10/2019		[NT]	[NT]
Date analysed	-			[NT]	21	29/10/2019	29/10/2019		[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-012/017	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
HCB	mg/kg	0.1	Org-012/017	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-012/017	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
gamma-BHC	mg/kg	0.1	Org-012/017	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-012/017	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
delta-BHC	mg/kg	0.1	Org-012/017	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-012/017	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-012/017	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
gamma-Chlordane	mg/kg	0.1	Org-012/017	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-012/017	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-012/017	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-012/017	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Dieldrin	mg/kg	0.1	Org-012/017	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Endrin	mg/kg	0.1	Org-012/017	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Endosulfan II	mg/kg	0.1	Org-012/017	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-012/017	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-012/017	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-012/017	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-012/017	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Methoxychlor	mg/kg	0.1	Org-012/017	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-012/017	[NT]	21	107	113	5	[NT]	[NT]

QUALITY CONTROL: Organophosphorus Pesticides in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	229219-3
Date extracted	-			28/10/2019	1	28/10/2019	28/10/2019		28/10/2019	28/10/2019
Date analysed	-			29/10/2019	1	29/10/2019	29/10/2019		29/10/2019	29/10/2019
Dichlorvos	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	130	109
Dimethoate	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	82	88
Diazinon	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos-methyl	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	110	103
Fenitrothion	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	108	75
Malathion	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	112	126
Chlorpyriphos	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	124	118
Parathion	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	128	101
Bromophos-ethyl	mg/kg	0.1	AT-008	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	110	83
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-012/017	114	1	111	114	3	99	103

QUALITY CONTROL: Organophosphorus Pesticides in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	[NT]
Date extracted	-			[NT]	13	28/10/2019	28/10/2019		28/10/2019	[NT]
Date analysed	-			[NT]	13	29/10/2019	29/10/2019		29/10/2019	[NT]
Dichlorvos	mg/kg	0.1	Org-012/017	[NT]	13	<0.1	<0.1	0	128	[NT]
Dimethoate	mg/kg	0.1	Org-012/017	[NT]	13	<0.1	<0.1	0	87	[NT]
Diazinon	mg/kg	0.1	Org-012/017	[NT]	13	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos-methyl	mg/kg	0.1	Org-012/017	[NT]	13	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-012/017	[NT]	13	<0.1	<0.1	0	116	[NT]
Fenitrothion	mg/kg	0.1	Org-012/017	[NT]	13	<0.1	<0.1	0	88	[NT]
Malathion	mg/kg	0.1	Org-012/017	[NT]	13	<0.1	<0.1	0	118	[NT]
Chlorpyriphos	mg/kg	0.1	Org-012/017	[NT]	13	<0.1	<0.1	0	126	[NT]
Parathion	mg/kg	0.1	Org-012/017	[NT]	13	<0.1	<0.1	0	116	[NT]
Bromophos-ethyl	mg/kg	0.1	AT-008	[NT]	13	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-012/017	[NT]	13	<0.1	<0.1	0	108	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-012/017	[NT]	13	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-012/017	[NT]	13	117	114	3	101	[NT]

QUALITY CONTROL: Organophosphorus Pesticides in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	21	28/10/2019	28/10/2019		[NT]	[NT]
Date analysed	-			[NT]	21	29/10/2019	29/10/2019		[NT]	[NT]
Dichlorvos	mg/kg	0.1	Org-012/017	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Dimethoate	mg/kg	0.1	Org-012/017	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-012/017	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos-methyl	mg/kg	0.1	Org-012/017	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-012/017	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Fenitrothion	mg/kg	0.1	Org-012/017	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Malathion	mg/kg	0.1	Org-012/017	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos	mg/kg	0.1	Org-012/017	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Parathion	mg/kg	0.1	Org-012/017	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	AT-008	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-012/017	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-012/017	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-012/017	[NT]	21	107	113	5	[NT]	[NT]

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	229219-3
Date extracted	-			28/10/2019	1	28/10/2019	28/10/2019		28/10/2019	28/10/2019
Date analysed	-			29/10/2019	1	29/10/2019	29/10/2019		29/10/2019	29/10/2019
Aroclor 1016	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	80	80
Aroclor 1260	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-006	114	1	111	114	3	99	103

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	[NT]
Date extracted	-			[NT]	13	28/10/2019	28/10/2019		28/10/2019	[NT]
Date analysed	-			[NT]	13	29/10/2019	29/10/2019		29/10/2019	[NT]
Aroclor 1016	mg/kg	0.1	Org-006	[NT]	13	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-006	[NT]	13	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-006	[NT]	13	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-006	[NT]	13	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-006	[NT]	13	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-006	[NT]	13	<0.1	<0.1	0	91	[NT]
Aroclor 1260	mg/kg	0.1	Org-006	[NT]	13	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-006	[NT]	13	117	114	3	101	[NT]

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	21	28/10/2019	28/10/2019		[NT]	[NT]
Date analysed	-			[NT]	21	29/10/2019	29/10/2019		[NT]	[NT]
Aroclor 1016	mg/kg	0.1	Org-006	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-006	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-006	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-006	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-006	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-006	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1260	mg/kg	0.1	Org-006	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-006	[NT]	21	107	113	5	[NT]	[NT]

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	229219-3
Date prepared	-			28/10/2019	1	28/10/2019	28/10/2019		28/10/2019	28/10/2019
Date analysed	-			28/10/2019	1	28/10/2019	28/10/2019		28/10/2019	28/10/2019
Arsenic	mg/kg	4	Metals-020	<4	1	9	10	11	109	107
Cadmium	mg/kg	0.4	Metals-020	<0.4	1	<0.4	<0.4	0	108	109
Chromium	mg/kg	1	Metals-020	<1	1	2	2	0	110	105
Copper	mg/kg	1	Metals-020	<1	1	4	4	0	108	110
Lead	mg/kg	1	Metals-020	<1	1	5	5	0	108	104
Mercury	mg/kg	0.1	Metals-021	<0.1	1	<0.1	<0.1	0	102	96
Nickel	mg/kg	1	Metals-020	<1	1	1	1	0	104	106
Zinc	mg/kg	1	Metals-020	<1	1	9	9	0	105	104

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	229219-22
Date prepared	-			[NT]	13	28/10/2019	28/10/2019		28/10/2019	28/10/2019
Date analysed	-			[NT]	13	28/10/2019	28/10/2019		28/10/2019	28/10/2019
Arsenic	mg/kg	4	Metals-020	[NT]	13	7	8	13	111	111
Cadmium	mg/kg	0.4	Metals-020	[NT]	13	<0.4	<0.4	0	109	110
Chromium	mg/kg	1	Metals-020	[NT]	13	3	3	0	115	110
Copper	mg/kg	1	Metals-020	[NT]	13	7	7	0	112	112
Lead	mg/kg	1	Metals-020	[NT]	13	17	18	6	113	107
Mercury	mg/kg	0.1	Metals-021	[NT]	13	0.1	0.1	0	103	92
Nickel	mg/kg	1	Metals-020	[NT]	13	2	2	0	104	109
Zinc	mg/kg	1	Metals-020	[NT]	13	13	13	0	109	108

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	21	28/10/2019	28/10/2019		[NT]	[NT]
Date analysed	-			[NT]	21	28/10/2019	28/10/2019		[NT]	[NT]
Arsenic	mg/kg	4	Metals-020	[NT]	21	10	11	10	[NT]	[NT]
Cadmium	mg/kg	0.4	Metals-020	[NT]	21	<0.4	<0.4	0	[NT]	[NT]
Chromium	mg/kg	1	Metals-020	[NT]	21	5	6	18	[NT]	[NT]
Copper	mg/kg	1	Metals-020	[NT]	21	8	7	13	[NT]	[NT]
Lead	mg/kg	1	Metals-020	[NT]	21	17	16	6	[NT]	[NT]
Mercury	mg/kg	0.1	Metals-021	[NT]	21	0.2	0.2	0	[NT]	[NT]
Nickel	mg/kg	1	Metals-020	[NT]	21	2	2	0	[NT]	[NT]
Zinc	mg/kg	1	Metals-020	[NT]	21	19	19	0	[NT]	[NT]

QUALITY CONTROL: Misc Soil - Inorg						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	229219-3
Date prepared	-			28/10/2019	1	28/10/2019	28/10/2019		28/10/2019	28/10/2019
Date analysed	-			28/10/2019	1	28/10/2019	28/10/2019		28/10/2019	28/10/2019
Total Phenolics (as Phenol)	mg/kg	5	Inorg-031	<5	1	<5	<5	0	103	107

QUALITY CONTROL: Misc Soil - Inorg						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	21	28/10/2019	28/10/2019		[NT]	[NT]
Date analysed	-			[NT]	21	28/10/2019	28/10/2019		[NT]	[NT]
Total Phenolics (as Phenol)	mg/kg	5	Inorg-031	[NT]	21	<5	<5	0	[NT]	[NT]

QUALITY CONTROL: Misc Inorg - Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			28/10/2019	3	28/10/2019	28/10/2019		28/10/2019	[NT]
Date analysed	-			28/10/2019	3	28/10/2019	28/10/2019		28/10/2019	[NT]
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	3	6.0	6.0	0	102	[NT]
Electrical Conductivity 1:5 soil:water	µS/cm	1	Inorg-002	<1	3	14	15	7	101	[NT]

QUALITY CONTROL: Misc Inorg - Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	[NT]
Date prepared	-			[NT]	11	28/10/2019	28/10/2019		28/10/2019	[NT]
Date analysed	-			[NT]	11	28/10/2019	28/10/2019		28/10/2019	[NT]
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	11	6.1	6.1	0	102	[NT]
Electrical Conductivity 1:5 soil:water	µS/cm	1	Inorg-002	[NT]	11	10	9	11	100	[NT]

QUALITY CONTROL: Misc Inorg - Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	20	28/10/2019	28/10/2019		[NT]	[NT]
Date analysed	-			[NT]	20	28/10/2019	28/10/2019		[NT]	[NT]
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	20	6.4	6.4	0	[NT]	[NT]
Electrical Conductivity 1:5 soil:water	µS/cm	1	Inorg-002	[NT]	20	11	11	0	[NT]	[NT]

Result Definitions

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

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

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 sam

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

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

Measurement Uncertainty estimates are available for most tests upon request.

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

Report Comments

Asbestos-ID in soil: NEPM
This report is consistent with the reporting recommendations in the National Environment Protection (Assessment of Site Contamination) Measure, Schedule B1, May 2013. This is reported outside our scope of NATA accreditation.

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CHAIN OF CUSTODY DESPATCH SHEET

Project No:	84944.02	**Suburb:**	Bellevue Hill	**To:**	EnviroLab
Project Name:	Cranbrook School In-situ assessment	**Order Number**			12 Ashley Street, Chatswood 2067
Project Manager:	Peter Oitmaa	**Sampler:**	Joel J-H	**Attn:**	Aileen Hie
Emails:	peter.oitmaa@douglaspartners.com.au; joel.james-hall@douglaspartners.com			**Phone:**	(02) 9910 6200
Date Required:	Same day ☐ 24 hours ☐ 48 hours ☐ 72 hours ☑ Standard ☐			**Email:**	Ahie@envirolab.com.au
Prior Storage:	☑ Esky ☑ Fridge ☐ Shelved	Do samples contain 'potential' HBM?	Yes ☑ No ☐ (If YES, then handle, transport and store in accordance with FPM HAZID)		

Sample ID	Lab ID	Date Sampled	Sample Type: S - soil W - water	Container Type: G - glass P - plastic	Analytes: Combo 8	Combo 3	AF/FA	pH, EC	Foreign Materials (ENM)					Notes/preservation
TP1/0-0.3	1	23/10/19	S	G/P	X			X	X					
TP2/0.4-0.5	2	23/10/19	S	G/P		X		X	X					
TP3/0.4-0.5	3	23/10/19	S	G/P	X			X	X					
TP4/0.4-0.5	4	23/10/19	S	G/P	X		X	X	X					
TP8/1.6-1.8	5	23/10/19	S	G/P	—	X	X	X	X					
TP8/4.6-4.8	6	23/10/19	S	G/P		X		X	X					
TP9/0-0.3	7	23/10/19	S	G/P	X		X	X	X					
TP10/0-0.3	8	23/10/19	S	G/P	X			X	X					
TP11/0-0.3	9	23/10/19	S	G/P	X			X	X					
TP11/0.8-1.0	10	23/10/19	S	G/P		X	X	X	X					
TP12/1.6-1.8	11	23/10/19	S	G/P		X		X	X					
TP12/3.6-3.8	12	23/10/19	S	G/P		X		X	X					
TP13/0-0.3	13	23/10/19	S	G/P	X		X	X	X					
TP13/2.8-3.0	14	23/10/19	S	G/P		X		X	X					
TP14/0.4-0.5	15	23/10/19	S	G/P	X			X	X					
														ANZECC PQLs req'd for all water analytes ☐

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

Job No: 229219
Date Received: 24/10/19
Time Received: 1805
Received by: JB
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

PQL = practical quantitation limit. If none given, default to Laboratory Method Detection Limit

Lab Report/Reference No: 229219

Metals to Analyse: 8HM unless specified here:

Total number of samples in container: **Relinquished by:** **Transported to laboratory by:**

Send Results to: Douglas Partners Pty Ltd **Address:** **Phone:** **Fax:**

Signed: **Received by:** Jason Dang ECS SM **Date & Time:** 1803 24/10/19

Douglas Partners
Geotechnics | Environment | Groundwater

CHAIN OF CUSTODY DESPATCH SHEET

Project No:	84944.02	**Suburb:**	Bellevue Hill	**To:**	EnviroLab
Project Name:	Cranbrook School In-situ assessment	**Order Number**			12 Ashley Street, Chatswood 2067
Project Manager:	Peter Oitmaa	**Sampler:**	Joel J-H	**Attn:**	Aileen Hie
Emails:	peter.oitmaa@douglaspartners.com.au; joel.james-hall@douglaspartners.com			**Phone:**	(02) 9910 6200
Date Required:	Same day ☐ 24 hours ☐ 48 hours ☐ 72 hours ☑ Standard ☐			**Email:**	Ahie@envirolab.com.au
Prior Storage:	☑ Esky ☑ Fridge ☐ Shelved	Do samples contain 'potential' HBM?	Yes ☑ No ☐ (If YES, then handle, transport and store in accordance with FPM HAZID)		

Sample ID	Lab ID	Date Sampled	Sample Type (S - soil W - water)	Container Type (G - glass P - plastic)	Analytes: Combo 8	Combo 3	AF/FA	pH, EC	Foreign Materials (ENM)					Notes/preservation
TP15/0.4-0.6	16	23/10/19	S	G/P	X		X	X	X					
TP16/0.4-0.6	17	23/10/19	S	G/P		X		X	X					
TP17/0-0.3	18	23/10/19	S	G/P	X		X	X	X					
TP17/0.4-0.5	19	23/10/19	S	G/P		X	X	X	X					
TP18/0.4-0.5	20	23/10/19	S	G/P		X		X	X					
TP23/0-0.3	21	23/10/19	S	G/P	X		X	X	X					
TP23/0.4-0.6	22	23/10/19	S	G/P		X		X	X					
BD1/20191023	23	23/10/19	S	G		X		X	X					
BD2/20191023	24	23/10/19	S	G		X		X	X					
TP2/0-0.3	25	23/10/19	S	P			X							
TP11_0-0.3 extra Enq	26	231019												
PQL (S) mg/kg													**ANZECC PQLs req'd for all water analytes** ☐	

PQL = practical quantitation limit. If none given, default to Laboratory Method Detection Limit

Metals to Analyse: 8HM unless specified here:

Lab Report/Reference No: 229219

Total number of samples in container: **Relinquished by:** **Transported to laboratory by:**

Send Results to: Douglas Partners Pty Ltd **Address:** **Phone:** **Fax:**

Signed: **Received by:** Jason Day ECS SYD **Date & Time:** 1803 24/10/19

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

SAMPLE RECEIPT ADVICE

Client Details

Client	Douglas Partners Pty Ltd
Attention	Joel James-Hall, Peter Oitmaa

Sample Login Details

Your reference	84944.02, Cranbrook School In-Situ Assessment
Envirolab Reference	229219
Date Sample Received	24/10/2019
Date Instructions Received	24/10/2019
Date Results Expected to be Reported	29/10/2019

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	26 Soil
Turnaround Time Requested	3 days
Temperature on Receipt (°C)	9.0
Cooling Method	Ice Pack
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

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

Analysis Underway, details on the following page:

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Sample ID	vTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticides in soil	Organophosphorus Pesticides in Soil	PCBsin Soil	Acid Extractable metalsin soil	Misc Soil - Inorg	Misc Inorg - Soil	Asbestos ID - soils NEPM	RTA276 ENM*Foreign Material	On Hold
TP1/0-0.3	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	
TP2/0.4-0.5	✓	✓	✓				✓		✓		✓	
TP3/0.4-0.5	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	
TP4/0.4-0.5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
TP8/1.6-1.8	✓	✓	✓				✓		✓	✓	✓	
TP8/4.6-4.8	✓	✓	✓				✓		✓		✓	
TP9/0-0.3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
TP10/0-0.3	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	
TP11/0-0.3	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	
TP11/1.8-1.0	✓	✓	✓				✓		✓	✓	✓	
TP12/1.6-1.8	✓	✓	✓				✓		✓		✓	
TP12/3.6-3.8	✓	✓	✓				✓		✓		✓	
TP13/0-0.3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
TP13/2.8-3.0	✓	✓	✓				✓		✓		✓	
TP14/0.4-0.5	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	
TP15/0.4-0.6	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
TP16/0.4-0.6	✓	✓	✓				✓		✓		✓	
TP17/0-0.3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
TP17/0.4-0.5	✓	✓	✓				✓		✓	✓	✓	
TP18/0.4-0.5	✓	✓	✓				✓		✓		✓	
TP23/0-0.3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
TP23/0.4-0.6	✓	✓	✓				✓		✓		✓	
BD1/20191023	✓	✓	✓				✓					
BD2/20191023	✓	✓	✓				✓					
TP2/0-0.3										✓		
TP11/0-0.3												✓

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

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Additional Info

Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.
Requests for longer term sample storage must be received in writing.
Please contact the laboratory immediately if observed settled sediment present in water samples is to be included in the extraction and/or analysis (exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS analysis where solids are included by default.
TAT for Micro is dependent on incubation. This varies from 3 to 6 days.

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Envirolab Services Pty Ltd - Sydney | ABN 37 112 535 645

CERTIFICATE OF ANALYSIS 165477

Client:
Douglas Partners Pty Ltd
96 Hermitage Rd
West Ryde
NSW 2114

Attention: Peter Oitmaa

Sample log in details:

Your Reference:	**84944.01, Bellevue Hill**
No. of samples:	30 soils
Date samples received / completed instructions received	19/04/17 / 19/04/17

Analysis Details:
Please refer to the following pages for results, methodology summary and quality control data.
Samples were analysed as received from the client. Results relate specifically to the samples as received.
Results are reported on a dry weight basis for solids and on an as received basis for other matrices.
Please refer to the last page of this report for any comments relating to the results.

Report Details:

Date results requested by: / Issue Date:	27/04/17 / 27/04/17
Date of Preliminary Report:	Not Issued

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Accredited for compliance with ISO/IEC 17025 - Testing **Tests not covered by NATA are denoted with *.**

Results Approved By:

David Springer
General Manager

vTRH(C6-C10)/BTEXN in Soil						
Our Reference:	UNITS	165477-1	165477-2	165477-3	165477-4	165477-5
Your Reference	---------- -	BH101	BH101	BH102	BH102	BH103
Depth	----------	0.5	4.0	0.5	2.0	0.1
Date Sampled		12/04/2017	12/04/2017	12/04/2017	12/04/2017	11/04/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/04/2017	20/04/2017	20/04/2017	20/04/2017	20/04/2017
Date analysed	-	20/04/2017	20/04/2017	20/04/2017	20/04/2017	20/04/2017
TRHC6 - C9	mg/kg	<25	<25	<25	<25	<25
TRHC6 - C10	mg/kg	<25	<25	<25	<25	<25
vTPHC6 - C10 less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	98	92	100	93	98

vTRH(C6-C10)/BTEXN in Soil						
Our Reference:	UNITS	165477-6	165477-7	165477-8	165477-9	165477-10
Your Reference	---------- -	BH103	BH104	BH105	BH111	BH111
Depth	----------	1.0	1.0	1.0	0.45-0.5	2.9-3.0
Date Sampled		11/04/2017	12/04/2017	10/04/2017	13/04/2017	13/04/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/04/2017	20/04/2017	20/04/2017	20/04/2017	20/04/2017
Date analysed	-	20/04/2017	20/04/2017	20/04/2017	20/04/2017	20/04/2017
TRHC6 - C9	mg/kg	<25	<25	<25	<25	<25
TRHC6 - C10	mg/kg	<25	<25	<25	<25	<25
vTPHC6 - C10 less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	103	94	93	99	97

vTRH(C6-C10)/BTEXN in Soil						
Our Reference:	UNITS	165477-11	165477-12	165477-13	165477-14	165477-15
Your Reference	---------- -	BH112	BH113	BH114	BH115	BH116
Depth	----------	0.5	1.0-1.05	1.0	0.1	1.0
Date Sampled		11/04/2017	13/04/2017	11/04/2017	11/04/2017	11/04/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/04/2017	20/04/2017	20/04/2017	20/04/2017	20/04/2017
Date analysed	-	20/04/2017	20/04/2017	20/04/2017	20/04/2017	20/04/2017
TRHC6 - C9	mg/kg	<25	<25	<25	<25	<25
TRHC6 - C10	mg/kg	<25	<25	<25	<25	<25
vTPHC6 - C10 less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	98	101	100	94	100

vTRH(C6-C10)/BTEXN in Soil						
Our Reference:	UNITS	165477-16	165477-17	165477-18	165477-19	165477-20
Your Reference	---------- -	BH117	BH118	BH119	BH120	BH121
Depth	----------	1.95-2.0	0.1-0.15	0.5	0.5	1.0
Date Sampled		13/04/2017	13/04/2017	10/04/2017	11/04/2017	12/04/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/04/2017	20/04/2017	20/04/2017	20/04/2017	20/04/2017
Date analysed	-	20/04/2017	20/04/2017	20/04/2017	20/04/2017	20/04/2017
TRHC6 - C9	mg/kg	<25	<25	<25	<25	<25
TRHC6 - C10	mg/kg	<25	<25	<25	<25	<25
vTPHC6 - C10 less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	99	97	102	98	86

vTRH(C6-C10)/BTEXN in Soil						
Our Reference:	UNITS	165477-21	165477-22	165477-23	165477-24	165477-25
Your Reference	---------- -	BH122	BH123	BH124	BH125	BH126
Depth	----------	1.0	0.5	0.1	0.5	2.0
Date Sampled		11/04/2017	11/04/2017	10/04/2017	10/04/2017	12/04/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/04/2017	20/04/2017	20/04/2017	20/04/2017	20/04/2017
Date analysed	-	20/04/2017	20/04/2017	20/04/2017	20/04/2017	20/04/2017
TRHC6 - C9	mg/kg	<25	<25	<25	<25	<25
TRHC6 - C10	mg/kg	<25	<25	<25	<25	<25
vTPHC6 - C10 less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	101	98	100	94	91

vTRH(C6-C10)/BTEXN in Soil						
Our Reference:	UNITS	165477-26	165477-27	165477-28	165477-29	165477-30
Your Reference	---------- -	BH127	BH128	BH129	BH129	BH130
Depth	----------	0.5	1.0	0.5	2.0	0.1
Date Sampled		11/04/2017	12/04/2017	10/04/2017	10/04/2017	10/04/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/04/2017	20/04/2017	20/04/2017	20/04/2017	20/04/2017
Date analysed	-	20/04/2017	20/04/2017	20/04/2017	21/04/2017	21/04/2017
TRHC6 - C9	mg/kg	<25	<25	<25	<25	<25
TRHC6 - C10	mg/kg	<25	<25	<25	<25	<25
vTPHC6 - C10 less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	94	87	96	96	94

svTRH (C10-C40) in Soil						
Our Reference:	UNITS	165477-1	165477-2	165477-3	165477-4	165477-5
Your Reference	---------- -	BH101	BH101	BH102	BH102	BH103
Depth	----------	0.5	4.0	0.5	2.0	0.1
Date Sampled		12/04/2017	12/04/2017	12/04/2017	12/04/2017	11/04/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/04/2017	20/04/2017	20/04/2017	20/04/2017	20/04/2017
Date analysed	-	20/04/2017	20/04/2017	20/04/2017	20/04/2017	20/04/2017
TRHC$_{10}$ - C$_{14}$	mg/kg	<50	<50	<50	<50	<50
TRHC$_{15}$ - C$_{28}$	mg/kg	<100	<100	<100	<100	<100
TRHC$_{29}$ - C$_{36}$	mg/kg	<100	<100	<100	<100	<100
TRH>C$_{10}$-C$_{16}$	mg/kg	<50	<50	<50	<50	<50
TRH>C$_{10}$ - C$_{16}$ less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH>C$_{16}$-C$_{34}$	mg/kg	<100	<100	<100	<100	<100
TRH>C$_{34}$-C$_{40}$	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	84	84	85	82	87

svTRH (C10-C40) in Soil						
Our Reference:	UNITS	165477-6	165477-7	165477-8	165477-9	165477-10
Your Reference	---------- -	BH103	BH104	BH105	BH111	BH111
Depth	----------	1.0	1.0	1.0	0.45-0.5	2.9-3.0
Date Sampled		11/04/2017	12/04/2017	10/04/2017	13/04/2017	13/04/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/04/2017	20/04/2017	20/04/2017	20/04/2017	20/04/2017
Date analysed	-	20/04/2017	20/04/2017	20/04/2017	20/04/2017	20/04/2017
TRHC$_{10}$ - C$_{14}$	mg/kg	<50	<50	<50	<50	<50
TRHC$_{15}$ - C$_{28}$	mg/kg	<100	<100	<100	<100	<100
TRHC$_{29}$ - C$_{36}$	mg/kg	<100	<100	<100	<100	<100
TRH>C$_{10}$-C$_{16}$	mg/kg	<50	<50	<50	<50	<50
TRH>C$_{10}$ - C$_{16}$ less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH>C$_{16}$-C$_{34}$	mg/kg	<100	<100	<100	<100	<100
TRH>C$_{34}$-C$_{40}$	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	83	83	84	83	82

svTRH (C10-C40) in Soil						
Our Reference:	UNITS	165477-11	165477-12	165477-13	165477-14	165477-15
Your Reference	---------- -	BH112	BH113	BH114	BH115	BH116
Depth	----------	0.5	1.0-1.05	1.0	0.1	1.0
Date Sampled		11/04/2017	13/04/2017	11/04/2017	11/04/2017	11/04/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/04/2017	20/04/2017	20/04/2017	20/04/2017	20/04/2017
Date analysed	-	20/04/2017	20/04/2017	20/04/2017	20/04/2017	21/04/2017
TRHC$_{10}$ - C$_{14}$	mg/kg	<50	<50	<50	<50	<50
TRHC$_{15}$ - C$_{28}$	mg/kg	<100	<100	<100	<100	<100
TRHC$_{29}$ - C$_{36}$	mg/kg	<100	<100	<100	<100	<100
TRH>C$_{10}$-C$_{16}$	mg/kg	<50	<50	<50	<50	<50
TRH>C$_{10}$ - C$_{16}$ less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH>C$_{16}$-C$_{34}$	mg/kg	<100	<100	<100	<100	<100
TRH>C$_{34}$-C$_{40}$	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	82	84	85	84	81

svTRH (C10-C40) in Soil						
Our Reference:	UNITS	165477-16	165477-17	165477-18	165477-19	165477-20
Your Reference	---------- -	BH117	BH118	BH119	BH120	BH121
Depth	----------	1.95-2.0	0.1-0.15	0.5	0.5	1.0
Date Sampled		13/04/2017	13/04/2017	10/04/2017	11/04/2017	12/04/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/04/2017	20/04/2017	20/04/2017	20/04/2017	20/04/2017
Date analysed	-	21/04/2017	21/04/2017	21/04/2017	21/04/2017	21/04/2017
TRHC$_{10}$ - C$_{14}$	mg/kg	<50	<50	<50	<50	<50
TRHC$_{15}$ - C$_{28}$	mg/kg	<100	<100	<100	<100	<100
TRHC$_{29}$ - C$_{36}$	mg/kg	<100	<100	<100	<100	<100
TRH>C$_{10}$-C$_{16}$	mg/kg	<50	<50	<50	<50	<50
TRH>C$_{10}$ - C$_{16}$ less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH>C$_{16}$-C$_{34}$	mg/kg	<100	<100	<100	<100	<100
TRH>C$_{34}$-C$_{40}$	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	83	81	83	81	83

svTRH (C10-C40) in Soil						
Our Reference:	UNITS	165477-21	165477-22	165477-23	165477-24	165477-25
Your Reference	---------- -	BH122	BH123	BH124	BH125	BH126
Depth	----------	1.0	0.5	0.1	0.5	2.0
Date Sampled		11/04/2017	11/04/2017	10/04/2017	10/04/2017	12/04/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/04/2017	20/04/2017	20/04/2017	20/04/2017	20/04/2017
Date analysed	-	21/04/2017	21/04/2017	21/04/2017	21/04/2017	21/04/2017
TRHC$_{10}$ - C$_{14}$	mg/kg	<50	<50	<50	<50	<50
TRHC$_{15}$ - C$_{28}$	mg/kg	<100	<100	<100	<100	<100
TRHC$_{29}$ - C$_{36}$	mg/kg	<100	<100	<100	<100	<100
TRH>C$_{10}$-C$_{16}$	mg/kg	<50	<50	<50	<50	<50
TRH>C$_{10}$ - C$_{16}$ less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH>C$_{16}$-C$_{34}$	mg/kg	<100	<100	<100	<100	<100
TRH>C$_{34}$-C$_{40}$	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	86	82	83	82	83

svTRH (C10-C40) in Soil						
Our Reference:	UNITS	165477-26	165477-27	165477-28	165477-29	165477-30
Your Reference	---------- -	BH127	BH128	BH129	BH129	BH130
Depth	----------	0.5	1.0	0.5	2.0	0.1
Date Sampled		11/04/2017	12/04/2017	10/04/2017	10/04/2017	10/04/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/04/2017	20/04/2017	20/04/2017	20/04/2017	20/04/2017
Date analysed	-	21/04/2017	21/04/2017	21/04/2017	21/04/2017	21/04/2017
TRHC$_{10}$ - C$_{14}$	mg/kg	<50	<50	<50	<50	<50
TRHC$_{15}$ - C$_{28}$	mg/kg	<100	<100	<100	<100	<100
TRHC$_{29}$ - C$_{36}$	mg/kg	<100	<100	<100	<100	<100
TRH>C$_{10}$-C$_{16}$	mg/kg	<50	<50	<50	<50	<50
TRH>C$_{10}$ - C$_{16}$ less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH>C$_{16}$-C$_{34}$	mg/kg	<100	<100	<100	<100	<100
TRH>C$_{34}$-C$_{40}$	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	84	84	86	85	86

PAHs in Soil Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ---------- - ---------- 	165477-1 BH101 0.5 12/04/2017 Soil	165477-2 BH101 4.0 12/04/2017 Soil	165477-3 BH102 0.5 12/04/2017 Soil	165477-4 BH102 2.0 12/04/2017 Soil	165477-5 BH103 0.1 11/04/2017 Soil
Date extracted	-	20/04/2017	20/04/2017	20/04/2017	20/04/2017	20/04/2017
Date analysed	-	21/04/2017	21/04/2017	21/04/2017	21/04/2017	21/04/2017
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.6	<0.1	0.2	<0.1	<0.1
Pyrene	mg/kg	0.5	<0.1	0.3	<0.1	<0.1
Benzo(a)anthracene	mg/kg	0.2	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	0.3	<0.1	0.2	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	0.5	<0.2	0.3	<0.2	<0.2
Benzo(a)pyrene	mg/kg	0.3	<0.05	0.2	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	0.3	<0.1	0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	0.2	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Total +ve PAH's	mg/kg	3.0	<0.05	1.2	<0.05	<0.05
Surrogate p-Terphenyl-d14	%	97	90	94	93	99

PAHs in Soil Our Reference: Your Reference	UNITS ----------	165477-6 BH103	165477-7 BH104	165477-8 BH105	165477-9 BH111	165477-10 BH111
Depth	----------	1.0	1.0	1.0	0.45-0.5	2.9-3.0
Date Sampled		11/04/2017	12/04/2017	10/04/2017	13/04/2017	13/04/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/04/2017	20/04/2017	20/04/2017	20/04/2017	20/04/2017
Date analysed	-	21/04/2017	21/04/2017	21/04/2017	21/04/2017	21/04/2017
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Surrogate p-Terphenyl-d14	%	95	92	92	95	94

PAHs in Soil Our Reference: Your Reference	UNITS ----------	165477-11 BH112	165477-12 BH113	165477-13 BH114	165477-14 BH115	165477-15 BH116
Depth	----------	0.5	1.0-1.05	1.0	0.1	1.0
Date Sampled		11/04/2017	13/04/2017	11/04/2017	11/04/2017	11/04/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/04/2017	20/04/2017	20/04/2017	20/04/2017	20/04/2017
Date analysed	-	21/04/2017	21/04/2017	21/04/2017	21/04/2017	21/04/2017
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Surrogate p-Terphenyl-d14	%	98	93	95	93	92

PAHs in Soil Our Reference: Your Reference	UNITS ----------	165477-16 BH117	165477-17 BH118	165477-18 BH119	165477-19 BH120	165477-20 BH121
Depth	----------	1.95-2.0	0.1-0.15	0.5	0.5	1.0
Date Sampled		13/04/2017	13/04/2017	10/04/2017	11/04/2017	12/04/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/04/2017	20/04/2017	20/04/2017	20/04/2017	20/04/2017
Date analysed	-	21/04/2017	21/04/2017	21/04/2017	21/04/2017	21/04/2017
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	0.2	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.1	0.2	<0.1	<0.1	<0.1
Pyrene	mg/kg	0.1	0.2	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	0.06	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Total +ve PAH's	mg/kg	0.2	0.78	<0.05	<0.05	<0.05
Surrogate p-Terphenyl-d14	%	94	94	95	97	91

PAHs in Soil Our Reference: Your Reference	UNITS ----------	165477-21 BH122	165477-22 BH123	165477-23 BH124	165477-24 BH125	165477-25 BH126
Depth	----------	1.0	0.5	0.1	0.5	2.0
Date Sampled		11/04/2017	11/04/2017	10/04/2017	10/04/2017	12/04/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/04/2017	20/04/2017	20/04/2017	20/04/2017	20/04/2017
Date analysed	-	21/04/2017	21/04/2017	21/04/2017	21/04/2017	21/04/2017
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	0.2	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	0.1	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Total +ve PAH's	mg/kg	<0.05	<0.05	0.59	<0.05	<0.05
Surrogate p-Terphenyl-d14	%	93	91	98	93	91

PAHs in Soil Our Reference: Your Reference	UNITS ----------	165477-26 BH127	165477-27 BH128	165477-28 BH129	165477-29 BH129	165477-30 BH130
Depth	----------	0.5	1.0	0.5	2.0	0.1
Date Sampled		11/04/2017	12/04/2017	10/04/2017	10/04/2017	10/04/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/04/2017	20/04/2017	20/04/2017	20/04/2017	20/04/2017
Date analysed	-	21/04/2017	21/04/2017	21/04/2017	21/04/2017	21/04/2017
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.4
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.4
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.3
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	0.5
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	0.2
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.3
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.2
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05	<0.05	2.3
Surrogate p-Terphenyl-d14	%	97	93	97	93	93

Organochlorine Pesticides in soil						
Our Reference:	UNITS	165477-1	165477-2	165477-3	165477-4	165477-5
Your Reference	----------	BH101	BH101	BH102	BH102	BH103
	-					
Depth	----------	0.5	4.0	0.5	2.0	0.1
Date Sampled		12/04/2017	12/04/2017	12/04/2017	12/04/2017	11/04/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/04/2017	20/04/2017	20/04/2017	20/04/2017	20/04/2017
Date analysed	-	20/04/2017	20/04/2017	20/04/2017	20/04/2017	20/04/2017
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	99	102	100	99	99

Organochlorine Pesticides in soil						
Our Reference:	UNITS	165477-6	165477-7	165477-8	165477-9	165477-10
Your Reference	----------	BH103	BH104	BH105	BH111	BH111
	-					
Depth	----------	1.0	1.0	1.0	0.45-0.5	2.9-3.0
Date Sampled		11/04/2017	12/04/2017	10/04/2017	13/04/2017	13/04/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/04/2017	20/04/2017	20/04/2017	20/04/2017	20/04/2017
Date analysed	-	20/04/2017	20/04/2017	20/04/2017	20/04/2017	20/04/2017
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	98	102	96	98	99

Organochlorine Pesticides in soil						
Our Reference:	UNITS	165477-11	165477-12	165477-13	165477-14	165477-15
Your Reference	----------	BH112	BH113	BH114	BH115	BH116
	-					
Depth	----------	0.5	1.0-1.05	1.0	0.1	1.0
Date Sampled		11/04/2017	13/04/2017	11/04/2017	11/04/2017	11/04/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/04/2017	20/04/2017	20/04/2017	20/04/2017	20/04/2017
Date analysed	-	20/04/2017	20/04/2017	20/04/2017	20/04/2017	20/04/2017
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	98	97	98	98	97

Organochlorine Pesticides in soil						
Our Reference:	UNITS	165477-16	165477-17	165477-18	165477-19	165477-20
Your Reference	---------- -	BH117	BH118	BH119	BH120	BH121
Depth	----------	1.95-2.0	0.1-0.15	0.5	0.5	1.0
Date Sampled		13/04/2017	13/04/2017	10/04/2017	11/04/2017	12/04/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/04/2017	20/04/2017	20/04/2017	20/04/2017	20/04/2017
Date analysed	-	20/04/2017	20/04/2017	20/04/2017	20/04/2017	20/04/2017
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	100	94	100	96	95

Organochlorine Pesticides in soil						
Our Reference:	UNITS	165477-21	165477-22	165477-23	165477-24	165477-25
Your Reference	----------	BH122	BH123	BH124	BH125	BH126
	-					
Depth	----------	1.0	0.5	0.1	0.5	2.0
Date Sampled		11/04/2017	11/04/2017	10/04/2017	10/04/2017	12/04/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/04/2017	20/04/2017	20/04/2017	20/04/2017	20/04/2017
Date analysed	-	20/04/2017	20/04/2017	20/04/2017	20/04/2017	20/04/2017
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	99	103	97	99	99

Organochlorine Pesticides in soil						
Our Reference:	UNITS	165477-26	165477-27	165477-28	165477-29	165477-30
Your Reference	---------- -	BH127	BH128	BH129	BH129	BH130
Depth	----------	0.5	1.0	0.5	2.0	0.1
Date Sampled		11/04/2017	12/04/2017	10/04/2017	10/04/2017	10/04/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/04/2017	20/04/2017	20/04/2017	20/04/2017	20/04/2017
Date analysed	-	20/04/2017	20/04/2017	20/04/2017	20/04/2017	20/04/2017
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	100	101	99	100	96

Organophosphorus Pesticides						
Our Reference:	UNITS	165477-1	165477-2	165477-3	165477-4	165477-5
Your Reference	----------	BH101	BH101	BH102	BH102	BH103
	-					
Depth	----------	0.5	4.0	0.5	2.0	0.1
Date Sampled		12/04/2017	12/04/2017	12/04/2017	12/04/2017	11/04/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/04/2017	20/04/2017	20/04/2017	20/04/2017	20/04/2017
Date analysed	-	20/04/2017	20/04/2017	20/04/2017	20/04/2017	20/04/2017
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	99	102	100	99	99

Organophosphorus Pesticides						
Our Reference:	UNITS	165477-6	165477-7	165477-8	165477-9	165477-10
Your Reference	----------	BH103	BH104	BH105	BH111	BH111
	-					
Depth	----------	1.0	1.0	1.0	0.45-0.5	2.9-3.0
Date Sampled		11/04/2017	12/04/2017	10/04/2017	13/04/2017	13/04/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/04/2017	20/04/2017	20/04/2017	20/04/2017	20/04/2017
Date analysed	-	20/04/2017	20/04/2017	20/04/2017	20/04/2017	20/04/2017
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	98	102	96	98	99

Organophosphorus Pesticides						
Our Reference:	UNITS	165477-11	165477-12	165477-13	165477-14	165477-15
Your Reference	---------- -	BH112	BH113	BH114	BH115	BH116
Depth	----------	0.5	1.0-1.05	1.0	0.1	1.0
Date Sampled		11/04/2017	13/04/2017	11/04/2017	11/04/2017	11/04/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/04/2017	20/04/2017	20/04/2017	20/04/2017	20/04/2017
Date analysed	-	20/04/2017	20/04/2017	20/04/2017	20/04/2017	20/04/2017
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	98	97	98	98	97

Organophosphorus Pesticides						
Our Reference:	UNITS	165477-16	165477-17	165477-18	165477-19	165477-20
Your Reference	---------- -	BH117	BH118	BH119	BH120	BH121
Depth	----------	1.95-2.0	0.1-0.15	0.5	0.5	1.0
Date Sampled		13/04/2017	13/04/2017	10/04/2017	11/04/2017	12/04/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/04/2017	20/04/2017	20/04/2017	20/04/2017	20/04/2017
Date analysed	-	20/04/2017	20/04/2017	20/04/2017	20/04/2017	20/04/2017
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	100	94	100	96	95

Organophosphorus Pesticides						
Our Reference:	UNITS	165477-21	165477-22	165477-23	165477-24	165477-25
Your Reference	---------- -	BH122	BH123	BH124	BH125	BH126
Depth	----------	1.0	0.5	0.1	0.5	2.0
Date Sampled		11/04/2017	11/04/2017	10/04/2017	10/04/2017	12/04/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/04/2017	20/04/2017	20/04/2017	20/04/2017	20/04/2017
Date analysed	-	20/04/2017	20/04/2017	20/04/2017	20/04/2017	20/04/2017
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	99	103	97	99	99

Organophosphorus Pesticides						
Our Reference:	UNITS	165477-26	165477-27	165477-28	165477-29	165477-30
Your Reference	---------- -	BH127	BH128	BH129	BH129	BH130
Depth	----------	0.5	1.0	0.5	2.0	0.1
Date Sampled		11/04/2017	12/04/2017	10/04/2017	10/04/2017	10/04/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/04/2017	20/04/2017	20/04/2017	20/04/2017	20/04/2017
Date analysed	-	20/04/2017	20/04/2017	20/04/2017	20/04/2017	20/04/2017
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	100	101	99	100	96

PCBs in Soil						
Our Reference:	UNITS	165477-1	165477-2	165477-3	165477-4	165477-5
Your Reference	----------	BH101	BH101	BH102	BH102	BH103
Depth	- ----------	0.5	4.0	0.5	2.0	0.1
Date Sampled		12/04/2017	12/04/2017	12/04/2017	12/04/2017	11/04/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/04/2017	20/04/2017	20/04/2017	20/04/2017	20/04/2017
Date analysed	-	20/04/2017	20/04/2017	20/04/2017	20/04/2017	20/04/2017
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	99	102	100	99	99

PCBs in Soil						
Our Reference:	UNITS	165477-6	165477-7	165477-8	165477-9	165477-10
Your Reference	----------	BH103	BH104	BH105	BH111	BH111
Depth	- ----------	1.0	1.0	1.0	0.45-0.5	2.9-3.0
Date Sampled		11/04/2017	12/04/2017	10/04/2017	13/04/2017	13/04/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/04/2017	20/04/2017	20/04/2017	20/04/2017	20/04/2017
Date analysed	-	20/04/2017	20/04/2017	20/04/2017	20/04/2017	20/04/2017
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	98	102	96	98	99

PCBs in Soil						
Our Reference:	UNITS	165477-11	165477-12	165477-13	165477-14	165477-15
Your Reference	----------	BH112	BH113	BH114	BH115	BH116
Depth	- ----------	0.5	1.0-1.05	1.0	0.1	1.0
Date Sampled		11/04/2017	13/04/2017	11/04/2017	11/04/2017	11/04/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/04/2017	20/04/2017	20/04/2017	20/04/2017	20/04/2017
Date analysed	-	20/04/2017	20/04/2017	20/04/2017	20/04/2017	20/04/2017
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	98	97	98	98	97

PCBs in Soil						
Our Reference:	UNITS	165477-16	165477-17	165477-18	165477-19	165477-20
Your Reference	----------	BH117	BH118	BH119	BH120	BH121
Depth	- ----------	1.95-2.0	0.1-0.15	0.5	0.5	1.0
Date Sampled		13/04/2017	13/04/2017	10/04/2017	11/04/2017	12/04/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/04/2017	20/04/2017	20/04/2017	20/04/2017	20/04/2017
Date analysed	-	20/04/2017	20/04/2017	20/04/2017	20/04/2017	20/04/2017
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	100	94	100	96	95

PCBs in Soil						
Our Reference:	UNITS	165477-21	165477-22	165477-23	165477-24	165477-25
Your Reference	----------	BH122	BH123	BH124	BH125	BH126
	-					
Depth	----------	1.0	0.5	0.1	0.5	2.0
Date Sampled		11/04/2017	11/04/2017	10/04/2017	10/04/2017	12/04/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/04/2017	20/04/2017	20/04/2017	20/04/2017	20/04/2017
Date analysed	-	20/04/2017	20/04/2017	20/04/2017	20/04/2017	20/04/2017
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	99	103	97	99	99

PCBs in Soil						
Our Reference:	UNITS	165477-26	165477-27	165477-28	165477-29	165477-30
Your Reference	----------	BH127	BH128	BH129	BH129	BH130
	-					
Depth	----------	0.5	1.0	0.5	2.0	0.1
Date Sampled		11/04/2017	12/04/2017	10/04/2017	10/04/2017	10/04/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/04/2017	20/04/2017	20/04/2017	20/04/2017	20/04/2017
Date analysed	-	20/04/2017	20/04/2017	20/04/2017	20/04/2017	20/04/2017
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	100	101	99	100	96

Acid Extractable metals in soil						
Our Reference:	UNITS	165477-1	165477-2	165477-3	165477-4	165477-5
Your Reference	----------	BH101	BH101	BH102	BH102	BH103
	-					
Depth	----------	0.5	4.0	0.5	2.0	0.1
Date Sampled		12/04/2017	12/04/2017	12/04/2017	12/04/2017	11/04/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	20/04/2017	20/04/2017	20/04/2017	20/04/2017	20/04/2017
Date analysed	-	20/04/2017	20/04/2017	20/04/2017	20/04/2017	20/04/2017
Arsenic	mg/kg	6	<4	11	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	2	1	7	1	42
Copper	mg/kg	18	2	18	2	15
Lead	mg/kg	22	<1	28	3	14
Mercury	mg/kg	<0.1	<0.1	0.3	<0.1	<0.1
Nickel	mg/kg	1	<1	3	<1	21
Zinc	mg/kg	12	2	24	3	24

Acid Extractable metals in soil						
Our Reference:	UNITS	165477-6	165477-7	165477-8	165477-9	165477-10
Your Reference	----------	BH103	BH104	BH105	BH111	BH111
	-					
Depth	----------	1.0	1.0	1.0	0.45-0.5	2.9-3.0
Date Sampled		11/04/2017	12/04/2017	10/04/2017	13/04/2017	13/04/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	20/04/2017	20/04/2017	20/04/2017	20/04/2017	20/04/2017
Date analysed	-	20/04/2017	20/04/2017	20/04/2017	20/04/2017	20/04/2017
Arsenic	mg/kg	<4	<4	<4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	<1	1	1	<1	1
Copper	mg/kg	2	<1	3	<1	<1
Lead	mg/kg	<1	2	3	1	3
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	<1	<1	<1	<1	<1
Zinc	mg/kg	3	4	4	1	2

Acid Extractable metals in soil						
Our Reference:	UNITS	165477-11	165477-12	165477-13	165477-14	165477-15
Your Reference	---------- -	BH112	BH113	BH114	BH115	BH116
Depth	----------	0.5	1.0-1.05	1.0	0.1	1.0
Date Sampled		11/04/2017	13/04/2017	11/04/2017	11/04/2017	11/04/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	20/04/2017	20/04/2017	20/04/2017	20/04/2017	20/04/2017
Date analysed	-	20/04/2017	20/04/2017	20/04/2017	20/04/2017	20/04/2017
Arsenic	mg/kg	<4	41	<4	14	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	0.6
Chromium	mg/kg	4	1	2	5	<1
Copper	mg/kg	4	2	1	5	1
Lead	mg/kg	10	2	3	6	7
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	2	<1	<1	3	<1
Zinc	mg/kg	11	4	4	16	3

Acid Extractable metals in soil						
Our Reference:	UNITS	165477-16	165477-17	165477-18	165477-19	165477-20
Your Reference	---------- -	BH117	BH118	BH119	BH120	BH121
Depth	----------	1.95-2.0	0.1-0.15	0.5	0.5	1.0
Date Sampled		13/04/2017	13/04/2017	10/04/2017	11/04/2017	12/04/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	20/04/2017	20/04/2017	20/04/2017	20/04/2017	20/04/2017
Date analysed	-	20/04/2017	20/04/2017	20/04/2017	20/04/2017	20/04/2017
Arsenic	mg/kg	<4	5	<4	9	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	1	4	<1	8	1
Copper	mg/kg	3	5	2	7	2
Lead	mg/kg	7	11	2	16	3
Mercury	mg/kg	<0.1	0.2	<0.1	0.1	<0.1
Nickel	mg/kg	<1	2	<1	3	<1
Zinc	mg/kg	6	9	5	17	7

Acid Extractable metals in soil						
Our Reference:	UNITS	165477-21	165477-22	165477-23	165477-24	165477-25
Your Reference	---------- -	BH122	BH123	BH124	BH125	BH126
Depth	----------	1.0	0.5	0.1	0.5	2.0
Date Sampled		11/04/2017	11/04/2017	10/04/2017	10/04/2017	12/04/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	20/04/2017	20/04/2017	20/04/2017	20/04/2017	20/04/2017
Date analysed	-	20/04/2017	20/04/2017	20/04/2017	20/04/2017	20/04/2017
Arsenic	mg/kg	<4	<4	5	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	8	<1	4	2	<1
Copper	mg/kg	4	1	5	7	1
Lead	mg/kg	6	3	12	4	2
Mercury	mg/kg	<0.1	<0.1	0.2	<0.1	<0.1
Nickel	mg/kg	8	<1	2	2	<1
Zinc	mg/kg	7	2	13	9	3

Acid Extractable metals in soil						
Our Reference:	UNITS	165477-26	165477-27	165477-28	165477-29	165477-30
Your Reference	---------- -	BH127	BH128	BH129	BH129	BH130
Depth	----------	0.5	1.0	0.5	2.0	0.1
Date Sampled		11/04/2017	12/04/2017	10/04/2017	10/04/2017	10/04/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	20/04/2017	20/04/2017	20/04/2017	20/04/2017	20/04/2017
Date analysed	-	20/04/2017	20/04/2017	20/04/2017	20/04/2017	20/04/2017
Arsenic	mg/kg	<4	<4	<4	<4	19
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	0.5
Chromium	mg/kg	1	1	2	2	9
Copper	mg/kg	2	2	2	<1	19
Lead	mg/kg	3	1	2	1	50
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	1	<1	1	<1	4
Zinc	mg/kg	13	5	12	1	42

Acid Extractable metals in soil				
Our Reference:	UNITS	165477-31	165477-32	165477-33
Your Reference	----------	BH101 - [TRIPLICATE]	BH112 - [TRIPLICATE]	BH122 - [TRIPLICATE]
	-			
Depth	----------	0.5	0.5	1.0
Date Sampled		12/04/2017	11/04/2017	11/04/2017
Type of sample		Soil	Soil	Soil
Date prepared	-	20/04/2017	20/04/2017	20/04/2017
Date analysed	-	20/04/2017	20/04/2017	20/04/2017
Arsenic	mg/kg	<4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4
Chromium	mg/kg	2	2	53
Copper	mg/kg	14	1	5
Lead	mg/kg	11	7	6
Mercury	mg/kg	<0.1	<0.1	<0.1
Nickel	mg/kg	1	<1	16
Zinc	mg/kg	7	6	8

Misc Soil - Inorg						
Our Reference:	UNITS	165477-1	165477-2	165477-3	165477-4	165477-5
Your Reference	----------	BH101	BH101	BH102	BH102	BH103
	-					
Depth	----------	0.5	4.0	0.5	2.0	0.1
Date Sampled		12/04/2017	12/04/2017	12/04/2017	12/04/2017	11/04/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	20/04/2017	20/04/2017	20/04/2017	20/04/2017	20/04/2017
Date analysed	-	20/04/2017	20/04/2017	20/04/2017	20/04/2017	20/04/2017
Total Phenolics (as Phenol)	mg/kg	<5	<5	<5	<5	<5

Misc Soil - Inorg						
Our Reference:	UNITS	165477-6	165477-7	165477-8	165477-9	165477-10
Your Reference	----------	BH103	BH104	BH105	BH111	BH111
	-					
Depth	----------	1.0	1.0	1.0	0.45-0.5	2.9-3.0
Date Sampled		11/04/2017	12/04/2017	10/04/2017	13/04/2017	13/04/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	20/04/2017	20/04/2017	20/04/2017	20/04/2017	20/04/2017
Date analysed	-	20/04/2017	20/04/2017	20/04/2017	20/04/2017	20/04/2017
Total Phenolics (as Phenol)	mg/kg	<5	<5	<5	<5	<5

Misc Soil - Inorg						
Our Reference:	UNITS	165477-11	165477-12	165477-13	165477-14	165477-15
Your Reference	----------	BH112	BH113	BH114	BH115	BH116
	-					
Depth	----------	0.5	1.0-1.05	1.0	0.1	1.0
Date Sampled		11/04/2017	13/04/2017	11/04/2017	11/04/2017	11/04/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	20/04/2017	20/04/2017	20/04/2017	20/04/2017	20/04/2017
Date analysed	-	20/04/2017	20/04/2017	20/04/2017	20/04/2017	20/04/2017
Total Phenolics (as Phenol)	mg/kg	<5	<5	<5	<5	<5

Misc Soil - Inorg						
Our Reference:	UNITS	165477-16	165477-17	165477-18	165477-19	165477-20
Your Reference	----------	BH117	BH118	BH119	BH120	BH121
	-					
Depth	----------	1.95-2.0	0.1-0.15	0.5	0.5	1.0
Date Sampled		13/04/2017	13/04/2017	10/04/2017	11/04/2017	12/04/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	20/04/2017	20/04/2017	20/04/2017	20/04/2017	20/04/2017
Date analysed	-	20/04/2017	20/04/2017	20/04/2017	20/04/2017	20/04/2017
Total Phenolics (as Phenol)	mg/kg	<5	<5	<5	<5	<5

Misc Soil - Inorg						
Our Reference:	UNITS	165477-21	165477-22	165477-23	165477-24	165477-25
Your Reference	----------	BH122	BH123	BH124	BH125	BH126
	-					
Depth	----------	1.0	0.5	0.1	0.5	2.0
Date Sampled		11/04/2017	11/04/2017	10/04/2017	10/04/2017	12/04/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	20/04/2017	20/04/2017	20/04/2017	20/04/2017	20/04/2017
Date analysed	-	20/04/2017	20/04/2017	20/04/2017	20/04/2017	20/04/2017
Total Phenolics (as Phenol)	mg/kg	<5	<5	<5	<5	<5

Misc Soil - Inorg						
Our Reference:	UNITS	165477-26	165477-27	165477-28	165477-29	165477-30
Your Reference	----------	BH127	BH128	BH129	BH129	BH130
	-					
Depth	----------	0.5	1.0	0.5	2.0	0.1
Date Sampled		11/04/2017	12/04/2017	10/04/2017	10/04/2017	10/04/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	20/04/2017	20/04/2017	20/04/2017	20/04/2017	20/04/2017
Date analysed	-	20/04/2017	20/04/2017	20/04/2017	20/04/2017	20/04/2017
Total Phenolics (as Phenol)	mg/kg	<5	<5	<5	<5	<5

Moisture						
Our Reference:	UNITS	165477-1	165477-2	165477-3	165477-4	165477-5
Your Reference	----------	BH101	BH101	BH102	BH102	BH103
	-					
Depth	----------	0.5	4.0	0.5	2.0	0.1
Date Sampled		12/04/2017	12/04/2017	12/04/2017	12/04/2017	11/04/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	20/04/2017	20/04/2017	20/04/2017	20/04/2017	20/04/2017
Date analysed	-	21/04/2017	21/04/2017	21/04/2017	21/04/2017	21/04/2017
Moisture	%	9.7	9.7	15	18	20

Moisture						
Our Reference:	UNITS	165477-6	165477-7	165477-8	165477-9	165477-10
Your Reference	----------	BH103	BH104	BH105	BH111	BH111
	-					
Depth	----------	1.0	1.0	1.0	0.45-0.5	2.9-3.0
Date Sampled		11/04/2017	12/04/2017	10/04/2017	13/04/2017	13/04/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	20/04/2017	20/04/2017	20/04/2017	20/04/2017	20/04/2017
Date analysed	-	21/04/2017	21/04/2017	21/04/2017	21/04/2017	21/04/2017
Moisture	%	5.5	9.0	17	5.6	5.5

Moisture						
Our Reference:	UNITS	165477-11	165477-12	165477-13	165477-14	165477-15
Your Reference	----------	BH112	BH113	BH114	BH115	BH116
	-					
Depth	----------	0.5	1.0-1.05	1.0	0.1	1.0
Date Sampled		11/04/2017	13/04/2017	11/04/2017	11/04/2017	11/04/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	20/04/2017	20/04/2017	20/04/2017	20/04/2017	20/04/2017
Date analysed	-	21/04/2017	21/04/2017	21/04/2017	21/04/2017	21/04/2017
Moisture	%	6.7	4.0	5.1	15	10

Moisture						
Our Reference:	UNITS	165477-16	165477-17	165477-18	165477-19	165477-20
Your Reference	----------	BH117	BH118	BH119	BH120	BH121
	-					
Depth	----------	1.95-2.0	0.1-0.15	0.5	0.5	1.0
Date Sampled		13/04/2017	13/04/2017	10/04/2017	11/04/2017	12/04/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	20/04/2017	20/04/2017	20/04/2017	20/04/2017	20/04/2017
Date analysed	-	21/04/2017	21/04/2017	21/04/2017	21/04/2017	21/04/2017
Moisture	%	6.3	15	4.0	9.5	19

Moisture						
Our Reference:	UNITS	165477-21	165477-22	165477-23	165477-24	165477-25
Your Reference	----------	BH122	BH123	BH124	BH125	BH126
	-					
Depth	----------	1.0	0.5	0.1	0.5	2.0
Date Sampled		11/04/2017	11/04/2017	10/04/2017	10/04/2017	12/04/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	20/04/2017	20/04/2017	20/04/2017	20/04/2017	20/04/2017
Date analysed	-	21/04/2017	21/04/2017	21/04/2017	21/04/2017	21/04/2017
Moisture	%	5.0	4.4	9.2	6.3	20

Moisture						
Our Reference:	UNITS	165477-26	165477-27	165477-28	165477-29	165477-30
Your Reference	----------	BH127	BH128	BH129	BH129	BH130
	-					
Depth	----------	0.5	1.0	0.5	2.0	0.1
Date Sampled		11/04/2017	12/04/2017	10/04/2017	10/04/2017	10/04/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	20/04/2017	20/04/2017	20/04/2017	20/04/2017	20/04/2017
Date analysed	-	21/04/2017	21/04/2017	21/04/2017	21/04/2017	21/04/2017
Moisture	%	4.1	20	6.2	7.0	15

Asbestos ID - soils						
Our Reference:	UNITS	165477-1	165477-2	165477-3	165477-4	165477-5
Your Reference	---------- -	BH101	BH101	BH102	BH102	BH103
Depth	----------	0.5	4.0	0.5	2.0	0.1
Date Sampled		12/04/2017	12/04/2017	12/04/2017	12/04/2017	11/04/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	26/04/2017	26/04/2017	26/04/2017	26/04/2017	26/04/2017
Sample mass tested	g	Approx. 40g	Approx. 30g	Approx. 40g	Approx. 35g	Approx. 40g
Sample Description	-	Brown sandy soil	Brown sandy soil	Brown sandy soil	Brown sandy soil	Brown coarse-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

Asbestos ID - soils						
Our Reference:	UNITS	165477-6	165477-7	165477-8	165477-9	165477-10
Your Reference	---------- -	BH103	BH104	BH105	BH111	BH111
Depth	----------	1.0	1.0	1.0	0.45-0.5	2.9-3.0
Date Sampled		11/04/2017	12/04/2017	10/04/2017	13/04/2017	13/04/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	26/04/2017	26/04/2017	26/04/2017	26/04/2017	26/04/2017
Sample mass tested	g	Approx. 35g	Approx. 20g	Approx. 40g	Approx. 30g	Approx. 30g
Sample Description	-	Brown sandy soil	Brown sandy soil	Brown sandy soil	Brown sandy soil	Brown sandy soil
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

Asbestos ID - soils						
Our Reference:	UNITS	165477-11	165477-12	165477-13	165477-14	165477-15
Your Reference	---------- -	BH112	BH113	BH114	BH115	BH116
Depth	----------	0.5	1.0-1.05	1.0	0.1	1.0
Date Sampled		11/04/2017	13/04/2017	11/04/2017	11/04/2017	11/04/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	26/04/2017	26/04/2017	26/04/2017	26/04/2017	26/04/2017
Sample mass tested	g	Approx. 40g	Approx. 30g	Approx. 30g	Approx. 30g	Approx. 30g
Sample Description	-	Brown sandy soil	Brown sandy soil	Brown sandy soil	Brown sandy soil	Brown sandy soil
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

Asbestos ID - soils						
Our Reference:	UNITS	165477-16	165477-17	165477-18	165477-19	165477-20
Your Reference	---------- -	BH117	BH118	BH119	BH120	BH121
Depth	----------	1.95-2.0	0.1-0.15	0.5	0.5	1.0
Date Sampled		13/04/2017	13/04/2017	10/04/2017	11/04/2017	12/04/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	26/04/2017	26/04/2017	26/04/2017	26/04/2017	26/04/2017
Sample mass tested	g	Approx. 30g	Approx. 30g	Approx. 50g	Approx. 50g	Approx. 40g
Sample Description	-	Brown sandy soil	Brown sandy soil	Brown sandy soil	Brown sandy soil	Brown sandy soil
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

Asbestos ID - soils						
Our Reference:	UNITS	165477-21	165477-22	165477-23	165477-24	165477-25
Your Reference	---------- -	BH122	BH123	BH124	BH125	BH126
Depth	----------	1.0	0.5	0.1	0.5	2.0
Date Sampled		11/04/2017	11/04/2017	10/04/2017	10/04/2017	12/04/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	26/04/2017	26/04/2017	26/04/2017	26/04/2017	26/04/2017
Sample mass tested	g	Approx. 30g	Approx. 30g	Approx. 50g	Approx. 40g	Approx. 40g
Sample Description	-	Brown sandy soil	Brown sandy soil	Brown sandy soil	Brown sandy soil	Brown sandy soil
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

Asbestos ID - soils						
Our Reference:	UNITS	165477-26	165477-27	165477-28	165477-29	165477-30
Your Reference	---------- -	BH127	BH128	BH129	BH129	BH130
Depth	----------	0.5	1.0	0.5	2.0	0.1
Date Sampled		11/04/2017	12/04/2017	10/04/2017	10/04/2017	10/04/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	26/04/2017	26/04/2017	26/04/2017	26/04/2017	26/04/2017
Sample mass tested	g	Approx. 30g	Approx. 40g	Approx. 40g	Approx. 35g	Approx. 35g
Sample Description	-	Brown sandy soil	Brown sandy soil	Brown sandy soil	Brown sandy soil	Brown sandy soil
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

Misc Inorg - Soil						
Our Reference:	UNITS	165477-1	165477-2	165477-3	165477-4	165477-5
Your Reference	---------- -	BH101	BH101	BH102	BH102	BH103
Depth	----------	0.5	4.0	0.5	2.0	0.1
Date Sampled		12/04/2017	12/04/2017	12/04/2017	12/04/2017	11/04/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	22/04/2017	22/04/2017	22/04/2017	22/04/2017	22/04/2017
Date analysed	-	22/04/2017	22/04/2017	22/04/2017	22/04/2017	22/04/2017
pH 1:5 soil:water	pH Units	6.4	6.1	6.2	6.0	5.3
Electrical Conductivity 1:5 soil:water	µS/cm	22	8	27	9	200

Misc Inorg - Soil						
Our Reference:	UNITS	165477-6	165477-7	165477-8	165477-9	165477-10
Your Reference	---------- -	BH103	BH104	BH105	BH111	BH111
Depth	----------	1.0	1.0	1.0	0.45-0.5	2.9-3.0
Date Sampled		11/04/2017	12/04/2017	10/04/2017	13/04/2017	13/04/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	22/04/2017	22/04/2017	22/04/2017	22/04/2017	22/04/2017
Date analysed	-	22/04/2017	22/04/2017	22/04/2017	22/04/2017	22/04/2017
pH 1:5 soil:water	pH Units	5.7	5.8	6.5	6.3	6.1
Electrical Conductivity 1:5 soil:water	µS/cm	31	11	18	12	10

Misc Inorg - Soil						
Our Reference:	UNITS	165477-11	165477-12	165477-13	165477-14	165477-15
Your Reference	---------- -	BH112	BH113	BH114	BH115	BH116
Depth	----------	0.5	1.0-1.05	1.0	0.1	1.0
Date Sampled		11/04/2017	13/04/2017	11/04/2017	11/04/2017	11/04/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	22/04/2017	22/04/2017	22/04/2017	22/04/2017	22/04/2017
Date analysed	-	22/04/2017	22/04/2017	22/04/2017	22/04/2017	22/04/2017
pH 1:5 soil:water	pH Units	5.6	6.1	6.0	6.1	6.4
Electrical Conductivity 1:5 soil:water	µS/cm	64	12	13	32	14

Misc Inorg - Soil						
Our Reference:	UNITS	165477-16	165477-17	165477-18	165477-19	165477-20
Your Reference	---------- -	BH117	BH118	BH119	BH120	BH121
Depth	----------	1.95-2.0	0.1-0.15	0.5	0.5	1.0
Date Sampled		13/04/2017	13/04/2017	10/04/2017	11/04/2017	12/04/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	22/04/2017	22/04/2017	22/04/2017	22/04/2017	22/04/2017
Date analysed	-	22/04/2017	22/04/2017	22/04/2017	22/04/2017	22/04/2017
pH 1:5 soil:water	pH Units	6.1	5.8	5.8	8.0	6.6
Electrical Conductivity 1:5 soil:water	µS/cm	14	27	12	130	12

Misc Inorg - Soil						
Our Reference:	UNITS	165477-21	165477-22	165477-23	165477-24	165477-25
Your Reference	---------- -	BH122	BH123	BH124	BH125	BH126
Depth	----------	1.0	0.5	0.1	0.5	2.0
Date Sampled		11/04/2017	11/04/2017	10/04/2017	10/04/2017	12/04/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	22/04/2017	22/04/2017	22/04/2017	22/04/2017	22/04/2017
Date analysed	-	22/04/2017	22/04/2017	22/04/2017	22/04/2017	22/04/2017
pH 1:5 soil:water	pH Units	6.6	6.4	6.2	6.1	6.4
Electrical Conductivity 1:5 soil:water	µS/cm	18	15	28	17	8

Misc Inorg - Soil						
Our Reference:	UNITS	165477-26	165477-27	165477-28	165477-29	165477-30
Your Reference	---------- -	BH127	BH128	BH129	BH129	BH130
Depth	----------	0.5	1.0	0.5	2.0	0.1
Date Sampled		11/04/2017	12/04/2017	10/04/2017	10/04/2017	10/04/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	22/04/2017	22/04/2017	22/04/2017	22/04/2017	22/04/2017
Date analysed	-	22/04/2017	22/04/2017	22/04/2017	22/04/2017	22/04/2017
pH 1:5 soil:water	pH Units	5.9	6.2	6.0	6.1	5.7
Electrical Conductivity 1:5 soil:water	µS/cm	13	11	16	15	25

Method ID	Methodology Summary
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX 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.
Org-014	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-012	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. For soil results:- 1. 'TEQ 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. 'TEQ 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. 'TEQ 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-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Org-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's. 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.
Org-008	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD. 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.

Method ID	Methodology Summary
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Inorg-031	Total Phenolics by segmented flow analyser (in line distillation with colourimetric finish). Solids are extracted in a caustic media prior to analysis.
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
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-001	pH - Measured using pH meter and electrode in accordance with APHA latest edition, 4500-H+. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
Inorg-002	Conductivity and Salinity - measured using a conductivity cell at 25°C in accordance with APHA latest edition 2510 and Rayment & Lyons.

QUALITY CONTROL vTRH(C6-C10)/BTEXN in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base || Duplicate || %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			20/04/2017	165477-1	20/04/2017 || 20/04/2017	LCS-6	20/04/2017
Date analysed	-			21/04/2017	165477-1	20/04/2017 || 20/04/2017	LCS-6	21/04/2017
TRHC$_6$ - C$_9$	mg/kg	25	Org-016	<25	165477-1	<25 || <25	LCS-6	111%
TRHC$_6$ - C$_{10}$	mg/kg	25	Org-016	<25	165477-1	<25 || <25	LCS-6	111%
Benzene	mg/kg	0.2	Org-016	<0.2	165477-1	<0.2 || <0.2	LCS-6	116%
Toluene	mg/kg	0.5	Org-016	<0.5	165477-1	<0.5 || <0.5	LCS-6	103%
Ethylbenzene	mg/kg	1	Org-016	<1	165477-1	<1 || <1	LCS-6	110%
m+p-xylene	mg/kg	2	Org-016	<2	165477-1	<2 || <2	LCS-6	113%
o-Xylene	mg/kg	1	Org-016	<1	165477-1	<1 || <1	LCS-6	110%
naphthalene	mg/kg	1	Org-014	<1	165477-1	<1 || <1	[NR]	[NR]
Surrogate aaa-Trifluorotoluene	%		Org-016	100	165477-1	98 || 97 || RPD: 1	LCS-6	104%

QUALITY CONTROL svTRH (C10-C40) in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base || Duplicate || %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			20/04/2017	165477-1	20/04/2017 || 20/04/2017	LCS-6	20/04/2017
Date analysed	-			21/04/2017	165477-1	20/04/2017 || 20/04/2017	LCS-6	21/04/2017
TRHC$_{10}$ - C$_{14}$	mg/kg	50	Org-003	<50	165477-1	<50 || <50	LCS-6	110%
TRHC$_{15}$ - C$_{28}$	mg/kg	100	Org-003	<100	165477-1	<100 || <100	LCS-6	104%
TRHC$_{29}$ - C$_{36}$	mg/kg	100	Org-003	<100	165477-1	<100 || <100	LCS-6	94%
TRH>C$_{10}$-C$_{16}$	mg/kg	50	Org-003	<50	165477-1	<50 || <50	LCS-6	110%
TRH>C$_{16}$-C$_{34}$	mg/kg	100	Org-003	<100	165477-1	<100 || <100	LCS-6	104%
TRH>C$_{34}$-C$_{40}$	mg/kg	100	Org-003	<100	165477-1	<100 || <100	LCS-6	94%
Surrogate o-Terphenyl	%		Org-003	87	165477-1	84 || 87 || RPD: 4	LCS-6	104%

QUALITY CONTROL PAHs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base || Duplicate || %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			20/04/2017	165477-1	20/04/2017 || 20/04/2017	LCS-6	20/04/2017
Date analysed	-			21/04/2017	165477-1	21/04/2017 || 21/04/2017	LCS-6	21/04/2017
Naphthalene	mg/kg	0.1	Org-012	<0.1	165477-1	<0.1 || <0.1	LCS-6	89%
Acenaphthylene	mg/kg	0.1	Org-012	<0.1	165477-1	<0.1 || <0.1	[NR]	[NR]
Acenaphthene	mg/kg	0.1	Org-012	<0.1	165477-1	<0.1 || <0.1	[NR]	[NR]
Fluorene	mg/kg	0.1	Org-012	<0.1	165477-1	<0.1 || <0.1	LCS-6	84%
Phenanthrene	mg/kg	0.1	Org-012	<0.1	165477-1	0.1 || <0.1	LCS-6	89%
Anthracene	mg/kg	0.1	Org-012	<0.1	165477-1	<0.1 || <0.1	[NR]	[NR]
Fluoranthene	mg/kg	0.1	Org-012	<0.1	165477-1	0.6 || 0.4 || RPD: 40	LCS-6	85%
Pyrene	mg/kg	0.1	Org-012	<0.1	165477-1	0.5 || 0.3 || RPD: 50	LCS-6	82%
Benzo(a)anthracene	mg/kg	0.1	Org-012	<0.1	165477-1	0.2 || 0.1 || RPD: 67	[NR]	[NR]
Chrysene	mg/kg	0.1	Org-012	<0.1	165477-1	0.3 || 0.2 || RPD: 40	LCS-6	79%
Benzo(b,j+k) fluoranthene	mg/kg	0.2	Org-012	<0.2	165477-1	0.5 || 0.3 || RPD: 50	[NR]	[NR]

QUALITY CONTROL PAHs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Benzo(a)pyrene	mg/kg	0.05	Org-012	<0.05	165477-1	0.3 || 0.2 || RPD: 40	LCS-6	83%
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	<0.1	165477-1	0.3 || 0.2 || RPD: 40	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	<0.1	165477-1	<0.1 || <0.1	[NR]	[NR]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	<0.1	165477-1	0.2 || 0.1 || RPD: 67	[NR]	[NR]
Surrogate p-Terphenyl-d14	%		Org-012	96	165477-1	97 || 96 || RPD: 1	LCS-6	122%

QUALITY CONTROL Organochlorine Pesticides in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			20/04/2017	165477-1	20/04/2017 || 20/04/2017	LCS-6	20/04/2017
Date analysed	-			20/04/2017	165477-1	20/04/2017 || 20/04/2017	LCS-6	20/04/2017
HCB	mg/kg	0.1	Org-005	<0.1	165477-1	<0.1 || <0.1	[NR]	[NR]
alpha-BHC	mg/kg	0.1	Org-005	<0.1	165477-1	<0.1 || <0.1	LCS-6	103%
gamma-BHC	mg/kg	0.1	Org-005	<0.1	165477-1	<0.1 || <0.1	[NR]	[NR]
beta-BHC	mg/kg	0.1	Org-005	<0.1	165477-1	<0.1 || <0.1	LCS-6	96%
Heptachlor	mg/kg	0.1	Org-005	<0.1	165477-1	<0.1 || <0.1	LCS-6	100%
delta-BHC	mg/kg	0.1	Org-005	<0.1	165477-1	<0.1 || <0.1	[NR]	[NR]
Aldrin	mg/kg	0.1	Org-005	<0.1	165477-1	<0.1 || <0.1	LCS-6	92%
Heptachlor Epoxide	mg/kg	0.1	Org-005	<0.1	165477-1	<0.1 || <0.1	LCS-6	103%
gamma-Chlordane	mg/kg	0.1	Org-005	<0.1	165477-1	<0.1 || <0.1	[NR]	[NR]
alpha-chlordane	mg/kg	0.1	Org-005	<0.1	165477-1	<0.1 || <0.1	[NR]	[NR]
Endosulfan I	mg/kg	0.1	Org-005	<0.1	165477-1	<0.1 || <0.1	[NR]	[NR]
pp-DDE	mg/kg	0.1	Org-005	<0.1	165477-1	<0.1 || <0.1	LCS-6	114%
Dieldrin	mg/kg	0.1	Org-005	<0.1	165477-1	<0.1 || <0.1	LCS-6	110%
Endrin	mg/kg	0.1	Org-005	<0.1	165477-1	<0.1 || <0.1	LCS-6	104%
pp-DDD	mg/kg	0.1	Org-005	<0.1	165477-1	<0.1 || <0.1	LCS-6	109%
Endosulfan II	mg/kg	0.1	Org-005	<0.1	165477-1	<0.1 || <0.1	[NR]	[NR]
pp-DDT	mg/kg	0.1	Org-005	<0.1	165477-1	<0.1 || <0.1	[NR]	[NR]
Endrin Aldehyde	mg/kg	0.1	Org-005	<0.1	165477-1	<0.1 || <0.1	[NR]	[NR]
Endosulfan Sulphate	mg/kg	0.1	Org-005	<0.1	165477-1	<0.1 || <0.1	LCS-6	81%
Methoxychlor	mg/kg	0.1	Org-005	<0.1	165477-1	<0.1 || <0.1	[NR]	[NR]
Surrogate TCMX	%		Org-005	101	165477-1	99 || 98 || RPD: 1	LCS-6	114%

QUALITY CONTROL Organophosphorus Pesticides	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			20/04/2017	165477-1	20/04/2017 || 20/04/2017	LCS-6	20/04/2017
Date analysed	-			20/04/2017	165477-1	20/04/2017 || 20/04/2017	LCS-6	20/04/2017
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-008	<0.1	165477-1	<0.1 || <0.1	[NR]	[NR]
Bromophos-ethyl	mg/kg	0.1	Org-008	<0.1	165477-1	<0.1 || <0.1	[NR]	[NR]
Chlorpyriphos	mg/kg	0.1	Org-008	<0.1	165477-1	<0.1 || <0.1	LCS-6	92%
Chlorpyriphos-methyl	mg/kg	0.1	Org-008	<0.1	165477-1	<0.1 || <0.1	[NR]	[NR]
Diazinon	mg/kg	0.1	Org-008	<0.1	165477-1	<0.1 || <0.1	[NR]	[NR]
Dichlorvos	mg/kg	0.1	Org-008	<0.1	165477-1	<0.1 || <0.1	LCS-6	84%
Dimethoate	mg/kg	0.1	Org-008	<0.1	165477-1	<0.1 || <0.1	[NR]	[NR]
Ethion	mg/kg	0.1	Org-008	<0.1	165477-1	<0.1 || <0.1	LCS-6	105%
Fenitrothion	mg/kg	0.1	Org-008	<0.1	165477-1	<0.1 || <0.1	LCS-6	111%
Malathion	mg/kg	0.1	Org-008	<0.1	165477-1	<0.1 || <0.1	LCS-6	79%
Parathion	mg/kg	0.1	Org-008	<0.1	165477-1	<0.1 || <0.1	LCS-6	90%
Ronnel	mg/kg	0.1	Org-008	<0.1	165477-1	<0.1 || <0.1	LCS-6	83%
Surrogate TCMX	%		Org-008	101	165477-1	99 || 98 || RPD: 1	LCS-6	98%

QUALITY CONTROL PCBs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			20/04/2017	165477-1	20/04/2017 || 20/04/2017	LCS-6	20/04/2017
Date analysed	-			20/04/2017	165477-1	20/04/2017 || 20/04/2017	LCS-6	20/04/2017
Aroclor 1016	mg/kg	0.1	Org-006	<0.1	165477-1	<0.1 || <0.1	[NR]	[NR]
Aroclor 1221	mg/kg	0.1	Org-006	<0.1	165477-1	<0.1 || <0.1	[NR]	[NR]
Aroclor 1232	mg/kg	0.1	Org-006	<0.1	165477-1	<0.1 || <0.1	[NR]	[NR]
Aroclor 1242	mg/kg	0.1	Org-006	<0.1	165477-1	<0.1 || <0.1	[NR]	[NR]
Aroclor 1248	mg/kg	0.1	Org-006	<0.1	165477-1	<0.1 || <0.1	[NR]	[NR]
Aroclor 1254	mg/kg	0.1	Org-006	<0.1	165477-1	<0.1 || <0.1	LCS-6	109%
Aroclor 1260	mg/kg	0.1	Org-006	<0.1	165477-1	<0.1 || <0.1	[NR]	[NR]
Surrogate TCLMX	%		Org-006	101	165477-1	99 || 98 || RPD: 1	LCS-6	98%

QUALITY CONTROL Acid Extractable metals in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date prepared	-			20/04/2017	165477-1	20/04/2017 || 20/04/2017	LCS-6	20/04/2017
Date analysed	-			20/04/2017	165477-1	20/04/2017 || 20/04/2017	LCS-6	20/04/2017
Arsenic	mg/kg	4	Metals-020	<4	165477-1	6 || 5 || RPD: 18	LCS-6	108%
Cadmium	mg/kg	0.4	Metals-020	<0.4	165477-1	<0.4 || <0.4	LCS-6	96%
Chromium	mg/kg	1	Metals-020	<1	165477-1	2 || 2 || RPD: 0	LCS-6	105%
Copper	mg/kg	1	Metals-020	<1	165477-1	18 || 15 || RPD: 18	LCS-6	104%
Lead	mg/kg	1	Metals-020	<1	165477-1	22 || 11 || RPD: 67	LCS-6	99%
Mercury	mg/kg	0.1	Metals-021	<0.1	165477-1	<0.1 || <0.1	LCS-6	108%
Nickel	mg/kg	1	Metals-020	<1	165477-1	1 || 1 || RPD: 0	LCS-6	96%
Zinc	mg/kg	1	Metals-020	<1	165477-1	12 || 7 || RPD: 53	LCS-6	98%

QUALITY CONTROL Misc Soil - Inorg	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date prepared	-			20/04/2017	165477-1	20/04/2017 || 20/04/2017	LCS-1	20/04/2017
Date analysed	-			20/04/2017	165477-1	20/04/2017 || 20/04/2017	LCS-1	20/04/2017
Total Phenolics (as Phenol)	mg/kg	5	Inorg-031	<5	165477-1	<5 || <5	LCS-1	100%

QUALITY CONTROL Misc Inorg - Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date prepared	-			22/04/2017	165477-1	22/04/2017 || 22/04/2017	LCS-6	22/04/2017
Date analysed	-			22/04/2017	165477-1	22/04/2017 || 22/04/2017	LCS-6	22/04/2017
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	165477-1	6.4 || 6.1 || RPD: 5	LCS-6	102%
Electrical Conductivity 1:5 soil:water	µS/cm	1	Inorg-002	<1	165477-1	22 || 21 || RPD: 5	LCS-6	107%

QUALITY CONTROL vTRH(C6-C10)/BTEXN in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	165477-11	20/04/2017 || 20/04/2017	LCS-5	20/04/2017
Date analysed	-	165477-11	20/04/2017 || 20/04/2017	LCS-5	20/04/2017
TRHC_6 - C_9	mg/kg	165477-11	<25 || <25	LCS-5	102%
TRHC_6 - C_{10}	mg/kg	165477-11	<25 || <25	LCS-5	102%
Benzene	mg/kg	165477-11	<0.2 || <0.2	LCS-5	108%
Toluene	mg/kg	165477-11	<0.5 || <0.5	LCS-5	94%
Ethylbenzene	mg/kg	165477-11	<1 || <1	LCS-5	101%
m+p-xylene	mg/kg	165477-11	<2 || <2	LCS-5	103%
o-Xylene	mg/kg	165477-11	<1 || <1	LCS-5	100%
naphthalene	mg/kg	165477-11	<1 || <1	[NR]	[NR]
Surrogate aaa-Trifluorotoluene	%	165477-11	98 || 97 || RPD: 1	LCS-5	97%

QUALITY CONTROL svTRH (C10-C40) in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	165477-11	20/04/2017 || 20/04/2017	LCS-5	20/04/2017
Date analysed	-	165477-11	20/04/2017 || 20/04/2017	LCS-5	20/04/2017
TRHC$_{10}$ - C$_{14}$	mg/kg	165477-11	<50 || <50	LCS-5	109%
TRHC$_{15}$ - C$_{28}$	mg/kg	165477-11	<100 || <100	LCS-5	104%
TRHC$_{29}$ - C$_{36}$	mg/kg	165477-11	<100 || <100	LCS-5	106%
TRH>C$_{10}$-C$_{16}$	mg/kg	165477-11	<50 || <50	LCS-5	109%
TRH>C$_{16}$-C$_{34}$	mg/kg	165477-11	<100 || <100	LCS-5	104%
TRH>C$_{34}$-C$_{40}$	mg/kg	165477-11	<100 || <100	LCS-5	106%
Surrogate o-Terphenyl	%	165477-11	82 || 83 || RPD: 1	LCS-5	105%
QUALITY CONTROL PAHs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	165477-11	20/04/2017 || 20/04/2017	LCS-5	20/04/2017
Date analysed	-	165477-11	21/04/2017 || 21/04/2017	LCS-5	21/04/2017
Naphthalene	mg/kg	165477-11	<0.1 || <0.1	LCS-5	88%
Acenaphthylene	mg/kg	165477-11	<0.1 || <0.1	[NR]	[NR]
Acenaphthene	mg/kg	165477-11	<0.1 || <0.1	[NR]	[NR]
Fluorene	mg/kg	165477-11	<0.1 || <0.1	LCS-5	83%
Phenanthrene	mg/kg	165477-11	<0.1 || <0.1	LCS-5	89%
Anthracene	mg/kg	165477-11	<0.1 || <0.1	[NR]	[NR]
Fluoranthene	mg/kg	165477-11	<0.1 || <0.1	LCS-5	85%
Pyrene	mg/kg	165477-11	<0.1 || <0.1	LCS-5	81%
Benzo(a)anthracene	mg/kg	165477-11	<0.1 || <0.1	[NR]	[NR]
Chrysene	mg/kg	165477-11	<0.1 || <0.1	LCS-5	79%
Benzo(b,j+k)fluoranthene	mg/kg	165477-11	<0.2 || <0.2	[NR]	[NR]
Benzo(a)pyrene	mg/kg	165477-11	<0.05 || <0.05	LCS-5	80%
Indeno(1,2,3-c,d)pyrene	mg/kg	165477-11	<0.1 || <0.1	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	165477-11	<0.1 || <0.1	[NR]	[NR]
Benzo(g,h,i)perylene	mg/kg	165477-11	<0.1 || <0.1	[NR]	[NR]
Surrogate p-Terphenyl-d14	%	165477-11	98 || 97 || RPD: 1	LCS-5	118%

QUALITY CONTROL Organochlorine Pesticides in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	165477-11	20/04/2017 || 20/04/2017	LCS-5	20/04/2017
Date analysed	-	165477-11	20/04/2017 || 20/04/2017	LCS-5	20/04/2017
HCB	mg/kg	165477-11	<0.1 || <0.1	[NR]	[NR]
alpha-BHC	mg/kg	165477-11	<0.1 || <0.1	LCS-5	103%
gamma-BHC	mg/kg	165477-11	<0.1 || <0.1	[NR]	[NR]
beta-BHC	mg/kg	165477-11	<0.1 || <0.1	LCS-5	95%
Heptachlor	mg/kg	165477-11	<0.1 || <0.1	LCS-5	99%
delta-BHC	mg/kg	165477-11	<0.1 || <0.1	[NR]	[NR]
Aldrin	mg/kg	165477-11	<0.1 || <0.1	LCS-5	90%
Heptachlor Epoxide	mg/kg	165477-11	<0.1 || <0.1	LCS-5	102%
gamma-Chlordane	mg/kg	165477-11	<0.1 || <0.1	[NR]	[NR]
alpha-chlordane	mg/kg	165477-11	<0.1 || <0.1	[NR]	[NR]
Endosulfan I	mg/kg	165477-11	<0.1 || <0.1	[NR]	[NR]
pp-DDE	mg/kg	165477-11	<0.1 || <0.1	LCS-5	111%
Dieldrin	mg/kg	165477-11	<0.1 || <0.1	LCS-5	108%
Endrin	mg/kg	165477-11	<0.1 || <0.1	LCS-5	103%
pp-DDD	mg/kg	165477-11	<0.1 || <0.1	LCS-5	107%
Endosulfan II	mg/kg	165477-11	<0.1 || <0.1	[NR]	[NR]
pp-DDT	mg/kg	165477-11	<0.1 || <0.1	[NR]	[NR]
Endrin Aldehyde	mg/kg	165477-11	<0.1 || <0.1	[NR]	[NR]
Endosulfan Sulphate	mg/kg	165477-11	<0.1 || <0.1	LCS-5	82%
Methoxychlor	mg/kg	165477-11	<0.1 || <0.1	[NR]	[NR]
Surrogate TCMX	%	165477-11	98 || 98 || RPD: 0	LCS-5	112%

QUALITY CONTROL Organophosphorus Pesticides	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	165477-11	20/04/2017 || 20/04/2017	LCS-5	20/04/2017
Date analysed	-	165477-11	20/04/2017 || 20/04/2017	LCS-5	20/04/2017
Azinphos-methyl (Guthion)	mg/kg	165477-11	<0.1 || <0.1	[NR]	[NR]
Bromophos-ethyl	mg/kg	165477-11	<0.1 || <0.1	[NR]	[NR]
Chlorpyriphos	mg/kg	165477-11	<0.1 || <0.1	LCS-5	93%
Chlorpyriphos-methyl	mg/kg	165477-11	<0.1 || <0.1	[NR]	[NR]
Diazinon	mg/kg	165477-11	<0.1 || <0.1	[NR]	[NR]
Dichlorvos	mg/kg	165477-11	<0.1 || <0.1	LCS-5	101%
Dimethoate	mg/kg	165477-11	<0.1 || <0.1	[NR]	[NR]
Ethion	mg/kg	165477-11	<0.1 || <0.1	LCS-5	105%
Fenitrothion	mg/kg	165477-11	<0.1 || <0.1	LCS-5	112%
Malathion	mg/kg	165477-11	<0.1 || <0.1	LCS-5	79%
Parathion	mg/kg	165477-11	<0.1 || <0.1	LCS-5	94%
Ronnel	mg/kg	165477-11	<0.1 || <0.1	LCS-5	85%
Surrogate TCMX	%	165477-11	98 || 98 || RPD: 0	LCS-5	100%

QUALITY CONTROL PCBs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	165477-11	20/04/2017 || 20/04/2017	LCS-5	20/04/2017
Date analysed	-	165477-11	20/04/2017 || 20/04/2017	LCS-5	20/04/2017
Aroclor 1016	mg/kg	165477-11	<0.1 || <0.1	[NR]	[NR]
Aroclor 1221	mg/kg	165477-11	<0.1 || <0.1	[NR]	[NR]
Aroclor 1232	mg/kg	165477-11	<0.1 || <0.1	[NR]	[NR]
Aroclor 1242	mg/kg	165477-11	<0.1 || <0.1	[NR]	[NR]
Aroclor 1248	mg/kg	165477-11	<0.1 || <0.1	[NR]	[NR]
Aroclor 1254	mg/kg	165477-11	<0.1 || <0.1	LCS-5	111%
Aroclor 1260	mg/kg	165477-11	<0.1 || <0.1	[NR]	[NR]
Surrogate TCLMX	%	165477-11	98 || 98 || RPD: 0	LCS-5	100%

QUALITY CONTROL Acid Extractable metals in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date prepared	-	165477-11	20/04/2017 || 20/04/2017	LCS-5	20/04/2017
Date analysed	-	165477-11	20/04/2017 || 20/04/2017	LCS-5	20/04/2017
Arsenic	mg/kg	165477-11	<4 || <4	LCS-5	107%
Cadmium	mg/kg	165477-11	<0.4 || <0.4	LCS-5	99%
Chromium	mg/kg	165477-11	4 || 2 || RPD: 67	LCS-5	104%
Copper	mg/kg	165477-11	4 || 1 || RPD: 120	LCS-5	103%
Lead	mg/kg	165477-11	10 || 4 || RPD: 86	LCS-5	100%
Mercury	mg/kg	165477-11	<0.1 || <0.1	LCS-5	111%
Nickel	mg/kg	165477-11	2 || <1	LCS-5	95%
Zinc	mg/kg	165477-11	11 || 5 || RPD: 75	LCS-5	96%

QUALITY CONTROL Misc Soil - Inorg	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date prepared	-	165477-11	20/04/2017 || 20/04/2017	LCS-2	20/04/2017
Date analysed	-	165477-11	20/04/2017 || 20/04/2017	LCS-2	20/04/2017
Total Phenolics (as Phenol)	mg/kg	165477-11	<5 || <5	LCS-2	101%
QUALITY CONTROL Misc Inorg - Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date prepared	-	165477-11	22/04/2017 || 22/04/2017	LCS-7	22/04/2017
Date analysed	-	165477-11	22/04/2017 || 22/04/2017	LCS-7	22/04/2017
pH 1:5 soil:water	pH Units	165477-11	5.6 || 5.9 || RPD: 5	LCS-7	102%
Electrical Conductivity 1:5 soil:water	µS/cm	165477-11	64 || 68 || RPD: 6	LCS-7	98%
QUALITY CONTROL vTRH(C6-C10)/BTEXN in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	165477-21	20/04/2017 || 20/04/2017	165477-2	20/04/2017
Date analysed	-	165477-21	20/04/2017 || 20/04/2017	165477-2	20/04/2017
$TRHC_6$ - C_9	mg/kg	165477-21	<25 || <25	165477-2	106%
$TRHC_6$ - C_{10}	mg/kg	165477-21	<25 || <25	165477-2	106%
Benzene	mg/kg	165477-21	<0.2 || <0.2	165477-2	110%
Toluene	mg/kg	165477-21	<0.5 || <0.5	165477-2	99%
Ethylbenzene	mg/kg	165477-21	<1 || <1	165477-2	105%
m+p-xylene	mg/kg	165477-21	<2 || <2	165477-2	108%
o-Xylene	mg/kg	165477-21	<1 || <1	165477-2	105%
naphthalene	mg/kg	165477-21	<1 || <1	[NR]	[NR]
Surrogate aaa-Trifluorotoluene	%	165477-21	101 || 97 || RPD: 4	165477-2	100%
QUALITY CONTROL svTRH (C10-C40) in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	165477-21	20/04/2017 || 20/04/2017	165477-2	20/04/2017
Date analysed	-	165477-21	21/04/2017 || 21/04/2017	165477-2	20/04/2017
$TRHC_{10}$ - C_{14}	mg/kg	165477-21	<50 || <50	165477-2	100%
$TRHC_{15}$ - C_{28}	mg/kg	165477-21	<100 || <100	165477-2	92%
$TRHC_{29}$ - C_{36}	mg/kg	165477-21	<100 || <100	165477-2	73%
$TRH>C_{10}$-C_{16}	mg/kg	165477-21	<50 || <50	165477-2	100%
$TRH>C_{16}$-C_{34}	mg/kg	165477-21	<100 || <100	165477-2	92%
$TRH>C_{34}$-C_{40}	mg/kg	165477-21	<100 || <100	165477-2	73%
Surrogate o-Terphenyl	%	165477-21	86 || 82 || RPD: 5	165477-2	84%

QUALITY CONTROL PAHs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	165477-21	20/04/2017 || 20/04/2017	165477-2	20/04/2017
Date analysed	-	165477-21	21/04/2017 || 21/04/2017	165477-2	21/04/2017
Naphthalene	mg/kg	165477-21	<0.1 || <0.1	165477-2	84%
Acenaphthylene	mg/kg	165477-21	<0.1 || <0.1	[NR]	[NR]
Acenaphthene	mg/kg	165477-21	<0.1 || <0.1	[NR]	[NR]
Fluorene	mg/kg	165477-21	<0.1 || <0.1	165477-2	78%
Phenanthrene	mg/kg	165477-21	<0.1 || <0.1	165477-2	76%
Anthracene	mg/kg	165477-21	<0.1 || <0.1	[NR]	[NR]
Fluoranthene	mg/kg	165477-21	<0.1 || <0.1	165477-2	73%
Pyrene	mg/kg	165477-21	<0.1 || <0.1	165477-2	75%
Benzo(a)anthracene	mg/kg	165477-21	<0.1 || <0.1	[NR]	[NR]
Chrysene	mg/kg	165477-21	<0.1 || <0.1	165477-2	70%
Benzo(b,j+k)fluoranthene	mg/kg	165477-21	<0.2 || <0.2	[NR]	[NR]
Benzo(a)pyrene	mg/kg	165477-21	<0.05 || <0.05	165477-2	76%
Indeno(1,2,3-c,d)pyrene	mg/kg	165477-21	<0.1 || <0.1	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	165477-21	<0.1 || <0.1	[NR]	[NR]
Benzo(g,h,i)perylene	mg/kg	165477-21	<0.1 || <0.1	[NR]	[NR]
Surrogate p-Terphenyl-d14	%	165477-21	93 || 97 || RPD: 4	165477-2	115%

QUALITY CONTROL Organochlorine Pesticides in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	165477-21	20/04/2017 || 20/04/2017	165477-2	20/04/2017
Date analysed	-	165477-21	20/04/2017 || 20/04/2017	165477-2	20/04/2017
HCB	mg/kg	165477-21	<0.1 || <0.1	[NR]	[NR]
alpha-BHC	mg/kg	165477-21	<0.1 || <0.1	165477-2	120%
gamma-BHC	mg/kg	165477-21	<0.1 || <0.1	[NR]	[NR]
beta-BHC	mg/kg	165477-21	<0.1 || <0.1	165477-2	96%
Heptachlor	mg/kg	165477-21	<0.1 || <0.1	165477-2	100%
delta-BHC	mg/kg	165477-21	<0.1 || <0.1	[NR]	[NR]
Aldrin	mg/kg	165477-21	<0.1 || <0.1	165477-2	92%
Heptachlor Epoxide	mg/kg	165477-21	<0.1 || <0.1	165477-2	103%
gamma-Chlordane	mg/kg	165477-21	<0.1 || <0.1	[NR]	[NR]
alpha-chlordane	mg/kg	165477-21	<0.1 || <0.1	[NR]	[NR]
Endosulfan I	mg/kg	165477-21	<0.1 || <0.1	[NR]	[NR]
pp-DDE	mg/kg	165477-21	<0.1 || <0.1	165477-2	113%
Dieldrin	mg/kg	165477-21	<0.1 || <0.1	165477-2	109%
Endrin	mg/kg	165477-21	<0.1 || <0.1	165477-2	103%
pp-DDD	mg/kg	165477-21	<0.1 || <0.1	165477-2	108%
Endosulfan II	mg/kg	165477-21	<0.1 || <0.1	[NR]	[NR]
pp-DDT	mg/kg	165477-21	<0.1 || <0.1	[NR]	[NR]
Endrin Aldehyde	mg/kg	165477-21	<0.1 || <0.1	[NR]	[NR]
Endosulfan Sulphate	mg/kg	165477-21	<0.1 || <0.1	165477-2	79%

QUALITY CONTROL Organochlorine Pesticides in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Methoxychlor	mg/kg	165477-21	<0.1 || <0.1	[NR]	[NR]
Surrogate TCMX	%	165477-21	99 || 100 || RPD: 1	165477-2	112%
QUALITY CONTROL Organophosphorus Pesticides	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	165477-21	20/04/2017 || 20/04/2017	165477-2	20/04/2017
Date analysed	-	165477-21	20/04/2017 || 20/04/2017	165477-2	20/04/2017
Azinphos-methyl (Guthion)	mg/kg	165477-21	<0.1 || <0.1	[NR]	[NR]
Bromophos-ethyl	mg/kg	165477-21	<0.1 || <0.1	[NR]	[NR]
Chlorpyriphos	mg/kg	165477-21	<0.1 || <0.1	165477-2	89%
Chlorpyriphos-methyl	mg/kg	165477-21	<0.1 || <0.1	[NR]	[NR]
Diazinon	mg/kg	165477-21	<0.1 || <0.1	[NR]	[NR]
Dichlorvos	mg/kg	165477-21	<0.1 || <0.1	165477-2	86%
Dimethoate	mg/kg	165477-21	<0.1 || <0.1	[NR]	[NR]
Ethion	mg/kg	165477-21	<0.1 || <0.1	165477-2	111%
Fenitrothion	mg/kg	165477-21	<0.1 || <0.1	165477-2	101%
Malathion	mg/kg	165477-21	<0.1 || <0.1	165477-2	75%
Parathion	mg/kg	165477-21	<0.1 || <0.1	165477-2	86%
Ronnel	mg/kg	165477-21	<0.1 || <0.1	165477-2	80%
Surrogate TCMX	%	165477-21	99 || 100 || RPD: 1	165477-2	97%
QUALITY CONTROL PCBs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	165477-21	20/04/2017 || 20/04/2017	165477-2	20/04/2017
Date analysed	-	165477-21	20/04/2017 || 20/04/2017	165477-2	20/04/2017
Aroclor 1016	mg/kg	165477-21	<0.1 || <0.1	[NR]	[NR]
Aroclor 1221	mg/kg	165477-21	<0.1 || <0.1	[NR]	[NR]
Aroclor 1232	mg/kg	165477-21	<0.1 || <0.1	[NR]	[NR]
Aroclor 1242	mg/kg	165477-21	<0.1 || <0.1	[NR]	[NR]
Aroclor 1248	mg/kg	165477-21	<0.1 || <0.1	[NR]	[NR]
Aroclor 1254	mg/kg	165477-21	<0.1 || <0.1	165477-2	107%
Aroclor 1260	mg/kg	165477-21	<0.1 || <0.1	[NR]	[NR]
Surrogate TCLMX	%	165477-21	99 || 100 || RPD: 1	165477-2	97%

QUALITY CONTROL Acid Extractable metals in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date prepared	-	165477-21	20/04/2017 || 20/04/2017	165477-2	20/04/2017
Date analysed	-	165477-21	20/04/2017 || 20/04/2017	165477-2	20/04/2017
Arsenic	mg/kg	165477-21	<4 || <4	165477-2	99%
Cadmium	mg/kg	165477-21	<0.4 || <0.4	165477-2	104%
Chromium	mg/kg	165477-21	8 || 14 || RPD: 55	165477-2	107%
Copper	mg/kg	165477-21	4 || 5 || RPD: 22	165477-2	104%
Lead	mg/kg	165477-21	6 || 5 || RPD: 18	165477-2	101%
Mercury	mg/kg	165477-21	<0.1 || <0.1	165477-2	108%
Nickel	mg/kg	165477-21	8 || 12 || RPD: 40	165477-2	103%
Zinc	mg/kg	165477-21	7 || 10 || RPD: 35	165477-2	102%

QUALITY CONTROL Misc Soil - Inorg	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date prepared	-	165477-21	20/04/2017 || 20/04/2017	165477-2	20/04/2017
Date analysed	-	165477-21	20/04/2017 || 20/04/2017	165477-2	20/04/2017
Total Phenolics (as Phenol)	mg/kg	165477-21	<5 || <5	165477-2	93%

QUALITY CONTROL Misc Inorg - Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD
Date prepared	-	165477-21	22/04/2017 || 22/04/2017
Date analysed	-	165477-21	22/04/2017 || 22/04/2017
pH 1:5 soil:water	pH Units	165477-21	6.6 || 6.6 || RPD: 0
Electrical Conductivity 1:5 soil:water	µS/cm	165477-21	18 || 18 || RPD: 0

QUALITY CONTROL vTRH(C6-C10)/BTEXN in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	[NT]	[NT]	165477-22	20/04/2017
Date analysed	-	[NT]	[NT]	165477-22	20/04/2017
TRH C_6 - C_9	mg/kg	[NT]	[NT]	165477-22	101%
TRH C_6 - C_{10}	mg/kg	[NT]	[NT]	165477-22	101%
Benzene	mg/kg	[NT]	[NT]	165477-22	106%
Toluene	mg/kg	[NT]	[NT]	165477-22	92%
Ethylbenzene	mg/kg	[NT]	[NT]	165477-22	100%
m+p-xylene	mg/kg	[NT]	[NT]	165477-22	103%
o-Xylene	mg/kg	[NT]	[NT]	165477-22	100%
naphthalene	mg/kg	[NT]	[NT]	[NR]	[NR]
Surrogate aaa-Trifluorotoluene	%	[NT]	[NT]	165477-22	96%

QUALITY CONTROL svTRH (C10-C40) in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	[NT]	[NT]	165477-22	20/04/2017
Date analysed	-	[NT]	[NT]	165477-22	21/04/2017
TRHC$_{10}$ - C$_{14}$	mg/kg	[NT]	[NT]	165477-22	105%
TRHC$_{15}$ - C$_{28}$	mg/kg	[NT]	[NT]	165477-22	98%
TRHC$_{29}$ - C$_{36}$	mg/kg	[NT]	[NT]	165477-22	103%
TRH>C$_{10}$-C$_{16}$	mg/kg	[NT]	[NT]	165477-22	105%
TRH>C$_{16}$-C$_{34}$	mg/kg	[NT]	[NT]	165477-22	98%
TRH>C$_{34}$-C$_{40}$	mg/kg	[NT]	[NT]	165477-22	103%
Surrogate o-Terphenyl	%	[NT]	[NT]	165477-22	93%
QUALITY CONTROL PAHs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	[NT]	[NT]	165477-22	20/04/2017
Date analysed	-	[NT]	[NT]	165477-22	21/04/2017
Naphthalene	mg/kg	[NT]	[NT]	165477-22	84%
Acenaphthylene	mg/kg	[NT]	[NT]	[NR]	[NR]
Acenaphthene	mg/kg	[NT]	[NT]	[NR]	[NR]
Fluorene	mg/kg	[NT]	[NT]	165477-22	78%
Phenanthrene	mg/kg	[NT]	[NT]	165477-22	77%
Anthracene	mg/kg	[NT]	[NT]	[NR]	[NR]
Fluoranthene	mg/kg	[NT]	[NT]	165477-22	73%
Pyrene	mg/kg	[NT]	[NT]	165477-22	74%
Benzo(a)anthracene	mg/kg	[NT]	[NT]	[NR]	[NR]
Chrysene	mg/kg	[NT]	[NT]	165477-22	67%
Benzo(b,j+k)fluoranthene	mg/kg	[NT]	[NT]	[NR]	[NR]
Benzo(a)pyrene	mg/kg	[NT]	[NT]	165477-22	77%
Indeno(1,2,3-c,d)pyrene	mg/kg	[NT]	[NT]	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	[NT]	[NT]	[NR]	[NR]
Benzo(g,h,i)perylene	mg/kg	[NT]	[NT]	[NR]	[NR]
Surrogate p-Terphenyl-d14	%	[NT]	[NT]	165477-22	117%

QUALITY CONTROL Organochlorine Pesticides in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	[NT]	[NT]	165477-22	20/04/2017
Date analysed	-	[NT]	[NT]	165477-22	20/04/2017
HCB	mg/kg	[NT]	[NT]	[NR]	[NR]
alpha-BHC	mg/kg	[NT]	[NT]	165477-22	109%
gamma-BHC	mg/kg	[NT]	[NT]	[NR]	[NR]
beta-BHC	mg/kg	[NT]	[NT]	165477-22	98%
Heptachlor	mg/kg	[NT]	[NT]	165477-22	101%
delta-BHC	mg/kg	[NT]	[NT]	[NR]	[NR]
Aldrin	mg/kg	[NT]	[NT]	165477-22	94%
Heptachlor Epoxide	mg/kg	[NT]	[NT]	165477-22	106%
gamma-Chlordane	mg/kg	[NT]	[NT]	[NR]	[NR]
alpha-chlordane	mg/kg	[NT]	[NT]	[NR]	[NR]
Endosulfan I	mg/kg	[NT]	[NT]	[NR]	[NR]
pp-DDE	mg/kg	[NT]	[NT]	165477-22	116%
Dieldrin	mg/kg	[NT]	[NT]	165477-22	113%
Endrin	mg/kg	[NT]	[NT]	165477-22	104%
pp-DDD	mg/kg	[NT]	[NT]	165477-22	110%
Endosulfan II	mg/kg	[NT]	[NT]	[NR]	[NR]
pp-DDT	mg/kg	[NT]	[NT]	[NR]	[NR]
Endrin Aldehyde	mg/kg	[NT]	[NT]	[NR]	[NR]
Endosulfan Sulphate	mg/kg	[NT]	[NT]	165477-22	78%
Methoxychlor	mg/kg	[NT]	[NT]	[NR]	[NR]
Surrogate TCMX	%	[NT]	[NT]	165477-22	116%

QUALITY CONTROL Organophosphorus Pesticides	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	[NT]	[NT]	165477-22	20/04/2017
Date analysed	-	[NT]	[NT]	165477-22	20/04/2017
Azinphos-methyl (Guthion)	mg/kg	[NT]	[NT]	[NR]	[NR]
Bromophos-ethyl	mg/kg	[NT]	[NT]	[NR]	[NR]
Chlorpyriphos	mg/kg	[NT]	[NT]	165477-22	93%
Chlorpyriphos-methyl	mg/kg	[NT]	[NT]	[NR]	[NR]
Diazinon	mg/kg	[NT]	[NT]	[NR]	[NR]
Dichlorvos	mg/kg	[NT]	[NT]	165477-22	84%
Dimethoate	mg/kg	[NT]	[NT]	[NR]	[NR]
Ethion	mg/kg	[NT]	[NT]	165477-22	113%
Fenitrothion	mg/kg	[NT]	[NT]	165477-22	75%
Malathion	mg/kg	[NT]	[NT]	165477-22	77%
Parathion	mg/kg	[NT]	[NT]	165477-22	86%
Ronnel	mg/kg	[NT]	[NT]	165477-22	83%
Surrogate TCMX	%	[NT]	[NT]	165477-22	98%
QUALITY CONTROL PCBs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	[NT]	[NT]	165477-22	20/04/2017
Date analysed	-	[NT]	[NT]	165477-22	20/04/2017
Aroclor 1016	mg/kg	[NT]	[NT]	[NR]	[NR]
Aroclor 1221	mg/kg	[NT]	[NT]	[NR]	[NR]
Aroclor 1232	mg/kg	[NT]	[NT]	[NR]	[NR]
Aroclor 1242	mg/kg	[NT]	[NT]	[NR]	[NR]
Aroclor 1248	mg/kg	[NT]	[NT]	[NR]	[NR]
Aroclor 1254	mg/kg	[NT]	[NT]	165477-22	110%
Aroclor 1260	mg/kg	[NT]	[NT]	[NR]	[NR]
Surrogate TCLMX	%	[NT]	[NT]	165477-22	98%
QUALITY CONTROL Acid Extractable metals in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date prepared	-	[NT]	[NT]	165477-22	20/04/2017
Date analysed	-	[NT]	[NT]	165477-22	20/04/2017
Arsenic	mg/kg	[NT]	[NT]	165477-22	97%
Cadmium	mg/kg	[NT]	[NT]	165477-22	100%
Chromium	mg/kg	[NT]	[NT]	165477-22	100%
Copper	mg/kg	[NT]	[NT]	165477-22	104%
Lead	mg/kg	[NT]	[NT]	165477-22	100%
Mercury	mg/kg	[NT]	[NT]	165477-22	116%
Nickel	mg/kg	[NT]	[NT]	165477-22	98%
Zinc	mg/kg	[NT]	[NT]	165477-22	101%

QUALITY CONTROL Misc Soil - Inorg	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date prepared	-	[NT]	[NT]	165477-22	20/04/2017
Date analysed	-	[NT]	[NT]	165477-22	20/04/2017
Total Phenolics (as Phenol)	mg/kg	[NT]	[NT]	165477-22	96%

Report Comments:

Acid Extractable Metals in Soil: The laboratory RPD acceptance criteria has been exceeded for 165477-1 for Pb and Zn. Therefore a triplicate result has been issued as laboratory sample number 165477-31.

Acid Extractable Metals in Soil: The laboratory RPD acceptance criteria has been exceeded for 165477-11 for Pb and Zn. Therefore a triplicate result has been issued as laboratory sample number 165477-32.

Acid Extractable Metals in Soil: The laboratory RPD acceptance criteria has been exceeded for 165477-21 for Cr. Therefore a triplicate result has been issued as laboratory sample number 165477-33.

Asbestos: A portion of the supplied sample was sub-sampled for asbestos analysis according to Envirolab procedures. We cannot guarantee that this sub-sample is indicative of the entire sample. Envirolab recommends supplying 40-50g of sample in its own container.
Note: Samples 165477-11, 19, 23, 24 were sub-sampled from jars and Samples 165477-1 to 10, 12 to 18, 20 to 22, 25 to 30 were sub-sampled from bags provided by the client.

Asbestos ID was analysed by Approved Identifier: Lucy Zhu
Asbestos ID was authorised by Approved Signatory: Paul Ching

INS: Insufficient sample for this test
NR: Test not required
<: Less than
PQL: Practical Quantitation Limit
RPD: Relative Percent Difference
>: Greater than
NT: Not tested
NA: Test not required
LCS: Laboratory Control Sample

Quality Control Definitions

Blank: This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.

Duplicate: This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.

Matrix Spike : A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

LCS (Laboratory Control Sample) : This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

Surrogate Spike: Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in 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: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

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

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

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

Measurement Uncertainty estimates are available for most tests upon request.

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SAMPLE RECEIPT ADVICE

Client Details	
Client	Douglas Partners Pty Ltd
Attention	Peter Oitmaa

Sample Login Details	
Your Reference	84944.01, Bellevue Hill
Envirolab Reference	**165477**
Date Sample Received	19/04/2017
Date Instructions Received	19/04/2017
Date Results Expected to be Reported	**27/04/2017**

Sample Condition	
Samples received in appropriate condition for analysis	YES
No. of Samples Provided	30 soils
Turnaround Time Requested	Standard
Temperature on receipt (°C)	16.0
Cooling Method	Ice
Sampling Date Provided	YES

Comments
Samples will be held for 1 month for water samples and 2 months for soil samples from date of receipt of samples

Please direct any queries to:

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

Sample and Testing Details on following page

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
enquiries@envirolabservices.com.au
www.envirolabservices.com.au

Sample Id	*vTRH(C6-C10)/BTEXN in Soil*	*svTRH (C10-C40) in Soil*	*PAHs in Soil*	*Organochlorine Pesticides in soil*	*Organophosphorus Pesticides*	*PCBs in Soil*	*Acid Extractable metals in soil*	*Total Phenolics (as Phenol)*	*Asbestos ID - soils*	*Electrical Conductivity 1:5 soil:water*	*pH 1:5 soil:water*
BH101-0.5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH101-4.0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH102-0.5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH102-2.0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH103-0.1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH103-1.0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH104-1.0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH105-1.0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH111-0.45-0.5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH111-2.9-3.0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH112-0.5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH113-1.0-1.05	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH114-1.0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH115-0.1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH116-1.0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH117-1.95-2.0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH118-0.1-0.15	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH119-0.5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH120-0.5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH121-1.0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH122-1.0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH123-0.5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH124-0.1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH125-0.5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH126-2.0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH127-0.5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH128-1.0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH129-0.5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH129-2.0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH130-0.1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Douglas Partners
Geotechnics · Environment · Groundwater

CHAIN OF CUSTODY

Project Name: Bellevue Hill
Project No: 84944.01 Sampler:R Wong
Project Mgr: Peter Oitmaa Mob. Phone: 0412 574 518
Email: Peter.Oitmaa@DouglasPartners.com.au
Date Required: Standard t/a Lab Quote No.

To: Envirolab Services
12 Ashley Street, Chatswood NSW 2068
Attn: Tania Notaras
Phone: 02 9910 6200 Fax: 02 9910 6201
Email: tnotaras@envirolabservices.com.au

Sample ID	Sample Depth (m)	Lab ID	Sampling Date	Sample Type S - soil W – water	Container type	Analytes										Notes
						Combo 8a	pH, EC									
BH101	0.5	1	12/4	S	Jar/bag	x	x									
BH101	4.0	2	12/4	S	Jar/bag	x	x									
BH102	0.5	3	12/4	S	Jar/bag	x	x									
BH102	2.0	4	12/4	S	Jar/bag	x	x									
BH103	0.1	5	11/4	S	Jar/bag	x	x									
BH103	1.0	6	11/4	S	Jar/bag	x	x									
BH104	1.0	7	12/4	S	Jar/bag	x	x									
BH105	1.0	8	10/4	S	Jar/bag	x	x									
BH111	0.45-0.5	9	13/4	S	Jar/bag	x	x									
BH111	2.9-3.0	10	13/4	S	Jar/bag	x	x									
BH112	0.5	11	11/4	S	Jar/bag	x	x									
BH113	1.0-1.05	12	13/4	S	Jar/bag	x	x									

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

Job No: 165477.
Date Received: 19/4
Time Received: 15:00
Received by: AZ.
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

Lab Report No.
Send Results to: Peter.Oitmaa@DouglasPartners.com.au Address: 96 Hermitage Road, West Ryde 2114 Phone: (02) 9809 0666 Fax: (02) 9809 4095

Relinquished by:	Signed:	Date & Time:	Received By:	Date & Time:
Relinquished by:	Signed:	Date & Time:	Received By: AZ.	Date & Time: 19/4

Douglas Partners
Geotechnics · Environment · Groundwater

CHAIN OF CUSTODY

Project Name: Bellevue Hill
Project No: 84944.01 Sampler: R Wong
Project Mgr: Peter Oitmaa Mob. Phone: 0412 574 518
Email: Peter.Oitmaa@DouglasPartners.com.au
Date Required: Standard t/a Lab Quote No.

To: Envirolab Services
12 Ashley Street, Chatswood NSW 2068
Attn: Tania Notaras
Phone: 02 9910 6200 Fax: 02 9910 6201
Email: tnotaras@envirolabservices.com.au

Sample ID	Sample Depth (m)	Lab ID	Sampling Date	Sample Type S - soil W – water	Container type	Analytes										Notes
	165477					Combo 8a	pH, EC									
BH114	1.0	13	11/4	S	Jar/bag	x	x									
BH115	0.1	14	11/4	S	Jar/bag	x	x									
BH116	1.0	15	11/4	S	Jar/bag	x	x									
BH117	1.95-2.0	16	13/4	S	Jar/bag	x	x									
BH118	0.1-0.15	17	13/4	S	Jar/bag	x	x									
BH119	0.5	18	10/4	S	Jar/bag	x	x									
BH120	0.5	19	11/4	S	Jar/bag	x	x									
BH121	1.0	20	12/4	S	Jar/bag	x	x									
BH122	1.0	21	11/4	S	Jar/bag	x	x									
BH123	0.5	22	11/4	S	Jar/bag	x	x									
BH124	0.1	23	10/4	S	Jar/bag	x	x									
BH125	0.5	24	10/4	S	Jar/bag	x	x									

Lab Report No.
Send Results to: Peter.Oitmaa@DouglasPartners.com.au Address: 96 Hermitage Road, West Ryde 2114 Phone: (02) 9809 0666 Fax: (02) 9809 4095

Relinquished by:	Signed:	Date & Time:	Received By: ELS	Date & Time: 19/4 1500
Relinquished by:	Signed:	Date & Time:	Received By:	Date & Time:

Douglas Partners
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CHAIN OF CUSTODY

Project Name: Bellevue Hill
Project No: 84944.01 Sampler:R Wong
Project Mgr: Peter Oitmaa Mob. Phone: 0412 574 518
Email: Peter.Oitmaa@DouglasPartners.com.au
Date Required: Standard t/a Lab Quote No.

To: Envirolab Services
12 Ashley Street, Chatswood NSW 2068
Attn: Tania Notaras
Phone: 02 9910 6200 Fax: 02 9910 6201
Email: tnotaras@envirolabservices.com.au

Sample ID	Sample Depth (m)	Lab ID	Sampling Date	Sample Type S - soil W – water	Container type	Analytes: Combo 8a	Analytes: pH, EC	Analytes	Analytes	Analytes	Analytes	Analytes	Analytes	Analytes	Analytes	Notes
165477.																
BH126	2.0	25	12/4	S	Jar/bag	x	x									
BH127	0.5	26	11/4	S	Jar/bag	x	x									
BH128	1.0	27	12/4	S	Jar/bag	x	x									
BH129	0.5	28	10/4	S	Jar/bag	x	x									
BH129	2.0	29	10/4	S	Jar/bag	x	x									
BH130	0.1	30	10/4	S	Jar/bag	x	x									

Lab Report No.
Phone: (02) 9809 0666
Send Results to: Peter.Oitmaa@DouglasPartners.com.au Address: 96 Hermitage Road, West Ryde 2114 Fax: (02) 9809 4095

Relinquished by:	Signed:	Date & Time:	Received By:	Date & Time:
			EZS	19/4 1500
Relinquished by:	Signed:	Date & Time:	Received By:	Date & Time:

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
enquiries@envirolabservices.com.au
www.envirolabservices.com.au

CERTIFICATE OF ANALYSIS 130980

Client:
Douglas Partners Pty Ltd
96 Hermitage Rd
West Ryde
NSW 2114

Attention: Peter Oitmaa

Sample log in details:

Your Reference:	**84944.00, Bellevue Hill**
No. of samples:	10 Soils
Date samples received / completed instructions received	10/07/2015 / 10/07/2015

Analysis Details:
Please refer to the following pages for results, methodology summary and quality control data.
Samples were analysed as received from the client. Results relate specifically to the samples as received.
Results are reported on a dry weight basis for solids and on an as received basis for other matrices.
Please refer to the last page of this report for any comments relating to the results.

Report Details:

Date results requested by: / Issue Date:	17/07/15 / 17/07/15
Date of Preliminary Report:	Not Issued

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Accredited for compliance with ISO/IEC 17025. **Tests not covered by NATA are denoted with *.**

Results Approved By:

Jacinta Hurst
Laboratory Manager

NATA
ACCREDITED FOR TECHNICAL COMPETENCE

vTRH(C6-C10)/BTEXN in Soil						
Our Reference:	UNITS	130980-1	130980-2	130980-3	130980-4	130980-5
Your Reference	----------	BH2	BH2	BH2	BH2	BH4
Depth	----------	1.0	2.0	3.0	4.0	1.0
Date Sampled		7/07/2015	7/07/2015	7/07/2015	7/07/2015	3/07/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	13/07/2015	13/07/2015	13/07/2015	13/07/2015	13/07/2015
Date analysed	-	14/07/2015	14/07/2015	14/07/2015	14/07/2015	14/07/2015
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	110	111	112	111	117

vTRH(C6-C10)/BTEXN in Soil						
Our Reference:	UNITS	130980-6	130980-7	130980-8	130980-9	130980-10
Your Reference	----------	BH4	BH4	BH4	BH10	BH10
Depth	----------	2.0	3.0	4.0	1.0	2.0
Date Sampled		3/07/2015	3/07/2015	3/07/2015	6/07/2015	6/07/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	13/07/2015	13/07/2015	13/07/2015	13/07/2015	13/07/2015
Date analysed	-	14/07/2015	14/07/2015	14/07/2015	14/07/2015	14/07/2015
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	110	121	106	117	120

svTRH (C10-C40) in Soil						
Our Reference:	UNITS	130980-1	130980-2	130980-3	130980-4	130980-5
Your Reference	----------	BH2	BH2	BH2	BH2	BH4
Depth	----------	1.0	2.0	3.0	4.0	1.0
Date Sampled		7/07/2015	7/07/2015	7/07/2015	7/07/2015	3/07/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	13/07/2015	13/07/2015	13/07/2015	13/07/2015	14/07/2015
Date analysed	-	14/07/2015	14/07/2015	14/07/2015	14/07/2015	14/07/2015
TRHC$_{10}$ - C$_{14}$	mg/kg	<50	<50	<50	<50	<50
TRHC$_{15}$ - C$_{28}$	mg/kg	<100	<100	<100	<100	<100
TRHC$_{29}$ - C$_{36}$	mg/kg	<100	<100	<100	<100	<100
TRH>C$_{10}$-C$_{16}$	mg/kg	<50	<50	<50	<50	<50
TRH>C$_{10}$ - C$_{16}$ less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH>C$_{16}$-C$_{34}$	mg/kg	<100	<100	<100	<100	<100
TRH>C$_{34}$-C$_{40}$	mg/kg	<100	<100	<100	<100	<100
Surrogate o-Terphenyl	%	81	72	79	76	117

svTRH (C10-C40) in Soil						
Our Reference:	UNITS	130980-6	130980-7	130980-8	130980-9	130980-10
Your Reference	----------	BH4	BH4	BH4	BH10	BH10
Depth	----------	2.0	3.0	4.0	1.0	2.0
Date Sampled		3/07/2015	3/07/2015	3/07/2015	6/07/2015	6/07/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	13/07/2015	13/07/2015	13/07/2015	13/07/2015	13/07/2015
Date analysed	-	14/07/2015	14/07/2015	14/07/2015	14/07/2015	14/07/2015
TRHC$_{10}$ - C$_{14}$	mg/kg	<50	<50	<50	<50	<50
TRHC$_{15}$ - C$_{28}$	mg/kg	<100	<100	<100	<100	<100
TRHC$_{29}$ - C$_{36}$	mg/kg	<100	<100	<100	<100	<100
TRH>C$_{10}$-C$_{16}$	mg/kg	<50	<50	<50	<50	<50
TRH>C$_{10}$ - C$_{16}$ less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH>C$_{16}$-C$_{34}$	mg/kg	<100	<100	<100	<100	<100
TRH>C$_{34}$-C$_{40}$	mg/kg	<100	<100	<100	<100	<100
Surrogate o-Terphenyl	%	80	76	78	82	78

PAHs in Soil						
Our Reference:	UNITS	130980-1	130980-2	130980-3	130980-4	130980-5
Your Reference	----------	BH2	BH2	BH2	BH2	BH4
Depth	----------	1.0	2.0	3.0	4.0	1.0
Date Sampled		7/07/2015	7/07/2015	7/07/2015	7/07/2015	3/07/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	13/07/2015	13/07/2015	13/07/2015	13/07/2015	14/07/2015
Date analysed	-	13/07/2015	13/07/2015	13/07/2015	13/07/2015	14/07/2015
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.2
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	1.4
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.3
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.9
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.9
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.4
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.4
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	0.5
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	0.3
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.2
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.2
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	0.5
Total Positive PAHs	mg/kg	NIL (+)VE	NIL (+)VE	NIL (+)VE	NIL (+)VE	5.8
Surrogate p-Terphenyl-d14	%	95	84	101	96	95

PAHs in Soil						
Our Reference:	UNITS	130980-6	130980-7	130980-8	130980-9	130980-10
Your Reference	----------	BH4	BH4	BH4	BH10	BH10
Depth	----------	2.0	3.0	4.0	1.0	2.0
Date Sampled		3/07/2015	3/07/2015	3/07/2015	6/07/2015	6/07/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	13/07/2015	13/07/2015	13/07/2015	13/07/2015	13/07/2015
Date analysed	-	13/07/2015	13/07/2015	13/07/2015	13/07/2015	13/07/2015
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	0.7	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	0.5	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	6.5	0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	1.8	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	5.0	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	4.7	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	2.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	1.8	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	2.4	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	1.6	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	0.9	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	0.7	<0.1
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	2.3	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	2.3	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	2.3	<0.5
Total Positive PAHs	mg/kg	NIL (+)VE	NIL (+)VE	NIL (+)VE	29	0.10
Surrogate p-Terphenyl-d14	%	95	95	104	105	96

Organochlorine Pesticides in soil						
Our Reference:	UNITS	130980-1	130980-2	130980-3	130980-4	130980-5
Your Reference	----------	BH2	BH2	BH2	BH2	BH4
Depth	----------	1.0	2.0	3.0	4.0	1.0
Date Sampled		7/07/2015	7/07/2015	7/07/2015	7/07/2015	3/07/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	13/07/2015	13/07/2015	13/07/2015	13/07/2015	13/07/2015
Date analysed	-	14/07/2015	14/07/2015	14/07/2015	14/07/2015	14/07/2015
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	89	79	88	83	87

Organochlorine Pesticides in soil						
Our Reference:	UNITS	130980-6	130980-7	130980-8	130980-9	130980-10
Your Reference	----------	BH4	BH4	BH4	BH10	BH10
Depth	----------	2.0	3.0	4.0	1.0	2.0
Date Sampled		3/07/2015	3/07/2015	3/07/2015	6/07/2015	6/07/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	13/07/2015	13/07/2015	13/07/2015	13/07/2015	13/07/2015
Date analysed	-	14/07/2015	14/07/2015	14/07/2015	14/07/2015	14/07/2015
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	79	86	85	83	84

Organophosphorus Pesticides						
Our Reference:	UNITS	130980-1	130980-2	130980-3	130980-4	130980-5
Your Reference	----------	BH2	BH2	BH2	BH2	BH4
Depth	----------	1.0	2.0	3.0	4.0	1.0
Date Sampled		7/07/2015	7/07/2015	7/07/2015	7/07/2015	3/07/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	13/07/2015	13/07/2015	13/07/2015	13/07/2015	13/07/2015
Date analysed	-	14/07/2015	14/07/2015	14/07/2015	14/07/2015	14/07/2015
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	89	79	88	83	87

Organophosphorus Pesticides						
Our Reference:	UNITS	130980-6	130980-7	130980-8	130980-9	130980-10
Your Reference	----------	BH4	BH4	BH4	BH10	BH10
Depth	----------	2.0	3.0	4.0	1.0	2.0
Date Sampled		3/07/2015	3/07/2015	3/07/2015	6/07/2015	6/07/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	13/07/2015	13/07/2015	13/07/2015	13/07/2015	13/07/2015
Date analysed	-	14/07/2015	14/07/2015	14/07/2015	14/07/2015	14/07/2015
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	79	86	85	83	84

PCBs in Soil						
Our Reference:	UNITS	130980-1	130980-2	130980-3	130980-4	130980-5
Your Reference	----------	BH2	BH2	BH2	BH2	BH4
Depth	----------	1.0	2.0	3.0	4.0	1.0
Date Sampled		7/07/2015	7/07/2015	7/07/2015	7/07/2015	3/07/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	13/07/2015	13/07/2015	13/07/2015	13/07/2015	13/07/2015
Date analysed	-	14/07/2015	14/07/2015	14/07/2015	14/07/2015	14/07/2015
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	89	79	88	83	87

PCBs in Soil						
Our Reference:	UNITS	130980-6	130980-7	130980-8	130980-9	130980-10
Your Reference	----------	BH4	BH4	BH4	BH10	BH10
Depth	----------	2.0	3.0	4.0	1.0	2.0
Date Sampled		3/07/2015	3/07/2015	3/07/2015	6/07/2015	6/07/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	13/07/2015	13/07/2015	13/07/2015	13/07/2015	13/07/2015
Date analysed	-	14/07/2015	14/07/2015	14/07/2015	14/07/2015	14/07/2015
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	79	86	85	83	84

Acid Extractable metals in soil						
Our Reference:	UNITS	130980-1	130980-2	130980-3	130980-4	130980-5
Your Reference	----------	BH2	BH2	BH2	BH2	BH4
Depth	----------	1.0	2.0	3.0	4.0	1.0
Date Sampled		7/07/2015	7/07/2015	7/07/2015	7/07/2015	3/07/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	13/07/2015	13/07/2015	13/07/2015	13/07/2015	13/07/2015
Date analysed	-	13/07/2015	13/07/2015	13/07/2015	13/07/2015	13/07/2015
Arsenic	mg/kg	41	<4	<4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	3	2	1	2	2
Copper	mg/kg	5	1	<1	<1	2
Lead	mg/kg	3	3	1	1	5
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	<1	<1	<1	<1	<1
Zinc	mg/kg	36	3	1	<1	3

Acid Extractable metals in soil						
Our Reference:	UNITS	130980-6	130980-7	130980-8	130980-9	130980-10
Your Reference	----------	BH4	BH4	BH4	BH10	BH10
Depth	----------	2.0	3.0	4.0	1.0	2.0
Date Sampled		3/07/2015	3/07/2015	3/07/2015	6/07/2015	6/07/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	13/07/2015	13/07/2015	13/07/2015	13/07/2015	13/07/2015
Date analysed	-	13/07/2015	13/07/2015	13/07/2015	13/07/2015	13/07/2015
Arsenic	mg/kg	<4	<4	<4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	1	1	2	2	2
Copper	mg/kg	1	<1	1	22	<1
Lead	mg/kg	9	4	14	10	2
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	<1	<1	<1	1	1
Zinc	mg/kg	3	2	4	10	1

Acid Extractable metals in soil		
Our Reference:	UNITS	130980-11
Your Reference	----------	BH2 - TRIPLICATE
Depth	----------	1.0
Date Sampled		07/07/2015
Type of sample		Soil
Date digested	-	13/07/2015
Date analysed	-	13/07/2015
Arsenic	mg/kg	20
Cadmium	mg/kg	<0.4
Chromium	mg/kg	2
Copper	mg/kg	4
Lead	mg/kg	5
Mercury	mg/kg	<0.1
Nickel	mg/kg	1

Acid Extractable metals in soil		
Our Reference:	UNITS	130980-11
Your Reference	----------	BH2 - TRIPLICATE
Depth	----------	1.0
Date Sampled		07/07/2015
Type of sample		Soil
Zinc	mg/kg	25

Misc Soil - Inorg						
Our Reference:	UNITS	130980-1	130980-2	130980-3	130980-4	130980-5
Your Reference	----------	BH2	BH2	BH2	BH2	BH4
Depth	----------	1.0	2.0	3.0	4.0	1.0
Date Sampled		7/07/2015	7/07/2015	7/07/2015	7/07/2015	3/07/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	13/07/2015	13/07/2015	13/07/2015	13/07/2015	13/07/2015
Date analysed	-	13/07/2015	13/07/2015	13/07/2015	13/07/2015	13/07/2015
Total Phenolics (as Phenol)	mg/kg	<5	<5	<5	<5	<5

Misc Soil - Inorg						
Our Reference:	UNITS	130980-6	130980-7	130980-8	130980-9	130980-10
Your Reference	----------	BH4	BH4	BH4	BH10	BH10
Depth	----------	2.0	3.0	4.0	1.0	2.0
Date Sampled		3/07/2015	3/07/2015	3/07/2015	6/07/2015	6/07/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	13/07/2015	13/07/2015	13/07/2015	13/07/2015	13/07/2015
Date analysed	-	13/07/2015	13/07/2015	13/07/2015	13/07/2015	13/07/2015
Total Phenolics (as Phenol)	mg/kg	<5	<5	<5	<5	<5

Misc Inorg - Soil						
Our Reference:	UNITS	130980-1	130980-2	130980-3	130980-4	130980-5
Your Reference	----------	BH2	BH2	BH2	BH2	BH4
Depth	----------	1.0	2.0	3.0	4.0	1.0
Date Sampled		7/07/2015	7/07/2015	7/07/2015	7/07/2015	3/07/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	14/07/2015	14/07/2015	14/07/2015	14/07/2015	14/07/2015
Date analysed	-	14/07/2015	14/07/2015	14/07/2015	14/07/2015	14/07/2015
pH 1:5 soil:water	pH Units	6.3	6.5	6.5	5.8	6.3
Electrical Conductivity 1:5 soil:water	µS/cm	21	13	13	14	14
Chloride, Cl 1:5 soil:water	mg/kg	<10	<10	<10	<10	<10
Sulphate, SO4 1:5 soil:water	mg/kg	<10	<10	<10	<10	<10

Misc Inorg - Soil						
Our Reference:	UNITS	130980-6	130980-7	130980-8	130980-9	130980-10
Your Reference	----------	BH4	BH4	BH4	BH10	BH10
Depth	----------	2.0	3.0	4.0	1.0	2.0
Date Sampled		3/07/2015	3/07/2015	3/07/2015	6/07/2015	6/07/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	14/07/2015	14/07/2015	14/07/2015	14/07/2015	14/07/2015
Date analysed	-	14/07/2015	14/07/2015	14/07/2015	14/07/2015	14/07/2015
pH 1:5 soil:water	pH Units	6.1	6.0	6.2	9.9	7.2
Electrical Conductivity 1:5 soil:water	µS/cm	12	11	14	87	36
Chloride, Cl 1:5 soil:water	mg/kg	<10	<10	<10	<10	<10
Sulphate, SO4 1:5 soil:water	mg/kg	<10	<10	<10	38	31

Moisture						
Our Reference:	UNITS	130980-1	130980-2	130980-3	130980-4	130980-5
Your Reference	----------	BH2	BH2	BH2	BH2	BH4
Depth	----------	1.0	2.0	3.0	4.0	1.0
Date Sampled		7/07/2015	7/07/2015	7/07/2015	7/07/2015	3/07/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	13/07/2015	13/07/2015	13/07/2015	13/07/2015	13/07/2015
Date analysed	-	14/07/2015	14/07/2015	14/07/2015	14/07/2015	14/07/2015
Moisture	%	7.7	4.0	4.6	5.5	4.4

Moisture						
Our Reference:	UNITS	130980-6	130980-7	130980-8	130980-9	130980-10
Your Reference	----------	BH4	BH4	BH4	BH10	BH10
Depth	----------	2.0	3.0	4.0	1.0	2.0
Date Sampled		3/07/2015	3/07/2015	3/07/2015	6/07/2015	6/07/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	13/07/2015	13/07/2015	13/07/2015	13/07/2015	13/07/2015
Date analysed	-	14/07/2015	14/07/2015	14/07/2015	14/07/2015	14/07/2015
Moisture	%	7.4	6.3	20	1.5	1.9

Asbestos ID - soils						
Our Reference:	UNITS	130980-1	130980-2	130980-3	130980-4	130980-5
Your Reference	----------	BH2	BH2	BH2	BH2	BH4
Depth	----------	1.0	2.0	3.0	4.0	1.0
Date Sampled		7/07/2015	7/07/2015	7/07/2015	7/07/2015	3/07/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	16/07/2015	16/07/2015	16/07/2015	16/07/2015	16/07/2015
Sample mass tested	g	Approx 60g	Approx 70g	Approx 70g	Approx 75g	Approx 65g
Sample Description	-	Brown coarse-grained sandy soil	Brown coarse-grained sandy soil	Brown coarse-grained sandy soil	Brown coarse-grained sandy soil	Brown coarse-grained sandy soil
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

Asbestos ID - soils					
Our Reference:	UNITS	130980-6	130980-7	130980-8	130980-9
Your Reference	----------	BH4	BH4	BH4	BH10
Depth	----------	2.0	3.0	4.0	1.0
Date Sampled		3/07/2015	3/07/2015	3/07/2015	6/07/2015
Type of sample		Soil	Soil	Soil	Soil
Date analysed	-	16/07/2015	16/07/2015	16/07/2015	16/07/2015
Sample mass tested	g	Approx 75g	Approx 75g	Approx 60g	Approx 40g
Sample Description	-	Brown coarse-grained sandy soil	Brown coarse-grained sandy soil	Grey coarse-grained sandy soil	Brown coarse-grained sandy soil
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

Method ID	Methodology Summary
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-014	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-012 subset	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. For soil results:- 1. 'TEQ 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. 'TEQ 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. 'TEQ 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-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Org-008	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Metals-020 ICP-AES	Determination of various metals by ICP-AES.
Metals-021 CV-AAS	Determination of Mercury by Cold Vapour AAS.
Inorg-031	Total Phenolics by segmented flow analyser (in line distillation with colourimetric finish). Solids are extracted in a caustic media prior to analysis.
Inorg-001	pH - Measured using pH meter and electrode in accordance with APHA latest edition, 4500-H+. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
Inorg-002	Conductivity and Salinity - measured using a conductivity cell at 25oC in accordance with APHA latest edition 2510 and Rayment & Lyons.
Inorg-081	Anions - a range of Anions are determined by Ion Chromatography, in accordance with APHA latest edition, 4110-B.
Inorg-008	Moisture content determined by heating at 105+/-5 deg C for a minimum of 12 hours.
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.

QUALITY CONTROL vTRH(C6-C10)/BTEXN in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			13/07/2015	130980-1	13/07/2015 || 13/07/2015	LCS-3	13/07/2015
Date analysed	-			14/07/2015	130980-1	14/07/2015 || 14/07/2015	LCS-3	14/07/2015
TRHC$_6$ - C$_9$	mg/kg	25	Org-016	<25	130980-1	<25 || <25	LCS-3	124%
TRHC$_6$ - C$_{10}$	mg/kg	25	Org-016	<25	130980-1	<25 || <25	LCS-3	124%
Benzene	mg/kg	0.2	Org-016	<0.2	130980-1	<0.2 || <0.2	LCS-3	125%
Toluene	mg/kg	0.5	Org-016	<0.5	130980-1	<0.5 || <0.5	LCS-3	122%
Ethylbenzene	mg/kg	1	Org-016	<1	130980-1	<1 || <1	LCS-3	122%
m+p-xylene	mg/kg	2	Org-016	<2	130980-1	<2 || <2	LCS-3	125%
o-Xylene	mg/kg	1	Org-016	<1	130980-1	<1 || <1	LCS-3	120%
naphthalene	mg/kg	1	Org-014	<1	130980-1	<1 || <1	[NR]	[NR]
Surrogate aaa-Trifluorotoluene	%		Org-016	119	130980-1	110 || 115 || RPD: 4	LCS-3	117%

QUALITY CONTROL svTRH (C10-C40) in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			13/07/2015	130980-1	13/07/2015 || 13/07/2015	LCS-3	13/07/2015
Date analysed	-			14/07/2015	130980-1	14/07/2015 || 14/07/2015	LCS-3	14/07/2015
TRHC$_{10}$ - C$_{14}$	mg/kg	50	Org-003	<50	130980-1	<50 || <50	LCS-3	90%
TRHC$_{15}$ - C$_{28}$	mg/kg	100	Org-003	<100	130980-1	<100 || <100	LCS-3	95%
TRHC$_{29}$ - C$_{36}$	mg/kg	100	Org-003	<100	130980-1	<100 || 210	LCS-3	77%
TRH>C$_{10}$-C$_{16}$	mg/kg	50	Org-003	<50	130980-1	<50 || <50	LCS-3	90%
TRH>C$_{16}$-C$_{34}$	mg/kg	100	Org-003	<100	130980-1	<100 || 160	LCS-3	95%
TRH>C$_{34}$-C$_{40}$	mg/kg	100	Org-003	<100	130980-1	<100 || 210	LCS-3	77%
Surrogate o-Terphenyl	%		Org-003	82	130980-1	81 || 87 || RPD: 7	LCS-3	89%

QUALITY CONTROL PAHs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			13/07/2015	130980-1	13/07/2015 || 13/07/2015	LCS-3	13/07/2015
Date analysed	-			13/07/2015	130980-1	13/07/2015 || 13/07/2015	LCS-3	13/07/2015
Naphthalene	mg/kg	0.1	Org-012 subset	<0.1	130980-1	<0.1 || <0.1	LCS-3	113%
Acenaphthylene	mg/kg	0.1	Org-012 subset	<0.1	130980-1	<0.1 || <0.1	[NR]	[NR]
Acenaphthene	mg/kg	0.1	Org-012 subset	<0.1	130980-1	<0.1 || <0.1	[NR]	[NR]
Fluorene	mg/kg	0.1	Org-012 subset	<0.1	130980-1	<0.1 || <0.1	LCS-3	95%
Phenanthrene	mg/kg	0.1	Org-012 subset	<0.1	130980-1	<0.1 || <0.1	LCS-3	105%
Anthracene	mg/kg	0.1	Org-012 subset	<0.1	130980-1	<0.1 || <0.1	[NR]	[NR]
Fluoranthene	mg/kg	0.1	Org-012 subset	<0.1	130980-1	<0.1 || <0.1	LCS-3	98%

QUALITY CONTROL PAHs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Pyrene	mg/kg	0.1	Org-012 subset	<0.1	130980-1	<0.1 || <0.1	LCS-3	103%
Benzo(a)anthracene	mg/kg	0.1	Org-012 subset	<0.1	130980-1	<0.1 || <0.1	[NR]	[NR]
Chrysene	mg/kg	0.1	Org-012 subset	<0.1	130980-1	<0.1 || <0.1	LCS-3	97%
Benzo(b,j+k) fluoranthene	mg/kg	0.2	Org-012 subset	<0.2	130980-1	<0.2 || <0.2	[NR]	[NR]
Benzo(a)pyrene	mg/kg	0.05	Org-012 subset	<0.05	130980-1	<0.05 || <0.05	LCS-3	105%
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012 subset	<0.1	130980-1	<0.1 || <0.1	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012 subset	<0.1	130980-1	<0.1 || <0.1	[NR]	[NR]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012 subset	<0.1	130980-1	<0.1 || <0.1	[NR]	[NR]
Surrogate p-Terphenyl-d14	%		Org-012 subset	101	130980-1	95 || 125 || RPD: 27	LCS-3	104%

QUALITY CONTROL Organochlorine Pesticides in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			13/07/2015	130980-1	13/07/2015 || 13/07/2015	LCS-3	13/07/2015
Date analysed	-			14/07/2015	130980-1	14/07/2015 || 14/07/2015	LCS-3	14/07/2015
HCB	mg/kg	0.1	Org-005	<0.1	130980-1	<0.1 || <0.1	[NR]	[NR]
alpha-BHC	mg/kg	0.1	Org-005	<0.1	130980-1	<0.1 || <0.1	LCS-3	88%
gamma-BHC	mg/kg	0.1	Org-005	<0.1	130980-1	<0.1 || <0.1	[NR]	[NR]
beta-BHC	mg/kg	0.1	Org-005	<0.1	130980-1	<0.1 || <0.1	LCS-3	85%
Heptachlor	mg/kg	0.1	Org-005	<0.1	130980-1	<0.1 || <0.1	LCS-3	88%
delta-BHC	mg/kg	0.1	Org-005	<0.1	130980-1	<0.1 || <0.1	[NR]	[NR]
Aldrin	mg/kg	0.1	Org-005	<0.1	130980-1	<0.1 || <0.1	LCS-3	96%
Heptachlor Epoxide	mg/kg	0.1	Org-005	<0.1	130980-1	<0.1 || <0.1	LCS-3	86%
gamma-Chlordane	mg/kg	0.1	Org-005	<0.1	130980-1	<0.1 || <0.1	[NR]	[NR]
alpha-chlordane	mg/kg	0.1	Org-005	<0.1	130980-1	<0.1 || <0.1	[NR]	[NR]
Endosulfan I	mg/kg	0.1	Org-005	<0.1	130980-1	<0.1 || <0.1	[NR]	[NR]
pp-DDE	mg/kg	0.1	Org-005	<0.1	130980-1	<0.1 || <0.1	LCS-3	87%
Dieldrin	mg/kg	0.1	Org-005	<0.1	130980-1	<0.1 || <0.1	LCS-3	89%
Endrin	mg/kg	0.1	Org-005	<0.1	130980-1	<0.1 || <0.1	LCS-3	97%
pp-DDD	mg/kg	0.1	Org-005	<0.1	130980-1	<0.1 || <0.1	LCS-3	94%
Endosulfan II	mg/kg	0.1	Org-005	<0.1	130980-1	<0.1 || <0.1	[NR]	[NR]
pp-DDT	mg/kg	0.1	Org-005	<0.1	130980-1	<0.1 || <0.1	[NR]	[NR]
Endrin Aldehyde	mg/kg	0.1	Org-005	<0.1	130980-1	<0.1 || <0.1	[NR]	[NR]
Endosulfan Sulphate	mg/kg	0.1	Org-005	<0.1	130980-1	<0.1 || <0.1	LCS-3	86%
Methoxychlor	mg/kg	0.1	Org-005	<0.1	130980-1	<0.1 || <0.1	[NR]	[NR]
Surrogate TCMX	%		Org-005	87	130980-1	89 || 96 || RPD: 8	LCS-3	82%

QUALITY CONTROL Organophosphorus Pesticides	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			13/07/2015	130980-1	13/07/2015 || 13/07/2015	LCS-3	13/07/2015
Date analysed	-			14/07/2015	130980-1	14/07/2015 || 14/07/2015	LCS-3	14/07/2015
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-008	<0.1	130980-1	<0.1 || <0.1	LCS-3	99%
Bromophos-ethyl	mg/kg	0.1	Org-008	<0.1	130980-1	<0.1 || <0.1	[NR]	[NR]
Chlorpyriphos	mg/kg	0.1	Org-008	<0.1	130980-1	<0.1 || <0.1	LCS-3	103%
Chlorpyriphos-methyl	mg/kg	0.1	Org-008	<0.1	130980-1	<0.1 || <0.1	[NR]	[NR]
Diazinon	mg/kg	0.1	Org-008	<0.1	130980-1	<0.1 || <0.1	[NR]	[NR]
Dichlorvos	mg/kg	0.1	Org-008	<0.1	130980-1	<0.1 || <0.1	LCS-3	104%
Dimethoate	mg/kg	0.1	Org-008	<0.1	130980-1	<0.1 || <0.1	[NR]	[NR]
Ethion	mg/kg	0.1	Org-008	<0.1	130980-1	<0.1 || <0.1	LCS-3	123%
Fenitrothion	mg/kg	0.1	Org-008	<0.1	130980-1	<0.1 || <0.1	LCS-3	101%
Malathion	mg/kg	0.1	Org-008	<0.1	130980-1	<0.1 || <0.1	LCS-3	78%
Parathion	mg/kg	0.1	Org-008	<0.1	130980-1	<0.1 || <0.1	LCS-3	108%
Ronnel	mg/kg	0.1	Org-008	<0.1	130980-1	<0.1 || <0.1	[NR]	[NR]
Surrogate TCMX	%		Org-008	87	130980-1	89 || 96 || RPD: 8	LCS-3	84%

QUALITY CONTROL PCBs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			13/07/2015	130980-1	13/07/2015 || 13/07/2015	LCS-3	13/07/2015
Date analysed	-			14/07/2015	130980-1	14/07/2015 || 14/07/2015	LCS-3	14/07/2015
Aroclor 1016	mg/kg	0.1	Org-006	<0.1	130980-1	<0.1 || <0.1	[NR]	[NR]
Aroclor 1221	mg/kg	0.1	Org-006	<0.1	130980-1	<0.1 || <0.1	[NR]	[NR]
Aroclor 1232	mg/kg	0.1	Org-006	<0.1	130980-1	<0.1 || <0.1	[NR]	[NR]
Aroclor 1242	mg/kg	0.1	Org-006	<0.1	130980-1	<0.1 || <0.1	[NR]	[NR]
Aroclor 1248	mg/kg	0.1	Org-006	<0.1	130980-1	<0.1 || <0.1	[NR]	[NR]
Aroclor 1254	mg/kg	0.1	Org-006	<0.1	130980-1	<0.1 || <0.1	LCS-3	122%
Aroclor 1260	mg/kg	0.1	Org-006	<0.1	130980-1	<0.1 || <0.1	[NR]	[NR]
Surrogate TCLMX	%		Org-006	87	130980-1	89 || 96 || RPD: 8	LCS-3	83%

QUALITY CONTROL Acid Extractable metals in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date digested	-			13/07/2015	130980-1	13/07/2015 || 13/07/2015	LCS-8	13/07/2015
Date analysed	-			13/07/2015	130980-1	13/07/2015 || 13/07/2015	LCS-8	13/07/2015
Arsenic	mg/kg	4	Metals-020 ICP-AES	<4	130980-1	41 || 14 || RPD: 98	LCS-8	106%
Cadmium	mg/kg	0.4	Metals-020 ICP-AES	<0.4	130980-1	<0.4 || <0.4	LCS-8	94%
Chromium	mg/kg	1	Metals-020 ICP-AES	<1	130980-1	3 || 2 || RPD: 40	LCS-8	103%
Copper	mg/kg	1	Metals-020 ICP-AES	<1	130980-1	5 || 5 || RPD: 0	LCS-8	104%
Lead	mg/kg	1	Metals-020 ICP-AES	<1	130980-1	3 || 7 || RPD: 80	LCS-8	98%
Mercury	mg/kg	0.1	Metals-021 CV-AAS	<0.1	130980-1	<0.1 || <0.1	LCS-8	90%
Nickel	mg/kg	1	Metals-020 ICP-AES	<1	130980-1	<1 || 1	LCS-8	100%
Zinc	mg/kg	1	Metals-020 ICP-AES	<1	130980-1	36 || 21 || RPD: 53	LCS-8	102%

QUALITY CONTROL Misc Soil - Inorg	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date prepared	-			13/07/2015	130980-1	13/07/2015 || 13/07/2015	LCS-1	13/07/2015
Date analysed	-			13/07/2015	130980-1	13/07/2015 || 13/07/2015	LCS-1	13/07/2015
Total Phenolics (as Phenol)	mg/kg	5	Inorg-031	<5	130980-1	<5 || <5	LCS-1	109%

QUALITY CONTROL Misc Inorg - Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date prepared	-			14/07/2015	130980-1	14/07/2015 || 14/07/2015	LCS-1	14/07/2015
Date analysed	-			14/07/2015	130980-1	14/07/2015 || 14/07/2015	LCS-1	14/07/2015
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	130980-1	6.3 || 6.4 || RPD: 2	LCS-1	102%
Electrical Conductivity 1:5 soil:water	µS/cm	1	Inorg-002	<1	130980-1	21 || 23 || RPD: 9	LCS-1	100%
Chloride, Cl 1:5 soil:water	mg/kg	10	Inorg-081	<10	130980-1	<10 || <10	LCS-1	95%
Sulphate, SO4 1:5 soil:water	mg/kg	10	Inorg-081	<10	130980-1	<10 || <10	LCS-1	98%

QUALITY CONTROL vTRH(C6-C10)/BTEXN in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	[NT]	[NT]	130980-2	13/07/2015
Date analysed	-	[NT]	[NT]	130980-2	14/07/2015
TRH C_6 - C_9	mg/kg	[NT]	[NT]	130980-2	118%
TRH C_6 - C_{10}	mg/kg	[NT]	[NT]	130980-2	118%
Benzene	mg/kg	[NT]	[NT]	130980-2	118%
Toluene	mg/kg	[NT]	[NT]	130980-2	116%
Ethylbenzene	mg/kg	[NT]	[NT]	130980-2	116%
m+p-xylene	mg/kg	[NT]	[NT]	130980-2	120%
o-Xylene	mg/kg	[NT]	[NT]	130980-2	114%
naphthalene	mg/kg	[NT]	[NT]	[NR]	[NR]
Surrogate aaa-Trifluorotoluene	%	[NT]	[NT]	130980-2	115%
QUALITY CONTROL svTRH (C10-C40) in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	130980-5	14/07/2015 || 13/07/2015	130980-2	13/07/2015
Date analysed	-	130980-5	14/07/2015 || 14/07/2015	130980-2	14/07/2015
TRH C_{10} - C_{14}	mg/kg	130980-5	<50 || <50	130980-2	95%
TRH C_{15} - C_{28}	mg/kg	130980-5	<100 || 810	130980-2	98%
TRH C_{29} - C_{36}	mg/kg	130980-5	<100 || 310	130980-2	68%
TRH>C_{10}-C_{16}	mg/kg	130980-5	<50 || 50	130980-2	95%
TRH>C_{16}-C_{34}	mg/kg	130980-5	<100 || 1000	130980-2	98%
TRH>C_{34}-C_{40}	mg/kg	130980-5	<100 || 140	130980-2	68%
Surrogate o-Terphenyl	%	130980-5	117 || 105 || RPD: 11	130980-2	99%
QUALITY CONTROL PAHs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	130980-5	14/07/2015 || 13/07/2015	130980-2	13/07/2015
Date analysed	-	130980-5	14/07/2015 || 13/07/2015	130980-2	13/07/2015
Naphthalene	mg/kg	130980-5	0.2 || 0.4 || RPD: 67	130980-2	104%
Acenaphthylene	mg/kg	130980-5	<0.1 || 0.3	[NR]	[NR]
Acenaphthene	mg/kg	130980-5	0.1 || 5.6 || RPD: 193	[NR]	[NR]
Fluorene	mg/kg	130980-5	<0.1 || 3.7	130980-2	90%
Phenanthrene	mg/kg	130980-5	1.4 || 52 || RPD: 190	130980-2	96%
Anthracene	mg/kg	130980-5	0.3 || 14 || RPD: 192	[NR]	[NR]
Fluoranthene	mg/kg	130980-5	0.9 || 44 || RPD: 192	130980-2	94%
Pyrene	mg/kg	130980-5	0.9 || 42 || RPD: 192	130980-2	99%
Benzo(a)anthracene	mg/kg	130980-5	0.4 || 18 || RPD: 191	[NR]	[NR]
Chrysene	mg/kg	130980-5	0.4 || 14 || RPD: 189	130980-2	88%
Benzo(b,j+k)fluoranthene	mg/kg	130980-5	0.5 || 15 || RPD: 187	[NR]	[NR]
Benzo(a)pyrene	mg/kg	130980-5	0.3 || 14 || RPD: 192	130980-2	87%
Indeno(1,2,3-c,d)pyrene	mg/kg	130980-5	0.2 || 6.2 || RPD: 188	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	130980-5	<0.1 || 1.2	[NR]	[NR]

QUALITY CONTROL PAHs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Benzo(g,h,i)perylene	mg/kg	130980-5	0.2 || 4.6 || RPD: 183	[NR]	[NR]
Surrogate p-Terphenyl-d14	%	130980-5	95 || 104 || RPD: 9	130980-2	101%
QUALITY CONTROL Organochlorine Pesticides in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	[NT]	[NT]	130980-2	13/07/2015
Date analysed	-	[NT]	[NT]	130980-2	14/07/2015
HCB	mg/kg	[NT]	[NT]	[NR]	[NR]
alpha-BHC	mg/kg	[NT]	[NT]	130980-2	90%
gamma-BHC	mg/kg	[NT]	[NT]	[NR]	[NR]
beta-BHC	mg/kg	[NT]	[NT]	130980-2	87%
Heptachlor	mg/kg	[NT]	[NT]	130980-2	98%
delta-BHC	mg/kg	[NT]	[NT]	[NR]	[NR]
Aldrin	mg/kg	[NT]	[NT]	130980-2	88%
Heptachlor Epoxide	mg/kg	[NT]	[NT]	130980-2	90%
gamma-Chlordane	mg/kg	[NT]	[NT]	[NR]	[NR]
alpha-chlordane	mg/kg	[NT]	[NT]	[NR]	[NR]
Endosulfan I	mg/kg	[NT]	[NT]	[NR]	[NR]
pp-DDE	mg/kg	[NT]	[NT]	130980-2	88%
Dieldrin	mg/kg	[NT]	[NT]	130980-2	98%
Endrin	mg/kg	[NT]	[NT]	130980-2	98%
pp-DDD	mg/kg	[NT]	[NT]	130980-2	95%
Endosulfan II	mg/kg	[NT]	[NT]	[NR]	[NR]
pp-DDT	mg/kg	[NT]	[NT]	[NR]	[NR]
Endrin Aldehyde	mg/kg	[NT]	[NT]	[NR]	[NR]
Endosulfan Sulphate	mg/kg	[NT]	[NT]	130980-2	86%
Methoxychlor	mg/kg	[NT]	[NT]	[NR]	[NR]
Surrogate TCMX	%	[NT]	[NT]	130980-2	88%

QUALITY CONTROL Organophosphorus Pesticides	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	[NT]	[NT]	130980-2	13/07/2015
Date analysed	-	[NT]	[NT]	130980-2	14/07/2015
Azinphos-methyl (Guthion)	mg/kg	[NT]	[NT]	130980-2	91%
Bromophos-ethyl	mg/kg	[NT]	[NT]	[NR]	[NR]
Chlorpyriphos	mg/kg	[NT]	[NT]	130980-2	106%
Chlorpyriphos-methyl	mg/kg	[NT]	[NT]	[NR]	[NR]
Diazinon	mg/kg	[NT]	[NT]	[NR]	[NR]
Dichlorvos	mg/kg	[NT]	[NT]	130980-2	123%
Dimethoate	mg/kg	[NT]	[NT]	[NR]	[NR]
Ethion	mg/kg	[NT]	[NT]	130980-2	120%
Fenitrothion	mg/kg	[NT]	[NT]	130980-2	100%
Malathion	mg/kg	[NT]	[NT]	130980-2	85%
Parathion	mg/kg	[NT]	[NT]	130980-2	100%
Ronnel	mg/kg	[NT]	[NT]	[NR]	[NR]
Surrogate TCMX	%	[NT]	[NT]	130980-2	74%
QUALITY CONTROL PCBs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	[NT]	[NT]	130980-2	13/07/2015
Date analysed	-	[NT]	[NT]	130980-2	14/07/2015
Aroclor 1016	mg/kg	[NT]	[NT]	[NR]	[NR]
Aroclor 1221	mg/kg	[NT]	[NT]	[NR]	[NR]
Aroclor 1232	mg/kg	[NT]	[NT]	[NR]	[NR]
Aroclor 1242	mg/kg	[NT]	[NT]	[NR]	[NR]
Aroclor 1248	mg/kg	[NT]	[NT]	[NR]	[NR]
Aroclor 1254	mg/kg	[NT]	[NT]	130980-2	117%
Aroclor 1260	mg/kg	[NT]	[NT]	[NR]	[NR]
Surrogate TCLMX	%	[NT]	[NT]	130980-2	75%
QUALITY CONTROL Acid Extractable metals in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date digested	-	[NT]	[NT]	130980-2	13/07/2015
Date analysed	-	[NT]	[NT]	130980-2	13/07/2015
Arsenic	mg/kg	[NT]	[NT]	130980-2	101%
Cadmium	mg/kg	[NT]	[NT]	130980-2	103%
Chromium	mg/kg	[NT]	[NT]	130980-2	105%
Copper	mg/kg	[NT]	[NT]	130980-2	110%
Lead	mg/kg	[NT]	[NT]	130980-2	105%
Mercury	mg/kg	[NT]	[NT]	130980-2	91%
Nickel	mg/kg	[NT]	[NT]	130980-2	105%
Zinc	mg/kg	[NT]	[NT]	130980-2	108%

QUALITY CONTROL Misc Soil - Inorg	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date prepared	-	[NT]	[NT]	130980-2	13/07/2015
Date analysed	-	[NT]	[NT]	130980-2	13/07/2015
Total Phenolics (as Phenol)	mg/kg	[NT]	[NT]	130980-2	107%
QUALITY CONTROL Misc Inorg - Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date prepared	-	[NT]	[NT]	130980-2	14/07/2015
Date analysed	-	[NT]	[NT]	130980-2	14/07/2015
pH 1:5 soil:water	pH Units	[NT]	[NT]	[NR]	[NR]
Electrical Conductivity 1:5 soil:water	µS/cm	[NT]	[NT]	[NR]	[NR]
Chloride, Cl 1:5 soil:water	mg/kg	[NT]	[NT]	130980-2	101%
Sulphate, SO4 1:5 soil:water	mg/kg	[NT]	[NT]	130980-2	103%

Report Comments:

Acid Extractable Metals in Soil: The laboratory RPD acceptance criteria has been exceeded for 130980-1 for As, Pb and Zn. Therefore a triplicate result has been issued as laboratory sample number 130980-11.

Asbestos: Excessive sample volume was provided for asbestos analysis. A portion of the supplied sample was sub-sampled according to Envirolab procedures. We cannot guarantee that this sub-sample is indicative of the entire sample. Envirolab recommends supplying 40-50g (50mL) of sample in its own container as per AS4964-2004.
Note: Samples 130980-1 to 8 were sub-sampled from bags and 130980-9 from jar provided by the client.

sTRH/PAH in soil: The RPD for duplicate results is accepted due to the non homogenous nature of the sample/s.

Asbestos ID was analysed by Approved Identifier: Paul Ching
Asbestos ID was authorised by Approved Signatory: Paul Ching

INS: Insufficient sample for this test
NA: Test not required
<: Less than

PQL: Practical Quantitation Limit
RPD: Relative Percent Difference
>: Greater than

NT: Not tested
NA: Test not required
LCS: Laboratory Control Sample

Quality Control Definitions

Blank: This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.

Duplicate: This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.

Matrix Spike : A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

LCS (Laboratory Control Sample) : This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

Surrogate Spike: Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in 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: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.
Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

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

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

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
enquiries@envirolabservices.com.au
www.envirolabservices.com.au

SAMPLE RECEIPT ADVICE

Client Details	
Client	Douglas Partners Pty Ltd
Attention	Peter Oitmaa

Sample Login Details	
Your Reference	84944.00, Bellevue Hill
Envirolab Reference	130980
Date Sample Received	10/07/2015
Date Instructions Received	10/07/2015
Date Results Expected to be Reported	17/07/2015

Sample Condition	
Samples received in appropriate condition for analysis	YES
No. of Samples Provided	10 Soils
Turnaround Time Requested	Standard
Temperature on receipt (°C)	4.0
Cooling Method	Ice Pack
Sampling Date Provided	YES

Comments
Samples will be held for 1 month for water samples and 2 months for soil samples from date of receipt of samples

Please direct any queries to:

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

Sample and Testing Details on following page

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Sample Id	*Acid Extractable metals in soil*	*Asbestos ID - soils*	*Chloride, Cl 1:5 soil:water*	*Electrical Conductivity 1:5 soil:water*	*Organochlorine Pesticides in soil*	*Organophosphorus Pesticides*	*PAHs in Soil*	*PCBs in Soil*	*pH 1:5 soil:water*	*Sulphate, SO4 1:5 soil:water*	*svTRH (C10-C40) in Soil*	*Total Phenolics (as Phenol)*	*vTRH(C6-C10)/BTEXN in Soil*
BH2-1.0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH2-2.0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH2-3.0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH2-4.0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH4-1.0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH4-2.0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH4-3.0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH4-4.0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH10-1.0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH10-2.0	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Douglas Partners
Geotechnics · Environment · Groundwater

CHAIN OF CUSTODY

Project Name: Bellevue Hill
Project No: 84944.00 Sampler: MP
Project Mgr: Peter Oitmaa Mob. Phone: 0412 574 518
Email: peter.oitmaa@douglaspartners.com.au
Date Required: Std. Lab Quote No.

To: Envirolab Services
12 Ashley Street, Chatswood NSW 2067
Attn: Tania Notaras
Phone: 02 9910 6200 Fax: 02 9910 6201
Email: tnotaras@envirolabservices.com.au

Sample ID	Sample Depth	Lab ID	Sampling Date	Sample Type S - soil W - water	Container type	Analytes: 8 Heavy metals	TRH BTEX	PAH	OCP PCB OPP	Phenol	Asbesto	PH EC	Cl^- SO_4^{2-}	Notes
BH2	1.0	1	7/7	S	Jar/Bag									
	2.0	2												
	3.0	3												
	4.0	4												
BH4	1.0	5	3/7											
	2.0	6												
	3.0	7												
	4.0	8												
BH10	1.0	9	6/7											
	2.0	10			Jar									

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

Job No: 130980
Date Received: 10/7/15
Time Received: 18:25
Received by: JYH.
Temp: Cool/Ambient
Cooling: Ice/Icepack 4.0
Security: Intact/Broken/None

Lab Report No.
Send Results to: Douglas Partners Address: 96 Hermitage Road, West Ryde 2114
Phone: (02) 9809 0666
Fax: (02) 9809 4095

Relinquished by: P. Oitmaa Signed: Date & Time: 10/7 1200hrs Received By: Date & Time: 10/7/15 18:25.
Relinquished by: Signed: Date & Time: Received By: Date & Time:

ENM Order and ENM Exemption

Resource Recovery Order under Part 9, Clause 93 of the Protection of the Environment Operations (Waste) Regulation 2014

The excavated natural material order 2014

Introduction

This order, issued by the Environment Protection Authority (EPA) under clause 93 of the Protection of the Environment Operations (Waste) Regulation 2014 (Waste Regulation), imposes the requirements that must be met by suppliers of excavated natural material to which 'the excavated natural material exemption 2014' applies. The requirements in this order apply in relation to the supply of excavated natural material for application to land as engineering fill or for use in earthworks.

1. Waste to which this order applies

1.1. This order applies to excavated natural material. In this order, excavated natural material means naturally occurring rock and soil (including but not limited to materials such as sandstone, shale, clay and soil) that has:

a) been excavated from the ground, and
b) contains at least 98% (by weight) natural material, and
c) does not meet the definition of Virgin Excavated Natural Material in the Act.

Excavated natural material does not include material located in a hotspot; that has been processed; or that contains asbestos, Acid Sulfate Soils (ASS), Potential Acid Sulfate soils (PASS) or sulfidic ores.

2. Persons to whom this order applies

2.1. The requirements in this order apply, as relevant, to any person who supplies excavated natural material, that has been generated, processed or recovered by the person.

2.2. This order does not apply to the supply of excavated natural material to a consumer for land application at a premises for which the consumer holds a licence under the POEO Act that authorises the carrying out of the scheduled activities on the premises under clause 39 'waste disposal (application to land)' or clause 40 'waste disposal (thermal treatment)' of Schedule 1 of the POEO Act.

3. Duration

3.1. This order commences on 24 November 2014 and is valid until revoked by the EPA by notice published in the Government Gazette.

4. Generator requirements

The EPA imposes the following requirements on any generator who supplies excavated natural material.

Sampling requirements

4.1. On or before supplying excavated natural material, the generator must:

4.1.1. Prepare a written sampling plan which includes a description of sample preparation and storage procedures for the excavated natural material.

4.1.2. Undertake sampling and testing of the excavated natural material as required under clauses 4.2, 4.3, and 4.4 below. The sampling must be carried out in accordance with the written sampling plan.

4.2. The generator must undertake sampling and analysis of the material for ASS and PASS, in accordance with the NSW Acid Sulfate Soil Manual, Acid Sulfate Soils Management Advisory Council, 1998 and the updated Laboratory Methods Guidelines version 2.1 – June 2004 where:

4.2.1. the pH measured in the material is below 5, and/or

4.2.2. the review of the applicable Acid Sulfate Soil Risk Maps (published by the former Department of Land and Water Conservation and available at http://www.environment.nsw.gov.au/acidsulfatesoil/riskmaps.htm) indicates the potential presence of ASS.

4.3. For stockpiled material, the generator must:

4.3.1. undertake sampling in accordance with Australian Standard 1141.3.1-2012 Methods for sampling and testing aggregates – Sampling – Aggregates (or equivalent);

4.3.2. undertake characterisation sampling by collecting the number of samples listed in Column 2 of Table 1 with respect to the quantity of the waste listed in Column 1 of Table 1 and testing each sample for the chemicals and other attributes listed in Column 1 of Table 4. For the purposes of characterisation sampling the generator must collect:

4.3.2.1. composite samples for attributes 1 to 10 and 18 in Column 1 of Table 4.

4.3.2.2. discrete samples for attributes 11 to 17 in Column 1 of Table 4.

4.3.2.3. The generator must carry out sampling in a way that ensures that the samples taken are representative of the material from the entire stockpile. All parts of the stockpile must be equally accessible for sampling.

4.3.2.4. for stockpiles greater than 4,000 tonnes the number of samples described in Table 1 must be repeated.

4.3.3. store the excavated natural material appropriately until the characterisation test results are validated as compliant with the maximum average concentration or other value listed in Column 2 of Table 4 and the absolute maximum concentration or other value listed in Column 3 of Table 4.

Table 1

Sampling of Stockpiled Material		
Column 1	**Column 2**	**Column 3**
Quantity (tonnes)	**Number of samples**	**Validation**
<500	3	Required
500 – 1,000	4	
1,000 – 2,000	5	
2,000 – 3,000	7	
3,000 – 4,000	10	

4.4. For in situ material, the generator must:

4.4.1. undertake sampling by collecting discrete samples. Compositing of samples is not permitted for in-situ materials.

4.4.2. undertake characterisation sampling for the range of chemicals and other attributes listed in Column 1 of Table 4 according to the requirements listed in Columns 1, 2 and 3 of Table 2. When the ground surface is not comprised of soil (e.g. concrete slab), samples must be taken at the depth at which the soil commences.

4.4.3. undertake sampling at depth according to Column 1 of Table 3.

4.4.4. collect additional soil samples (and analyse them for the range of chemicals and other attributes listed in Column 1 of Table 4), at any depth exhibiting discolouration, staining, odour or other indicators of contamination inconsistent with soil samples collected at the depth intervals indicated in Table 3.

4.4.5. segregate and exclude hotspots identified in accordance with Table 2, from material excavated for reuse.

4.4.6. subdivide sites larger than 50,000 m² into smaller areas and sample each area as per Table 2.

4.4.7. store the excavated natural material appropriately until the characterisation test results are validated as compliant with the maximum average concentration or other value listed in Column 2 of Table 4 and the absolute maximum concentration or other value listed in Column 3 of Table 4.

Table 2

***In Situ* Sampling at surface**				
Column 1	**Column 2**	**Column 3**	**Column 4**	**Column 5**
Size of *in situ* area (m^2)	**Number of systematic sampling points recommended**	**Distance between two sampling points** (m)	**Diameter of the hot spot that can be detected with 95% confidence** (m)	**Validation**
500	5	10.0	11.8	Required
1000	6	12.9	15.2	
2000	7	16.9	19.9	
3000	9	18.2	21.5	
4000	11	19.1	22.5	
5000	13	19.6	23.1	
6000	15	20.0	23.6	
7000	17	20.3	23.9	
8000	19	20.5	24.2	
9000	20	21.2	25.0	
10,000	21	21.8	25.7	
15,000	25	25.0	28.9	
20,000	30	25.8	30.5	
25,000	35	26.7	31.5	
30,000	40	27.5	32.4	
35,000	45	27.9	32.9	
40,000	50	28.3	33.4	
45,000	52	29.3	34.6	
50,000	55	30.2	35.6	

Table 2 has been taken from NSW EPA 1995, *Contaminated Sites Sampling Design Guidelines*, NSW Environment Protection Authority.

Table 3

***In Situ* Sampling at Depth**	
Column 1	**Column 2**
Sampling Requirements *	**Validation**
1 soil sample at 1.0 m bgl from each surface sampling point followed by 1 soil sample for every metre thereafter. From 1.0 m bgl, sample at the next metre interval until the proposed depth of excavation of the material is reached. If the proposed depth of excavation is between 0.5 to 0.9 m after the last metre interval, sample at the base of the proposed depth of excavation.	Required if the depth of excavation is equal to or greater than 1.0 m bgl

* Refer to Notes for examples

Chemical and other material requirements

4.5. The generator must not supply excavated natural material waste to any person if, in relation to any of the chemical and other attributes of the excavated natural material:

4.5.1. The chemical concentration or other attribute of any sample collected and tested as part of the characterisation of the excavated natural material exceeds the absolute maximum concentration or other value listed in Column 3 of Table 4:

4.5.2. The average concentration or other value of that attribute from the characterisation of the excavated natural material (based on the arithmetic mean) exceeds the maximum average concentration or other value listed in Column 2 of Table 4.

4.6. The absolute maximum concentration or other value of that attribute in any excavated natural material supplied under this order must not exceed the absolute maximum concentration or other value listed in Column 3 of Table 4.

Table 4

Column 1	Column 2	Column 3
Chemicals and other attributes	**Maximum average concentration for characterisation** (mg/kg 'dry weight' unless otherwise specified)	**Absolute maximum concentration** (mg/kg 'dry weight' unless otherwise specified)
1. Mercury	0.5	1
2. Cadmium	0.5	1
3. Lead	50	100
4. Arsenic	20	40
5. Chromium (total)	75	150
6. Copper	100	200
7. Nickel	30	60
8. Zinc	150	300
9. Electrical Conductivity	1.5 dS/m	3 dS/m
10. pH *	5 to 9	4.5 to 10
11. Total Polycyclic Aromatic Hydrocarbons (PAHs)	20	40
12. Benzo(a)pyrene	0.5	1
13. Benzene	NA	0.5
14. Toluene	NA	65
15. Ethyl-benzene	NA	25
16. Xylene	NA	15
17. Total Petroleum Hydrocarbons C_{10}-C_{36}	250	500
18. Rubber, plastic, bitumen, paper, cloth, paint and wood	0.05%	0.10%

* The ranges given for pH are for the minimum and maximum acceptable pH values in the excavated natural material.

Test methods

4.7. The generator must ensure that any testing of samples required by this order is undertaken by analytical laboratories accredited by the National Association of Testing Authorities (NATA), or equivalent.

4.8. The generator must ensure that the chemicals and other attributes (listed in Column 1 of Table 4) in the excavated natural material it supplies are tested in accordance with the test methods specified below or other equivalent analytical methods. Where an equivalent analytical method is used the detection limit must be equal to or less than that nominated for the given method below.

4.8.1. Test methods for measuring the mercury concentration.

4.8.1.1. Analysis using USEPA SW-846 Method 7471B Mercury in solid or semisolid waste (manual cold vapour technique), or an equivalent analytical method with a detection limit < 20% of the stated absolute maximum concentration in Column 3 of Table 2 (i.e. < 0.20 mg/kg dry weight).

4.8.1.2. Report as mg/kg dry weight.

4.8.2. Test methods for measuring chemicals 2 to 8.

4.8.2.1. Sample preparation by digesting using USEPA SW-846 Method 3051A Microwave assisted acid digestion of sediments, sludges, soils, and oils (or an equivalent analytical method).

4.8.2.2. Analysis using USEPA SW-846 Method 6010C Inductively coupled plasma - atomic emission spectrometry, or an equivalent analytical method with a detection limit < 10% of the stated absolute maximum concentration in Column 3 of Table 2, (e.g. 10 mg/kg dry weight for lead).

4.8.2.3. Report as mg/kg dry weight.

4.8.3. Test methods for measuring electrical conductivity and pH.

4.8.3.1. Sample preparation by mixing 1 part excavated natural material with 5 parts distilled water.

4.8.3.2. Analysis using Method 103 (pH) and 104 (Electrical Conductivity) in Schedule B (3): Guideline on Laboratory Analysis of Potentially Contaminated Soils, National Environment Protection (Assessment of Site Contamination) Measure 1999 (or an equivalent analytical method).

4.8.3.3. Report electrical conductivity in deciSiemens per metre (dS/m).

4.8.4. Test method for measuring Polynuclear Aromatic Hydrocarbons (PAHs) and benzo(a)pyrene.

4.8.4.1. Analysis using USEPA SW-846 Method 8100 Polynuclear Aromatic Hydrocarbons (or an equivalent analytical method).

4.8.4.2. Calculate the sum of all 16 PAHs for total PAHs.

4.8.4.3. Report total PAHs as mg/kg dry weight.

4.8.4.4. Report benzo(a)pyrene as mg/kg.

4.8.5. Test method for measuring benzene, toluene, ethylbenzene and xylenes (BTEX).

4.8.5.1. Method 501 (Volatile Alkanes and Monocyclic Aromatic Hydrocarbons) in Schedule B (3): Guideline on Laboratory Analysis of Potentially Contaminated Soils, National Environment Protection (Assessment of Site Contamination) Measure 1999 (or an equivalent analytical method).

4.8.5.2. Report BTEX as mg/kg.

4.8.6. Test method for measuring Total Petroleum Hydrocarbons (TPH).

4.8.6.1. Method 506 (Petroleum Hydrocarbons) in Schedule B (3): Guideline on Laboratory Analysis of Potentially Contaminated Soils, National Environment Protection (Assessment of Site Contamination) Measure 1999 (or an equivalent analytical method).

4.8.6.2. Report as mg/kg dry weight.

4.8.7. Test method for measuring rubber, plastic, bitumen, paper, cloth, paint and wood.

4.8.7.1. NSW Roads & Traffic Authority Test Method T276 Foreign Materials Content of Recycled Crushed Concrete (or an equivalent method).

4.8.7.2. Report as percent.

Notification

4.9. On or before each transaction, the generator must provide the following to each person to whom the generator supplies the excavated natural material:

- a written statement of compliance certifying that all the requirements set out in this order have been met;
- a copy of the excavated natural material exemption, or a link to the EPA website where the excavated natural material exemption can be found; and
- a copy of the excavated natural material order, or a link to the EPA website where the excavated natural material order can be found.

Record keeping and reporting

4.10. The generator must keep a written record of the following for a period of six years:

- the sampling plan required to be prepared under clause 4.1.1;
- all characterisation sampling results in relation to the excavated natural material supplied;
- the volume of detected hotspot material and the location;
- the quantity of the excavated natural material supplied; and
- the name and address of each person to whom the generator supplied the excavated natural material.

4.11. The generator must provide, on request, the characterisation and sampling results for that excavated natural material supplied to the consumer of the excavated natural material.

5. Definitions

In this order:

application or apply to land means applying to land by:

- spraying, spreading or depositing on the land; or
- ploughing, injecting or mixing into the land; or
- filling, raising, reclaiming or contouring the land.

Bgl means below ground level, referring to soil at depth beneath the ground surface.

composite sample means a sample that combines five discrete sub-samples of equal size into a single sample for the purpose of analysis.

consumer means a person who applies, or intends to apply excavated natural material to land.

discrete sample means a sample collected and analysed individually that will not be composited.

generator means a person who generates excavated natural material for supply to a consumer.

hotspot means a cylindrical volume which extends through the soil profile from the ground surface to the proposed depth of excavation, where the level of any contaminant listed in Column 1 of Table 2 is greater than the absolute maximum concentration in Column 3 of Table 2.

***in situ* material** means material that exists on or below the ground level. It does not include stockpiled material.

***in situ* sampling** means sampling undertaken on *in situ* material.

N/A means not applicable.

stockpiled material means material that has been excavated from the ground and temporarily stored on the ground prior to use.

systematic sampling means sampling at points that are selected at even intervals and are statistically unbiased.

transaction means:

- in the case of a one-off supply, the supply of a batch, truckload or stockpile of excavated natural material that is not repeated.
- in the case where the supplier has an arrangement with the recipient for more than one supply of excavated natural material, the first supply of excavated natural material as required under the arrangement.

Manager Waste Strategy and Innovation

Environment Protection Authority

(by delegation)

Notes

The EPA may amend or revoke this order at any time. It is the responsibility of each of the generator and processor to ensure it complies with all relevant requirements of the most current order. The current version of this order will be available on ' www.epa.nsw.gov.au

In gazetting or otherwise issuing this order, the EPA is not in any way endorsing the supply or use of this substance or guaranteeing that the substance will confer benefit.

The conditions set out in this order are designed to minimise the risk of potential harm to the environment, human health or agriculture, although neither this order nor the accompanying exemption guarantee that the environment, human health or agriculture will not be harmed.

Any person or entity which supplies excavated natural material should assess whether the material is fit for the purpose the material is proposed to be used for, and whether this use may cause harm. The supplier may need to seek expert engineering or technical advice.

Regardless of any exemption or order provided by the EPA, the person who causes or permits the application of the substance to land must ensure that the action is lawful and consistent with any other legislative requirements including, if applicable, any development consent(s) for managing operations on the site(s).

The supply of excavated natural material remains subject to other relevant environmental regulations in the POEO Act and Waste Regulation. For example, a person who pollutes land (s. 142A) or water (s. 120), or causes air pollution through the emission of odours (s. 126), or does not meet the special requirements for asbestos waste (Part 7 of the Waste Regulation), regardless of this order, is guilty of an offence and subject to prosecution.

This order does not alter the requirements of any other relevant legislation that must be met in supplying this material, including for example, the need to prepare a Safety Data Sheet. Failure to comply with the conditions of this order constitutes an offence under clause 93 of the Waste Regulation.

Examples

In situ sampling at depth

Example 1.

If the proposed depth of ENM excavation is between 1 m bgl and 1.4 m bgl, then:

- 1 sample on surface (as per the requirements of Table 2).
- 1 sample at 1 m bgl.
- No further depth sampling after 1 m bgl, unless required under section 4.4.4.

Example 2.

If the proposed depth of ENM excavation is at 1.75 m bgl, then:

- 1 sample on surface (as per the requirements of Table 2).
- 1 sample at 1 m bgl.
- 1 sample at 1.75 m bgl.
- No further depth sampling after 1.75 m bgl, unless required under section 4.4.4.

Example 3.

If the proposed depth of ENM excavation is at 2.25 m bgl, then:

- 1 sample on surface (as per the requirements of Table 2).
- 1 sample at 1 m bgl.
- 1 sample at 2 m bgl.
- No further depth sampling after 2 m bgl, unless required under section 4.4.4.

Resource Recovery Exemption under Part 9, Clauses 91 and 92 of the Protection of the Environment Operations (Waste) Regulation 2014

The excavated natural material exemption 2014

Introduction

This exemption:

- is issued by the Environment Protection Authority (EPA) under clauses 91 and 92 of the Protection of the Environment Operations (Waste) Regulation 2014 (Waste Regulation); and
- exempts a consumer of excavated natural material from certain requirements under the *Protection of the Environment Operations Act 1997* (POEO Act) and the Waste Regulation in relation to the application of that waste to land, provided the consumer complies with the conditions of this exemption.

This exemption should be read in conjunction with 'the excavated natural material order 2014'.

1. Waste to which this exemption applies

1.1. This exemption applies to excavated natural material that is, or is intended to be, applied to land as engineering fill or for use in earthworks.

1.2. Excavated natural material is naturally occurring rock and soil (including but not limited to materials such as sandstone, shale, clay and soil) that has:

a) been excavated from the ground, and
b) contains at least 98% (by weight) natural material, and
c) does not meet the definition of Virgin Excavated Natural Material in the Act.

Excavated natural material does not include material located in a hotspot; that has been processed; or that contains asbestos, Acid Sulfate Soils (ASS), Potential Acid Sulfate soils (PASS) or sulfidic ores.

2. Persons to whom this exemption applies

2.1. This exemption applies to any person who applies or intends to apply excavated natural material to land as set out in 1.1.

3. Duration

3.1. This exemption commences on 24 November 2014 and is valid until revoked by the EPA by notice published in the Government Gazette.

4. Premises to which this exemption applies

4.1. This exemption applies to the premises at which the consumer's actual or intended application of excavated natural material is carried out.

5. Revocation

5.1. 'The excavated natural material exemption 2012' which commenced 19 October 2012 is revoked from 24 November 2014.

6. Exemption

6.1. Subject to the conditions of this exemption, the EPA exempts each consumer from the following provisions of the POEO Act and the Waste Regulation in relation to the consumer's actual or intended application of excavated natural material to land as engineering fill or for use in earthworks at the premises:

- section 48 of the POEO Act in respect of the scheduled activities described in clauses 39 of Schedule 1 of the POEO Act;
- Part 4 of the Waste Regulation;
- section 88 of the POEO Act; and
- clause 109 and 110 of the Waste Regulation.

6.2. The exemption does not apply in circumstances where excavated natural material is received at the premises for which the consumer holds a licence under the POEO Act that authorises the carrying out of the scheduled activities on the premises under clause 39 'waste disposal (application to land) or clause 40 'waste disposal' (thermal treatment) of Schedule 1 of the POEO Act.

7. Conditions of exemption

The exemption is subject to the following conditions:

7.1. At the time the excavated natural material is received at the premises, the material must meet all chemical and other material requirements for excavated natural material which are required on or before the supply of excavated natural material under 'the excavated natural material order 2014'.

7.2. The excavated natural material can only be applied to land as engineering fill or for use in earthworks.

7.3. The consumer must keep a written record of the following for a period of six years:

- the quantity of any excavated natural material received; and
- the name and address of the supplier of the excavated natural material received.

7.4. The consumer must make any records required to be kept under this exemption available to authorised officers of the EPA on request.

7.5. The consumer must ensure that any application of excavated natural material to land must occur within a reasonable period of time after its receipt.

8. Definitions

In this exemption:

application or apply to land means applying to land by:

- spraying, spreading or depositing on the land; or
- ploughing, injecting or mixing into the land; or
- filling, raising, reclaiming or contouring the land.

consumer means a person who applies, or intends to apply excavated natural material to land.

Manager Waste Strategy and Innovation

Environment Protection Authority

(by delegation)

Notes

The EPA may amend or revoke this exemption at any time. It is the responsibility of the consumer to ensure they comply with all relevant requirements of the most current exemption The current version of this exemption will be available on www.epa.nsw.gov.au

In gazetting or otherwise issuing this exemption, the EPA is not in any way endorsing the use of this substance or guaranteeing that the substance will confer benefit.

The conditions set out in this exemption are designed to minimise the risk of potential harm to the environment, human health or agriculture, although neither this exemption nor the accompanying order guarantee that the environment, human health or agriculture will not be harmed.

The consumer should assess whether or not the excavated natural material is fit for the purpose the material is proposed to be used for, and whether this use will cause harm. The consumer may need to seek expert engineering or technical advice.

Regardless of any exemption provided by the EPA, the person who causes or permits the application of the substance to land must ensure that the action is lawful and consistent with any other legislative requirements including, if applicable, any development consent(s) for managing operations on the site(s).

The receipt of excavated natural material remains subject to other relevant environmental regulations in the POEO Act and the Waste Regulation. For example, a person who pollutes land (s. 142A) or water (s. 120), or causes air pollution through the emission of odours (s. 126), or does not meet the special requirements for asbestos waste (Part 7 of the Waste Regulation), regardless of having an exemption, is guilty of an offence and subject to prosecution.

This exemption does not alter the requirements of any other relevant legislation that must be met in utilising this material, including for example, the need to prepare a Safety Data Sheet (SDS).

Failure to comply with the conditions of this exemption constitutes an offence under clause 91 of the Waste Regulation.

Notes About this Report

About this Report

Douglas Partners

Introduction

These notes have been provided to amplify DP's report in regard to classification methods, field procedures and the comments section. Not all are necessarily relevant to all reports.

DP's reports are based on information gained from limited subsurface excavations and sampling, supplemented by knowledge of local geology and experience. For this reason, they must be regarded as interpretive rather than factual documents, limited to some extent by the scope of information on which they rely.

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Borehole and Test Pit Logs

The borehole and test pit logs presented in this report are an engineering and/or geological interpretation of the subsurface conditions, and their reliability will depend to some extent on frequency of sampling and the method of drilling or excavation. Ideally, continuous undisturbed sampling or core drilling will provide the most reliable assessment, but this is not always practicable or possible to justify on economic grounds. In any case the boreholes and test pits represent only a very small sample of the total subsurface profile.

Interpretation of the information and its application to design and construction should therefore take into account the spacing of boreholes or pits, the frequency of sampling, and the possibility of other than 'straight line' variations between the test locations.

Groundwater

Where groundwater levels are measured in boreholes there are several potential problems, namely:

- In low permeability soils groundwater may enter the hole very slowly or perhaps not at all during the time the hole is left open;
- A localised, perched water table may lead to an erroneous indication of the true water table;
- Water table levels will vary from time to time with seasons or recent weather changes. They may not be the same at the time of construction as are indicated in the report; and
- The use of water or mud as a drilling fluid will mask any groundwater inflow. Water has to be blown out of the hole and drilling mud must first be washed out of the hole if water measurements are to be made.

More reliable measurements can be made by installing standpipes which are read at intervals over several days, or perhaps weeks for low permeability soils. Piezometers, sealed in a particular stratum, may be advisable in low permeability soils or where there may be interference from a perched water table.

Reports

The report has been prepared by qualified personnel, is based on the information obtained from field and laboratory testing, and has been undertaken to current engineering standards of interpretation and analysis. Where the report has been prepared for a specific design proposal, the information and interpretation may not be relevant if the design proposal is changed. If this happens, DP will be pleased to review the report and the sufficiency of the investigation work.

Every care is taken with the report as it relates to interpretation of subsurface conditions, discussion of geotechnical and environmental aspects, and recommendations or suggestions for design and construction. However, DP cannot always anticipate or assume responsibility for:

- Unexpected variations in ground conditions. The potential for this will depend partly on borehole or pit spacing and sampling frequency;
- Changes in policy or interpretations of policy by statutory authorities; or
- The actions of contractors responding to commercial pressures.

If these occur, DP will be pleased to assist with investigations or advice to resolve the matter.

About this Report

Site Anomalies

In the event that conditions encountered on site during construction appear to vary from those which were expected from the information contained in the report, DP requests that it be immediately notified. Most problems are much more readily resolved when conditions are exposed rather than at some later stage, well after the event.

Information for Contractual Purposes

Where information obtained from this report is provided for tendering purposes, it is recommended that all information, including the written report and discussion, be made available. In circumstances where the discussion or comments section is not relevant to the contractual situation, it may be appropriate to prepare a specially edited document. DP would be pleased to assist in this regard and/or to make additional report copies available for contract purposes at a nominal charge.

Site Inspection

The company will always be pleased to provide engineering inspection services for geotechnical and environmental aspects of work to which this report is related. This could range from a site visit to confirm that conditions exposed are as expected, to full time engineering presence on site.

Sampling Methods

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Sampling

Sampling is carried out during drilling or test pitting to allow engineering examination (and laboratory testing where required) of the soil or rock.

Disturbed samples taken during drilling provide information on colour, type, inclusions and, depending upon the degree of disturbance, some information on strength and structure.

Undisturbed samples are taken by pushing a thin-walled sample tube into the soil and withdrawing it to obtain a sample of the soil in a relatively undisturbed state. Such samples yield information on structure and strength, and are necessary for laboratory determination of shear strength and compressibility. Undisturbed sampling is generally effective only in cohesive soils.

Test Pits

Test pits are usually excavated with a backhoe or an excavator, allowing close examination of the in-situ soil if it is safe to enter into the pit. The depth of excavation is limited to about 3 m for a backhoe and up to 6 m for a large excavator. A potential disadvantage of this investigation method is the larger area of disturbance to the site.

Large Diameter Augers

Boreholes can be drilled using a rotating plate or short spiral auger, generally 300 mm or larger in diameter commonly mounted on a standard piling rig. The cuttings are returned to the surface at intervals (generally not more than 0.5 m) and are disturbed but usually unchanged in moisture content. Identification of soil strata is generally much more reliable than with continuous spiral flight augers, and is usually supplemented by occasional undisturbed tube samples.

Continuous Spiral Flight Augers

The borehole is advanced using 90-115 mm diameter continuous spiral flight augers which are withdrawn at intervals to allow sampling or in-situ testing. This is a relatively economical means of drilling in clays and sands above the water table. Samples are returned to the surface, or may be collected after withdrawal of the auger flights, but they are disturbed and may be mixed with soils from the sides of the hole. Information from the drilling (as distinct from specific sampling by SPTs or undisturbed samples) is of relatively low reliability, due to the remoulding, possible mixing or softening of samples by groundwater.

Non-core Rotary Drilling

The borehole is advanced using a rotary bit, with water or drilling mud being pumped down the drill rods and returned up the annulus, carrying the drill cuttings. Only major changes in stratification can be determined from the cuttings, together with some information from the rate of penetration. Where drilling mud is used this can mask the cuttings and reliable identification is only possible from separate sampling such as SPTs.

Continuous Core Drilling

A continuous core sample can be obtained using a diamond tipped core barrel, usually with a 50 mm internal diameter. Provided full core recovery is achieved (which is not always possible in weak rocks and granular soils), this technique provides a very reliable method of investigation.

Standard Penetration Tests

Standard penetration tests (SPT) are used as a means of estimating the density or strength of soils and also of obtaining a relatively undisturbed sample. The test procedure is described in Australian Standard 1289, Methods of Testing Soils for Engineering Purposes - Test 6.3.1.

The test is carried out in a borehole by driving a 50 mm diameter split sample tube under the impact of a 63 kg hammer with a free fall of 760 mm. It is normal for the tube to be driven in three successive 150 mm increments and the 'N' value is taken as the number of blows for the last 300 mm. In dense sands, very hard clays or weak rock, the full 450 mm penetration may not be practicable and the test is discontinued.

The test results are reported in the following form.

- In the case where full penetration is obtained with successive blow counts for each 150 mm of, say, 4, 6 and 7 as:

  4,6,7
  N=13

- In the case where the test is discontinued before the full penetration depth, say after 15 blows for the first 150 mm and 30 blows for the next 40 mm as:

  15, 30/40 mm

The results of the SPT tests can be related empirically to the engineering properties of the soils.

Dynamic Cone Penetrometer Tests / Perth Sand Penetrometer Tests

Dynamic penetrometer tests (DCP or PSP) are carried out by driving a steel rod into the ground using a standard weight of hammer falling a specified distance. As the rod penetrates the soil the number of blows required to penetrate each successive 150 mm depth are recorded. Normally there is a depth limitation of 1.2 m, but this may be extended in certain conditions by the use of extension rods. Two types of penetrometer are commonly used.

- Perth sand penetrometer - a 16 mm diameter flat ended rod is driven using a 9 kg hammer dropping 600 mm (AS 1289, Test 6.3.3). This test was developed for testing the density of sands and is mainly used in granular soils and filling.
- Cone penetrometer - a 16 mm diameter rod with a 20 mm diameter cone end is driven using a 9 kg hammer dropping 510 mm (AS 1289, Test 6.3.2). This test was developed initially for pavement subgrade investigations, and correlations of the test results with California Bearing Ratio have been published by various road authorities.

Description and Classification Methods

The methods of description and classification of soils and rocks used in this report are based on Australian Standard AS 1726, Geotechnical Site Investigations Code. In general, the descriptions include strength or density, colour, structure, soil or rock type and inclusions.

Soil Types

Soil types are described according to the predominant particle size, qualified by the grading of other particles present:

Type	Particle size (mm)
Boulder	>200
Cobble	63 - 200
Gravel	2.36 - 63
Sand	0.075 - 2.36
Silt	0.002 - 0.075
Clay	<0.002

The sand and gravel sizes can be further subdivided as follows:

Type	Particle size (mm)
Coarse gravel	20 - 63
Medium gravel	6 - 20
Fine gravel	2.36 - 6
Coarse sand	0.6 - 2.36
Medium sand	0.2 - 0.6
Fine sand	0.075 - 0.2

The proportions of secondary constituents of soils are described as:

Term	Proportion	Example
And	Specify	Clay (60%) and Sand (40%)
Adjective	20 - 35%	Sandy Clay
Slightly	12 - 20%	Slightly Sandy Clay
With some	5 - 12%	Clay with some sand
With a trace of	0 - 5%	Clay with a trace of sand

Definitions of grading terms used are:

- Well graded - a good representation of all particle sizes
- Poorly graded - an excess or deficiency of particular sizes within the specified range
- Uniformly graded - an excess of a particular particle size
- Gap graded - a deficiency of a particular particle size with the range

Cohesive Soils

Cohesive soils, such as clays, are classified on the basis of undrained shear strength. The strength may be measured by laboratory testing, or estimated by field tests or engineering examination. The strength terms are defined as follows:

Description	Abbreviation	Undrained shear strength (kPa)
Very soft	vs	<12
Soft	s	12 - 25
Firm	f	25 - 50
Stiff	st	50 - 100
Very stiff	vst	100 - 200
Hard	h	>200

Cohesionless Soils

Cohesionless soils, such as clean sands, are classified on the basis of relative density, generally from the results of standard penetration tests (SPT), cone penetration tests (CPT) or dynamic penetrometers (PSP). The relative density terms are given below:

Relative Density	Abbreviation	SPT N value	CPT qc value (MPa)
Very loose	vl	<4	<2
Loose	l	4 - 10	2 -5
Medium dense	md	10 - 30	5 - 15
Dense	d	30 - 50	15 - 25
Very dense	vd	>50	>25

Soil Descriptions

Soil Origin

It is often difficult to accurately determine the origin of a soil. Soils can generally be classified as:

- Residual soil - derived from in-situ weathering of the underlying rock;
- Transported soils - formed somewhere else and transported by nature to the site; or
- Filling - moved by man.

Transported soils may be further subdivided into:

- Alluvium - river deposits
- Lacustrine - lake deposits
- Aeolian - wind deposits
- Littoral - beach deposits
- Estuarine - tidal river deposits
- Talus - scree or coarse colluvium
- Slopewash or Colluvium - transported downslope by gravity assisted by water. Often includes angular rock fragments and boulders.

Rock Strength

Rock strength is defined by the Point Load Strength Index ($Is_{(50)}$) and refers to the strength of the rock substance and not the strength of the overall rock mass, which may be considerably weaker due to defects. The test procedure is described by Australian Standard 4133.4.1 - 1993. The terms used to describe rock strength are as follows:

Term	Abbreviation	Point Load Index $Is_{(50)}$ MPa	Approx Unconfined Compressive Strength MPa*
Extremely low	EL	<0.03	<0.6
Very low	VL	0.03 - 0.1	0.6 - 2
Low	L	0.1 - 0.3	2 - 6
Medium	M	0.3 - 1.0	6 - 20
High	H	1 - 3	20 - 60
Very high	VH	3 - 10	60 - 200
Extremely high	EH	>10	>200

* Assumes a ratio of 20:1 for UCS to $Is_{(50)}$

Degree of Weathering

The degree of weathering of rock is classified as follows:

Term	Abbreviation	Description
Extremely weathered	EW	Rock substance has soil properties, i.e. it can be remoulded and classified as a soil but the texture of the original rock is still evident.
Highly weathered	HW	Limonite staining or bleaching affects whole of rock substance and other signs of decomposition are evident. Porosity and strength may be altered as a result of iron leaching or deposition. Colour and strength of original fresh rock is not recognisable
Moderately weathered	MW	Staining and discolouration of rock substance has taken place
Slightly weathered	SW	Rock substance is slightly discoloured but shows little or no change of strength from fresh rock
Fresh stained	Fs	Rock substance unaffected by weathering but staining visible along defects
Fresh	Fr	No signs of decomposition or staining

Degree of Fracturing

The following classification applies to the spacing of natural fractures in diamond drill cores. It includes bedding plane partings, joints and other defects, but excludes drilling breaks.

Term	Description
Fragmented	Fragments of <20 mm
Highly Fractured	Core lengths of 20-40 mm with some fragments
Fractured	Core lengths of 40-200 mm with some shorter and longer sections
Slightly Fractured	Core lengths of 200-1000 mm with some shorter and loner sections
Unbroken	Core lengths mostly > 1000 mm

Rock Descriptions

Rock Quality Designation

The quality of the cored rock can be measured using the Rock Quality Designation (RQD) index, defined as:

$$\text{RQD \%} = \frac{\text{cumulative length of 'sound' core sections} \geq \text{100 mm long}}{\text{total drilled length of section being assessed}}$$

where 'sound' rock is assessed to be rock of low strength or better. The RQD applies only to natural fractures. If the core is broken by drilling or handling (i.e. drilling breaks) then the broken pieces are fitted back together and are not included in the calculation of RQD.

Stratification Spacing

For sedimentary rocks the following terms may be used to describe the spacing of bedding partings:

Term	Separation of Stratification Planes
Thinly laminated	< 6 mm
Laminated	6 mm to 20 mm
Very thinly bedded	20 mm to 60 mm
Thinly bedded	60 mm to 0.2 m
Medium bedded	0.2 m to 0.6 m
Thickly bedded	0.6 m to 2 m
Very thickly bedded	> 2 m

Symbols & Abbreviations

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Introduction

These notes summarise abbreviations commonly used on borehole logs and test pit reports.

Drilling or Excavation Methods

C	Core Drilling
R	Rotary drilling
SFA	Spiral flight augers
NMLC	Diamond core - 52 mm dia
NQ	Diamond core - 47 mm dia
HQ	Diamond core - 63 mm dia
PQ	Diamond core - 81 mm dia

Water

▷	Water seep
▽	Water level

Sampling and Testing

A	Auger sample
B	Bulk sample
D	Disturbed sample
E	Environmental sample
U_{50}	Undisturbed tube sample (50mm)
W	Water sample
pp	pocket penetrometer (kPa)
PID	Photo ionisation detector
PL	Point load strength Is(50) MPa
S	Standard Penetration Test
V	Shear vane (kPa)

Description of Defects in Rock

The abbreviated descriptions of the defects should be in the following order: Depth, Type, Orientation, Coating, Shape, Roughness and Other. Drilling and handling breaks are not usually included on the logs.

Defect Type

B	Bedding plane
Cs	Clay seam
Cv	Cleavage
Cz	Crushed zone
Ds	Decomposed seam
F	Fault
J	Joint
Lam	lamination
Pt	Parting
Sz	Sheared Zone
V	Vein

Orientation

The inclination of defects is always measured from the perpendicular to the core axis.

h	horizontal
v	vertical
sh	sub-horizontal
sv	sub-vertical

Coating or Infilling Term

cln	clean
co	coating
he	healed
inf	infilled
stn	stained
ti	tight
vn	veneer

Coating Descriptor

ca	calcite
cbs	carbonaceous
cly	clay
fe	iron oxide
mn	manganese
slt	silty

Shape

cu	curved
ir	irregular
pl	planar
st	stepped
un	undulating

Roughness

po	polished
ro	rough
sl	slickensided
sm	smooth
vr	very rough

Other

fg	fragmented
bnd	band
qtz	quartz

Symbols & Abbreviations

Graphic Symbols for Soil and Rock

General


Asphalt


Road base


Concrete


Filling

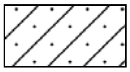
Soils


Topsoil

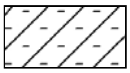

Peat


Clay

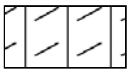

Silty clay

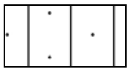

Sandy clay

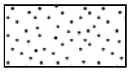

Gravelly clay

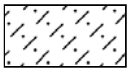

Shaly clay

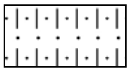

Silt


Clayey silt


Sandy silt

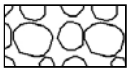

Sand

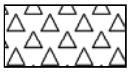

Clayey sand


Silty sand


Gravel


Sandy gravel


Cobbles, boulders

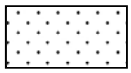

Talus

Sedimentary Rocks

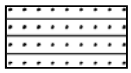

Boulder conglomerate

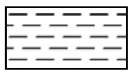

Conglomerate


Conglomeratic sandstone

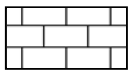

Sandstone


Siltstone


Laminite

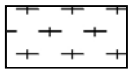

Mudstone, claystone, shale

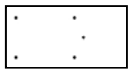

Coal


Limestone

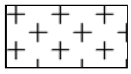
Metamorphic Rocks

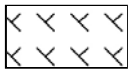

Slate, phyllite, schist

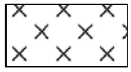

Gneiss

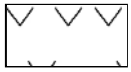

Quartzite

Igneous Rocks


Granite


Dolerite, basalt, andesite


Dacite, epidote


Tuff, breccia


Porphyry

Rego		Date		Site	Tip Site		Docket			Weight
XN27PT	UHS	20/03/2020	DSA	BELLVUE HILL	ORCHARD HILLS	SAND	091352		Tonnage	32.00
XN27PT	UHS	20/03/2020	DSA	BELLVUE HILL	ORCHARD HILLS	SAND	091352		Tonnage	32.00
CLH908	UHS	19/03/2020	DSA	BELLVUE HILL	ORCHARD HILLS	SAND	1065		Tonnage	31.00
CLH908	UHS	19/03/2020	DSA	BELLVUE HILL	ORCHARD HILLS	SAND	1065		Tonnage	31.00
CLH908	UHS	19/03/2020	DSA	BELLVUE HILL	ORCHARD HILLS	SAND	1065		Tonnage	31.00
CI20VO	UHS	19/03/2020	DSA	BELLVUE HILL	ORCHARD HILLS	SAND	0133		Tonnage	31.00
CI20VO	UHS	19/03/2020	DSA	BELLVUE HILL	ORCHARD HILLS	SAND	0133		Tonnage	31.00
CI20VO	UHS	19/03/2020	DSA	BELLVUE HILL	ORCHARD HILLS	SAND	0133		Tonnage	31.00
XN22CE	UHS	19/03/2020	DSA	BELLVUE HILL	ORCHARD HILLS	SAND	70		Tonnage	31.00
XN22CE	UHS	19/03/2020	DSA	BELLVUE HILL	ORCHARD HILLS	SAND	70		Tonnage	31.00
XN22CE	UHS	19/03/2020	DSA	BELLVUE HILL	ORCHARD HILLS	SAND	70		Tonnage	31.00
XN39MS	UHS	19/03/2020	DSA	BELLVUE HILL	ORCHARD HILLS	SAND	0628		Tonnage	31.00
XN39MS	UHS	19/03/2020	DSA	BELLVUE HILL	ORCHARD HILLS	SAND	0628		Tonnage	31.00
XN39MS	UHS	19/03/2020	DSA	BELLVUE HILL	ORCHARD HILLS	SAND	0628		Tonnage	31.00
CI20VO	UHS	20/03/2020	DSA	BELLVUE HILL	ORCHARD HILLS	SAND	72		Tonnage	31.00
CI20VO	UHS	20/03/2020	DSA	BELLVUE HILL	ORCHARD HILLS	SAND	72		Tonnage	31.00
CLH908	UHS	20/03/2020	DSA	BELLVUE HILL	ORCHARD HILLS	SAND	1067		Tonnage	31.00
CLH908	UHS	20/03/2020	DSA	BELLVUE HILL	ORCHARD HILLS	SAND	1067		Tonnage	31.00
BK34SH	UHS	20/03/2020	DSA	BELLVUE HILL	ORCHARD HILLS	SAND	136913		Tonnage	31.00
BK34SH	UHS	20/03/2020	DSA	BELLVUE HILL	ORCHARD HILLS	SAND	136913		Tonnage	31.00
CO00UH	UHS	20/03/2020	DSA	BELLVUE HILL	ORCHARD HILLS	SAND	5848		Tonnage	32.00
CO00UH	UHS	20/03/2020	DSA	BELLVUE HILL	ORCHARD HILLS	SAND	5848		Tonnage	32.00
									Total	**654.00**

JM Environments
0427 893 668
37 Tooke St
COOKS HILL NSW 2300
ABN 67 166 341 288

14 October 2019

Samuel Bell
Lendlease Samsung Bouygues Joint Venture
WestConnex M4-M5 Link Tunnels
Level 7, 189 O'Riordan Street
MASCOT, NSW 2020

Dear Samuel,

RE: JME18057-97 M4-M5 LINK TUNNEL SPOIL ORDER ASSESSMENT
PYRMONT BRIDGE ROAD CIVIL SITE

1 INTRODUCTION

JM Environments (JME) was commissioned by Lendlease Samsung Bouygues Joint Venture (LSBJV) to undertake an assessment of stockpiled material with reference to the M4-M5 Link tunnel spoil order 2019 (the Spoil Order).

The assessed material, understood to be tunnel spoil, was stockpiled in a large shed in the Pyrmont Bridge Road (PBR) compound located at 73 Pyrmont Bridge Road, Annandale NSW (see Figure 1).



Figure 1: Site location

1.1 M4-M5 Link Tunnel Spoil Order 2019

The NSW Environment Protection Authority (EPA) has provided a resource recovery exemption under clause 93 of the Protection of the Environment Operations (Waste) Regulation 2014. The Spoil Order applies to M4-M5 Link tunnel spoil, defined as approximately 3 million cubic meters of naturally occurring rock and soil (including but not limited to materials such as sandstone, shale, clay and soil) that:

(a) has been generated from the WestConnex M4-M5 Link Tunnel Project extending from Haberfield to St Peters;

(b) has been excavated by the use of machinery;

(c) contains no more than 0.2% w/w shotcrete;

(d) has not been contaminated with manufactured chemicals or process residues (except for shotcrete);

(e) does not meet the definition of virgin excavated natural material in the POEO Act; and

(f) may have been processed by intermediate waste facilities licensed by the EPA.

M4-M5 Link tunnel spoil does not include material that has been mixed with glass fibre plastic reinforced rods and bolts; or that contains asbestos, Acid Sulfate Soils (ASS), Potential Acid Sulfate soils (PASS) or sulfidic ores.

1.2 Scope of Work

The objective was to assess whether the material met the requirements of the Spoil Order. The following scope of work was undertaken:

- Field work including the collection of samples (including a QC sample), and observations of the material;
- Laboratory analysis;
- Tabulation of analytical results; and
- Preparation of this letter report.

2 FIELD WORK

Sampling was undertaken by a JME environmental scientist on 3 October 2019. During sampling operations, material was being exported from the stockpile.

The stockpile was estimated to contain approximately 2,000 tonnes of material. Five samples (1-5) were collected from safely accessible areas of the stockpile. Each sample was divided into two subsamples: one subsample was collected into a laboratory-supplied jar with a Teflon-lined lid, and the remainder was placed into a laboratory-supplied bulk sample bag. Subsamples were labelled with the same unique identifier. In addition, two samples (6 and 7) were collected from drier material in safely accessible areas of the stockpile. Samples 6 and 7 were collected in laboratory-supplied jars with Teflon-lined lids. Another sample (F) was collected in a laboratory-supplied jar with a Teflon-lined lid by LSBJV personnel directly from the tunnel face.

Samples were collected using disposable nitrile gloves which were changed between each sample. Jar samples were stored and transported on ice, and samples were delivered by JME to the laboratory for analysis.

3 ANALYTICAL SUITE

Jar samples 1-5 were analysed by SGS Australia Pty Ltd (SGS) for:

- Benzene, toluene, ethylbenzene and xylenes (BTEX);
- Polycyclic aromatic hydrocarbons (PAH), including benzo[a]pyrene (BaP);
- Total petroleum hydrocarbons (TPH);
- Heavy metals (arsenic, cadmium, chromium, copper, lead, nickel, zinc, and mercury);
- pH; and
- Electrical conductivity (EC).

Jar samples 6, 7 and F were analysed by SGS for:

- pH.

Samples in bulk bags were analysed by SGS for foreign materials by mass, including:

- Rubber, plastic, bitumen, paper, cloth, paint, wood and concrete.

Laboratory results are summarised in Summary Table LR1 (attached), and laboratory documentation is attached.

4 QUALITY ASSURANCE / QUALITY CONTROL

Samples were collected in appropriate laboratory-supplied containers, using a clean pair of disposable nitrile gloves which were changed between each sample. Jar samples were stored on ice, and received by the laboratory at a temperature of 8.5°C. Samples were delivered to the laboratory by JME under Chain of Custody (CoC) conditions, and received with sufficient time to undertake analyses within specified holding times.

During field sampling operations, a field duplicate sample was collected; it was later analysed by SGS to assess the repeatability of field sampling procedures. The relative percentage difference (RPD) of analyte concentrations between the duplicate and its primary sample were calculated to be below the acceptance criterion of 50% for concentrations greater than 5x the laboratory limit of reporting.

RPD results are included in Summary Table LR1 (attached).

SGS is NATA-certified for the analyses undertaken for this assessment. SGS conducted internal quality control using spikes, laboratory duplicates and method blanks. A review of SGS's data quality objectives (DQOs) for the analysis of soil samples indicated that DQOs were met.

Based on a review of the QA/QC data, it is considered that results are likely to be representative of conditions at the sampling locations at the time of sampling and are suitable for use in waste classification assessment.

5 RESULTS and DISCUSSION

5.1 Field Observations

Stockpiled material within the site shed was observed to comprise crushed light grey to light grey brown to yellow brown fine to medium grained quartzose sandstone, wet in parts, with some shotcrete and metal fibres (see Photographs 1 and 2).

ACM was not observed within the stockpiled material.



Photograph 1: Material stockpiled at Pyrmont Bridge Road compound



Photograph 2: PBR sample 2 showing shotcrete and metal fibres

5.2 Laboratory Results

Laboratory results for samples 1-5 were compared with background metal concentrations provided in:

- DA Berkman's Field Geologists' Manual (2001); and
- Australian and New Zealand Environment Conservation Council (ANZECC) and National Health and Medical Research Council (NHMRC) Australian and New Zealand Guidelines for the Assessment and Management of Contaminated Sites (1992).

Laboratory results did not indicate that the sampled material had been contaminated with manufactured chemicals or process residues.

pH values for samples 1-7 (collected from the shotcrete-impacted stockpile) ranged between 8.6 and 9.9 (alkaline). The pH value for sample F (collected directly from the tunnel face) was 7.1 (neutral).

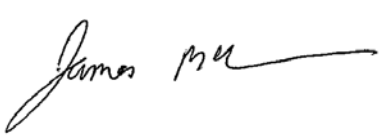
Laboratory results are summarised in Summary Table LR1 (attached), and laboratory documentation is attached.

6 CONCLUSION and RECOMMENDATIONS

Based on the data presented, JME considers that the stockpiled material meets the requirements of the Spoil Order, and must be disposed of at a site that is licensed to accept such material. Further to this, JME considers these results are indicative of material to be excavated from the same lithology using the same excavation methods.

We trust that this meets your requirements at this time. Should you have any questions, please do not hesitate to contact the undersigned.

For and on behalf of JM Environments





James McMahon
Licenced Asbestos Assessor LAA001286
Certified Environmental Practitioner/Site Contamination Specialist SC41110

Attachments

Summary Table LR1

Laboratory Documentation

LIMITATIONS

The findings contained in this report are the result of discrete/specific methodologies used in accordance with normal practices and standards. To the best of our knowledge, they represent

a reasonable interpretation of the general condition of the samples analysed. This report has been provided by JME for the benefit of LSBJV only.

Summary Table LR1

Laboratory Analysis

		Berkman [1] 1989	ANZECC [2]	Sample ID	1	QC1	Relative Percentage Difference	2	3	4	5	6	7	F
				Sample Date	3/10/2019	3/10/2019		3/10/2019	3/10/2019	3/10/2019	3/10/2019	3/10/2019	3/10/2019	3/10/2019
				Matrix	Soil	Soil		Soil	Soil	Soil	Soil	Soil	Soil	Soil
Analyte Name	**Units**			**Reporting Limit**	**Result**	**Result**		**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
Benzene	mg/kg	-	-	0.1	<0.1	<0.1	0%	<0.1	<0.1	<0.1	<0.1	N.A.	N.A.	N.A.
Toluene	mg/kg	-	-	0.1	<0.1	<0.1	0%	<0.1	<0.1	<0.1	<0.1	N.A.	N.A.	N.A.
Ethylbenzene	mg/kg	-	-	0.1	<0.1	<0.1	0%	<0.1	<0.1	<0.1	<0.1	N.A.	N.A.	N.A.
Total Xylenes	mg/kg	-	-	0.3	<0.3	<0.3	0%	<0.3	<0.3	<0.3	<0.3	N.A.	N.A.	N.A.
TRH C6-C9	mg/kg	-	-	20	<20	<20	0%	<20	<20	<20	<20	N.A.	N.A.	N.A.
TRH C10-C36 Total	mg/kg	-	-	110	<110	<110	0%	<110	<110	<110	<110	N.A.	N.A.	N.A.
Benzo(a)pyrene	mg/kg	-	-	0.1	<0.1	<0.1	0%	<0.1	<0.1	<0.1	<0.1	N.A.	N.A.	N.A.
Total PAH	mg/kg	-	-	0.8	<0.8	<0.8	0%	<0.8	<0.8	<0.8	<0.8	N.A.	N.A.	N.A.
pH	pH Units	-	-	0.1	**9.1**	N.A.	N.A.	**9.7**	**9.5**	**9.3**	**9.9**	**9.6**	**8.6**	**7.1**
Conductivity	µS/cm	-	-	1	**190**	N.A.	N.A.	**200**	**170**	**150**	**240**	N.A.	N.A.	N.A.
Arsenic, As	mg/kg	1-50	0.2-30	1	<1	<1	0%	<1	<1	<1	<1	N.A.	N.A.	N.A.
Cadmium, Cd	mg/kg	1	0.04-2	0.3	<0.3	<0.3	0%	<0.3	<0.3	<0.3	<0.3	N.A.	N.A.	N.A.
Chromium, Cr	mg/kg	5-1000	0.5-110	0.5	**4.0**	**4.1**	2%	**4.4**	**4.7**	**4.9**	**4.8**	N.A.	N.A.	N.A.
Copper, Cu	mg/kg	2-100	1-190	0.5	**2.5**	**3.4**	31%	**3.9**	**1.4**	**0.6**	**2.0**	N.A.	N.A.	N.A.
Lead, Pb	mg/kg	2-200	<2-200	1	**8**	**7**	13%	**11**	**8**	**6**	**10**	N.A.	N.A.	N.A.
Nickel, Ni	mg/kg	5-500	2-400	0.5	**3.3**	**3.5**	6%	**3.1**	**3.1**	**3.2**	**3.4**	N.A.	N.A.	N.A.
Zinc, Zn	mg/kg	10-300	2-180	0.5	**28**	**36**	25%	**20**	**17**	**14**	**19**	N.A.	N.A.	N.A.
Mercury	mg/kg	0.03	0.001-0.1	0.05	<0.05	<0.05	0%	<0.05	<0.05	<0.05	<0.05	N.A.	N.A.	N.A.
Rubber, plastic, bitumen, paper, cloth, paint and wood	%w/w	-	-	0.04	<0.04	N.A.	N.A.	<0.04	<0.04	<0.04	<0.04	N.A.	N.A.	N.A.

1 DA Berkman (1989) Field Geologists Manual

2 ANZECC/NHMRC (1992) Australian and New Zealand Guidelines for the Assessment and Management of Contaminated Sites, Environmental Soil Quality Guidelines Background A [ANZECC A]

source: [Untitled].pdf page: 3 SGS Ref: SE198406_COC

CHAIN OF CUSTODY & ANALYSIS REQUEST

SGS Environmental Services Sydney
Unit 16, 33 Maddox Street
Alexandria NSW 2015
Facsimile No: (02) 85940499
Telephone No: (02) 85940400
Email:
au.samplereceipt.sydney@sgs.com

Sample Date: 3/10/19

Company Name:	JM Environments	Project Name/No:	JME18057-97
Address:	37 Tooke St	Purchase Order No:	JME18057-97
	COOKS HILL NSW 2300	Results Required By:	Standard
Contact Name:	James McMahon	Email:	johnh@jmenvironments.com
Telephone	0427 893 668	Email:	james@jmenvironments.com

Relinquished by: J Howard	Date /Time: 3/10/19	Received by: B. Bahng	Date /Time: 03/10/19 @ 3:30
Relinquished by:	Date /Time:	Received by:	Date /Time:
Samples intact: Yes/No	Temperature:	Sample Cooler Sealed: Yes/No	Laboratory Quotation: JM EN_EERHEL 2016 V4 M4M5

Lab Sample ID	Sample ID	Water	Soil	Other	Preservative	No. of Containers		pH/[illegible]	BTEX/TPH/ PAH/ 8HM	8HM	OCP/PCB	Asbestos	ENM Soil					Comments
1	1		X			2							X					
2	2		X			2							X					
3	3		X			2							X					
4	4		X			2							X					
5	5		X			2							X					
6	6		X			1		X										
7	7		X			1		X										
8	F		X			1		X										
9	QC		X			1			X									

SGS EHS Alexandria Laboratory

SE198406 COC
Received: 03 – Oct – 2019

SAMPLE RECEIPT ADVICE

SE198406

CLIENT DETAILS

Contact	James McMahon
Client	JM ENVIRONMENTS
Address	37 TOOKE STREET COOKS HILL NSW 2300
Telephone	0427 893 668
Facsimile	(Not specified)
Email	james@jmenvironments.com
Project	**JME18057-97**
Order Number	**JME18057-97**
Samples	9

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
Samples Received	Thu 3/10/2019
Report Due	Fri 11/10/2019
SGS Reference	**SE198406**

SUBMISSION DETAILS

This is to confirm that 9 samples were received on Thursday 3/10/2019. Results are expected to be ready by COB Friday 11/10/2019. Please quote SGS reference SE198406 when making enquiries. Refer below for details relating to sample integrity upon receipt.

Samples clearly labelled	Yes	Complete documentation received	Yes
Sample container provider	SGS	Sample cooling method	Ice
Samples received in correct containers	Yes	Sample counts by matrix	9 Soil
Date documentation received	3/10/2019	Type of documentation received	COC
Samples received in good order	Yes	Samples received without headspace	Yes
Sample temperature upon receipt	8.5°C	Sufficient sample for analysis	Yes
Turnaround time requested	Standard		

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

COMMENTS

This document is issued by the Company under its General Conditions of Service accessible at www.sgs.com/en/Terms-and-Conditions.aspx. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein.

SAMPLE RECEIPT ADVICE

SE198406

CLIENT DETAILS

Client JM ENVIRONMENTS

Project JME18057-97

SUMMARY OF ANALYSIS

No.	Sample ID	Conductivity and TDS by Calculation - Soil	PAH (Polynuclear Aromatic Hydrocarbons) in Soil	pH in soil (1:5)	Total Recoverable Elements in Soil/Waste	TRH (Total Recoverable Hydrocarbons) in Soil	VOC's in Soil	Volatile Petroleum Hydrocarbons in Soil
001	1	1	26	1	7	10	11	7
002	2	1	26	1	7	10	11	7
003	3	1	26	1	7	10	11	7
004	4	1	26	1	7	10	11	7
005	5	1	26	1	7	10	11	7
006	6	-	-	1	-	-	-	-
007	7	-	-	1	-	-	-	-
008	F	-	-	1	-	-	-	-
009	QC1	-	26	-	7	10	11	7

CONTINUED OVERLEAF

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

SAMPLE RECEIPT ADVICE

SE198406

CLIENT DETAILS

Client JM ENVIRONMENTS

Project JME18057-97

SUMMARY OF ANALYSIS

No.	Sample ID	Foreign Materials Content of Soils	Mercury in Soil	Moisture Content
001	1	8	1	1
002	2	8	1	1
003	3	8	1	1
004	4	8	1	1
005	5	8	1	1
009	QC1	-	1	1

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

ANALYTICAL REPORT

Accreditation No. 2562

CLIENT DETAILS

Contact	James McMahon
Client	JM ENVIRONMENTS
Address	37 TOOKE STREET COOKS HILL NSW 2300
Telephone	0427 893 668
Facsimile	(Not specified)
Email	james@jmenvironments.com
Project	**JME18057-97**
Order Number	**JME18057-97**
Samples	9

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
SGS Reference	**SE198406 R0**
Date Received	3/10/2019
Date Reported	11/10/2019

COMMENTS

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

Foreign Material Content of sample supplied analysed by Bennel Jiri.

SIGNATORIES

Dong LIANG
Metals/Inorganics Team Leader

Ly Kim HA
Organic Section Head

Ravee SIVASUBRAMANIAM
Hygiene Team Leader

Shane MCDERMOTT
Inorganic/Metals Chemist

VOC's in Soil [AN433] Tested: 4/10/2019

PARAMETER	UOM	LOR	1 SOIL - 3/10/2019 SE198406.001	2 SOIL - 3/10/2019 SE198406.002	3 SOIL - 3/10/2019 SE198406.003	4 SOIL - 3/10/2019 SE198406.004	5 SOIL - 3/10/2019 SE198406.005
Benzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Ethylbenzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
m/p-xylene	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
o-xylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Xylenes	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Total BTEX	mg/kg	0.6	<0.6	<0.6	<0.6	<0.6	<0.6

PARAMETER	UOM	LOR	QC1 SOIL - 3/10/2019 SE198406.009
Benzene	mg/kg	0.1	<0.1
Toluene	mg/kg	0.1	<0.1
Ethylbenzene	mg/kg	0.1	<0.1
m/p-xylene	mg/kg	0.2	<0.2
o-xylene	mg/kg	0.1	<0.1
Naphthalene	mg/kg	0.1	<0.1
Total Xylenes	mg/kg	0.3	<0.3
Total BTEX	mg/kg	0.6	<0.6

Volatile Petroleum Hydrocarbons in Soil [AN433] Tested: 4/10/2019

PARAMETER	UOM	LOR	1 SOIL - 3/10/2019 SE198406.001	2 SOIL - 3/10/2019 SE198406.002	3 SOIL - 3/10/2019 SE198406.003	4 SOIL - 3/10/2019 SE198406.004	5 SOIL - 3/10/2019 SE198406.005
Benzene (F0)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TRH C6-C9	mg/kg	20	<20	<20	<20	<20	<20
TRH C6-C10	mg/kg	25	<25	<25	<25	<25	<25
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	<25	<25	<25

PARAMETER	UOM	LOR	QC1 SOIL - 3/10/2019 SE198406.009
Benzene (F0)	mg/kg	0.1	<0.1
TRH C6-C9	mg/kg	20	<20
TRH C6-C10	mg/kg	25	<25
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25

TRH (Total Recoverable Hydrocarbons) in Soil [AN403] Tested: 4/10/2019

PARAMETER	UOM	LOR	1 SOIL - 3/10/2019 SE198406.001	2 SOIL - 3/10/2019 SE198406.002	3 SOIL - 3/10/2019 SE198406.003	4 SOIL - 3/10/2019 SE198406.004	5 SOIL - 3/10/2019 SE198406.005
TRH C10-C14	mg/kg	20	<20	<20	<20	<20	<20
TRH C15-C28	mg/kg	45	**53**	**62**	<45	<45	<45
TRH C29-C36	mg/kg	45	<45	<45	<45	<45	<45
TRH C37-C40	mg/kg	100	<100	<100	<100	<100	<100
TRH >C10-C16	mg/kg	25	<25	<25	<25	<25	<25
TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25	<25	<25	<25	<25
TRH >C16-C34 (F3)	mg/kg	90	<90	<90	<90	<90	<90
TRH >C34-C40 (F4)	mg/kg	120	<120	<120	<120	<120	<120
TRH C10-C36 Total	mg/kg	110	<110	<110	<110	<110	<110
TRH C10-C40 Total (F bands)	mg/kg	210	<210	<210	<210	<210	<210

PARAMETER	UOM	LOR	QC1 SOIL - 3/10/2019 SE198406.009
TRH C10-C14	mg/kg	20	<20
TRH C15-C28	mg/kg	45	**49**
TRH C29-C36	mg/kg	45	<45
TRH C37-C40	mg/kg	100	<100
TRH >C10-C16	mg/kg	25	<25
TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25
TRH >C16-C34 (F3)	mg/kg	90	<90
TRH >C34-C40 (F4)	mg/kg	120	<120
TRH C10-C36 Total	mg/kg	110	<110
TRH C10-C40 Total (F bands)	mg/kg	210	<210

PAH (Polynuclear Aromatic Hydrocarbons) in Soil [AN420] Tested: 4/10/2019

PARAMETER	UOM	LOR	1 SOIL - 3/10/2019 SE198406.001	2 SOIL - 3/10/2019 SE198406.002	3 SOIL - 3/10/2019 SE198406.003	4 SOIL - 3/10/2019 SE198406.004	5 SOIL - 3/10/2019 SE198406.005
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Total PAH (18)	mg/kg	0.8	<0.8	<0.8	<0.8	<0.8	<0.8
Total PAH (NEPM/WHO 16)	mg/kg	0.8	<0.8	<0.8	<0.8	<0.8	<0.8

PARAMETER	UOM	LOR	QC1 SOIL - 3/10/2019 SE198406.009
Naphthalene	mg/kg	0.1	<0.1
2-methylnaphthalene	mg/kg	0.1	<0.1
1-methylnaphthalene	mg/kg	0.1	<0.1
Acenaphthylene	mg/kg	0.1	<0.1
Acenaphthene	mg/kg	0.1	<0.1
Fluorene	mg/kg	0.1	<0.1
Phenanthrene	mg/kg	0.1	<0.1
Anthracene	mg/kg	0.1	<0.1
Fluoranthene	mg/kg	0.1	<0.1
Pyrene	mg/kg	0.1	<0.1
Benzo(a)anthracene	mg/kg	0.1	<0.1
Chrysene	mg/kg	0.1	<0.1
Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1
Benzo(k)fluoranthene	mg/kg	0.1	<0.1
Benzo(a)pyrene	mg/kg	0.1	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1
Dibenzo(ah)anthracene	mg/kg	0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.1	<0.1
Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.2	<0.2
Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	<0.3
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	<0.2
Total PAH (18)	mg/kg	0.8	<0.8
Total PAH (NEPM/WHO 16)	mg/kg	0.8	<0.8

pH in soil (1:5) [AN101] Tested: 10/10/2019

PARAMETER	UOM	LOR	1 SOIL - 3/10/2019 SE198406.001	2 SOIL - 3/10/2019 SE198406.002	3 SOIL - 3/10/2019 SE198406.003	4 SOIL - 3/10/2019 SE198406.004	5 SOIL - 3/10/2019 SE198406.005
pH	pH Units	0.1	**9.1**	**9.7**	**9.5**	**9.3**	**9.9**

PARAMETER	UOM	LOR	6 SOIL - 3/10/2019 SE198406.006	7 SOIL - 3/10/2019 SE198406.007	F SOIL - 3/10/2019 SE198406.008
pH	pH Units	0.1	**9.6**	**8.6**	**7.1**

Conductivity and TDS by Calculation - Soil [AN106] Tested: 10/10/2019

PARAMETER	UOM	LOR	1 SOIL - 3/10/2019 SE198406.001	2 SOIL - 3/10/2019 SE198406.002	3 SOIL - 3/10/2019 SE198406.003	4 SOIL - 3/10/2019 SE198406.004	5 SOIL - 3/10/2019 SE198406.005
Conductivity of Extract (1:5 dry sample basis)	µS/cm	1	190	200	170	150	240

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES [AN040/AN320] Tested: 4/10/2019

PARAMETER	UOM	LOR	1 SOIL - 3/10/2019 SE198406.001	2 SOIL - 3/10/2019 SE198406.002	3 SOIL - 3/10/2019 SE198406.003	4 SOIL - 3/10/2019 SE198406.004	5 SOIL - 3/10/2019 SE198406.005
Arsenic, As	mg/kg	1	<1	<1	<1	<1	<1
Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Chromium, Cr	mg/kg	0.5	4.0	4.4	4.7	4.9	4.8
Copper, Cu	mg/kg	0.5	2.5	3.9	1.4	0.6	2.0
Lead, Pb	mg/kg	1	8	11	8	6	10
Nickel, Ni	mg/kg	0.5	3.3	3.1	3.1	3.2	3.4
Zinc, Zn	mg/kg	0.5	28	20	17	14	19

PARAMETER	UOM	LOR	QC1 SOIL - 3/10/2019 SE198406.009
Arsenic, As	mg/kg	1	<1
Cadmium, Cd	mg/kg	0.3	<0.3
Chromium, Cr	mg/kg	0.5	4.1
Copper, Cu	mg/kg	0.5	3.4
Lead, Pb	mg/kg	1	7
Nickel, Ni	mg/kg	0.5	3.5
Zinc, Zn	mg/kg	0.5	36

Mercury in Soil [AN312] Tested: 4/10/2019

PARAMETER	UOM	LOR	1 SOIL - 3/10/2019 SE198406.001	2 SOIL - 3/10/2019 SE198406.002	3 SOIL - 3/10/2019 SE198406.003	4 SOIL - 3/10/2019 SE198406.004	5 SOIL - 3/10/2019 SE198406.005
Mercury	mg/kg	0.05	<0.05	<0.05	<0.05	<0.05	<0.05

PARAMETER	UOM	LOR	QC1 SOIL - 3/10/2019 SE198406.009
Mercury	mg/kg	0.05	<0.05

Moisture Content [AN002] Tested: 4/10/2019

PARAMETER	UOM	LOR	1 SOIL - 3/10/2019 SE198406.001	2 SOIL - 3/10/2019 SE198406.002	3 SOIL - 3/10/2019 SE198406.003	4 SOIL - 3/10/2019 SE198406.004	5 SOIL - 3/10/2019 SE198406.005
% Moisture	%w/w	1	**12.3**	**10.7**	**9.6**	**7.8**	**11.8**

PARAMETER	UOM	LOR	QC1 SOIL - 3/10/2019 SE198406.009
% Moisture	%w/w	1	**12.0**

Foreign Materials Content of Soils [AN030] Tested: 9/10/2019

PARAMETER	UOM	LOR	1 SOIL - 3/10/2019 SE198406.001	2 SOIL - 3/10/2019 SE198406.002	3 SOIL - 3/10/2019 SE198406.003	4 SOIL - 3/10/2019 SE198406.004	5 SOIL - 3/10/2019 SE198406.005
Rubber Weight (%)*	%w/w	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Plastic Weight (%)*	%w/w	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Bitumen Weight (%)*	%w/w	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Paper Weight (%)*	%w/w	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cloth Weight (%)*	%w/w	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Paint Weight (%)*	%w/w	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Wood Weight (%)*	%w/w	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Total Type 3*	%w/w	0.04	<0.04	<0.04	<0.04	<0.04	<0.04

METHOD	METHODOLOGY SUMMARY
AN002	The test is carried out by drying (at either 40°C or 105°C) a known mass of sample in a weighed evaporating basin. After fully dry the sample is re-weighed. Samples such as sludge and sediment having high percentages of moisture will take some time in a drying oven for complete removal of water.
AN030	A sample is dried at 50 - 60°C, sieved and separated into lots. The three types of foreign material are determined. The weights of each type are calculated as a percentage of the entire dry sample weight (including material passing 4.75mm sieve). Based on RTA test method T276. Type I: Metal, Glass, Asphalt, Stone, Ceramics and Slag (other than blast furnace slag) Type II: Plaster, Clay lumps and other Friable Material Type III: Rubber, Plastic, Bitumen, Paper, Cloth, Paint, Wood
AN040/AN320	A portion of sample is digested with nitric acid to decompose organic matter and hydrochloric acid to complete the digestion of metals. The digest is then analysed by ICP OES with metals results reported on the dried sample basis. Based on USEPA method 200.8 and 6010C.
AN040	A portion of sample is digested with Nitric acid to decompose organic matter and Hydrochloric acid to complete the digestion of metals and then filtered for analysis by ASS or ICP as per USEPA Method 200.8.
AN101	pH in Soil Sludge Sediment and Water: pH is measured electrometrically using a combination electrode and is calibrated against 3 buffers purchased commercially. For soils, sediments and sludges, an extract with water (or 0.01M CaCl2) is made at a ratio of 1:5 and the pH determined and reported on the extract. Reference APHA 4500-H+.
AN106	Conductivity and TDS by Calculation: Conductivity is measured by meter with temperature compensation and is calibrated against a standard solution of potassium chloride. Conductivity is generally reported as µmhos/cm or µS/cm @ 25°C. For soils, an extract with water is made at a ratio of 1:5 and the EC determined and reported on the extract, or calculated back to the as-received sample. Salinity can be estimated from conductivity using a conversion factor, which for natural waters, is in the range 0.55 to 0.75. Reference APHA 2510 B.
AN312	Mercury by Cold Vapour AAS in Soils: After digestion with nitric acid, hydrogen peroxide and hydrochloric acid, mercury ions are reduced by stannous chloride reagent in acidic solution to elemental mercury. This mercury vapour is purged by nitrogen into a cold cell in an atomic absorption spectrometer or mercury analyser. Quantification is made by comparing absorbances to those of the calibration standards. Reference APHA 3112/3500
AN403	Total Recoverable Hydrocarbons: Determination of Hydrocarbons by gas chromatography after a solvent extraction. Detection is by flame ionisation detector (FID) that produces an electronic signal in proportion to the combustible matter passing through it. Total Recoverable Hydrocarbons (TRH) are routinely reported as four alkane groupings based on the carbon chain length of the compounds: C6-C9, C10-C14, C15-C28 and C29-C36 and in recognition of the NEPM 1999 (2013), >C10-C16 (F2), >C16-C34 (F3) and >C34-C40 (F4). F2 is reported directly and also corrected by subtracting Naphthalene (from VOC method AN433) where available.
AN403	Additionally, the volatile C6-C9 fraction may be determined by a purge and trap technique and GC/MS because of the potential for volatiles loss. Total Recoverable Hydrocarbons - Silica (TRH-Si) follows the same method of analysis after silica gel cleanup of the solvent extract. Aliphatic/Aromatic Speciation follows the same method of analysis after fractionation of the solvent extract over silica with differential polarity of the eluent solvents.
AN403	The GC/FID method is not well suited to the analysis of refined high boiling point materials (ie lubricating oils or greases) but is particularly suited for measuring diesel, kerosene and petrol if care to control volatility is taken. This method will detect naturally occurring hydrocarbons, lipids, animal fats, phenols and PAHs if they are present at sufficient levels, dependent on the use of specific cleanup/fractionation techniques. Reference USEPA 3510B, 8015B.
AN420	(SVOCs) including OC, OP, PCB, Herbicides, PAH, Phthalates and Speciated Phenols (etc) in soils, sediments and waters are determined by GCMS/ECD technique following appropriate solvent extraction process (Based on USEPA 3500C and 8270D).
AN420	Carcinogenic PAHs may be expressed as Benzo(a)pyrene equivalents by applying the BaP toxicity equivalence factor (NEPM 1999, June 2013, B7). These can be reported as the individual PAHs and as a sum of carcinogenic PAHs. The sum is reported three ways, the first assuming all <LOR results are zero, the second assuming all < LOR results are half the LOR and the third assuming all <LOR results are the LOR.
AN433	VOCs and C6-C9 Hydrocarbons by GC-MS P&T: VOC`s are volatile organic compounds. The sample is presented to a gas chromatograph via a purge and trap (P&T) concentrator and autosampler and is detected with a Mass Spectrometer (MSD). Solid samples are initially extracted with methanol whilst liquid samples are processed directly. References: USEPA 5030B, 8020A, 8260.

FOOTNOTES

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

Unless it is reported that sampling has been performed by SGS, the samples have been analysed as received.
Solid samples expressed on a dry weight basis.

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

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

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

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

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

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

The QC and MU criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here: www.sgs.com.au.pv.sgsvr/en-gb/environment.

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STATEMENT OF QA/QC PERFORMANCE

SE198406 R0

CLIENT DETAILS

Contact	James McMahon
Client	JM ENVIRONMENTS
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Telephone	0427 893 668
Facsimile	(Not specified)
Email	james@jmenvironments.com
Project	**JME18057-97**
Order Number	**JME18057-97**
Samples	9

LABORATORY DETAILS

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Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
SGS Reference	**SE198406 R0**
Date Received	03 Oct 2019
Date Reported	11 Oct 2019

COMMENTS

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

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

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

Analysis Date	Moisture Content	6 items

SAMPLE SUMMARY

Samples clearly labelled	Yes	Complete documentation received	Yes
Sample container provider	SGS	Sample cooling method	Ice
Samples received in correct containers	Yes	Sample counts by matrix	9 Soil
Date documentation received	3/10/2019	Type of documentation received	COC
Samples received in good order	Yes	Samples received without headspace	Yes
Sample temperature upon receipt	8.5°C	Sufficient sample for analysis	Yes
Turnaround time requested	Standard		

HOLDING TIME SUMMARY

SE198406 R0

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

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

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

Conductivity and TDS by Calculation - Soil

Method: ME-(AU)-[ENV]AN106

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
1	SE198406.001	LB185013	03 Oct 2019	03 Oct 2019	10 Oct 2019	10 Oct 2019	10 Oct 2019	10 Oct 2019
2	SE198406.002	LB185013	03 Oct 2019	03 Oct 2019	10 Oct 2019	10 Oct 2019	10 Oct 2019	10 Oct 2019
3	SE198406.003	LB185013	03 Oct 2019	03 Oct 2019	10 Oct 2019	10 Oct 2019	10 Oct 2019	10 Oct 2019
4	SE198406.004	LB185013	03 Oct 2019	03 Oct 2019	10 Oct 2019	10 Oct 2019	10 Oct 2019	10 Oct 2019
5	SE198406.005	LB185013	03 Oct 2019	03 Oct 2019	10 Oct 2019	10 Oct 2019	10 Oct 2019	10 Oct 2019
6	SE198406.006	LB185013	03 Oct 2019	03 Oct 2019	10 Oct 2019	10 Oct 2019	10 Oct 2019	10 Oct 2019
7	SE198406.007	LB185013	03 Oct 2019	03 Oct 2019	10 Oct 2019	10 Oct 2019	10 Oct 2019	10 Oct 2019
F	SE198406.008	LB185013	03 Oct 2019	03 Oct 2019	10 Oct 2019	10 Oct 2019	10 Oct 2019	10 Oct 2019

Foreign Materials Content of Soils

Method: ME-(AU)-[ENV]AN030

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
1	SE198406.001	LB184961	03 Oct 2019	03 Oct 2019	31 Oct 2019	09 Oct 2019	31 Oct 2019	11 Oct 2019
2	SE198406.002	LB184961	03 Oct 2019	03 Oct 2019	31 Oct 2019	09 Oct 2019	31 Oct 2019	11 Oct 2019
3	SE198406.003	LB184961	03 Oct 2019	03 Oct 2019	31 Oct 2019	09 Oct 2019	31 Oct 2019	11 Oct 2019
4	SE198406.004	LB184961	03 Oct 2019	03 Oct 2019	31 Oct 2019	09 Oct 2019	31 Oct 2019	11 Oct 2019
5	SE198406.005	LB184961	03 Oct 2019	03 Oct 2019	31 Oct 2019	09 Oct 2019	31 Oct 2019	11 Oct 2019

Mercury in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
1	SE198406.001	LB184769	03 Oct 2019	03 Oct 2019	31 Oct 2019	04 Oct 2019	31 Oct 2019	10 Oct 2019
2	SE198406.002	LB184769	03 Oct 2019	03 Oct 2019	31 Oct 2019	04 Oct 2019	31 Oct 2019	10 Oct 2019
3	SE198406.003	LB184769	03 Oct 2019	03 Oct 2019	31 Oct 2019	04 Oct 2019	31 Oct 2019	10 Oct 2019
4	SE198406.004	LB184769	03 Oct 2019	03 Oct 2019	31 Oct 2019	04 Oct 2019	31 Oct 2019	10 Oct 2019
5	SE198406.005	LB184769	03 Oct 2019	03 Oct 2019	31 Oct 2019	04 Oct 2019	31 Oct 2019	10 Oct 2019
QC1	SE198406.009	LB184769	03 Oct 2019	03 Oct 2019	31 Oct 2019	04 Oct 2019	31 Oct 2019	10 Oct 2019

Moisture Content

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
1	SE198406.001	LB184714	03 Oct 2019	03 Oct 2019	17 Oct 2019	04 Oct 2019	09 Oct 2019	10 Oct 2019†
2	SE198406.002	LB184714	03 Oct 2019	03 Oct 2019	17 Oct 2019	04 Oct 2019	09 Oct 2019	10 Oct 2019†
3	SE198406.003	LB184714	03 Oct 2019	03 Oct 2019	17 Oct 2019	04 Oct 2019	09 Oct 2019	10 Oct 2019†
4	SE198406.004	LB184714	03 Oct 2019	03 Oct 2019	17 Oct 2019	04 Oct 2019	09 Oct 2019	10 Oct 2019†
5	SE198406.005	LB184714	03 Oct 2019	03 Oct 2019	17 Oct 2019	04 Oct 2019	09 Oct 2019	10 Oct 2019†
QC1	SE198406.009	LB184714	03 Oct 2019	03 Oct 2019	17 Oct 2019	04 Oct 2019	09 Oct 2019	10 Oct 2019†

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
1	SE198406.001	LB184711	03 Oct 2019	03 Oct 2019	17 Oct 2019	04 Oct 2019	13 Nov 2019	11 Oct 2019
2	SE198406.002	LB184711	03 Oct 2019	03 Oct 2019	17 Oct 2019	04 Oct 2019	13 Nov 2019	11 Oct 2019
3	SE198406.003	LB184711	03 Oct 2019	03 Oct 2019	17 Oct 2019	04 Oct 2019	13 Nov 2019	11 Oct 2019
4	SE198406.004	LB184711	03 Oct 2019	03 Oct 2019	17 Oct 2019	04 Oct 2019	13 Nov 2019	11 Oct 2019
5	SE198406.005	LB184711	03 Oct 2019	03 Oct 2019	17 Oct 2019	04 Oct 2019	13 Nov 2019	11 Oct 2019
QC1	SE198406.009	LB184711	03 Oct 2019	03 Oct 2019	17 Oct 2019	04 Oct 2019	13 Nov 2019	11 Oct 2019

pH in soil (1:5)

Method: ME-(AU)-[ENV]AN101

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
1	SE198406.001	LB185013	03 Oct 2019	03 Oct 2019	10 Oct 2019	10 Oct 2019	11 Oct 2019	10 Oct 2019
2	SE198406.002	LB185013	03 Oct 2019	03 Oct 2019	10 Oct 2019	10 Oct 2019	11 Oct 2019	10 Oct 2019
3	SE198406.003	LB185013	03 Oct 2019	03 Oct 2019	10 Oct 2019	10 Oct 2019	11 Oct 2019	10 Oct 2019
4	SE198406.004	LB185013	03 Oct 2019	03 Oct 2019	10 Oct 2019	10 Oct 2019	11 Oct 2019	10 Oct 2019
5	SE198406.005	LB185013	03 Oct 2019	03 Oct 2019	10 Oct 2019	10 Oct 2019	11 Oct 2019	10 Oct 2019
6	SE198406.006	LB185013	03 Oct 2019	03 Oct 2019	10 Oct 2019	10 Oct 2019	11 Oct 2019	10 Oct 2019
7	SE198406.007	LB185013	03 Oct 2019	03 Oct 2019	10 Oct 2019	10 Oct 2019	11 Oct 2019	10 Oct 2019
F	SE198406.008	LB185013	03 Oct 2019	03 Oct 2019	10 Oct 2019	10 Oct 2019	11 Oct 2019	10 Oct 2019

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

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
1	SE198406.001	LB184770	03 Oct 2019	03 Oct 2019	31 Mar 2020	04 Oct 2019	31 Mar 2020	10 Oct 2019
2	SE198406.002	LB184770	03 Oct 2019	03 Oct 2019	31 Mar 2020	04 Oct 2019	31 Mar 2020	10 Oct 2019
3	SE198406.003	LB184770	03 Oct 2019	03 Oct 2019	31 Mar 2020	04 Oct 2019	31 Mar 2020	10 Oct 2019
4	SE198406.004	LB184770	03 Oct 2019	03 Oct 2019	31 Mar 2020	04 Oct 2019	31 Mar 2020	10 Oct 2019
5	SE198406.005	LB184770	03 Oct 2019	03 Oct 2019	31 Mar 2020	04 Oct 2019	31 Mar 2020	10 Oct 2019
QC1	SE198406.009	LB184770	03 Oct 2019	03 Oct 2019	31 Mar 2020	04 Oct 2019	31 Mar 2020	10 Oct 2019

HOLDING TIME SUMMARY

SE198406 R0

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

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

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

TRH (Total Recoverable Hydrocarbons) in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
1	SE198406.001	LB184711	03 Oct 2019	03 Oct 2019	17 Oct 2019	04 Oct 2019	13 Nov 2019	10 Oct 2019
2	SE198406.002	LB184711	03 Oct 2019	03 Oct 2019	17 Oct 2019	04 Oct 2019	13 Nov 2019	10 Oct 2019
3	SE198406.003	LB184711	03 Oct 2019	03 Oct 2019	17 Oct 2019	04 Oct 2019	13 Nov 2019	10 Oct 2019
4	SE198406.004	LB184711	03 Oct 2019	03 Oct 2019	17 Oct 2019	04 Oct 2019	13 Nov 2019	10 Oct 2019
5	SE198406.005	LB184711	03 Oct 2019	03 Oct 2019	17 Oct 2019	04 Oct 2019	13 Nov 2019	10 Oct 2019
QC1	SE198406.009	LB184711	03 Oct 2019	03 Oct 2019	17 Oct 2019	04 Oct 2019	13 Nov 2019	10 Oct 2019

VOC's in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
1	SE198406.001	LB184707	03 Oct 2019	03 Oct 2019	17 Oct 2019	04 Oct 2019	13 Nov 2019	10 Oct 2019
2	SE198406.002	LB184707	03 Oct 2019	03 Oct 2019	17 Oct 2019	04 Oct 2019	13 Nov 2019	10 Oct 2019
3	SE198406.003	LB184707	03 Oct 2019	03 Oct 2019	17 Oct 2019	04 Oct 2019	13 Nov 2019	10 Oct 2019
4	SE198406.004	LB184707	03 Oct 2019	03 Oct 2019	17 Oct 2019	04 Oct 2019	13 Nov 2019	10 Oct 2019
5	SE198406.005	LB184707	03 Oct 2019	03 Oct 2019	17 Oct 2019	04 Oct 2019	13 Nov 2019	10 Oct 2019
QC1	SE198406.009	LB184707	03 Oct 2019	03 Oct 2019	17 Oct 2019	04 Oct 2019	13 Nov 2019	10 Oct 2019

Volatile Petroleum Hydrocarbons in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
1	SE198406.001	LB184707	03 Oct 2019	03 Oct 2019	17 Oct 2019	04 Oct 2019	13 Nov 2019	10 Oct 2019
2	SE198406.002	LB184707	03 Oct 2019	03 Oct 2019	17 Oct 2019	04 Oct 2019	13 Nov 2019	10 Oct 2019
3	SE198406.003	LB184707	03 Oct 2019	03 Oct 2019	17 Oct 2019	04 Oct 2019	13 Nov 2019	10 Oct 2019
4	SE198406.004	LB184707	03 Oct 2019	03 Oct 2019	17 Oct 2019	04 Oct 2019	13 Nov 2019	10 Oct 2019
5	SE198406.005	LB184707	03 Oct 2019	03 Oct 2019	17 Oct 2019	04 Oct 2019	13 Nov 2019	10 Oct 2019
QC1	SE198406.009	LB184707	03 Oct 2019	03 Oct 2019	17 Oct 2019	04 Oct 2019	13 Nov 2019	10 Oct 2019

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

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

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2-fluorobiphenyl (Surrogate)	1	SE198406.001	%	70 - 130%	84
	2	SE198406.002	%	70 - 130%	86
	3	SE198406.003	%	70 - 130%	86
	4	SE198406.004	%	70 - 130%	98
	5	SE198406.005	%	70 - 130%	86
	QC1	SE198406.009	%	70 - 130%	90
d14-p-terphenyl (Surrogate)	1	SE198406.001	%	70 - 130%	86
	2	SE198406.002	%	70 - 130%	88
	3	SE198406.003	%	70 - 130%	86
	4	SE198406.004	%	70 - 130%	98
	5	SE198406.005	%	70 - 130%	86
	QC1	SE198406.009	%	70 - 130%	88
d5-nitrobenzene (Surrogate)	1	SE198406.001	%	70 - 130%	80
	2	SE198406.002	%	70 - 130%	82
	3	SE198406.003	%	70 - 130%	82
	4	SE198406.004	%	70 - 130%	96
	5	SE198406.005	%	70 - 130%	82
	QC1	SE198406.009	%	70 - 130%	86

VOC's in Soil

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	1	SE198406.001	%	60 - 130%	69
	2	SE198406.002	%	60 - 130%	70
	3	SE198406.003	%	60 - 130%	71
	4	SE198406.004	%	60 - 130%	81
	5	SE198406.005	%	60 - 130%	72
	QC1	SE198406.009	%	60 - 130%	71
d4-1,2-dichloroethane (Surrogate)	1	SE198406.001	%	60 - 130%	88
	2	SE198406.002	%	60 - 130%	84
	3	SE198406.003	%	60 - 130%	93
	4	SE198406.004	%	60 - 130%	107
	5	SE198406.005	%	60 - 130%	87
	QC1	SE198406.009	%	60 - 130%	95
d8-toluene (Surrogate)	1	SE198406.001	%	60 - 130%	84
	2	SE198406.002	%	60 - 130%	88
	3	SE198406.003	%	60 - 130%	86
	4	SE198406.004	%	60 - 130%	100
	5	SE198406.005	%	60 - 130%	89
	QC1	SE198406.009	%	60 - 130%	86

Volatile Petroleum Hydrocarbons in Soil

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	1	SE198406.001	%	60 - 130%	69
	2	SE198406.002	%	60 - 130%	70
	3	SE198406.003	%	60 - 130%	71
	4	SE198406.004	%	60 - 130%	81
	5	SE198406.005	%	60 - 130%	72
	QC1	SE198406.009	%	60 - 130%	71
d4-1,2-dichloroethane (Surrogate)	1	SE198406.001	%	60 - 130%	88
	2	SE198406.002	%	60 - 130%	84
	3	SE198406.003	%	60 - 130%	93
	4	SE198406.004	%	60 - 130%	107
	5	SE198406.005	%	60 - 130%	87
	QC1	SE198406.009	%	60 - 130%	95
d8-toluene (Surrogate)	1	SE198406.001	%	60 - 130%	84
	2	SE198406.002	%	60 - 130%	88
	3	SE198406.003	%	60 - 130%	86
	4	SE198406.004	%	60 - 130%	100
	5	SE198406.005	%	60 - 130%	89
	QC1	SE198406.009	%	60 - 130%	86

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

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

Conductivity and TDS by Calculation - Soil

Method: ME-(AU)-[ENV]AN106

Sample Number	Parameter	Units	LOR	Result
LB185013.001	Conductivity of Extract (1:5 dry sample basis)	µS/cm	1	0

Mercury in Soil

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

Sample Number	Parameter	Units	LOR	Result
LB184769.001	Mercury	mg/kg	0.05	<0.05

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Sample Number		Parameter	Units	LOR	Result
LB184711.001		Naphthalene	mg/kg	0.1	<0.1
		2-methylnaphthalene	mg/kg	0.1	<0.1
		1-methylnaphthalene	mg/kg	0.1	<0.1
		Acenaphthylene	mg/kg	0.1	<0.1
		Acenaphthene	mg/kg	0.1	<0.1
		Fluorene	mg/kg	0.1	<0.1
		Phenanthrene	mg/kg	0.1	<0.1
		Anthracene	mg/kg	0.1	<0.1
		Fluoranthene	mg/kg	0.1	<0.1
		Pyrene	mg/kg	0.1	<0.1
		Benzo(a)anthracene	mg/kg	0.1	<0.1
		Chrysene	mg/kg	0.1	<0.1
		Benzo(a)pyrene	mg/kg	0.1	<0.1
		Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1
		Dibenzo(ah)anthracene	mg/kg	0.1	<0.1
		Benzo(ghi)perylene	mg/kg	0.1	<0.1
		Total PAH (18)	mg/kg	0.8	<0.8
	Surrogates	d5-nitrobenzene (Surrogate)	%	-	72
		2-fluorobiphenyl (Surrogate)	%	-	72
		d14-p-terphenyl (Surrogate)	%	-	76

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

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

Sample Number	Parameter	Units	LOR	Result
LB184770.001	Arsenic, As	mg/kg	1	<1
	Cadmium, Cd	mg/kg	0.3	<0.3
	Chromium, Cr	mg/kg	0.5	<0.5
	Copper, Cu	mg/kg	0.5	<0.5
	Nickel, Ni	mg/kg	0.5	<0.5
	Lead, Pb	mg/kg	1	<1
	Zinc, Zn	mg/kg	0.5	<0.5

TRH (Total Recoverable Hydrocarbons) in Soil

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

Sample Number	Parameter	Units	LOR	Result
LB184711.001	TRH C10-C14	mg/kg	20	<20
	TRH C15-C28	mg/kg	45	<45
	TRH C29-C36	mg/kg	45	<45
	TRH C37-C40	mg/kg	100	<100
	TRH C10-C36 Total	mg/kg	110	<110

VOC's in Soil

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

Sample Number		Parameter	Units	LOR	Result
LB184707.001	Monocyclic Aromatic	Benzene	mg/kg	0.1	<0.1
	Hydrocarbons	Toluene	mg/kg	0.1	<0.1
		Ethylbenzene	mg/kg	0.1	<0.1
		m/p-xylene	mg/kg	0.2	<0.2
		o-xylene	mg/kg	0.1	<0.1
	Polycyclic VOCs	Naphthalene	mg/kg	0.1	<0.1
	Surrogates	d4-1,2-dichloroethane (Surrogate)	%	-	92
		d8-toluene (Surrogate)	%	-	90
		Bromofluorobenzene (Surrogate)	%	-	75
	Totals	Total BTEX	mg/kg	0.6	<0.6

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

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

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

Sample Number		Parameter	Units	LOR	Result
LB184707.001		TRH C6-C9	mg/kg	20	<20
	Surrogates	d4-1,2-dichloroethane (Surrogate)	%	-	92

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

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

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

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

Conductivity and TDS by Calculation - Soil

Method: ME-(AU)-[ENV]AN106

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE198407.004	LB185013.014	Conductivity of Extract (1:5 dry sample basis)	µS/cm	1	27.0172989374	0.811456752	31	6
SE198407.021	LB185013.023	Conductivity of Extract (1:5 dry sample basis)	µS/cm	1	75.8562258062	1.500354838	31	23

Mercury in Soil

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE198407.008	LB184769.014	Mercury	mg/kg	0.05	0.017330368	70.019944845	3 200	0
SE198407.021	LB184769.022	Mercury	mg/kg	0.05	0.026604758	80.019654087	0 200	0

Moisture Content

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE198405.004	LB184714.011	% Moisture	%w/w	1	8.7	8.8	41	1
SE198406.009	LB184714.020	% Moisture	%w/w	1	12.0	13.3	38	10

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE198405.004	LB184711.014		Naphthalene	mg/kg	0.1	<0.1	<0.1	200	0
			2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	200	0
			1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	200	0
			Acenaphthylene	mg/kg	0.1	<0.1	<0.1	200	0
			Acenaphthene	mg/kg	0.1	<0.1	<0.1	200	0
			Fluorene	mg/kg	0.1	<0.1	<0.1	200	0
			Phenanthrene	mg/kg	0.1	<0.1	<0.1	200	0
			Anthracene	mg/kg	0.1	<0.1	<0.1	200	0
			Fluoranthene	mg/kg	0.1	<0.1	<0.1	200	0
			Pyrene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(a)anthracene	mg/kg	0.1	<0.1	<0.1	200	0
			Chrysene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(a)pyrene	mg/kg	0.1	<0.1	<0.1	200	0
			Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	200	0
			Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	200	0
			Carcinogenic PAHs, BaP TEQ <LOR=0	mg/kg	0.2	<0.2	<0.2	200	0
			Carcinogenic PAHs, BaP TEQ <LOR=LOR	mg/kg	0.3	<0.3	<0.3	134	0
			Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	mg/kg	0.2	<0.2	<0.2	175	0
			Total PAH (18)	mg/kg	0.8	<0.8	<0.8	200	0
		Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.4	0.4	30	20
			2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.5	30	27
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.4	0.5	30	27
SE198406.009	LB184711.023		Naphthalene	mg/kg	0.1	<0.1	<0.1	200	0
			2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	200	0
			1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	200	0
			Acenaphthylene	mg/kg	0.1	<0.1	<0.1	200	0
			Acenaphthene	mg/kg	0.1	<0.1	<0.1	200	0
			Fluorene	mg/kg	0.1	<0.1	<0.1	200	0
			Phenanthrene	mg/kg	0.1	<0.1	<0.1	200	0
			Anthracene	mg/kg	0.1	<0.1	<0.1	200	0
			Fluoranthene	mg/kg	0.1	<0.1	<0.1	200	0
			Pyrene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(a)anthracene	mg/kg	0.1	<0.1	<0.1	200	0
			Chrysene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(a)pyrene	mg/kg	0.1	<0.1	<0.1	200	0
			Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	200	0
			Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	200	0

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

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

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

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

PAH (Polynuclear Aromatic Hydrocarbons) in Soil (continued)

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE198406.009	LB184711.023		Carcinogenic PAHs, BaP TEQ <LOR=0	mg/kg	0.2	<0.2	<0.2	200	0
			Carcinogenic PAHs, BaP TEQ <LOR=LOR	mg/kg	0.3	<0.3	<0.3	134	0
			Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	mg/kg	0.2	<0.2	<0.2	175	0
			Total PAH (18)	mg/kg	0.8	<0.8	<0.8	200	0
		Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.4	0.4	30	2
			2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.4	30	5
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.4	0.4	30	2

pH in soil (1:5)

Method: ME-(AU)-[ENV]AN101

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE198407.004	LB185013.014	pH	pH Units	0.1	10.155	10.4	31	2
SE198407.021	LB185013.023	pH	pH Units	0.1	9.883	9.98	31	1

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

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE198407.008	LB184770.014	Arsenic, As	mg/kg	1	3.1702876825	3.46968	60	9
		Cadmium, Cd	mg/kg	0.3	0.0739363398	0.1103127272	200	0
		Chromium, Cr	mg/kg	0.5	3.7562224915	3.7411527272	43	0
		Copper, Cu	mg/kg	0.5	39.38670026159	39.349325454[illegible]	31	0
		Nickel, Ni	mg/kg	0.5	14.1466288192	14.319970909[illegible]	34	1
		Lead, Pb	mg/kg	1	16.8117560757	16.884310909[illegible]	36	0
		Zinc, Zn	mg/kg	0.5	30.8671301907	31.245109090[illegible]	33	1
SE198407.021	LB184770.022	Arsenic, As	mg/kg	1	2.7129677419	2.7598707627	67	2
		Cadmium, Cd	mg/kg	0.3	0.0684319775	0.0947745762	200	0
		Chromium, Cr	mg/kg	0.5	2.9547307152	4.5035474576	43	42
		Copper, Cu	mg/kg	0.5	31.1694151472	36.109991101[illegible]	31	15
		Nickel, Ni	mg/kg	0.5	13.8016493688	16.152044915[illegible]	33	16
		Lead, Pb	mg/kg	1	14.5336914444	17.5850716101	36	19
		Zinc, Zn	mg/kg	0.5	58.4958345021	65.719148305[illegible]	33	12

TRH (Total Recoverable Hydrocarbons) in Soil

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE198405.004	LB184711.014		TRH C10-C14	mg/kg	20	<20	<20	200	0
			TRH C15-C28	mg/kg	45	<45	<45	200	0
			TRH C29-C36	mg/kg	45	<45	<45	200	0
			TRH C37-C40	mg/kg	100	<100	<100	200	0
			TRH C10-C36 Total	mg/kg	110	<110	<110	200	0
			TRH C10-C40 Total (F bands)	mg/kg	210	<210	<210	200	0
		TRH F Bands	TRH >C10-C16	mg/kg	25	<25	<25	200	0
			TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25	<25	200	0
			TRH >C16-C34 (F3)	mg/kg	90	<90	<90	200	0
			TRH >C34-C40 (F4)	mg/kg	120	<120	<120	200	0
SE198406.009	LB184711.023		TRH C10-C14	mg/kg	20	<20	<20	200	0
			TRH C15-C28	mg/kg	45	49	46	125	6
			TRH C29-C36	mg/kg	45	<45	<45	200	0
			TRH C37-C40	mg/kg	100	<100	<100	200	0
			TRH C10-C36 Total	mg/kg	110	<110	<110	200	0
			TRH C10-C40 Total (F bands)	mg/kg	210	<210	<210	200	0
		TRH F Bands	TRH >C10-C16	mg/kg	25	<25	<25	200	0
			TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25	<25	200	0
			TRH >C16-C34 (F3)	mg/kg	90	<90	<90	200	0
			TRH >C34-C40 (F4)	mg/kg	120	<120	<120	200	0

VOC's in Soil

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE198405.004	LB184707.014	Monocyclic	Benzene	mg/kg	0.1	<0.1	<0.1	200	0
		Aromatic	Toluene	mg/kg	0.1	<0.1	<0.1	200	0
			Ethylbenzene	mg/kg	0.1	<0.1	<0.1	200	0
			m/p-xylene	mg/kg	0.2	<0.2	<0.2	200	0
			o-xylene	mg/kg	0.1	<0.1	<0.1	200	0
		Polycyclic	Naphthalene	mg/kg	0.1	<0.1	<0.1	200	0

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

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

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

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

VOC's in Soil (continued)

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE198405.004	LB184707.014	Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	9.5	9.7	50	2
			d8-toluene (Surrogate)	mg/kg	-	9.0	8.8	50	1
			Bromofluorobenzene (Surrogate)	mg/kg	-	7.4	7.4	50	1
		Totals	Total Xylenes	mg/kg	0.3	<0.3	<0.3	200	0
			Total BTEX	mg/kg	0.6	<0.6	<0.6	200	0
SE198406.009	LB184707.023	Monocyclic	Benzene	mg/kg	0.1	<0.1	<0.1	200	0
		Aromatic	Toluene	mg/kg	0.1	<0.1	<0.1	200	0
			Ethylbenzene	mg/kg	0.1	<0.1	<0.1	200	0
			m/p-xylene	mg/kg	0.2	<0.2	<0.2	200	0
			o-xylene	mg/kg	0.1	<0.1	<0.1	200	0
		Polycyclic	Naphthalene	mg/kg	0.1	<0.1	<0.1	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	9.5	9.7	50	2
			d8-toluene (Surrogate)	mg/kg	-	8.6	8.8	50	2
			Bromofluorobenzene (Surrogate)	mg/kg	-	7.1	7.4	50	4
		Totals	Total Xylenes	mg/kg	0.3	<0.3	<0.3	200	0
			Total BTEX	mg/kg	0.6	<0.6	<0.6	200	0

Volatile Petroleum Hydrocarbons in Soil

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE198405.004	LB184707.014		TRH C6-C10	mg/kg	25	<25	<25	200	0
			TRH C6-C9	mg/kg	20	<20	<20	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	9.5	9.7	30	2
			d8-toluene (Surrogate)	mg/kg	-	9.0	8.8	30	1
			Bromofluorobenzene (Surrogate)	mg/kg	-	7.4	7.4	30	1
		VPH F Bands	Benzene (F0)	mg/kg	0.1	<0.1	<0.1	200	0
			TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	200	0
SE198406.009	LB184707.023		TRH C6-C10	mg/kg	25	<25	<25	200	0
			TRH C6-C9	mg/kg	20	<20	<20	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	9.5	9.7	30	2
			d8-toluene (Surrogate)	mg/kg	-	8.6	8.8	30	2
			Bromofluorobenzene (Surrogate)	mg/kg	-	7.1	7.4	30	4
		VPH F Bands	Benzene (F0)	mg/kg	0.1	<0.1	<0.1	200	0
			TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	200	0

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

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

Conductivity and TDS by Calculation - Soil

Method: ME-(AU)-[ENV]AN106

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB185013.002	Conductivity of Extract (1:5 dry sample basis)	µS/cm	1	NA	303	85 - 115	102

Mercury in Soil

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB184769.002	Mercury	mg/kg	0.05	0.18	0.2	70 - 130	88

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB184711.002		Naphthalene	mg/kg	0.1	4.4	4	60 - 140	111
		Acenaphthylene	mg/kg	0.1	4.4	4	60 - 140	109
		Acenaphthene	mg/kg	0.1	4.7	4	60 - 140	119
		Phenanthrene	mg/kg	0.1	5.0	4	60 - 140	125
		Anthracene	mg/kg	0.1	4.7	4	60 - 140	117
		Fluoranthene	mg/kg	0.1	4.4	4	60 - 140	109
		Pyrene	mg/kg	0.1	4.6	4	60 - 140	116
		Benzo(a)pyrene	mg/kg	0.1	4.8	4	60 - 140	120
	Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.4	0.5	40 - 130	84
		2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.5	40 - 130	86
		d14-p-terphenyl (Surrogate)	mg/kg	-	0.4	0.5	40 - 130	84

pH in soil (1:5)

Method: ME-(AU)-[ENV]AN101

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB185013.003	pH	pH Units	0.1	7.5	7.415	98 - 102	101

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

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB184770.002	Arsenic, As	mg/kg	1	330	318.22	80 - 120	103
	Cadmium, Cd	mg/kg	0.3	5.3	4.62	80 - 120	115
	Chromium, Cr	mg/kg	0.5	37	38.31	80 - 120	97
	Copper, Cu	mg/kg	0.5	300	290	80 - 120	103
	Nickel, Ni	mg/kg	0.5	180	187	80 - 120	99
	Lead, Pb	mg/kg	1	92	89.9	80 - 120	102
	Zinc, Zn	mg/kg	0.5	290	273	80 - 120	107

TRH (Total Recoverable Hydrocarbons) in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB184711.002		TRH C10-C14	mg/kg	20	48	40	60 - 140	120
		TRH C15-C28	mg/kg	45	46	40	60 - 140	115
		TRH C29-C36	mg/kg	45	45	40	60 - 140	113
	TRH F Bands	TRH >C10-C16	mg/kg	25	47	40	60 - 140	118
		TRH >C16-C34 (F3)	mg/kg	90	<90	40	60 - 140	123
		TRH >C34-C40 (F4)	mg/kg	120	<120	20	60 - 140	65

VOC's in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB184707.002	Monocyclic	Benzene	mg/kg	0.1	4.2	5	60 - 140	84
	Aromatic	Toluene	mg/kg	0.1	4.3	5	60 - 140	85
		Ethylbenzene	mg/kg	0.1	4.3	5	60 - 140	85
		m/p-xylene	mg/kg	0.2	8.7	10	60 - 140	87
		o-xylene	mg/kg	0.1	4.4	5	60 - 140	87
	Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	8.2	10	70 - 130	82
		d8-toluene (Surrogate)	mg/kg	-	8.5	10	70 - 130	85
		Bromofluorobenzene (Surrogate)	mg/kg	-	9.1	10	70 - 130	91

Volatile Petroleum Hydrocarbons in Soil

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

Sample Number	Parameter	Units	LOR

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

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

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB184707.002		TRH C6-C10	mg/kg	25	77	92.5	60 - 140	83
		TRH C6-C9	mg/kg	20	68	80	60 - 140	86
	Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	8.2	10	70 - 130	82
		Bromofluorobenzene (Surrogate)	mg/kg	-	9.1	10	70 - 130	91
	VPH F Bands	TRH C6-C10 minus BTEX (F1)	mg/kg	25	51	62.5	60 - 140	81

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

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

Mercury in Soil

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

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE198406.001	LB184769.004	Mercury	mg/kg	0.05	0.18	<0.05	0.2	90

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE198404.001	LB184711.004		Naphthalene	mg/kg	0.1	4.3	<0.1	4	107
			2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	-	-
			1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	-	-
			Acenaphthylene	mg/kg	0.1	4.2	<0.1	4	104
			Acenaphthene	mg/kg	0.1	4.6	<0.1	4	115
			Fluorene	mg/kg	0.1	<0.1	<0.1	-	-
			Phenanthrene	mg/kg	0.1	4.8	<0.1	4	120
			Anthracene	mg/kg	0.1	4.5	<0.1	4	113
			Fluoranthene	mg/kg	0.1	4.4	<0.1	4	110
			Pyrene	mg/kg	0.1	4.5	<0.1	4	113
			Benzo(a)anthracene	mg/kg	0.1	<0.1	<0.1	-	-
			Chrysene	mg/kg	0.1	<0.1	<0.1	-	-
			Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	<0.1	-	-
			Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	-	-
			Benzo(a)pyrene	mg/kg	0.1	4.6	<0.1	4	114
			Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	-	-
			Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1	-	-
			Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	-	-
			Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.2	4.6	<0.2	-	-
			Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	4.7	<0.3	-	-
			Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	4.6	<0.2	-	-
			Total PAH (18)	mg/kg	0.8	36	<0.8	-	-
		Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.4	0.4	-	86
			2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.4	-	86
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.4	0.4	-	86

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

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

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE198406.001	LB184770.004	Arsenic, As	mg/kg	1	47	<1	50	93
		Cadmium, Cd	mg/kg	0.3	42	<0.3	50	84
		Chromium, Cr	mg/kg	0.5	51	4.0	50	93
		Copper, Cu	mg/kg	0.5	51	2.5	50	96
		Nickel, Ni	mg/kg	0.5	49	3.3	50	92
		Lead, Pb	mg/kg	1	53	8	50	90
		Zinc, Zn	mg/kg	0.5	88	28	50	120

TRH (Total Recoverable Hydrocarbons) in Soil

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

QC Sample	Sample Number		Parameter	Units	LOR	Original	Spike	Recovery%
SE198404.001	LB184711.024		TRH C10-C14	mg/kg	20	<20	40	115
			TRH C15-C28	mg/kg	45	<45	40	115
			TRH C29-C36	mg/kg	45	<45	40	70
			TRH C37-C40	mg/kg	100	<100	-	-
			TRH C10-C36 Total	mg/kg	110	<110	-	-
			TRH C10-C40 Total (F bands)	mg/kg	210	<210	-	-
		TRH F Bands	TRH >C10-C16	mg/kg	25	<25	40	115
			TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25	-	-
			TRH >C16-C34 (F3)	mg/kg	90	<90	40	98
			TRH >C34-C40 (F4)	mg/kg	120	<120	-	-

VOC's in Soil

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE198404.001	LB184707.004	Monocyclic Aromatic	Benzene	mg/kg	0.1	3.9	<0.1	5	78
			Toluene	mg/kg	0.1	4.0	<0.1	5	79
			Ethylbenzene	mg/kg	0.1	4.0	<0.1	5	81
			m/p-xylene	mg/kg	0.2	8.3	<0.2	10	83
			o-xylene	mg/kg	0.1	4.2	<0.1	5	83

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

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

VOC's in Soil (continued)

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE198404.001	LB184707.004	Polycyclic	Naphthalene	mg/kg	0.1	4.2	<0.1	-	-
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	7.8	8.5	10	78
			d8-toluene (Surrogate)	mg/kg	-	8.5	8.9	10	85
			Bromofluorobenzene (Surrogate)	mg/kg	-	8.8	7.4	10	88
		Totals	Total Xylenes	mg/kg	0.3	12	<0.3	-	-
			Total BTEX	mg/kg	0.6	24	<0.6	-	-

Volatile Petroleum Hydrocarbons in Soil

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE198404.001	LB184707.004		TRH C6-C10	mg/kg	25	74	<25	92.5	80
			TRH C6-C9	mg/kg	20	67	<20	80	83
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	7.8	8.5	10	78
			d8-toluene (Surrogate)	mg/kg	-	8.5	8.9	10	85
			Bromofluorobenzene (Surrogate)	mg/kg	-	8.8	7.4	-	88
		VPH F	Benzene (F0)	mg/kg	0.1	3.9	<0.1	-	-
		Bands	TRH C6-C10 minus BTEX (F1)	mg/kg	25	50	<25	62.5	80

MATRIX SPIKE DUPLICATES

SE198406 R0

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

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

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

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

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

No matrix spike duplicates were required for this job.

Samples analysed as received.

Solid samples expressed on a dry weight basis.

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

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

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

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This test report shall not be reproduced, except in full.

received 11/06/20. weather ca.

Sandstone. From Pyrmont Bridge. 10.40. 4p.

Rego	Driver	Date		Site	Tip Site		LNG Docket	WCX Dkt		Weight
CM76UW	NED	27/01/2020	WCX	PBR	PATON		48710	22005	Tonnage	38.00
CM76UW	NED	27/01/2020	WCX	PBR	PATON		48710	22018	Tonnage	38.00
CM76UW	NED	27/01/2020	WCX	PBR	PATON		48710	23241	Tonnage	38.00
CM76UW	NED	27/01/2020	WCX	PBR	PATON		48710	23229	Tonnage	38.00
CM76UW	NED	27/01/2020	WCX	PBR	PATON		48710	23214	Tonnage	38.00
CM76UW	NED	27/01/2020	WCX	PBR	PATON		48710	23189	Tonnage	38.00
XN87FP	BIG KEV	27/01/2020	WCX	PBR	PATON		44777	23242	Tonnage	37.50
XN87FP	BIG KEV	27/01/2020	WCX	PBR	PATON		44777	22006	Tonnage	37.40
XN87FP	BIG KEV	27/01/2020	WCX	PBR	PATON		44777	23228	Tonnage	37.50
XN87FP	BIG KEV	27/01/2020	WCX	PBR	PATON		44777	23160	Tonnage	37.40
XN87FP	BIG KEV	27/01/2020	WCX	PBR	PATON		44777	23185	Tonnage	37.40
XN87FP	BIG KEV	27/01/2020	WCX	PBR	PATON		44777	23212	Tonnage	37.30
VILIAN	BIG G	27/01/2020	WCX	PBR	PATON		57553	23199	Tonnage	37.80
VILIAN	BIG G	27/01/2020	WCX	PBR	PATON		57553	23175	Tonnage	37.50
VILIAN	BIG G	27/01/2020	WCX	PBR	PATON		57553	23224	Tonnage	37.50
VILIAN	BIG G	27/01/2020	WCX	PBR	PATON		57553	23237	Tonnage	37.60
VILIAN	BIG G	27/01/2020	WCX	PBR	PATON		57553	22013	Tonnage	37.50
VILIAN	BIG G	27/01/2020	WCX	PBR	PATON		57553	22001	Tonnage	37.60
BMT685	BMT	27/01/2020	WCX	PBR	PATON		43232	23158	Tonnage	39.20
BMT685	BMT	27/01/2020	WCX	PBR	PATON		43232	23188	Tonnage	39.00
BMT685	BMT	27/01/2020	WCX	PBR	PATON		43232	23217	Tonnage	39.05
BMT685	BMT	27/01/2020	WCX	PBR	PATON		43232	23232	Tonnage	38.95
BMT685	BMT	27/01/2020	WCX	PBR	PATON		43232	23246	Tonnage	39.25
BMT685	BMT	27/01/2020	WCX	PBR	PATON		43232	22009	Tonnage	39.00
BMT685	BMT	27/01/2020	WCX	PBR	PATON		43232	22022	Tonnage	39.18
BMT535	BMT	27/01/2020	WCX	PBR	PATON		43279	23244	Tonnage	38.50
BMT535	BMT	27/01/2020	WCX	PBR	PATON		43279	22007	Tonnage	38.20
BMT535	BMT	27/01/2020	WCX	PBR	PATON		43279	23216	Tonnage	38.35
BMT535	BMT	27/01/2020	WCX	PBR	PATON		43279	23159	Tonnage	38.50
BMT535	BMT	27/01/2020	WCX	PBR	PATON		43279	23231	Tonnage	38.50
BMT535	BMT	27/01/2020	WCX	PBR	PATON		43279	23187	Tonnage	38.50
BMT535	BMT	27/01/2020	WCX	PBR	PATON		43279	22020	Tonnage	38.10
PJT049	PJT	27/01/2020	WCX	PBR	PATON		57259	22014	Tonnage	36.90

Sandstone. 1/4.

PJT049	PJT	27/01/2020	WCX	PBR	PATON		57259	23180	Tonnage	37.00
PJT049	PJT	27/01/2020	WCX	PBR	PATON		57259	23250	Tonnage	36.80
PJT049	PJT	27/01/2020	WCX	PBR	PATON		57259	23222	Tonnage	36.90
PJT049	PJT	27/01/2020	WCX	PBR	PATON		57259	23235	Tonnage	37.00
PJT049	PJT	27/01/2020	WCX	PBR	PATON		57259	23202	Tonnage	37.00
PJT040	PJT	27/01/2020	WCX	PBR	PATON		57304	23179	Tonnage	36.50
PJT040	PJT	27/01/2020	WCX	PBR	PATON		57304	22012	Tonnage	36.50
PJT040	PJT	27/01/2020	WCX	PBR	PATON		57304	23234	Tonnage	36.50
PJT040	PJT	27/01/2020	WCX	PBR	PATON		57304	23221	Tonnage	36.00
PJT040	PJT	27/01/2020	WCX	PBR	PATON		57304	23201	Tonnage	36.00
PJT040	PJT	27/01/2020	WCX	PBR	PATON		57304	23249	Tonnage	36.50
909PJT	PJT	27/01/2020	WCX	PBR	PATON		57351	23181	Tonnage	37.00
909PJT	PJT	27/01/2020	WCX	PBR	PATON		57351	22002	Tonnage	37.00
909PJT	PJT	27/01/2020	WCX	PBR	PATON		57351	22015	Tonnage	37.00
909PJT	PJT	27/01/2020	WCX	PBR	PATON		57351	23203	Tonnage	37.00
909PJT	PJT	27/01/2020	WCX	PBR	PATON		57351	23225	Tonnage	37.00
909PJT	PJT	27/01/2020	WCX	PBR	PATON		57351	23238	Tonnage	37.00
AMC909	AM CIVIL	27/01/2020	WCX	PBR	PATON		31481	23186	Tonnage	38.40
AMC909	AM CIVIL	27/01/2020	WCX	PBR	PATON		31481	23165	Tonnage	38.20
AMC909	AM CIVIL	27/01/2020	WCX	PBR	PATON		31481	23227	Tonnage	38.50
AMC909	AM CIVIL	27/01/2020	WCX	PBR	PATON		31481	23213	Tonnage	38.50
AMC909	AM CIVIL	27/01/2020	WCX	PBR	PATON		31481	22004	Tonnage	38.50
AMC909	AM CIVIL	27/01/2020	WCX	PBR	PATON		31481	23240	Tonnage	38.50
AMC909	AM CIVIL	27/01/2020	WCX	PBR	PATON		31481	22017	Tonnage	38.50
AMC409	AM CIVIL	27/01/2020	WCX	PBR	PATON		37305	22011	Tonnage	39.20
AMC409	AM CIVIL	27/01/2020	WCX	PBR	PATON		37305	22023	Tonnage	39.00
AMC409	AM CIVIL	27/01/2020	WCX	PBR	PATON		37305	23233	Tonnage	39.20
AMC409	AM CIVIL	27/01/2020	WCX	PBR	PATON		37305	23247	Tonnage	39.00
AMC409	AM CIVIL	27/01/2020	WCX	PBR	PATON		37305	23193	Tonnage	39.10
AMC409	AM CIVIL	27/01/2020	WCX	PBR	PATON		37305	23220	Tonnage	39.20
AMC409	AM CIVIL	27/01/2020	WCX	PBR	PATON		37305	23166	Tonnage	39.20
CD08MS	AM CIVIL	27/01/2020	WCX	PBR	PATON		37362	22008	Tonnage	39.20
CD08MS	AM CIVIL	27/01/2020	WCX	PBR	PATON		37362	22021	Tonnage	39.20
CD08MS	AM CIVIL	27/01/2020	WCX	PBR	PATON		37362	23230	Tonnage	39.10

CD08MS	AM CIVIL	27/01/2020	WCX	PBR	PATON		37362	23245	Tonnage	39.20
CD08MS	AM CIVIL	27/01/2020	WCX	PBR	PATON		37362	23190	Tonnage	39.20
CD08MS	AM CIVIL	27/01/2020	WCX	PBR	PATON		37362	23219	Tonnage	39.10
CD08MS	AM CIVIL	27/01/2020	WCX	PBR	PATON		37362	23161	Tonnage	39.20
CN47ZH	TS TRANSPO	27/01/2020	WCX	PBR	PATON		49759	23177	Tonnage	37.50
CN47ZH	TS TRANSPO	27/01/2020	WCX	PBR	PATON		49759	23198	Tonnage	38.00
CN47ZH	TS TRANSPO	27/01/2020	WCX	PBR	PATON		49759	23223	Tonnage	37.95
CN47ZH	TS TRANSPO	27/01/2020	WCX	PBR	PATON		49759	23236	Tonnage	38.00
CN47ZH	TS TRANSPO	27/01/2020	WCX	PBR	PATON		49759	22019	Tonnage	38.00
CN47ZH	TS TRANSPO	27/01/2020	WCX	PBR	PATON		49759	23248	Tonnage	37.80
CF03CH	NEXGEN	27/01/2020	WCX	SPI	PATON		49404	22665	Tonnage	41.65
CF03CH	NEXGEN	27/01/2020	WCX	PBR	PATON		49405	22003	Tonnage	41.75
CF03CH	NEXGEN	27/01/2020	WCX	PBR	PATON		49405	23239	Tonnage	41.50
CF03CH	NEXGEN	27/01/2020	WCX	PBR	PATON		49405	23226	Tonnage	41.60
CF03CH	NEXGEN	27/01/2020	WCX	PBR	PATON		49405	23210	Tonnage	41.00
CF03CH	NEXGEN	27/01/2020	WCX	PBR	PATON		49405	22016	Tonnage	41.80
01SHFT	ISHIFT	27/01/2020	WCX	SPI	PATON		45842	22694	Tonnage	38.10
01SHFT	ISHIFT	27/01/2020	WCX	SPI	PATON		45842	22679	Tonnage	38.10
01SHFT	ISHIFT	27/01/2020	WCX	SPI	PATON		45842	22671	Tonnage	38.50
01SHFT	ISHIFT	27/01/2020	WCX	SPI	PATON		45842	22661	Tonnage	38.10
01SHFT	ISHIFT	27/01/2020	WCX	SPI	PATON		45842	22699	Tonnage	37.90
01SHFT	ISHIFT	27/01/2020	WCX	SPI	PATON		45842	22687	Tonnage	37.75
03SHFT	ISHIFT	27/01/2020	WCX	SPI	PATON		43487	22691	Tonnage	39.00
03SHFT	ISHIFT	27/01/2020	WCX	SPI	PATON		43487	22657	Tonnage	38.85
03SHFT	ISHIFT	27/01/2020	WCX	SPI	PATON		43487	22683	Tonnage	38.90
03SHFT	ISHIFT	27/01/2020	WCX	SPI	PATON		43487	22668	Tonnage	39.00
03SHFT	ISHIFT	27/01/2020	WCX	SPI	PATON		43487	22676	Tonnage	38.85
12SHFT	ISHIFT	27/01/2020	WCX	SPI	PATON		45686	22693	Tonnage	38.00
12SHFT	ISHIFT	27/01/2020	WCX	SPI	PATON		45686	22678	Tonnage	38.15
12SHFT	ISHIFT	27/01/2020	WCX	SPI	PATON		45686	22685	Tonnage	38.30
12SHFT	ISHIFT	27/01/2020	WCX	SPI	PATON		45686	22670	Tonnage	37.95
12SHFT	ISHIFT	27/01/2020	WCX	SPI	PATON		45686	22658	Tonnage	38.85
XQ56GF	ISHIFT	27/01/2020	WCX	SPI	PATON		45792	22696	Tonnage	37.95
XQ56GF	ISHIFT	27/01/2020	WCX	SPI	PATON		45792	22681	Tonnage	37.80

Sandstones 3/14

XQ56GF	ISHIFT	27/01/2020	WCX	SPI	PATON		45792	22688	Tonnage	38.80
XQ56GF	ISHIFT	27/01/2020	WCX	SPI	PATON		45792	22673	Tonnage	38.00
XQ56GF	ISHIFT	27/01/2020	WCX	SPI	PATON		45792	22663	Tonnage	37.95
CN24VQ	ISHIFT	27/01/2020	WCX	SPI	PATON		39696	22692	Tonnage	38.50
CN24VQ	ISHIFT	27/01/2020	WCX	SPI	PATON		39696	22684	Tonnage	38.85
CN24VQ	ISHIFT	27/01/2020	WCX	SPI	PATON		39696	22669	Tonnage	36.85
CN24VQ	ISHIFT	27/01/2020	WCX	SPI	PATON		39696	22677	Tonnage	37.95
CN24VQ	ISHIFT	27/01/2020	WCX	SPI	PATON		39696	22664	Tonnage	39.00
XN64DD	ISHIFT	27/01/2020	WCX	SPI	PATON		47544	22680	Tonnage	39.00
XN64DD	ISHIFT	27/01/2020	WCX	SPI	PATON		47544	22672	Tonnage	39.00
XN64DD	ISHIFT	27/01/2020	WCX	SPI	PATON		47544	22695	Tonnage	38.90
XN64DD	ISHIFT	27/01/2020	WCX	SPI	PATON		47544	22662	Tonnage	38.80
XN64DD	ISHIFT	27/01/2020	WCX	SPI	PATON		47544	22686	Tonnage	39.00
XN64DD	ISHIFT	27/01/2020	WCX	SPI	PATON		47544	22700	Tonnage	39.00
CN00UE	NEXGEN	27/01/2020	WCX	SPI	PATON		49553	22660	Tonnage	37.85
CN00UE	NEXGEN	27/01/2020	WCX	SPI	PATON		49553	22667	Tonnage	38.00
CN00UE	NEXGEN	27/01/2020	WCX	SPI	PATON		49553	22675	Tonnage	38.20
CN00UE	NEXGEN	27/01/2020	WCX	SPI	PATON		49553	25511	Tonnage	38.50
CN00UE	NEXGEN	27/01/2020	WCX	SPI	PATON		49553	22698	Tonnage	38.50
CN00UE	NEXGEN	27/01/2020	WCX	SPI	PATON		49553	22690	Tonnage	38.50
BY79WF	NEXGEN	27/01/2020	WCX	SPI	PATON		49173	25651	Tonnage	37.00
BY79WF	NEXGEN	27/01/2020	WCX	SPI	PATON		49173	22697	Tonnage	36.85
BY79WF	NEXGEN	27/01/2020	WCX	SPI	PATON		49173	22689	Tonnage	37.00
BY79WF	NEXGEN	27/01/2020	WCX	SPI	PATON		49173	22682	Tonnage	37.00
BY79WF	NEXGEN	27/01/2020	WCX	SPI	PATON		49173	22674	Tonnage	37.10
BY79WF	NEXGEN	27/01/2020	WCX	SPI	PATON		49173	22666	Tonnage	37.00
BY79WF	NEXGEN	27/01/2020	WCX	SPI	PATON		49173	22659	Tonnage	37.00
									Total	**4,893.78**

Sandstone. 4/4

221-227 and 289-311
Luddenham Road,
Orchard Hill, NSW, 2748

APPENDIX

I

CALIBRATION CERTIFICATE

PID Calibration Certificate

Instrument **PhoCheck Tiger**
Serial No. **T-105892**

Air-Met Scientific Pty Ltd
1300 137 067

Item	Test	Pass	Comments			
Battery	Charge Condition	✓				
	Fuses	✓				
	Capacity	✓				
	Recharge OK?	✓				
Switch/keypad	Operation	✓				
Display	Intensity	✓				
	Operation (segments)	✓				
Grill Filter	Condition	✓				
	Seal	✓				
Pump	Operation	✓				
	Filter	✓				
	Flow	✓				
	Valves, Diaphragm	✓				
PCB	Condition	✓				
Connectors	Condition	✓				
Sensor	PID	✓	10.6 ev			
Alarms	Beeper	✓	Low	High	TWA	STEL
	Settings	✓	50ppm	100ppm	N/A	N/A
Software	Version	✓				
Data logger	Operation	✓				
Download	Operation	✓				
Other tests:						

Certificate of Calibration

This is to certify that the above instrument has been calibrated to the following specifications:

Sensor	Serial no	Calibration gas and concentration	Certified	Gas bottle No		Instrument Reading
PID Lamp		92ppm Isobutylene	NATA	SY245		92.2ppm

Calibrated by: **Sarah Lian**

Calibration date: **30/04/2020**

Next calibration due: **30/05/2020**

221-227 and 289-311
Luddenham Road,
Orchard Hill, NSW, 2748

APPENDIX J

TEST PIT LOGS

Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP01

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.81810, 150.75232 **Angle from Horizontal:** 90° **Surface Elevation:**
Machine Type: 5 tonne Excavator **Excavation Method:** EX
Excavation Dimensions: 1.50m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation
Date Excavated: 7/5/20 **Logged By:** NL **Checked By:** VDS

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	VH	Stable	Not Encountered	ES 0.00 - 0.20 m (ID: TP01 0.00m - 0.20m)	0			SILT: low plasticity, brown	M (<PL)		TOPSOIL
					0.30m						
				D 0.50 - 0.60 m	0.5		CL	CLAY: low plasticity, brown mottled grey and red	M (<PL)	H	RESIDUAL SOIL
					0.90m						
					1.0		CL	Silty CLAY: low plasticity, grey mottled brown	M (<PL)	H	
				D 1.40 - 1.50 m	1.5						
					1.50m			TERMINATED AT 1.50 m Target depth			
					2.0						
					2.5						

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
DT Diatube

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=Resdual (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

CONSTRUCTION SCIENCES

CS 2.01.7.GLB Log CARDNO NON-CORED 5017200153 LOGS.GPJ <<DrawingFile>> 01/06/2020 15:35 10.0.000 Datgel AGS RTA, Photo, Monitoring Tools

Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP02

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.81840, 150.75362 **Angle from Horizontal:** 90° **Surface Elevation:**

Machine Type: 5 tonne Excavator **Excavation Method:** EX

Excavation Dimensions: 1.50m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation

Date Excavated: 7/5/20 **Logged By:** NL **Checked By:** VDS

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	F	Stable	Not Encountered	ES 0.00 - 0.20 m (ID: TP02 0.00m - 0.20m)	0			SILT: low plasticity, brown, trace clay with crushed sandstone on surface	M (<PL)		TOPSOIL
					0.20m						
				D 0.50 - 0.60 m	0.5		CH	Silty CLAY: high plasticity, orange brown mottled red and grey	M (≈PL)	F	RESIDUAL SOIL
				D 1.40 - 1.50 m	1.0						
					1.5						
					1.50m			TERMINATED AT 1.50 m Target depth			
					2.0						
					2.5						

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
DT Diatube

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=Resdual (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

CONSTRUCTION SCIENCES

CS 2.01.7.GLB Log CARDNO NON-CORED 5017200153 LOGS.GPJ <<DrawingFile>> 01/06/2020 15:35 10.0.000 Datgel AGS RTA, Photo, Monitoring Tools

Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP03

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.81913, 150.75632 **Angle from Horizontal:** 90° **Surface Elevation:**

Machine Type: 5 tonne Excavator **Excavation Method:** EX

Excavation Dimensions: 1.50m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation

Date Excavated: 7/5/20 **Logged By:** NL **Checked By:** VDS

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	F	Stable	Not Encountered	ES 0.00 - 0.40 m (ID: TP03 0.00m - 0.20m)				Gravelly SILT: low plasticity, dark brown to brown, ironstone gravel	M (<PL)		TOPSOIL
								0.40m			
				D 0.50 - 0.60 m	0.5		MH	Clayey SILT: high plasticity, brown orange mottled grey and red	M (≈PL)	F to St	RESIDUAL SOIL
					1.0			1.00m			
							CH	CLAY: high plasticity, grey mottled brown orange and red	M (≈PL)	St	
				D 1.40 - 1.50 m				grades: trace ironstone gravel			
					1.5			1.50m			
								TERMINATED AT 1.50 m Target depth			
					2.0						
					2.5						

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
DT Diatube

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=Resdual (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

CONSTRUCTION SCIENCES

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Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP04

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.81845, 150.75716 **Angle from Horizontal:** 90° **Surface Elevation:**

Machine Type: 5 tonne Excavator **Excavation Method:** EX

Excavation Dimensions: 1.50m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation

Date Excavated: 7/5/20 **Logged By:** NL **Checked By:** VDS

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	F	Stable	Not Encountered	ES 0.00 - 0.20 m (ID: TP04 0.00m - 0.20m)	0			SILT: medium plasticity, dark brown, with gravel	M (≈PL)		TOPSOIL
								0.20m			
								Clayey SILT: high plasticity, brown orange mottled red and grey			RESIDUAL SOIL
				D 0.40 - 0.50 m	0.5		MH		M (≈PL)	F	
								0.90m			
					1.0			Clayey SILT: medium plasticity, grey mottled red, with ironstone gravel			
							ML		M (<PL)		
				D 1.40 - 1.50 m	1.5			1.50m			
								TERMINATED AT 1.50 m Target depth			
					2.0						
					2.5						

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
DT Diatube

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=Resdual (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

CONSTRUCTION SCIENCES

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Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP05

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.81847, 150.75958 **Angle from Horizontal:** 90° **Surface Elevation:**

Machine Type: 5 tonne Excavator **Excavation Method:** EX

Excavation Dimensions: 1.50m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation

Date Excavated: 7/5/20 **Logged By:** NL **Checked By:** VDS

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	F	Stable	Not Encountered	ES 0.00 - 0.20 m (ID: TP05 0.00m - 0.20m)				SILT: low plasticity, dark brown to brown, with gravel	M (<PL)		TOPSOIL
								0.20m			
							MH	Clayey SILT: high plasticity, orange brown mottled grey red	M (≈PL)	F	RESIDUAL SOIL
				D 0.50 - 0.60 m	0.5						
								0.90m			
					1.0		CH	Silty CLAY: high plasticity, grey mottled orange brown and red	M (≈PL)	F	
								1.30m			
	H			D 1.30 - 1.40 m				SILTSTONE, pale grey, extremely weathered, low strength	D		WEATHERED ROCK
								1.40m			
					1.5			TERMINATED AT 1.40 m Refusal			
					2.0						
					2.5						

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
DT Diatube

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=Resdual (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

CONSTRUCTION SCIENCES

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Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP06

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.81968, 150.75408 **Angle from Horizontal:** 90° **Surface Elevation:**

Machine Type: 5 tonne Excavator **Excavation Method:** EX

Excavation Dimensions: 1.50m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation

Date Excavated: 7/5/20 **Logged By:** NL **Checked By:** VDS

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	F	Stable	Not Encountered	ES 0.00 - 0.20 m (ID: TP06 0.00m - 0.20m) (ID: QC301) (ID: QC302)	0			SILT: low plasticity, dark brown	M (<PL)		TOPSOIL
								0.40m			
				D 0.50 - 0.60 m	0.5		CI	Silty CLAY: medium plasticity, brown orange mottled grey			RESIDUAL SOIL
					1.0			grades: trace ironstone	M (≈PL)	F to St	
								grades: with ironstone			
				D 1.40 - 1.50 m	1.5			1.50m			
								TERMINATED AT 1.50 m Target depth			
					2.0						
					2.5						

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
DT Diatube

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=Resdual (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

CONSTRUCTION SCIENCES

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Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP07

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.82007, 150.75182 **Angle from Horizontal:** 90° **Surface Elevation:**

Machine Type: 5 tonne Excavator **Excavation Method:** EX

Excavation Dimensions: 1.50m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation

Date Excavated: 7/5/20 **Logged By:** NL **Checked By:** VDS

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	F	Stable	Not Encountered	ES 0.00 - 0.20 m (ID: TP07 0.00m - 0.20m)	0			SILT: low plasticity, brown	M (<PL)		TOPSOIL
					0.20m						
							CH	Silty CLAY: high plasticity, yellow brown			RESIDUAL SOIL
				D 0.50 - 0.60 m	0.5			grades: grey mottled yellow brown and pale red	M (≈PL)	F	
				D 1.40 - 1.50 m	1.0						
					1.5						
					1.50m			TERMINATED AT 1.50 m Target depth			
					2.0						
					2.5						

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
DT Diatube

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=Resdual (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

CONSTRUCTION SCIENCES

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Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP08

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.82045, 150.75693 **Angle from Horizontal:** 90° **Surface Elevation:**

Machine Type: 5 tonne Excavator **Excavation Method:** EX

Excavation Dimensions: 1.50m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation

Date Excavated: 6/5/20 **Logged By:** NL **Checked By:** VDS

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	F	Stable	Not Encountered	ES 0.00 - 0.20 m (ID: TP08 0.00m - 0.20m)	0			SILT: low plasticity, dark brown	M (<PL)		TOPSOIL 0.00 m: PID = 4.20ppm
								0.20m			
				D 0.50 - 0.60 m	0.5		ML	SILT: medium plasticity, orange brown mottled red and grey, trace gravel	M (≈PL)	F	Possibly ALLUVIUM
								0.90m			
					1.0		CH	CLAY: high plasticity, grey mottled brown	M (≈PL)	St	RESIDUAL SOIL
				D 1.40 - 1.50 m				1.50m			
					1.5			TERMINATED AT 1.50 m Target depth			
					2.0						
					2.5						

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
DT Diatube

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=Resdual (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

CONSTRUCTION SCIENCES

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Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP09

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.82109, 150.75498 **Angle from Horizontal:** 90° **Surface Elevation:**

Machine Type: 5 tonne Excavator **Excavation Method:** EX

Excavation Dimensions: 1.50m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation

Date Excavated: 6/5/20 **Logged By:** NL **Checked By:** VDS

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	F	Stable	Not Encountered	ES 0.00 - 0.20 m (ID: TP09 0.00m - 0.20m)				Gravelly SAND: fine grained, poorly graded, rounded, brown, medium poorly graded rounded gravel	M		TOPSOIL 0.00 m: PID = 0.80ppm
								0.30m			
				D 0.50 - 0.60 m	0.5			Clayey SILT: medium plasticity, brown orange mottled red		F	RESIDUAL SOIL
					1.0		ML	grades: grey mottled red	M (≈PL)	St	
								grades: with ironstone gravel		H	
				D 1.40 - 1.50 m	1.5			1.50m			
								TERMINATED AT 1.50 m Target depth			
					2.0						
					2.5						

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
DT Diatube

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=Resdual (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

CONSTRUCTION SCIENCES

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Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP10

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.82118, 150.75627 **Angle from Horizontal:** 90° **Surface Elevation:**

Machine Type: 5 tonne Excavator **Excavation Method:** EX

Excavation Dimensions: 1.50m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation

Date Excavated: 6/5/20 **Logged By:** NL **Checked By:** VDS

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	F	Stable	Not Encountered	ES 0.00 - 0.20 m (ID: TP10 0.00m - 0.20m)				SILT: low plasticity, brown	M (<PL)		TOPSOIL 0.00 m: PID = 0.50ppm
								0.20m			
							CH	Silty CLAY: high plasticity, brown	M (≈PL)	F to St	RESIDUAL SOIL
								0.40m			
				D 0.50 - 0.60 m	0.5		CH	CLAY: high plasticity, grey mottled brown red	M (≈PL)	St	
								1.00m			
					1.0		CI	Sandy CLAY: medium plasticity, grey mottled brown	M (<PL)	St	
				D 1.40 - 1.50 m				1.50m			
					1.5			TERMINATED AT 1.50 m Target depth			
					2.0						
					2.5						

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
DT Diatube

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=Resdual (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

CONSTRUCTION SCIENCES

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Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP11

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.82186, 150.75599 **Angle from Horizontal:** 90° **Surface Elevation:**

Machine Type: 5 tonne Excavator **Excavation Method:** EX

Excavation Dimensions: 1.50m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation

Date Excavated: 6/5/20 **Logged By:** NL **Checked By:** VDS

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	F	Stable	Not Encountered	ES 0.00 - 0.20 m (ID: TP11 0.00m - 0.20m)	0			SILT: low plasticity, dark brown	M (<PL)		TOPSOIL 0.00 m: PID = 0.60ppm
								0.20m			
							CI	Silty CLAY: medium plasticity, brown	M (≈PL)	F	RESIDUAL SOIL
				D 0.40 - 0.50 m	0.5						
					1.0			1.00m			
							CH	CLAY: high plasticity, grey mottled brown red, with ironstone gravel	M (≈PL)	F	1.20 m: increasing ironstone content with depth
				D 1.40 - 1.50 m	1.5			1.50m			
								TERMINATED AT 1.50 m Target depth			
					2.0						
					2.5						

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
DT Diatube

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=Resdual (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

CONSTRUCTION SCIENCES

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Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP12

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.18234, 150.75650 **Angle from Horizontal:** 90° **Surface Elevation:**

Machine Type: 5 tonne Excavator **Excavation Method:** EX

Excavation Dimensions: 1.50m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation

Date Excavated: 6/5/20 **Logged By:** NL **Checked By:** VDS

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	F	Stable	Not Encountered	ES 0.00 - 0.20 m (ID: TP12 0.00m - 0.20m)				SILT: low plasticity, dark brown, trace gravel	M (<PL)		TOPSOIL 0.00 m: PID = 0.60ppm
								0.20m			
								Silty CLAY: medium plasticity, brown orange mottled red, trace gravel			RESIDUAL SOIL
				D 0.40 - 0.50 m	0.5				M (≈PL)		
							Cl			F to St	
					1.0			grades: grey mottled red			
									M (<PL)		
				D 1.40 - 1.50 m	1.5						
								1.50m			
								TERMINATED AT 1.50 m Target depth			
					2.0						
					2.5						

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
DT Diatube

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=Resdual (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

CONSTRUCTION SCIENCES

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Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP13

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.82344, 150.75349 **Angle from Horizontal:** 90° **Surface Elevation:**

Machine Type: 5 tonne Excavator **Excavation Method:** EX

Excavation Dimensions: 1.50m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation

Date Excavated: 6/5/20 **Logged By:** NL **Checked By:** VDS

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	F	Stable	Not Encountered	ES 0.00 - 0.20 m (ID: TP13 0.00m - 0.20m)				Silty CLAY: medium plasticity, dark brown	M (≈PL)		TOPSOIL 0.00 m: with grass roots PID = 0.80ppm
								0.20m			
								CLAY: high plasticity, grey mottled brown			RESIDUAL SOIL
				D 0.40 - 0.50 m	0.5						
					1.0		CH	grades: grey mottled red and brown orange	M (≈PL)	St	
				D 1.40 - 1.50 m	1.5			1.50m			
								TERMINATED AT 1.50 m Target depth			
					2.0						
					2.5						

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
- DT Diatube

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=Resdual (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

CONSTRUCTION SCIENCES

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Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP14

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.82437, 150.75592 **Angle from Horizontal:** 90° **Surface Elevation:**

Machine Type: 5 tonne Excavator **Excavation Method:** EX

Excavation Dimensions: 1.50m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation

Date Excavated: 5/5/20 **Logged By:** NL **Checked By:** VDS

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	F	Stable	Not Encountered	ES 0.00 - 0.20 m (ID: TP14 0.00m - 0.20m)	0			SILT: low plasticity, dark brown	M (≈PL)		TOPSOIL 0.00 m: PID = 0.40ppm
								0.20m			
								CLAY: high plasticity, red to red mottled grey			RESIDUAL SOIL
				D 0.40 - 0.50 m	0.5						
					1.0		CH		M (<PL)	St to VSt	
								1.30m			
								CLAY: low plasticity, grey mottled red			
				D 1.40 - 1.50 m	1.5		CL		M (<PL)	H	
								1.50m			
								TERMINATED AT 1.50 m Target depth			
					2.0						
					2.5						

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
DT Diatube

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=Resdual (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

CONSTRUCTION SCIENCES

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TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP15

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.82398, 150.75107 **Angle from Horizontal:** 90° **Surface Elevation:**

Machine Type: 5 tonne Excavator **Excavation Method:** EX

Excavation Dimensions: 1.50m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation

Date Excavated: 5/5/20 **Logged By:** NL **Checked By:** VDS

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	F	Stable	Not Encountered	ES 0.00 - 0.20 m (ID: TP15 0.00m - 0.20m)				SILT: low plasticity, dark brown, trace gravel	M (<PL)		TOPSOIL
								0.20m			
								CLAY: medium plasticity, grey mottled red and brown			RESIDUAL SOIL
				D 0.40 - 0.50 m	0.5		CI		M (<PL)	St	
					1.0			1.00m			
								Silty CLAY: high plasticity, grey, trace ironstone			
							CH		M (≈PL)	F	
				D 1.40 - 1.50 m	1.5			1.50m			
								TERMINATED AT 1.50 m Target depth			
					2.0						
					2.5						

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
- DT Diatube

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=Resdual (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

CONSTRUCTION SCIENCES

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TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP16

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.82571, 150.75751 **Angle from Horizontal:** 90° **Surface Elevation:**

Machine Type: 5 tonne Excavator **Excavation Method:** EX

Excavation Dimensions: 1.50m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation

Date Excavated: 5/5/20 **Logged By:** NL **Checked By:** VDS

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	F	Stable	Not Encountered	ES 0.01 - 0.20 m (ID: TP16 0.00m - 0.20m) (ID: QC101) (ID: QC102)	0.01m			FILL: Gravelly SAND: dark brown to brown, trace silt	D		PAVEMENT FILL 0.01 m: PID = 0.50ppm
					0.30m						
				D 0.40 - 0.50 m	0.5		CL	CLAY: low plasticity, grey with brown streaks mottled red	M (<PL)	St	RESIDUAL SOIL
				D 0.90 - 1.00 m	1.0						
					1.10m		CI	Silty CLAY: medium plasticity, grey mottled red	M (<PL)	St	
				D 1.40 - 1.50 m	1.5						
					1.50m			TERMINATED AT 1.50 m Target depth			
					2.0						
					2.5						

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
DT Diatube

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=Resdual (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

CONSTRUCTION SCIENCES

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Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP17

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.82538, 150.75780 **Angle from Horizontal:** 90° **Surface Elevation:**

Machine Type: 5 tonne Excavator **Excavation Method:** EX

Excavation Dimensions: 1.50m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation

Date Excavated: 5/5/20 **Logged By:** NL **Checked By:** VDS

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	F	Stable	Not Encountered	ES 0.00 - 0.20 m (ID: TP17 0.00m - 0.20m)				SILT: low plasticity, dark brown to brown, trace gravel PID = 0.4ppm	M (≈PL)		TOPSOIL 0.00 m: PID = 0.40ppm
								0.30m			
				D 0.40 - 0.50 m	0.5		CL	Silty CLAY: high plasticity, brown mottled red	M (≈PL)	F	RESIDUAL SOIL
				D 0.90 - 1.00 m	1.0			1.00m			
							ML	Clayey SILT: low plasticity, grey mottled brown	M (<PL) to M (≈PL)	F	
								1.50m			
	H			D 1.50 - 1.60 m	1.5			SANDSTONE, grey, with ironstone gravel, low strength			WEATHERED ROCK
								1.60m			
								TERMINATED AT 1.60 m Target depth			
					2.0						
					2.5						

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
- DT Diatube

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=Resdual (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
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- St - Stiff
- VSt - Very Stiff
- H - Hard

RELATIVE DENSITY
- VL - Very Loose
- L - Loose
- MD - Medium Dense
- D - Dense
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Refer to explanatory notes for details of abbreviations and basis of descriptions

CONSTRUCTION SCIENCES

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Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP18

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.82630, 150.75868 **Angle from Horizontal:** 90° **Surface Elevation:**

Machine Type: 5 tonne Excavator **Excavation Method:** EX

Excavation Dimensions: 1.50m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation

Date Excavated: 5/5/20 **Logged By:** NL **Checked By:** VDS

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	F	Stable	Not Encountered	ES 0.00 - 0.20 m (ID: TP17 0.00m - 0.20m)				FILL: Gravelly SAND: dark brown, with silt	M		FILL 0.00 m: PID = 0.40ppm
				D 0.40 - 0.50 m	0.5			grades: wet	W		
								0.80m			
				D 0.90 - 1.00 m	1.0		GC	Clayey GRAVEL: red mottled brown, ironstone gravel	M	L	RESIDUAL SOIL
				D 1.30 - 1.40 m				1.40m			
					1.5			TERMINATED AT 1.40 m Refusal			
					2.0						
					2.5						

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
DT Diatube

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=Resdual (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

CONSTRUCTION SCIENCES

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Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP19

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.82640, 150.75688 **Angle from Horizontal:** 90° **Surface Elevation:**

Machine Type: 5 tonne Excavator **Excavation Method:** EX

Excavation Dimensions: 1.00m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation

Date Excavated: 4/5/20 **Logged By:** NL **Checked By:** VDS

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	F	Stable	Not Encountered	ES 0.00 - 0.20 m (ID: TP19 0.00m - 0.20m)				Sandy SILT: low plasticity, dark brown, trace gravel	M (<PL)		TOPSOIL 0.00 m: polypipe on surface PID = 0.10ppm
								0.20m			
							CH	CLAY: high plasticity, red mottled grey		St	RESIDUAL SOIL
					0.5			grades: with ironstone gravel, grey mttled brown orange	M (≈LL)	VSt to H	
								0.80m			
								TERMINATED AT 0.80 m Target depth			
					1.0						
					1.5						
					2.0						
					2.5						

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
DT Diatube

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=Resdual (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

CONSTRUCTION SCIENCES

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Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP20

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.82609, 150.75635 **Angle from Horizontal:** 90° **Surface Elevation:**

Machine Type: 5 tonne Excavator **Excavation Method:** EX

Excavation Dimensions: 1.00m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation

Date Excavated: 4/5/20 **Logged By:** NL **Checked By:** VDS

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	F	Stable	Not Encountered	ES 0.00 - 0.20 m (ID: TP20 0.00m - 0.20m)				SILT: low plasticity, dark brown	M (<PL)		TOPSOIL 0.00 m: with ceramic tiles, timber PID = 0.10ppm
				D 0.20 - 0.30 m			CL	0.20m Sandy CLAY: low plasticity, brown mottled brown orange	M (<PL)	S to F	RESIDUAL SOIL
					0.5		CH	0.30m Silty CLAY: high plasticity, red mottled brown	M (≈PL)	St	
					1.0			grades: grey mottled pale brown 1.00m TERMINATED AT 1.00 m Target depth			
					1.5						
					2.0						
					2.5						

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
DT Diatube

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=Resdual (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

CONSTRUCTION SCIENCES

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TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP21

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.82504, 150.75602 **Angle from Horizontal:** 90° **Surface Elevation:**
Machine Type: 5 tonne Excavator **Excavation Method:** EX
Excavation Dimensions: 1.00m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation
Date Excavated: 4/5/20 **Logged By:** NL **Checked By:** VDS

Excavation: Method	Excavation: Resistance	Excavation: Stability	Water	Sampling & Testing: Sample or Field Test	Depth (m)	Material Description: 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	F	Stable	Not Encountered	ES 0.00 - 0.30 m (ID: TP21 0.00m - 0.20m) (ID: TP21-ACM-0.30m) (ID: Asbestos sample)				Sandy SILT: low plasticity, dark brown, trace clay	M (<PL)		TOPSOIL 0.00 m: with conrete, bricks and iron bar Abestos Containing Material at 0.30m PID = 0.20ppm
								0.30m			
							CI	CLAY: medium plasticity, red mottled grey	M (≈PL)	F to St	RESIDUAL SOIL
					0.5			0.50m TERMINATED AT 0.50 m Target depth			
					1.0						
					1.5						
					2.0						
					2.5						

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
DT Diatube

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=Resdual (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

CONSTRUCTION SCIENCES

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TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP22

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.82790, 150.75457 **Angle from Horizontal:** 90° **Surface Elevation:**
Machine Type: 5 tonne Excavator **Excavation Method:** EX
Excavation Dimensions: 1.00m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation
Date Excavated: 4/5/20 **Logged By:** NL **Checked By:** VDS

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	F	Stable	Not Encountered	ES 0.00 - 0.20 m (ID: TP22 0.00m - 0.20m)				Sandy SILT: low plasticity, brown	M (<PL)		TOPSOIL 0.00 m: PID = 0.20ppm
								0.20m			
							CL	Sandy CLAY: low plasticity, brown, coarse poorly graded rounded sand	M (<PL)		RESIDUAL SOIL
					0.5			0.30m			
							CH	CLAY: high plasticity, brown mottled grey	M (<PL) to M (≈PL)	St	
								0.70m			
								TERMINATED AT 0.70 m Target depth			
					1.0						
					1.5						
					2.0						
					2.5						

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
DT Diatube

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=Resdual (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

CONSTRUCTION SCIENCES

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Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP23

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.82748, 150.75128 **Angle from Horizontal:** 90° **Surface Elevation:**

Machine Type: 5 tonne Excavator **Excavation Method:** EX

Excavation Dimensions: 1.00m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation

Date Excavated: 4/5/20 **Logged By:** NL **Checked By:** VDS

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	F	Stable	Not Encountered	ES 0.00 - 0.10 m (ID: TP23 0.00m - 0.10m)	0.5			SILT: low plasticity, brown 0.10m	M (<PL)		TOPSOIL 0.00 m: PID = 0.30ppm
							CH	CLAY: high plasticity, red mottled grey 0.60m	M (≈PL)	St	RESIDUAL SOIL
					1.0		CL	CLAY: low plasticity, grey mottled pale brown 1.00m	M (<PL)	St to VSt	
								TERMINATED AT 1.00 m Target depth			
					1.5						
					2.0						
					2.5						

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
DT Diatube

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=Resdual (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

CONSTRUCTION SCIENCES

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Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP24

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.82586, 150.75151 **Angle from Horizontal:** 90° **Surface Elevation:**

Machine Type: 5 tonne Excavator **Excavation Method:** EX

Excavation Dimensions: 1.00m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation

Date Excavated: 4/5/20 **Logged By:** NL **Checked By:** VDS

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	F	Stable	Not Encountered	ES 0.00 - 0.40 m (ID: TP24 0.00m - 0.40m)	0			SILT: low plasticity, dark brown, trace clay	M (<PL)		TOPSOIL 0.00 m: with grass roots PID = 0.40m
								0.30m			
				D 0.40 - 0.50 m	0.5		CH	CLAY: high plasticity, red mottled grey		St	RESIDUAL SOIL 0.30 m: PID = 0.30ppm
								grades: grey mottled brown	M (≈PL)	St to VSt	
					1.0			1.00m			
								TERMINATED AT 1.00 m Target depth			
					1.5						
					2.0						
					2.5						

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
DT Diatube

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=Resdual (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

CONSTRUCTION SCIENCES

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Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP25

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.87473, 150.75144 **Angle from Horizontal:** 90° **Surface Elevation:**

Machine Type: 5 tonne Excavator **Excavation Method:** EX

Excavation Dimensions: 1.50m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation

Date Excavated: 4/5/20 **Logged By:** NL **Checked By:** VDS

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	F	Stable	Not Encountered	ES 0.00 - 0.20 m (ID: TP25 0.00m - 0.20m)				Sandy SILT: low plasticity, dark brown	M (<PL)		TOPSOIL 0.00 m: ceramic, plastic, metal on surface PID = 0.50ppm
								0.20m			
					0.5		CH	CLAY: high plasticity, red brown mottled grey			RESIDUAL SOIL
								grades: grey mottles pale brown	M (≈PL)	F to St	
					1.0			1.00m			
							CL	Sandy CLAY: low plasticity, grey mottled pale brown	M (<PL)	St to VSt	
								1.20m			
								TERMINATED AT 1.20 m Target depth			
					1.5						
					2.0						
					2.5						

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
DT Diatube

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=Resdual (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

CONSTRUCTION SCIENCES

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Explanatory Notes

The methods of description and classification of soils and rocks used in this report are based on Australian Standard AS1726-2017 Geotechnical Site Investigations. Material descriptions are deduced from field observation or engineering examination, and may be appended or confirmed by in situ or laboratory testing. The information is dependent on the scope of investigation, the extent of sampling and testing, and the inherent variability of the conditions encountered.

Subsurface investigation may be conducted by one or a combination of the following methods.

Method	
Test Pitting: excavation/trench	
BH	Backhoe bucket
EX	Excavator bucket
R	Ripper
H	Hydraulic Hammer
X	Existing excavation
N	Natural exposure
Manual drilling: hand operated tools	
HA	Hand Auger
Continuous sample drilling	
PT	Push tube
PS	Percussion sampling
SON	Sonic drilling
Hammer drilling	
AH	Air hammer
AT	Air track
Spiral flight auger drilling	
AS	Auger screwing
AD/V	Continuous flight auger: V-bit
AD/T	Continuous spiral flight auger: TC-Bit
HFA	Continuous hollow flight auger
Rotary non-core drilling	
WB	Washbore drilling
RR	Rock roller
Rotary core drilling	
PQ	85mm core (wire line core barrel)
HQ	63.5mm core (wire line core barrel)
NMLC	51.94mm core (conventional core barrel)
NQ	47.6mm core (wire line core barrel)
DT	Diatube (concrete coring)

Sampling is conducted to facilitate further assessment of selected materials encountered.

Sampling method	
Soil sampling	
B	Bulk disturbed sample
D	Disturbed sample
C	Core sample
ES	Environmental soil sample
SPT	Standard Penetration Test sample
U	Thin wall tube ‘undisturbed’ sample
Water sampling	
WS	Environmental water sample

Field testing may be conducted as a means of assessment of the in situ conditions of materials.

Field testing	
SPT	Standard Penetration Test
HP/PP	Hand/Pocket Penetrometer
Dynamic Penetrometers (blows per noted increment)	
DCP	Dynamic Cone Penetrometer
PSP	Perth Sand Penetrometer
MC	Moisture Content
VS	Vane Shear
PBT	Plate Bearing Test
IMP	Borehole Impression Test
PID	Photo Ionization Detector

If encountered, refusal (R), virtual refusal (VR) or hammer bouncing (HB) of penetrometers may be noted.

The quality of the rock can be assessed by the degree of natural defects/fractures and the following.

Rock quality description	
TCR	Total Core Recovery (%) (length of core recovered divided by the length of core run)
RQD	Rock Quality Designation (%) (sum of axial lengths of core greater than 100mm long divided by the length of core run)

Notes on groundwater conditions encountered may include.

Groundwater	
Not Encountered	Excavation is dry in the short term
Not Observed	Water level observation not possible
Seepage	Water seeping into hole
Inflow	Water flowing/flooding into hole

Perched groundwater may result in a misleading indication of the depth to the true water table. Groundwater levels are also likely to fluctuate with variations in climatic and site conditions.

Notes on the stability of excavations may include.

Excavation conditions	
Stable	No obvious/gross short term instability noted
Spalling	Material falling into excavation (minor/major)
Unstable	Collapse of the majority, or one or more face of the excavation

Explanatory Notes: General Soil Description

The methods of description and classification of soils used in this report are based on Australian Standard AS1726-2017 Geotechnical Site Investigations. In practice, a material is described as a soil if it can be remoulded by hand in its field condition or in water. The dominant component is shown in upper case, with secondary components in lower case. In general descriptions cover: soil type, plasticity or particle size/shape, colour, strength or density, moisture and inclusions.

In general, soil types are classified according to the dominant particle on the basis of the following particle sizes.

Soil Classification		Particle Size (mm)
CLAY		< 0.002
SILT		0.002 0.075
SAND	fine	0.075 to 0.21
	medium	0.21 to 0.6
	coarse	0.6 to 2.36
GRAVEL	fine	2.36 to 6.7
	medium	6.7 to 19
	coarse	19 to 63
COBBLES		63 to 200
BOULDERS		> 200

Soil types may be qualified by the presence of minor components on the basis of field examination methods and/or the soil grading.

Terminology	In coarse grained soils		In fine soils
	% fines	% coarse	% coarse
Trace	≤5	≤15	≤15
With	>5, ≤12	>15, ≤30	>15, ≤30

The strength of cohesive soils is classified by engineering assessment or field/lab testing as follows.

Strength	Symbol	Undrained shear strength
Very Soft	VS	≤12kPa
Soft	S	12kPa to ≤25kPa
Firm	F	25kPa to ≤50kPa
Stiff	St	50kPa to ≤100kPa
Very Stiff	VSt	100kPa to ≤200kPa
Hard	H	>200kPa

Cohesionless soils are classified on the basis of relative density as follows.

Relative Density	Symbol	Density Index
Very Loose	VL	<15%
Loose	L	15% to ≤35%
Medium Dense	MD	35% to ≤65%
Dense	D	65% to ≤85%
Very Dense	VD	>85%

The plasticity of cohesive soils is defined by the Liquid Limit (LL) as follows.

Plasticity	Silt LL	Clay LL
Low plasticity	≤ 35%	≤ 35%
Medium plasticity	N/A	> 35% ≤ 50%
High plasticity	> 50%	> 50%

The moisture condition of soil (*w*) is described by appearance and feel and may be described in relation to the Plastic Limit (PL), Liquid Limit (LL) or Optimum Moisture Content (OMC).

Moisture condition and description	
Dry	Cohesive soils: hard, friable, dry of plastic limit. Granular soils: cohesionless and free-running
Moist	Cool feel and darkened colour: Cohesive soils can be moulded. Granular soils tend to cohere
Wet	Cool feel and darkened colour: Cohesive soils usually weakened and free water forms when handling. Granular soils tend to cohere

The structure of the soil may be described as follows.

Zoning	Description
Layer	Continuous across exposure or sample
Lens	Discontinuous layer (lenticular shape)
Pocket	Irregular inclusion of different material

The structure of soil layers may include: defects such as softened zones, fissures, cracks, joints and root-holes; and coarse grained soils may be described as strongly or weakly cemented.

The soil origin may also be noted if possible to deduce.

Soil origin and description	
Fill	Anthropogenic deposits or disturbed material
Topsoil	Zone of soil affected by roots and root fibres
Peat	Significantly organic soils
Colluvial	Transported down slopes by gravity/water
Aeolian	Transported and deposited by wind
Alluvial	Deposited by rivers
Estuarine	Deposited in coastal estuaries
Lacustrine	Deposited in freshwater lakes
Marine	Deposits in marine environments
Residual soil	Soil formed by in situ weathering of rock, with no structure/fabric of parent rock evident
Extremely weathered material	Formed by in situ weathering of geological formations, with the structure/fabric of parent rock intact but with soil strength properties

The origin of the soil generally cannot be deduced solely on the appearance of the material and the inference may be supplemented by further geological evidence or other field observation. Where there is doubt, the terms ‘possibly’ or ‘probably’ may be used

Explanatory Notes: General Rock Description

The methods of description and classification of rocks used in this report are based on Australian Standard AS1726-2017 Geotechnical Site Investigations. In practice, if a material cannot be remoulded by hand in its field condition or in water, it is described as a rock. In general, descriptions cover: rock type, grain size, structure, colour, degree of weathering, strength, minor components or inclusions, and where applicable, the defect types, shape, roughness and coating/infill.

Rock types are generally described according to the predominant grain or crystal size, and in groups for each rock type as follows.

Rock type	Groups
Sedimentary	Deposited, carbonate (porous or non), volcanic ejection
Igneous	Felsic (much quartz, pale), Intermediate, or mafic (little quartz, dark)
Metamorphic	Foliated or non-foliated
Duricrust	Cementing minerology (iron oxides or hydroxides, silica, calcium carbonate, gypsum)

Reference should be made to AS1726 for details of the rock types and methods of classification.

The classification of rock weathering is described based on definitions in AS1726 and summarised as follows.

Term and symbol		Definition
Residual Soil	RS	Soil developed on rock with the mass structure and substance of the parent rock no longer evident
Extremely weathered	XW	Weathered to such an extent that the rock has 'soil-like' properties. Mass structure and substance still evident
Distinctly weathered	DW	The strength is usually changed and may be highly discoloured. Porosity may be increased by leaching, or decreased due to deposition in pores. May be distinguished into MW (Moderately Weathered) and HW (Highly Weathered).
Slightly weathered	SW	Slightly discoloured; little or no change of strength from fresh rock
Fresh Rock	FR	The rock shows no sign of decomposition or staining

The rock material strength can be defined based on the point load index as follows.

Term and symbol		Point Load Index I_s50 (MPa)
Very Low	VL	0.03 to 0.1
Low	L	0.1 to 0.3
Medium	M	0.3 to 1.0
High	H	1.0 to 3
Very High	VH	3 to 10
Extremely High	EH	> 10

It is important to note that the rock material strength as above is distinct from the rock mass strength which can be significantly weaker due to the effect of defects.

A preliminary assessment of rock strength may be made using the field guide detailed in AS1726, and this is conducted in the absence of point load testing.

The defect spacing measured normal to defects of the same set or bedding, is described as follows.

Definition	Defect Spacing (mm)
Thinly laminated	< 6
Laminated	6 to 20
Very thinly bedded	20 to 60
Thinly bedded	60 to 200
Medium bedded	200 to 600
Thickly bedded	600 to 2000
Very thickly bedded	> 2000

Terms for describing rock and defects are as follows.

Defect Terms			
Joint	JT	Sheared zone	SZ
Bedding Parting	BP	Seam	SM
Foliation	FL	Vein	VN
Cleavage	CL	Drill Lift	DL
Crushed Seam	CS	Handling Break	HB
Fracture Zone	FZ	Drilling Break	DB

The shape and roughness of defects in the rock mass are described using the following terms.

Planarity		Roughness	
Planar	PR	Very Rough	VR
Curved	CU	Rough	RF
Undulose	UN	Smooth	S
Irregular	IR	Slickensided	SL
Stepped	ST	Polished	POL
Discontinuous	DIS		

The coating or infill associated with defects in the rock mass are described as follows.

Infill and Coating		
Clean	CN	
Stained	SN	
Carbonaceous	X	
Minerals	MU	Unidentified mineral
	MS	Secondary mineral
	KT	Chlorite
	CA	Calcite
	Fe	Iron Oxide
	Qz	Quartz
Veneer	VNR	Thin or patchy coating
Coating	CT	Infill up to 1mm

Construction Sciences

Graphic Symbols Index


CLAY


Silty CLAY


Sandy CLAY


Gravelly CLAY


Silty Gravelly CLAY


Silty Sandy CLAY


Sandy Gravelly


CLAY SILT


Clayey SILT


Sandy SILT Gravelly


SILT


Clayey Sandy SILT


Clayey Gravelly SILT


Sandy Gravelly SILT


SAND


Clayey SAND


Silty SAND


Gravelly SAND


Clayey Silty SAND


Clayey Gravelly SAND


Silty Gravelly SAND


GRAVEL


Clayey GRAVEL


Silty GRAVEL


Sandy GRAVEL


Clayey Silty GRAVEL


Clayey Sandy GRAVEL


Silty Sandy GRAVEL


COBBLES & BOULDERS


PEAT, highly organic soil


TOPSOIL


FILL


FILL: Asphalt or Bituminous Seal


FILL: Ballast


FILL: Concrete


FILL: Roadbase


Sedimentary rock: fine, mostly clay (CLAYSTONE)


Sedimentary rock: fine, mostly silt (SILTSTONE)


Sedimentary rock: fine, silt and clay (MUDSTONE, SHALE, LAMINITE)


Sedimentary rock: medium (SANDSTONE, GREYWACKE)


Sedimentary rock: fine to coarse, angular (BRECCIA)


Sedimentary rock: coarse, rounded (CONGLOMERATE)


Sedimentary rock: Organic (COAL)


Sedimentary rock: Carbonate (LIMESTONE, DOLOMITE)


Sedimentary rock: Volcanic (TUFF, VOLCANIC BRECCIA, AGGLOMERATE)


Igneous rock: Felsic, fine (RHYOLITE)


Igneous rock: Felsic, coarse (GRANITE)


Igneous rock: Mafic, fine to medium (BASALT, DOLERITE)


Igneous rock: Mafic, coarse (GABBRO)


Metamorphic rock: Foliated, fine to medium (SLATE, PHYLLITE, SHIST)


Metamorphic rock: Foliated, coarse (GNEISS)


Metamorphic rock: Non-foliated (QUARTZITE, HORNFELS, MARBLE)

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APPENDIX K

DATA SUMMARY TABLES

LR02 - Stockpile Soil Results

Construction Sciences

							Field ID	SP1-1	SP1-2	SP1-3	SP2-1	SP2-2	SP2-3	SP3-1	SP3-2	SP3-3	SP4-1	SP4-2	SP4-3	Statistics						QC201	QC202
							Date	5/05/2020	5/05/2020	5/05/2020	5/05/2020	5/05/2020	5/05/2020	5/05/2020	5/05/2020	5/05/2020	5/05/2020	5/05/2020	5/05/2020							5/05/2020	5/05/2020
	Unit	EQL	CRC Care HSL-D Commercial / Industrial	NEPM 2013 Table 1B(7) Management Limits in Commercial/Ind D, Coarse Soil	NEPM 2013 Table 1A(3) Comm/Ind D Soil HSL for Vapour Intrusion, Sand	NEPM 2013 Table 1A(1) HILs Comm/Ind D Soil	Lab Reference	717918	717918	717918	717918	717918	717918	717918	717918	717918	717918	717918	717918	Min (Detect)	Max	Average	Standard Dev.	Procedure B	95% UCL	717918	SE206102
							Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil							Soil (SP1-1)	Soil (SP1-1)
Asbestos																															
AF/FA	% w/w							ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND								
ACM - Comment	% w/w							ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND								
BTEX																															
Benzene	mg/kg	0.1	430		3			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	ND	ND					<0.1	<0.1
Toluene	mg/kg	0.1	99,000		NL			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	ND	ND					<0.1	<0.1
Ethylbenzene	mg/kg	0.1	27,000		NL			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	ND	ND					<0.1	<0.1
Xylene Total	mg/kg	0.3	81,000		230			<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	ND	ND					<0.3	<0.3
Napthalene	mg/kg	0.3	11,000		NL			<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	ND	ND					<0.3	<0.1
TRH																															
C6-C10 (F1)	mg/kg	20	26,000	700	260			<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	ND	ND					<20	<25
C10-C16 (F2)	mg/kg	25	20,000	1,000	NL			<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	ND	ND					<50	<25
C16-C34 (F3)	mg/kg	90	27,000	3,500				<100	<100	<100	**280**	**300**	**510**	**230**	**380**	**280**	**310**	**200**	**330**	200	510	313	85	0.00445	321	<100	<90
C34-C40 (F4)	mg/kg	100	38,000	10,000				<100	<100	<100	**650**	**420**	**690**	**570**	**560**	**650**	**480**	**510**	**530**	420	690	562	83	0.00048	561	<100	<120
Metals																															
Arsenic	mg/kg	1				3,000		<2	<2	<2	**5**	**4.8**	**4.4**	**7.1**	**6.2**	**5.1**	**4.1**	**3.9**	**6.7**	3.9	7.1	5.3	1	0.0000008	5	<2	<1
Cadmium	mg/kg	0.3				900		<0.4	<0.4	<0.4	<0.4	0.9	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	ND	ND					<0.4	<0.3
Chromium (III+VI)	mg/kg	0.5				3,000		<5	<5	<5	<5	**82**	**35**	**93**	**120**	**110**	**92**	**37**	**63**	**89**	35	120	80	28	0.00057	83	<5	**1.5**
Copper	mg/kg	0.5				240,000		**9.6**	**9.3**	**6.8**	**46**	**48**	**49**	**38**	**46**	**37**	**30**	**19**	**46**	6.8	49	32	16	0.00000	41	9.7	**8.2**
Lead	mg/kg	1				1,500		**29**	**26**	**22**	**16**	**17**	**15**	**18**	**17**	**15**	**11**	**12**	**18**	11	29	18	5	0.00007	21	39	**28**
Mercury	mg/kg	0.05				730		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	ND	ND					<0.1	<0.05
Nickel	mg/kg	0.5				6,000		<5	<5	<5	**21**	**18**	**22**	**21**	**24**	**24**	**19**	**16**	**26**	16	26	21	3	0.0000016	21	<5	**1.6**
Zinc	mg/kg	2				400,000		**31**	**24**	**22**	**87**	**180**	**78**	**73**	**82**	**78**	**48**	**57**	**82**	22	180	70	40	0.0000001	103	**28**	**37**
Organochlorine Pesticides																															
Aldrin + Dieldrin	mg/kg	0.05				45		<0.05	<0.05	<0.05	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ND	ND					<0.05	<0.1
Chlordane	mg/kg	0.1				530		<0.1	<0.1	<0.1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ND	ND					<0.1	<0.1
DDT+DDE+DDD	mg/kg	0.05				3,600		<0.05	<0.05	<0.05	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ND	ND					<0.05	<0.1
HCB	mg/kg	0.05				80		<0.05	<0.05	<0.05	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ND	ND					<0.05	<0.1
Endosulfan	mg/kg	0.05				2,000		<0.05	<0.05	<0.05	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ND	ND					<0.05	<0.1
Endrin	mg/kg	0.05				100		<0.05	<0.05	<0.05	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ND	ND					<0.05	<0.1
Heptachlor	mg/kg	0.05				50		<0.05	<0.05	<0.05	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ND	ND					<0.05	<0.1
Methoxychlor	mg/kg	0.1				2,500		<0.2	<0.2	<0.2	<0.5	<0.5	<0.5	<0.5	<2	<2	<2	<2	<2	ND	ND					<0.2	<0.1
PAH																															
Benzo(a) pyrene	mg/kg	0.1						<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ND	ND					<0.5	<0.1
Benzo(a)pyrene TEQ calc (Half)	mg/kg	0.2				40		**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	0.6	0.6	0.6	0.0			**0.6**	<0.3
PAHs (Sum of total)	mg/kg	0.5				4,000		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	**0.6**	<0.5	<0.5	0.6	0.6	0.6	0.0		0.3	<0.5	<0.8

Environmental Standards
CRC Care, 2011, CRC Care HSL-D Commercial / Industrial
NEPM, NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Coarse Soil

Statistics
* A Non Detect Multiplier of 0.5 has been applied.
*ELs calculated based on worst case scenario of ACL values for aged
ND not detected

5046200067

LR02A - Stockpile Relative Percentage Differences

Sample ID	Date	Report	BTEX				TRH				PAH	
			Benzene	Toluene	Ethylbenzene	Xylene	F1	F2	F3	F4	B(a)P TEQ	Total
INTRA-LABORATORY												
SP1-1	5/05/2020	717918	<0.1	<0.1	<0.1	<0.3	<20	<50	<100	<100	**0.6**	<0.5
QC201	5/05/2020	717918	<0.1	<0.1	<0.1	<0.3	<20	<50	<100	<100	**0.6**	<0.5
RPD			**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**
INTER-LABORATORY												
SP1-1	5/05/2020	717918	<0.1	<0.1	<0.1	<0.3	<20	<50	<100	<100	**0.6**	<0.5
QC202	5/05/2020	SE206102	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	<0.3	<0.8
RPD			**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**120%**	**0%**

Sample ID	Date	Report	Heavy Metals							
			As	Cd	Cr	Cu	Pb	Hg	Ni	Zn
INTRA-LABORATORY										
SP1-1	5/05/2020	717918	<2	<0.4	<5	**9.6**	**29**	<0.1	<5	**31**
QC201	5/05/2020	717918	<2	<0.4	<5	**9.7**	**39**	<0.1	<5	**28**
RPD			**0%**	**0%**	**0%**	**1%**	**29%**	**0%**	**0%**	**10%**
INTER-LABORATORY										
SP1-1	5/05/2020	717918	<2	<0.4	<5	**9.6**	**29**	<0.1	<5	**31**
QC202	5/5/2020	SE206102	<1	<0.3	**1.5**	**8.2**	**28**	<0.05	**1.6**	**37**
RPD			**0%**	**0%**	**50%**	**16%**	**4%**	**0%**	**44%**	**18%**

| | | |

								Statistics						QC101	QC102	QC301	QC302
														5/05/2020	5/05/2020	7/05/2020	7/05/2020
			CRC Care HSL-D Commercial / Industrial Direct Contact	NEPM 2013 Table 1B(7) Management Limits Comm / Ind, Fine Soil	NEPM 2013 Table 1A(3) Comm/Ind D Soil HSL for Vapour Intrusion, Clay (0 to <1)	NEPM 2013 Table 1A(3) Comm/Ind D Soil HSL for Vapour Intrusion, Silt (0 to <1)	NEPM 2013 Table 1A(1) HILs Comm/Ind D Soil	Min (Detect)	Max	Average	Standard Dev.	Procedure B	95% UCL	717918	SE206019	718468	718468
	Unit	EQL												Soil (Primary TP16)	Soil Primary (TP16)	Soil Primary (TP06)	Soil Primary (TP06)
Asbestos																	
Detect/Non-Detect	**Comment**																
BTEX																	
Benzene	**mg/kg**	0.1	430		4	4		ND	ND					<0.1	<0.1		
Toluene	**mg/kg**	0.1	99,000		NL	NL		ND	ND					<0.1	<0.1		
Ethylbenzene	**mg/kg**	0.1	27,000		NL	NL		ND	ND					<0.1	<0.1		
Xylene Total	**mg/kg**	0.3	81,000		NL	NL		ND	ND					<0.3	<0.3		
Naphthalene	**mg/kg**	0.5	11,000		NL	NL		ND	ND					<0.5	<0.5		
TRH																	
C6-C10 (F1 minus BTEX)	**mg/kg**	20	26,000	800	310	250		ND	ND					<20	<25		
C10-C16 (F2 minus Naph.)	**mg/kg**	25	20,000	1,000	NL	NL		ND	ND					<50	<25		
C16-C34	**mg/kg**	90	27,000	5,000				250	250	250	0		157	<100	<90		
C34-C40	**mg/kg**	100	38,000	10,000				250	250	250	0		157	140	<120		
Metals																	
Arsenic	**mg/kg**	1					3,000	3.6	41	14	9	0.00006	17	**18**	**5**	**18**	**14**
Cadmium	**mg/kg**	0.3					900	2	2	2	0	0.00000	0.4	<0.4	<0.3	<0.4	<0.4
Chromium (III+VI)	**mg/kg**	0.5					3,000	11	200	48	39	0.00109	63	**88**	**21**	**58**	**44**
Copper	**mg/kg**	0.5					240,000	5.3	26	11	5	0.00000	11	**6.5**	**12**	**7.2**	**6.9**
Lead	**mg/kg**	1					1,500	12	46	23	10	0.00027	26	**13**	**10**	**23**	**22**
Mercury	**mg/kg**	0.05					730	0.3	0.3	0.3	0	0.00000	0.08	<0.1	<0.05	<0.1	<0.1
Nickel	**mg/kg**	0.5					6,000	5.2	15	8	3	0.000001	9	<5	**5.3**	**6.4**	**6**
Zinc	**mg/kg**	2					400,000	5.5	96	25	24	0.00000002	34	**7.6**	**12**	**7.2**	**7.1**
Organochlorine Pesticides																	
Aldrin + Dieldrin	**mg/kg**	0.05					45	ND	ND								
Chlordane	**mg/kg**	0.05					530	ND	ND								
DDT+DDE+DDD	**mg/kg**	0.05					3,600	ND	ND								
HCB	**mg/kg**	0.05					80	ND	ND								
Endosulfan	**mg/kg**	0.05					2000	ND	ND								
Endrin	**mg/kg**	0.05					100	ND	ND								
Heptachlor	**mg/kg**	0.05					50	ND	ND								
Methoxychlor	**mg/kg**	0.1					2,500	ND	ND								
Organophosphorous Pesticides																	
Tokuthion	**mg/kg**	0.2						ND	ND								
Azinophos methyl	**mg/kg**	0.2						ND	ND								
Bolstar (Sulprofos)	**mg/kg**	0.2						ND	ND								
Chlorfenvinphos	**mg/kg**	0.2						ND	ND								
Chlorpyrifos	**mg/kg**	0.2					2,000	ND	ND								
Chlorpyrifos-methyl	**mg/kg**	0.2						ND	ND								
Coumaphos	**mg/kg**	2						ND	ND								
Demeton-O	**mg/kg**	0.2						ND	ND								
Demeton-S	**mg/kg**	0.2						ND	ND								
Diazinon	**mg/kg**	0.2						ND	ND								
Dichlorvos	**mg/kg**	0.2						ND	ND								
Dimethoate	**mg/kg**	0.2						ND	ND								
Disulfoton	**mg/kg**	0.2						ND	ND								
Ethion	**mg/kg**	0.2						ND	ND								
Ethoprop	**mg/kg**	0.2						ND	ND								
Fenitrothion	**mg/kg**	0.2						ND	ND								
Fensulfothion	**mg/kg**	0.2						ND	ND								
Fenthion	**mg/kg**	0.2						ND	ND								
EPN	**mg/kg**	0.2						ND	ND								
Malathion	**mg/kg**	0.2						ND	ND								
Merphos	**mg/kg**	0.2						ND	ND								
Methyl parathion	**mg/kg**	0.2						ND	ND								
Mevinphos (Phosdrin)	**mg/kg**	0.2						ND	ND								
Monocrotophos	**mg/kg**	2						ND	ND								
Naled (Dibrom)	**mg/kg**	0.2						ND	ND								
Omethoate	**mg/kg**	2						ND	ND								
Phorate	**mg/kg**	0.2						ND	ND								
Pyrazophos	**mg/kg**	0.2						ND	ND								
Ronnel	**mg/kg**	0.2						ND	ND								
Terbufos	**mg/kg**	0.2						ND	ND								
Trichloronate	**mg/kg**	0.2						ND	ND								
Tetrachlorvinphos	**mg/kg**	0.2						ND	ND								
PAH																	
Benzo(a) pyrene	**mg/kg**	0.1						ND	ND					<0.5	**0.2**	<0.5	<0.5
Benzo(a)pyrene TEQ calc (Half)	**mg/kg**	0.2					40	0.6	0.6					**0.6**	**0.3**	**0.6**	**0.6**
PAHs (Sum of total)	**mg/kg**	0.5					4,000	ND	ND					<0.5	**1.6**	<0.5	<0.5

Environmental Standards
CRC Care, 2011, CRC Care HSL-D Commercial / Industrial
NEPM, NEPM 2013 Table 1B(7) Management Limits Comm / Ind, Fine Soil

Statistics
* A Non Detect Multiplier of 0.5 has been applied.
^EILs calculated based on worst case scenario of ACL values for aged
ND not detected

5046200067

Table LR1-A - Relative Percent Difference Test Pit Results

Sample ID	Date	Report	BTEX				TRH				PAH	
			Benzene	Toluene	Ethylbenzene	Xylene	F1	F2	F3	F4	B(a)P TEQ	Total
INTRA-LABORATORY												
TP16-0-0.2	5/05/2020	717918	<0.1	<0.1	<0.1	<0.3	<20	<50	**250**	**250**	**0.6**	<0.5
QC101	5/05/2020	717918	<0.1	<0.1	<0.1	<0.3	<20	<50	<100	**140**	**0.6**	<0.5
RPD			**0%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**133%**	**56%**	**0%**	**0%**
TP06-0-0.2	7/05/2020	718468	--	--	--	--	--	--	--	--	**0.6**	<0.5
QC301	7/05/2020	718468	--	--	--	--	--	--	--	--	**0.6**	<0.5
RPD											**0%**	**0%**
TP06-0-0.2	7/05/2020	718468	--	--	--	--	--	--	--	--	**0.6**	<0.5
QC302	7/05/2020	718468	--	--	--	--	--	--	--	--	**0.6**	<0.5
RPD			**#VALUE!**	**#VALUE!**	**#VALUE!**	**#VALUE!**	**#VALUE!**	**#VALUE!**	**#VALUE!**	**#VALUE!**	**0%**	**0%**
INTER-LABORATORY												
TP16-0-0.2	5/05/2020	717918	<0.1	<0.1	<0.1	<0.3	<20	<50	**250**	**250**	**0.6**	<0.5
QC201	5/05/2020	SE206019	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	**0.3**	**1.6**
RPD			**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**139%**	**123%**	**67%**	**146%**

Sample ID	Date	Report	Heavy Metals							
			As	Cd	Cr	Cu	Pb	Hg	Ni	Zn
INTRA-LABORATORY										
TP16-0-0.2	5/05/2020	717918	**15**	<0.4	**60**	**9**	**18**	<0.1	**6.1**	**14**
QC101	5/05/2020	717918	**18**	<0.4	**88**	**6.5**	**13**	<0.1	<5	**7.6**
RPD			**18%**	**0%**	**38%**	**32%**	**32%**	**0%**	**84%**	**59%**
TP06-0-0.2	7/05/2020	718468	**4.9**	<0.4	**20**	**5.3**	**13**	<0.1	<5	**5.5**
QC301	7/05/2020	718468	**18**	<0.4	**58**	**7.2**	**23**	<0.1	**6.4**	**7.2**
RPD			**114%**	**0%**	**97%**	**30%**	**56%**	**0%**	**88%**	**27%**
TP06-0-0.2	7/05/2020	718468	**4.9**	<0.4	**20**	**5.3**	**13**	<0.1	<5	**5.5**
QC302	7/05/2020	718468	**14**	<0.4	**44**	**6.9**	**22**	<0.1	**6**	**7.1**
RPD			**96%**	**0%**	**75%**	**26%**	**51%**	**0%**	**82%**	**25%**
INTER-LABORATORY										
TP16-0-0.2	5/05/2020	717918	**15**	<0.4	**60**	**9**	**18**	<0.1	**6.1**	**14**
QC201	5/5/2020	SE206019	**5**	<0.3	**21**	**12**	**10**	<0.05	**5.3**	**12**
RPD			**100%**	**0%**	**96%**	**29%**	**57%**	**0%**	**14%**	**15%**

221-227 and 289-311
Luddenham Road,
Orchard Hill, NSW, 2748

APPENDIX L

LABORATORY ANALYTICAL DATA

eurofins | Environment Testing

Melbourne
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Site # 1254 & 14271

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NATA # 1261 Site # 18217

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NATA # 1261 Site # 20794

Perth
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Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261 Site # 23736

ABN – 50 005 085 521 e.mail : EnviroSales@eurofins.com web : www.eurofins.com.au

Sample Receipt Advice

Company name:	**Construction Sciences Pty Ltd**
Contact name:	Beau Dubois
Project name:	LUDDENHAM ORCHARD HILLS
Project ID:	5046200067
COC number:	Not provided
Turn around time:	5 Day
Date/Time received:	May 5, 2020 9:23 AM
Eurofins reference:	**717585**

Sample information

☑ A detailed list of analytes logged into our LIMS, is included in the attached summary table.

☑ All samples have been received as described on the above COC.

☑ COC has been completed correctly.

☑ Attempt to chill was evident.

☑ Appropriately preserved sample containers have been used.

☑ All samples were received in good condition.

☑ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.

☑ Appropriate sample containers have been used.

☑ Sample containers for volatile analysis received with zero headspace.

☒ Split sample sent to requested external lab.

☒ Some samples have been subcontracted.

N/A Custody Seals intact (if used).

Contact notes

If you have any questions with respect to these samples please contact:

Ursula Long on Phone : or by e.mail: UrsulaLong@eurofins.com

Results will be delivered electronically via e.mail to Beau Dubois - Beau.Dubois@constructionsciences.net.

eurofins | Environment Testing

ABN – 50 005 085 521 web : www.eurofins.com.au e.mail : EnviroSales@eurofins.com

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IANZ # 1290

Company Name: Construction Sciences Pty Ltd
Address: 2/4 Kellogg Rd
Glendenning
NSW 2761

Project Name: LUDDENHAM ORCHARD HILLS
Project ID: 5046200067

Order No.:
Report #: 717585
Phone: 02 9854 1700
Fax:

Received: May 5, 2020 9:23 AM
Due: May 12, 2020
Priority: 5 Day
Contact Name: Beau Dubois

Eurofins Analytical Services Manager : Ursula Long

Sample Detail						Asbestos - AS4964	Asbestos Absence /Presence	Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	Organophosphorus Pesticides	Metals M8	Metals M8 filtered	BTEX	Moisture Set	Total Recoverable Hydrocarbons	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271																
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																
Perth Laboratory - NATA Site # 23736																
External Laboratory																
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**											
1	TP25-0-0.2	May 04, 2020		Soil	S20-My05935	X		X	X				X	X	X	
2	TP24-0-0.4	May 04, 2020		Soil	S20-My05936	X		X			X			X		
3	TP23-0-0.1	May 04, 2020		Soil	S20-My05937	X		X			X			X		
4	TP22-0-0.2	May 04, 2020		Soil	S20-My05938	X		X			X			X		
5	TP21-0-0.2	May 04, 2020		Soil	S20-My05939	X		X			X		X	X	X	
6	TP21-ACM-0.3	May 04, 2020		Building Materials	S20-My05940		X									
7	TP20-0-0.2	May 04, 2020		Soil	S20-My05941	X		X	X	X	X			X		
8	TP19-0-0.2	May 04, 2020		Soil	S20-My05942	X		X	X	X	X			X		
9	TS	May 04, 2020		Water	S20-My05943											X

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Address: 2/4 Kellogg Rd
Glendenning
NSW 2761

Project Name: LUDDENHAM ORCHARD HILLS
Project ID: 5046200067

Order No.:
Report #: 717585
Phone: 02 9854 1700
Fax:

Received: May 5, 2020 9:23 AM
Due: May 12, 2020
Priority: 5 Day
Contact Name: Beau Dubois

Eurofins Analytical Services Manager : Ursula Long

Sample Detail						Asbestos - AS4964	Asbestos Absence /Presence	Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	Organophosphorus Pesticides	Metals M8	Metals M8 filtered	BTEX	Moisture Set	Total Recoverable Hydrocarbons	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271																
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																
Perth Laboratory - NATA Site # 23736																
10	TB	May 04, 2020		Water	S20-My05944											X
11	R-1	May 04, 2020		Water	S20-My05945							X				
12	RB-1	May 04, 2020		Water	S20-My05946						X					
Test Counts						7	1	7	3	2	7	1	2	7	2	2

Certificate of Analysis

eurofins | Environment Testing

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025–Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Construction Sciences Pty Ltd
2/4 Kellogg Rd
Glendenning
NSW 2761

Attention:	Beau Dubois
Report	717585-V2-AID
Project Name	LUDDENHAM ORCHARD HILLS
Project ID	5046200067
Received Date	May 05, 2020
Date Reported	May 20, 2020

Methodology:

Asbestos Fibre Identification	Conducted in accordance with the Australian Standard AS 4964 – 2004: Method for the Qualitative Identification of Asbestos in Bulk Samples and in-house Method LTM-ASB-8020 by polarised light microscopy (PLM) and dispersion staining (DS) techniques. *NOTE: Positive Trace Analysis results indicate the sample contains detectable respirable fibres.*
Unknown Mineral Fibres	Mineral fibres of unknown type, as determined by PLM with DS, may require another analytical technique, such as Electron Microscopy, to confirm unequivocal identity. *NOTE: While Actinolite, Anthophyllite and Tremolite asbestos may be detected by PLM with DS, due to variability in the optical properties of these materials, AS4964 requires that these are reported as UMF unless confirmed by an independent technique.*
Subsampling Soil Samples	The whole sample submitted is first dried and then passed through a 10mm sieve followed by a 2mm sieve. All fibrous matter greater than 10mm, greater than 2mm as well as the material passing through the 2mm sieve are retained and analysed for the presence of asbestos. If the sub 2mm fraction is greater than approximately 30 to 60g then a sub-sampling routine based on ISO 3082:2009(E) is employed. *NOTE: Depending on the nature and size of the soil sample, the sub-2 mm residue material may need to be sub-sampled for trace analysis, in accordance with AS 4964-2004.*
Bonded asbestos-containing material (ACM)	The material is first examined and any fibres isolated for identification by PLM and DS. Where required, interfering matrices may be removed by disintegration using a range of heat, chemical or physical treatments, possibly in combination.The resultant material is then further examined in accordance with AS 4964 - 2004. *NOTE: Even after disintegration it may be difficult to detect the presence of asbestos in some asbestos-containing bulk materials using PLM and DS. This is due to the low grade or small length or diameter of the asbestos fibres present in the material, or to the fact that very fine fibres have been distributed intimately throughout the materials. Vinyl/asbestos floor tiles, some asbestos-containing sealants and mastics, asbestos-containing epoxy resins and some ore samples are examples of these types of material, which are difficult to analyse.*
Limit of Reporting	The performance limitation of the AS 4964 (2004) method for non-homogeneous samples is around 0.1 g/kg (equivalent to 0.01% (w/w)). Where no asbestos is found by PLM and DS, including Trace Analysis, this is considered to be at the nominal reporting limit of 0.01% (w/w). The NEPM screening level of 0.001% (w/w) is intended as an on-site determination, not a laboratory Limit of Reporting (LOR), per se. Examination of a large sample size (e.g. 500 mL) may improve the likelihood of detecting asbestos, particularly AF, to aid assessment against the NEPM criteria. Gravimetric determinations to this level of accuracy are outside of AS 4964 and hence NATA Accreditation does not cover the performance of this service (non-NATA results shown with an asterisk). *NOTE: NATA News March 2014, p.7, states in relation to AS 4964: "This is a qualitative method with a nominal reporting limit of 0.01 % " and that currently in Australia "there is no validated method available for the quantification of asbestos".This report is consistent with the analytical procedures and reporting recommendations in the NEPM and the WA DoH.*

Project Name LUDDENHAM ORCHARD HILLS
Project ID 5046200067
Date Sampled May 04, 2020
Report 717585-V2-AID

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
TP25-0-0.2	20-My05935	May 04, 2020	Approximate Sample 169g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
TP24-0-0.4	20-My05936	May 04, 2020	Approximate Sample 326g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
TP23-0-0.1	20-My05937	May 04, 2020	Approximate Sample 242g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
TP22-0-0.2	20-My05938	May 04, 2020	Approximate Sample 204g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
TP21-0-0.2	20-My05939	May 04, 2020	Approximate Sample 223g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
TP21-ACM-0.3	20-My05940	May 04, 2020	Approximate Sample 20g / 70x60x3mm Sample consisted of: Grey compressed fibre cement fragment	Chrysotile and amosite asbestos detected.
TP20-0-0.2	20-My05941	May 04, 2020	Approximate Sample 234g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Synthetic mineral fibre detected. Organic fibre detected. No trace asbestos detected.
TP19-0-0.2	20-My05942	May 04, 2020	Approximate Sample 250g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Asbestos - LTM-ASB-8020	Sydney	May 06, 2020	Indefinite
Asbestos - LTM-ASB-8020	Sydney	May 06, 2020	Indefinite

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NSW 2761

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Order No.:
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Phone: 02 9854 1700
Fax:

Received: May 5, 2020 9:23 AM
Due: May 12, 2020
Priority: 5 Day
Contact Name: Beau Dubois

Eurofins Analytical Services Manager : Ursula Long

Sample Detail						Asbestos - AS4964	Asbestos Absence /Presence	Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	Organophosphorus Pesticides	Metals M8	Metals M8 filtered	BTEX	Moisture Set	Total Recoverable Hydrocarbons	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271																
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																
Perth Laboratory - NATA Site # 23736																
External Laboratory																
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**											
1	TP25-0-0.2	May 04, 2020		Soil	S20-My05935	X		X	X				X	X	X	
2	TP24-0-0.4	May 04, 2020		Soil	S20-My05936	X		X			X			X		
3	TP23-0-0.1	May 04, 2020		Soil	S20-My05937	X		X			X			X		
4	TP22-0-0.2	May 04, 2020		Soil	S20-My05938	X		X			X			X		
5	TP21-0-0.2	May 04, 2020		Soil	S20-My05939	X		X			X		X	X	X	
6	TP21-ACM-0.3	May 04, 2020		Building Materials	S20-My05940		X									
7	TP20-0-0.2	May 04, 2020		Soil	S20-My05941	X		X	X	X	X			X		
8	TP19-0-0.2	May 04, 2020		Soil	S20-My05942	X		X	X	X	X			X		
9	TS	May 04, 2020		Water	S20-My05943											X

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Project Name: LUDDENHAM ORCHARD HILLS
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Sample Detail						Asbestos - AS4964	Asbestos Absence /Presence	Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	Organophosphorus Pesticides	Metals M8	Metals M8 filtered	BTEX	Moisture Set	Total Recoverable Hydrocarbons	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271																
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																
Perth Laboratory - NATA Site # 23736																
10	TB	May 04, 2020		Water	S20-My05944											X
11	R-1	May 04, 2020		Water	S20-My05945							X				
12	RB-1	May 04, 2020		Water	S20-My05946						X					
Test Counts						7	1	7	3	2	7	1	2	7	2	2

Internal Quality Control Review and Glossary

General

1. QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Samples were analysed on an 'as received' basis.
4. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
5. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Advice.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

Units

% w/w: weight for weight basis	grams per kilogram
Filter loading:	fibres/100 graticule areas
Reported Concentration:	fibres/mL
Flowrate:	L/min

Terms

Dry	Sample is dried by heating prior to analysis
LOR	Limit of Reporting
COC	Chain of Custody
SRA	Sample Receipt Advice
ISO	International Standards Organisation
AS	Australian Standards
WA DOH	Reference document for the NEPM. Government of Western Australia, Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia (2009), including supporting document Recommended Procedures for Laboratory Analysis of Asbestos in Soil (2011)
NEPM	National Environment Protection (Assessment of Site Contamination) Measure, 2013 (as amended)
ACM	Asbestos Containing Materials. Asbestos contained within a non-asbestos matrix, typically presented in bonded and/or sound condition. For the purposes of the NEPM, ACM is generally restricted to those materials that do not pass a 7mm x 7mm sieve.
AF	Asbestos Fines. Asbestos containing materials, including friable, weathered and bonded materials, able to pass a 7mm x 7mm sieve. Considered under the NEPM as equivalent to “non-bonded / friable”.
FA	Fibrous Asbestos. Asbestos containing materials in a friable and/or severely weathered condition. For the purposes of the NEPM, FA is generally restricted to those materials that do not pass a 7mm x 7mm sieve.
Friable	Asbestos-containing materials of any size that may be broken or crumbled by hand pressure. For the purposes of the NEPM, this includes both AF and FA. It is outside of the laboratory’s remit to assess degree of friability.
Trace Analysis	Analytical procedure used to detect the presence of respirable fibres in the matrix.

Comments

This report has been revised (V2) to amend sample ID of S20-My05940.

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N/A	Not applicable

Asbestos Counter/Identifier:

Sayeed Abu	Senior Analyst-Asbestos (NSW)

Authorised by:

Laxman Dias	Senior Analyst-Asbestos (NSW)



Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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Construction Sciences Pty Ltd
2/4 Kellogg Rd
Glendenning
NSW 2761

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Attention: **Beau Dubois**

Report **717585-S-V2**
Project name LUDDENHAM ORCHARD HILLS
Project ID 5046200067
Received Date May 05, 2020

Client Sample ID			**TP25-0-0.2**	**TP24-0-0.4**	**TP23-0-0.1**	**TP22-0-0.2**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**S20-My05935**	**S20-My05936**	**S20-My05937**	**S20-My05938**
Date Sampled			**May 04, 2020**	**May 04, 2020**	**May 04, 2020**	**May 04, 2020**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	-	-	-
TRH C10-C14	20	mg/kg	< 20	-	-	-
TRH C15-C28	50	mg/kg	< 50	-	-	-
TRH C29-C36	50	mg/kg	55	-	-	-
TRH C10-C36 (Total)	50	mg/kg	55	-	-	-
BTEX						
Benzene	0.1	mg/kg	< 0.1	-	-	-
Toluene	0.1	mg/kg	< 0.1	-	-	-
Ethylbenzene	0.1	mg/kg	< 0.1	-	-	-
m&p-Xylenes	0.2	mg/kg	< 0.2	-	-	-
o-Xylene	0.1	mg/kg	< 0.1	-	-	-
Xylenes - Total*	0.3	mg/kg	< 0.3	-	-	-
4-Bromofluorobenzene (surr.)	1	%	57	-	-	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	-	-	-
TRH C6-C10	20	mg/kg	< 20	-	-	-
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	-	-	-
TRH >C10-C16	50	mg/kg	< 50	-	-	-
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	-	-	-
TRH >C16-C34	100	mg/kg	< 100	-	-	-
TRH >C34-C40	100	mg/kg	< 100	-	-	-
TRH >C10-C40 (total)*	100	mg/kg	< 100	-	-	-
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			TP25-0-0.2	TP24-0-0.4	TP23-0-0.1	TP22-0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-My05935	S20-My05936	S20-My05937	S20-My05938
Date Sampled			May 04, 2020	May 04, 2020	May 04, 2020	May 04, 2020
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	104	114	118	96
p-Terphenyl-d14 (surr.)	1	%	119	129	108	125
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	-	-	-
4.4'-DDD	0.05	mg/kg	< 0.05	-	-	-
4.4'-DDE	0.05	mg/kg	< 0.05	-	-	-
4.4'-DDT	0.05	mg/kg	< 0.05	-	-	-
a-BHC	0.05	mg/kg	< 0.05	-	-	-
Aldrin	0.05	mg/kg	< 0.05	-	-	-
b-BHC	0.05	mg/kg	< 0.05	-	-	-
d-BHC	0.05	mg/kg	< 0.05	-	-	-
Dieldrin	0.05	mg/kg	< 0.05	-	-	-
Endosulfan I	0.05	mg/kg	< 0.05	-	-	-
Endosulfan II	0.05	mg/kg	< 0.05	-	-	-
Endosulfan sulphate	0.05	mg/kg	< 0.05	-	-	-
Endrin	0.05	mg/kg	< 0.05	-	-	-
Endrin aldehyde	0.05	mg/kg	< 0.05	-	-	-
Endrin ketone	0.05	mg/kg	< 0.05	-	-	-
g-BHC (Lindane)	0.05	mg/kg	< 0.05	-	-	-
Heptachlor	0.05	mg/kg	< 0.05	-	-	-
Heptachlor epoxide	0.05	mg/kg	< 0.05	-	-	-
Hexachlorobenzene	0.05	mg/kg	< 0.05	-	-	-
Methoxychlor	0.2	mg/kg	< 0.2	-	-	-
Toxaphene	1	mg/kg	< 1	-	-	-
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	-	-	-
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	-	-	-
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.2	-	-	-
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.2	-	-	-
Dibutylchlorendate (surr.)	1	%	134	-	-	-
Tetrachloro-m-xylene (surr.)	1	%	113	-	-	-
Heavy Metals						
Arsenic	2	mg/kg	-	13	7.3	17
Cadmium	0.4	mg/kg	-	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	-	35	19	64
Copper	5	mg/kg	-	13	11	< 5
Lead	5	mg/kg	-	25	16	21
Mercury	0.1	mg/kg	-	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	-	8.0	7.3	< 5
Zinc	5	mg/kg	-	26	19	7.3
% Moisture	1	%	20	21	19	13

Client Sample ID			TP21-0-0.2	TP20-0-0.2	TP19-0-0.2
Sample Matrix			Soil	Soil	Soil
Eurofins Sample No.			S20-My05939	S20-My05941	S20-My05942
Date Sampled			May 04, 2020	May 04, 2020	May 04, 2020
Test/Reference	LOR	Unit			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions					
TRH C6-C9	20	mg/kg	< 20	-	-
TRH C10-C14	20	mg/kg	< 20	-	-
TRH C15-C28	50	mg/kg	< 50	-	-
TRH C29-C36	50	mg/kg	< 50	-	-
TRH C10-C36 (Total)	50	mg/kg	< 50	-	-
BTEX					
Benzene	0.1	mg/kg	< 0.1	-	-
Toluene	0.1	mg/kg	< 0.1	-	-
Ethylbenzene	0.1	mg/kg	< 0.1	-	-
m&p-Xylenes	0.2	mg/kg	< 0.2	-	-
o-Xylene	0.1	mg/kg	< 0.1	-	-
Xylenes - Total*	0.3	mg/kg	< 0.3	-	-
4-Bromofluorobenzene (surr.)	1	%	66	-	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions					
Naphthalene[N02]	0.5	mg/kg	< 0.5	-	-
TRH C6-C10	20	mg/kg	< 20	-	-
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	-	-
TRH >C10-C16	50	mg/kg	< 50	-	-
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	-	-
TRH >C16-C34	100	mg/kg	< 100	-	-
TRH >C34-C40	100	mg/kg	< 100	-	-
TRH >C10-C40 (total)*	100	mg/kg	< 100	-	-
Polycyclic Aromatic Hydrocarbons					
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	108	69	103
p-Terphenyl-d14 (surr.)	1	%	114	125	95

Client Sample ID			TP21-0-0.2	TP20-0-0.2	TP19-0-0.2
Sample Matrix			Soil	Soil	Soil
Eurofins Sample No.			S20-My05939	S20-My05941	S20-My05942
Date Sampled			May 04, 2020	May 04, 2020	May 04, 2020
Test/Reference	LOR	Unit			
Organochlorine Pesticides					
Chlordanes - Total	0.1	mg/kg	-	< 0.1	< 0.1
4.4'-DDD	0.05	mg/kg	-	< 0.05	< 0.05
4.4'-DDE	0.05	mg/kg	-	< 0.05	< 0.05
4.4'-DDT	0.05	mg/kg	-	< 0.05	< 0.05
a-BHC	0.05	mg/kg	-	< 0.05	< 0.05
Aldrin	0.05	mg/kg	-	< 0.05	< 0.05
b-BHC	0.05	mg/kg	-	< 0.05	< 0.05
d-BHC	0.05	mg/kg	-	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	-	< 0.05	< 0.05
Endosulfan I	0.05	mg/kg	-	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	-	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	-	< 0.05	< 0.05
Endrin	0.05	mg/kg	-	< 0.05	< 0.05
Endrin aldehyde	0.05	mg/kg	-	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	-	< 0.05	< 0.05
g-BHC (Lindane)	0.05	mg/kg	-	< 0.05	< 0.05
Heptachlor	0.05	mg/kg	-	< 0.05	< 0.05
Heptachlor epoxide	0.05	mg/kg	-	< 0.05	< 0.05
Hexachlorobenzene	0.05	mg/kg	-	< 0.05	< 0.05
Methoxychlor	0.2	mg/kg	-	< 0.2	< 0.2
Toxaphene	1	mg/kg	-	< 1	< 1
Aldrin and Dieldrin (Total)*	0.05	mg/kg	-	< 0.05	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	-	< 0.05	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	-	< 0.2	< 0.2
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	-	< 0.2	< 0.2
Dibutylchlorendate (surr.)	1	%	-	139	99
Tetrachloro-m-xylene (surr.)	1	%	-	128	99
Organophosphorus Pesticides					
Azinphos-methyl	0.2	mg/kg	-	< 0.2	< 0.2
Bolstar	0.2	mg/kg	-	< 0.2	< 0.2
Chlorfenvinphos	0.2	mg/kg	-	< 0.2	< 0.2
Chlorpyrifos	0.2	mg/kg	-	< 0.2	< 0.2
Chlorpyrifos-methyl	0.2	mg/kg	-	< 0.2	< 0.2
Coumaphos	2	mg/kg	-	< 2	< 2
Demeton-S	0.2	mg/kg	-	< 0.2	< 0.2
Demeton-O	0.2	mg/kg	-	< 0.2	< 0.2
Diazinon	0.2	mg/kg	-	< 0.2	< 0.2
Dichlorvos	0.2	mg/kg	-	< 0.2	< 0.2
Dimethoate	0.2	mg/kg	-	< 0.2	< 0.2
Disulfoton	0.2	mg/kg	-	< 0.2	< 0.2
EPN	0.2	mg/kg	-	< 0.2	< 0.2
Ethion	0.2	mg/kg	-	< 0.2	< 0.2
Ethoprop	0.2	mg/kg	-	< 0.2	< 0.2
Ethyl parathion	0.2	mg/kg	-	< 0.2	< 0.2
Fenitrothion	0.2	mg/kg	-	< 0.2	< 0.2
Fensulfothion	0.2	mg/kg	-	< 0.2	< 0.2
Fenthion	0.2	mg/kg	-	< 0.2	< 0.2
Malathion	0.2	mg/kg	-	< 0.2	< 0.2
Merphos	0.2	mg/kg	-	< 0.2	< 0.2

Client Sample ID			TP21-0-0.2	TP20-0-0.2	TP19-0-0.2
Sample Matrix			Soil	Soil	Soil
Eurofins Sample No.			S20-My05939	S20-My05941	S20-My05942
Date Sampled			May 04, 2020	May 04, 2020	May 04, 2020
Test/Reference	LOR	Unit			
Organophosphorus Pesticides					
Methyl parathion	0.2	mg/kg	-	< 0.2	< 0.2
Mevinphos	0.2	mg/kg	-	< 0.2	< 0.2
Monocrotophos	2	mg/kg	-	< 2	< 2
Naled	0.2	mg/kg	-	< 0.2	< 0.2
Omethoate	2	mg/kg	-	< 2	< 2
Phorate	0.2	mg/kg	-	< 0.2	< 0.2
Pirimiphos-methyl	0.2	mg/kg	-	< 0.2	< 0.2
Pyrazophos	0.2	mg/kg	-	< 0.2	< 0.2
Ronnel	0.2	mg/kg	-	< 0.2	< 0.2
Terbufos	0.2	mg/kg	-	< 0.2	< 0.2
Tetrachlorvinphos	0.2	mg/kg	-	< 0.2	< 0.2
Tokuthion	0.2	mg/kg	-	< 0.2	< 0.2
Trichloronate	0.2	mg/kg	-	< 0.2	< 0.2
Triphenylphosphate (surr.)	1	%	-	140	94
Heavy Metals					
Arsenic	2	mg/kg	12	3.6	17
Cadmium	0.4	mg/kg	2.0	< 0.4	< 0.4
Chromium	5	mg/kg	27	11	41
Copper	5	mg/kg	19	< 5	14
Lead	5	mg/kg	38	12	20
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	8.4	< 5	< 5
Zinc	5	mg/kg	87	7.2	24
% Moisture	1	%	20	28	11

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Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Sydney	May 11, 2020	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
BTEX	Sydney	May 11, 2020	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	May 11, 2020	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	May 11, 2020	
- Method: LTM-ORG-2010 TRH C6-C40			
Polycyclic Aromatic Hydrocarbons	Sydney	May 11, 2020	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Organochlorine Pesticides	Sydney	May 11, 2020	14 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Organophosphorus Pesticides	Sydney	May 11, 2020	14 Days
- Method: LTM-ORG-2200 Organophosphorus Pesticides by GC-MS			
Metals M8	Sydney	May 11, 2020	180 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
% Moisture	Sydney	May 06, 2020	14 Days
- Method: LTM-GEN-7080 Moisture			

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IANZ # 1290

Company Name: Construction Sciences Pty Ltd
Address: 2/4 Kellogg Rd
Glendenning
NSW 2761

Project Name: LUDDENHAM ORCHARD HILLS
Project ID: 5046200067

Order No.:
Report #: 717585
Phone: 02 9854 1700
Fax:

Received: May 5, 2020 9:23 AM
Due: May 12, 2020
Priority: 5 Day
Contact Name: Beau Dubois

Eurofins Analytical Services Manager : Ursula Long

Sample Detail						Asbestos - AS4964	Asbestos Absence /Presence	Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	Organophosphorus Pesticides	Metals M8	Metals M8 filtered	BTEX	Moisture Set	Total Recoverable Hydrocarbons	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271																
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																
Perth Laboratory - NATA Site # 23736																
External Laboratory																
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**											
1	TP25-0-0.2	May 04, 2020		Soil	S20-My05935	X		X	X				X	X	X	
2	TP24-0-0.4	May 04, 2020		Soil	S20-My05936	X		X			X			X		
3	TP23-0-0.1	May 04, 2020		Soil	S20-My05937	X		X			X			X		
4	TP22-0-0.2	May 04, 2020		Soil	S20-My05938	X		X			X			X		
5	TP21-0-0.2	May 04, 2020		Soil	S20-My05939	X		X			X		X	X	X	
6	TP21-ACM-0.3	May 04, 2020		Building Materials	S20-My05940		X									
7	TP20-0-0.2	May 04, 2020		Soil	S20-My05941	X		X	X	X	X			X		
8	TP19-0-0.2	May 04, 2020		Soil	S20-My05942	X		X	X	X	X			X		
9	TS	May 04, 2020		Water	S20-My05943											X

eurofins | Environment Testing

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Order No.:
Report #: 717585
Phone: 02 9854 1700
Fax:

Received: May 5, 2020 9:23 AM
Due: May 12, 2020
Priority: 5 Day
Contact Name: Beau Dubois

Eurofins Analytical Services Manager : Ursula Long

Sample Detail						Asbestos - AS4964	Asbestos Absence /Presence	Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	Organophosphorus Pesticides	Metals M8	Metals M8 filtered	BTEX	Moisture Set	Total Recoverable Hydrocarbons	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271																
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																
Perth Laboratory - NATA Site # 23736																
10	TB	May 04, 2020		Water	S20-My05944											X
11	R-1	May 04, 2020		Water	S20-My05945							X				
12	RB-1	May 04, 2020		Water	S20-My05946						X					
Test Counts						7	1	7	3	2	7	1	2	7	2	2

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.3
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 20-130% Phenols & 50-150% PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.3 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/kg	< 20			20	Pass	
TRH C10-C14	mg/kg	< 20			20	Pass	
TRH C15-C28	mg/kg	< 50			50	Pass	
TRH C29-C36	mg/kg	< 50			50	Pass	
Method Blank							
BTEX							
Benzene	mg/kg	< 0.1			0.1	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Xylenes - Total*	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g.h.i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a.h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/kg	< 0.1			0.1	Pass	
4.4'-DDD	mg/kg	< 0.05			0.05	Pass	
4.4'-DDE	mg/kg	< 0.05			0.05	Pass	
4.4'-DDT	mg/kg	< 0.05			0.05	Pass	
a-BHC	mg/kg	< 0.05			0.05	Pass	
Aldrin	mg/kg	< 0.05			0.05	Pass	
b-BHC	mg/kg	< 0.05			0.05	Pass	
d-BHC	mg/kg	< 0.05			0.05	Pass	
Dieldrin	mg/kg	< 0.05			0.05	Pass	
Endosulfan I	mg/kg	< 0.05			0.05	Pass	
Endosulfan II	mg/kg	< 0.05			0.05	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endosulfan sulphate	mg/kg	< 0.05			0.05	Pass	
Endrin	mg/kg	< 0.05			0.05	Pass	
Endrin aldehyde	mg/kg	< 0.05			0.05	Pass	
Endrin ketone	mg/kg	< 0.05			0.05	Pass	
g-BHC (Lindane)	mg/kg	< 0.05			0.05	Pass	
Heptachlor	mg/kg	< 0.05			0.05	Pass	
Heptachlor epoxide	mg/kg	< 0.05			0.05	Pass	
Hexachlorobenzene	mg/kg	< 0.05			0.05	Pass	
Methoxychlor	mg/kg	< 0.2			0.2	Pass	
Toxaphene	mg/kg	< 1			1	Pass	
Method Blank							
Organophosphorus Pesticides							
Azinphos-methyl	mg/kg	< 0.2			0.2	Pass	
Bolstar	mg/kg	< 0.2			0.2	Pass	
Chlorfenvinphos	mg/kg	< 0.2			0.2	Pass	
Chlorpyrifos	mg/kg	< 0.2			0.2	Pass	
Chlorpyrifos-methyl	mg/kg	< 0.2			0.2	Pass	
Coumaphos	mg/kg	< 2			2	Pass	
Demeton-S	mg/kg	< 0.2			0.2	Pass	
Demeton-O	mg/kg	< 0.2			0.2	Pass	
Diazinon	mg/kg	< 0.2			0.2	Pass	
Dichlorvos	mg/kg	< 0.2			0.2	Pass	
Dimethoate	mg/kg	< 0.2			0.2	Pass	
Disulfoton	mg/kg	< 0.2			0.2	Pass	
EPN	mg/kg	< 0.2			0.2	Pass	
Ethion	mg/kg	< 0.2			0.2	Pass	
Ethoprop	mg/kg	< 0.2			0.2	Pass	
Ethyl parathion	mg/kg	< 0.2			0.2	Pass	
Fenitrothion	mg/kg	< 0.2			0.2	Pass	
Fensulfothion	mg/kg	< 0.2			0.2	Pass	
Fenthion	mg/kg	< 0.2			0.2	Pass	
Malathion	mg/kg	< 0.2			0.2	Pass	
Merphos	mg/kg	< 0.2			0.2	Pass	
Methyl parathion	mg/kg	< 0.2			0.2	Pass	
Mevinphos	mg/kg	< 0.2			0.2	Pass	
Monocrotophos	mg/kg	< 2			2	Pass	
Naled	mg/kg	< 0.2			0.2	Pass	
Omethoate	mg/kg	< 2			2	Pass	
Phorate	mg/kg	< 0.2			0.2	Pass	
Pirimiphos-methyl	mg/kg	< 0.2			0.2	Pass	
Pyrazophos	mg/kg	< 0.2			0.2	Pass	
Ronnel	mg/kg	< 0.2			0.2	Pass	
Terbufos	mg/kg	< 0.2			0.2	Pass	
Tetrachlorvinphos	mg/kg	< 0.2			0.2	Pass	
Tokuthion	mg/kg	< 0.2			0.2	Pass	
Trichloronate	mg/kg	< 0.2			0.2	Pass	
Method Blank							
Heavy Metals							
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	73			70-130	Pass	
TRH C10-C14	%	82			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	96			70-130	Pass	
Toluene	%	88			70-130	Pass	
Ethylbenzene	%	97			70-130	Pass	
m&p-Xylenes	%	99			70-130	Pass	
o-Xylene	%	98			70-130	Pass	
Xylenes - Total*	%	99			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	86			70-130	Pass	
TRH C6-C10	%	75			70-130	Pass	
TRH >C10-C16	%	83			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	73			70-130	Pass	
Acenaphthylene	%	125			70-130	Pass	
Anthracene	%	125			70-130	Pass	
Benz(a)anthracene	%	80			70-130	Pass	
Benzo(a)pyrene	%	88			70-130	Pass	
Benzo(b&j)fluoranthene	%	87			70-130	Pass	
Benzo(g.h.i)perylene	%	96			70-130	Pass	
Benzo(k)fluoranthene	%	91			70-130	Pass	
Chrysene	%	84			70-130	Pass	
Dibenz(a.h)anthracene	%	89			70-130	Pass	
Fluoranthene	%	76			70-130	Pass	
Fluorene	%	100			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	86			70-130	Pass	
Naphthalene	%	84			70-130	Pass	
Phenanthrene	%	110			70-130	Pass	
Pyrene	%	76			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
Chlordanes - Total	%	72			70-130	Pass	
4.4'-DDD	%	78			70-130	Pass	
4.4'-DDE	%	84			70-130	Pass	
4.4'-DDT	%	75			70-130	Pass	
a-BHC	%	82			70-130	Pass	
Aldrin	%	91			70-130	Pass	
b-BHC	%	107			70-130	Pass	
d-BHC	%	104			70-130	Pass	
Dieldrin	%	71			70-130	Pass	
Endosulfan I	%	83			70-130	Pass	
Endosulfan II	%	72			70-130	Pass	
Endosulfan sulphate	%	82			70-130	Pass	
Endrin	%	71			70-130	Pass	
Endrin aldehyde	%	75			70-130	Pass	
Endrin ketone	%	71			70-130	Pass	
g-BHC (Lindane)	%	105			70-130	Pass	
Heptachlor	%	88			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Heptachlor epoxide	%	72			70-130	Pass	
Hexachlorobenzene	%	119			70-130	Pass	
Methoxychlor	%	72			70-130	Pass	
LCS - % Recovery							
Organophosphorus Pesticides							
Diazinon	%	77			70-130	Pass	
Dimethoate	%	94			70-130	Pass	
Ethion	%	103			70-130	Pass	
Fenitrothion	%	117			70-130	Pass	
Methyl parathion	%	129			70-130	Pass	
Mevinphos	%	94			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	103			70-130	Pass	
Cadmium	%	100			70-130	Pass	
Chromium	%	107			70-130	Pass	
Copper	%	107			70-130	Pass	
Lead	%	106			70-130	Pass	
Mercury	%	110			70-130	Pass	
Nickel	%	107			70-130	Pass	
Zinc	%	105			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C10-C14	S20-My08221	NCP	%	81			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	S20-My14628	NCP	%	101			70-130	Pass	
Toluene	S20-My14628	NCP	%	77			70-130	Pass	
Ethylbenzene	S20-My14628	NCP	%	70			70-130	Pass	
m&p-Xylenes	S20-My14628	NCP	%	83			70-130	Pass	
o-Xylene	S20-My14628	NCP	%	82			70-130	Pass	
Xylenes - Total*	S20-My14628	NCP	%	83			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	S20-My14628	NCP	%	91			70-130	Pass	
TRH C6-C10	S20-My06372	NCP	%	77			70-130	Pass	
TRH >C10-C16	S20-My08221	NCP	%	84			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
Chlordanes - Total	S20-My01692	NCP	%	77			70-130	Pass	
4.4'-DDD	S20-My01692	NCP	%	111			70-130	Pass	
4.4'-DDE	S20-My01625	NCP	%	76			70-130	Pass	
4.4'-DDT	S20-My01625	NCP	%	91			70-130	Pass	
a-BHC	S20-My01692	NCP	%	72			70-130	Pass	
Aldrin	S20-My01625	NCP	%	75			70-130	Pass	
b-BHC	S20-My01692	NCP	%	76			70-130	Pass	
d-BHC	S20-My01692	NCP	%	76			70-130	Pass	
Dieldrin	S20-My01625	NCP	%	71			70-130	Pass	
Endosulfan I	S20-My01692	NCP	%	92			70-130	Pass	
Endosulfan II	S20-My01692	NCP	%	78			70-130	Pass	
Endosulfan sulphate	S20-My01625	NCP	%	71			70-130	Pass	
Endrin	S20-My01625	NCP	%	98			70-130	Pass	
Endrin aldehyde	S20-My01625	NCP	%	72			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endrin ketone	S20-My01625	NCP	%	79			70-130	Pass	
g-BHC (Lindane)	S20-My01692	NCP	%	73			70-130	Pass	
Heptachlor	S20-My01625	NCP	%	86			70-130	Pass	
Heptachlor epoxide	S20-My01692	NCP	%	75			70-130	Pass	
Hexachlorobenzene	S20-My01625	NCP	%	76			70-130	Pass	
Methoxychlor	S20-My01625	NCP	%	89			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S20-My06372	NCP	%	103			70-130	Pass	
Cadmium	S20-My05918	NCP	%	102			70-130	Pass	
Chromium	S20-My05918	NCP	%	105			70-130	Pass	
Copper	S20-My05918	NCP	%	101			70-130	Pass	
Lead	S20-My05918	NCP	%	94			70-130	Pass	
Mercury	S20-My05918	NCP	%	104			70-130	Pass	
Nickel	S20-My05918	NCP	%	101			70-130	Pass	
Zinc	S20-My05918	NCP	%	97			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	S20-My05939	CP	%	97			70-130	Pass	
Acenaphthylene	S20-My05939	CP	%	116			70-130	Pass	
Anthracene	S20-My05939	CP	%	114			70-130	Pass	
Benz(a)anthracene	S20-My05939	CP	%	111			70-130	Pass	
Benzo(a)pyrene	S20-My05939	CP	%	117			70-130	Pass	
Benzo(b&j)fluoranthene	S20-My05939	CP	%	120			70-130	Pass	
Benzo(g.h.i)perylene	S20-My05939	CP	%	119			70-130	Pass	
Benzo(k)fluoranthene	S20-My05939	CP	%	123			70-130	Pass	
Chrysene	S20-My05939	CP	%	116			70-130	Pass	
Dibenz(a.h)anthracene	S20-My05939	CP	%	111			70-130	Pass	
Fluoranthene	S20-My05939	CP	%	121			70-130	Pass	
Fluorene	S20-My05939	CP	%	121			70-130	Pass	
Indeno(1.2.3-cd)pyrene	S20-My05939	CP	%	108			70-130	Pass	
Naphthalene	S20-My05939	CP	%	111			70-130	Pass	
Phenanthrene	S20-My05939	CP	%	117			70-130	Pass	
Pyrene	S20-My05939	CP	%	120			70-130	Pass	
Spike - % Recovery									
Organophosphorus Pesticides				Result 1					
Diazinon	W20-My02664	NCP	%	90			70-130	Pass	
Dimethoate	W20-My02664	NCP	%	108			70-130	Pass	
Ethion	W20-My02664	NCP	%	129			70-130	Pass	
Fenitrothion	W20-My02664	NCP	%	124			70-130	Pass	
Methyl parathion	S20-My01692	NCP	%	117			70-130	Pass	
Mevinphos	W20-My02664	NCP	%	118			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S20-My05916	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	S20-My10146	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	S20-My10146	NCP	mg/kg	< 50	51	13	30%	Pass	
TRH C29-C36	S20-My10146	NCP	mg/kg	110	140	17	30%	Pass	

Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S20-My05916	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S20-My05916	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S20-My05916	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S20-My05916	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S20-My05916	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total*	S20-My05916	NCP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S20-My05916	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	S20-My05916	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH >C10-C16	S20-My10146	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	S20-My10146	NCP	mg/kg	130	150	14	30%	Pass	
TRH >C34-C40	S20-My10146	NCP	mg/kg	< 100	120	22	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Toxaphene	S20-My08416	NCP	mg/kg	< 10	< 10	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S20-My05938	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S20-My05938	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S20-My05938	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S20-My05938	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	S20-My05938	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	S20-My05938	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	S20-My05938	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	S20-My05938	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	S20-My05938	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	S20-My05938	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S20-My05938	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	S20-My05938	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	S20-My05938	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	S20-My05938	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	S20-My05938	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	S20-My05938	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	S20-My05938	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	S20-My05938	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	S20-My05938	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	S20-My05938	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-BHC	S20-My05938	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	S20-My05938	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-BHC	S20-My05938	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-BHC	S20-My05938	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	S20-My05938	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	S20-My05938	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	S20-My05938	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	S20-My05938	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	S20-My05938	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	S20-My05938	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	S20-My05938	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-BHC (Lindane)	S20-My05938	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	S20-My05938	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	S20-My05938	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	

Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Hexachlorobenzene	S20-My05938	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	S20-My05938	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Duplicate									
Organophosphorus Pesticides				Result 1	Result 2	RPD			
Azinphos-methyl	S20-My08416	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Bolstar	S20-My08416	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorfenvinphos	S20-My08416	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorpyrifos	S20-My08416	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorpyrifos-methyl	S20-My08416	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Coumaphos	S20-My08416	NCP	mg/kg	< 10	< 10	<1	30%	Pass	
Demeton-S	S20-My08416	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Demeton-O	S20-My08416	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Diazinon	S20-My08416	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Dichlorvos	S20-My08416	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Dimethoate	S20-My08416	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Disulfoton	S20-My08416	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
EPN	S20-My08416	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethion	S20-My08416	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethoprop	S20-My08416	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethyl parathion	S20-My08416	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fenitrothion	S20-My08416	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fensulfothion	S20-My08416	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fenthion	S20-My08416	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Malathion	S20-My08416	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Merphos	S20-My08416	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Methyl parathion	S20-My08416	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Mevinphos	S20-My08416	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Monocrotophos	S20-My08416	NCP	mg/kg	< 10	< 10	<1	30%	Pass	
Naled	S20-My08416	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Omethoate	S20-My08416	NCP	mg/kg	< 10	< 10	<1	30%	Pass	
Phorate	S20-My08416	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Pirimiphos-methyl	S20-My08416	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Pyrazophos	S20-My08416	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ronnel	S20-My08416	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Terbufos	S20-My08416	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tetrachlorvinphos	S20-My08416	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tokuthion	S20-My08416	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Trichloronate	S20-My08416	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S20-My05941	CP	mg/kg	3.6	3.5	3.0	30%	Pass	
Cadmium	S20-My05941	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S20-My05941	CP	mg/kg	11	9.7	12	30%	Pass	
Copper	S20-My05941	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Lead	S20-My05941	CP	mg/kg	12	11	3.0	30%	Pass	
Mercury	S20-My05941	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	S20-My05941	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Zinc	S20-My05941	CP	mg/kg	7.2	6.8	6.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S20-My05941	CP	%	28	28	<1	30%	Pass	

Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S20-My05942	CP	mg/kg	17	12	34	30%	Fail	Q15
Cadmium	S20-My05942	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S20-My05942	CP	mg/kg	41	28	39	30%	Fail	Q15
Copper	S20-My05942	CP	mg/kg	14	11	27	30%	Pass	
Lead	S20-My05942	CP	mg/kg	20	15	32	30%	Fail	Q15
Mercury	S20-My05942	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	S20-My05942	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Zinc	S20-My05942	CP	mg/kg	24	22	8.0	30%	Pass	

Comments

This report has been revised (V2) to amend sample ID of S20-My05940.

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
Q15	The RPD reported passes Eurofins Environment Testing's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.

Authorised By

Ursula Long	Analytical Services Manager
Andrew Sullivan	Senior Analyst-Organic (NSW)
Gabriele Cordero	Senior Analyst-Metal (NSW)
Nibha Vaidya	Senior Analyst-Asbestos (NSW)



Glenn Jackson

General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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Certificate of Analysis

Construction Sciences Pty Ltd
2/4 Kellogg Rd
Glendenning
NSW 2761

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Attention: **Beau Dubois**

Report **717585-W-V2**
Project name LUDDENHAM ORCHARD HILLS
Project ID 5046200067
Received Date May 05, 2020

Client Sample ID			R20 **TS**	**TB**	**R-1**	**RB-1**
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins Sample No.			**S20-My05943**	**S20-My05944**	**S20-My05945**	**S20-My05946**
Date Sampled			**May 04, 2020**	**May 04, 2020**	**May 04, 2020**	**May 04, 2020**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene N02	0.01	mg/L	89	< 0.01	-	-
TRH C6-C10	0.02	mg/L	76	< 0.02	-	-
TRH C6-C10 less BTEX (F1) N04	0.02	mg/L	-	< 0.02	-	-
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	0.02	mg/L	76	< 0.02	-	-
BTEX						
Benzene	0.001	mg/L	120	< 0.001	-	-
Toluene	0.001	mg/L	110	< 0.001	-	-
Ethylbenzene	0.001	mg/L	110	< 0.001	-	-
m&p-Xylenes	0.002	mg/L	110	< 0.002	-	-
o-Xylene	0.001	mg/L	110	< 0.001	-	-
Xylenes - Total*	0.003	mg/L	110	< 0.003	-	-
4-Bromofluorobenzene (surr.)	1	%	87	72	-	-
Heavy Metals						
Arsenic	0.001	mg/L	-	-	-	< 0.001
Arsenic (filtered)	0.001	mg/L	-	-	0.001	-
Cadmium	0.0002	mg/L	-	-	-	< 0.0002
Cadmium (filtered)	0.0002	mg/L	-	-	0.0007	-
Chromium	0.001	mg/L	-	-	-	< 0.001
Chromium (filtered)	0.001	mg/L	-	-	< 0.001	-
Copper	0.001	mg/L	-	-	-	< 0.001
Copper (filtered)	0.001	mg/L	-	-	< 0.001	-
Lead	0.001	mg/L	-	-	-	< 0.001
Lead (filtered)	0.001	mg/L	-	-	< 0.001	-
Mercury	0.0001	mg/L	-	-	-	< 0.0001
Mercury (filtered)	0.0001	mg/L	-	-	< 0.0001	-
Nickel	0.001	mg/L	-	-	-	< 0.001
Nickel (filtered)	0.001	mg/L	-	-	< 0.001	-
Zinc	0.005	mg/L	-	-	-	< 0.005
Zinc (filtered)	0.005	mg/L	-	-	< 0.005	-

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Total Recoverable Hydrocarbons	Sydney	May 06, 2020	7 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Sydney	May 06, 2020	7 Days
- Method: LTM-ORG-2010 TRH C6-C40			
BTEX	Sydney	May 06, 2020	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Metals M8	Sydney	May 06, 2020	180 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Metals M8 filtered	Sydney	May 06, 2020	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			

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IANZ # 1290

Company Name: Construction Sciences Pty Ltd
Address: 2/4 Kellogg Rd
Glendenning
NSW 2761

Project Name: LUDDENHAM ORCHARD HILLS
Project ID: 5046200067

Order No.:
Report #: 717585
Phone: 02 9854 1700
Fax:

Received: May 5, 2020 9:23 AM
Due: May 12, 2020
Priority: 5 Day
Contact Name: Beau Dubois

Eurofins Analytical Services Manager : Ursula Long

Sample Detail						Asbestos - AS4964	Asbestos Absence /Presence	Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	Organophosphorus Pesticides	Metals M8	Metals M8 filtered	BTEX	Moisture Set	Total Recoverable Hydrocarbons	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271																
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																
Perth Laboratory - NATA Site # 23736																
External Laboratory																
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**											
1	TP25-0-0.2	May 04, 2020		Soil	S20-My05935	X		X	X				X	X	X	
2	TP24-0-0.4	May 04, 2020		Soil	S20-My05936	X		X			X			X		
3	TP23-0-0.1	May 04, 2020		Soil	S20-My05937	X		X			X			X		
4	TP22-0-0.2	May 04, 2020		Soil	S20-My05938	X		X			X			X		
5	TP21-0-0.2	May 04, 2020		Soil	S20-My05939	X		X			X		X	X	X	
6	TP21-ACM-0.3	May 04, 2020		Building Materials	S20-My05940		X									
7	TP20-0-0.2	May 04, 2020		Soil	S20-My05941	X		X	X	X	X			X		
8	TP19-0-0.2	May 04, 2020		Soil	S20-My05942	X		X	X	X	X			X		
9	TS	May 04, 2020		Water	S20-My05943											X

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Company Name: Construction Sciences Pty Ltd
Address: 2/4 Kellogg Rd
Glendenning
NSW 2761

Project Name: LUDDENHAM ORCHARD HILLS
Project ID: 5046200067

Order No.:
Report #: 717585
Phone: 02 9854 1700
Fax:

Received: May 5, 2020 9:23 AM
Due: May 12, 2020
Priority: 5 Day
Contact Name: Beau Dubois

Eurofins Analytical Services Manager : Ursula Long

Sample Detail						Asbestos - AS4964	Asbestos Absence /Presence	Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	Organophosphorus Pesticides	Metals M8	Metals M8 filtered	BTEX	Moisture Set	Total Recoverable Hydrocarbons	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271																
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																
Perth Laboratory - NATA Site # 23736																
10	TB	May 04, 2020		Water	S20-My05944											X
11	R-1	May 04, 2020		Water	S20-My05945							X				
12	RB-1	May 04, 2020		Water	S20-My05946						X					
Test Counts						7	1	7	3	2	7	1	2	7	2	2

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
ug/L: micrograms per litre
ppm: Parts per million
ppb: Parts per billion
%: Percentage
org/100mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.3
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 20-130% Phenols & 50-150% PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.3 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/L	< 0.01			0.01	Pass	
TRH C6-C10	mg/L	< 0.02			0.02	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/L	< 0.02			0.02	Pass	
Method Blank							
BTEX							
Benzene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
m&p-Xylenes	mg/L	< 0.002			0.002	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	
Xylenes - Total*	mg/L	< 0.003			0.003	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/L	< 0.001			0.001	Pass	
Arsenic (filtered)	mg/L	< 0.001			0.001	Pass	
Cadmium	mg/L	< 0.0002			0.0002	Pass	
Cadmium (filtered)	mg/L	< 0.0002			0.0002	Pass	
Chromium	mg/L	< 0.001			0.001	Pass	
Chromium (filtered)	mg/L	< 0.001			0.001	Pass	
Copper	mg/L	< 0.001			0.001	Pass	
Copper (filtered)	mg/L	< 0.001			0.001	Pass	
Lead	mg/L	< 0.001			0.001	Pass	
Lead (filtered)	mg/L	< 0.001			0.001	Pass	
Mercury	mg/L	< 0.0001			0.0001	Pass	
Mercury (filtered)	mg/L	< 0.0001			0.0001	Pass	
Nickel	mg/L	< 0.001			0.001	Pass	
Nickel (filtered)	mg/L	< 0.001			0.001	Pass	
Zinc	mg/L	< 0.005			0.005	Pass	
Zinc (filtered)	mg/L	< 0.005			0.005	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	104			70-130	Pass	
TRH C6-C10	%	128			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	126			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	107			70-130	Pass	
Toluene	%	107			70-130	Pass	
Ethylbenzene	%	115			70-130	Pass	
m&p-Xylenes	%	119			70-130	Pass	
o-Xylene	%	113			70-130	Pass	
Xylenes - Total*	%	117			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	98			70-130	Pass	
Arsenic (filtered)	%	98			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Cadmium	%	95			70-130	Pass	
Cadmium (filtered)	%	89			70-130	Pass	
Chromium	%	98			70-130	Pass	
Chromium (filtered)	%	93			70-130	Pass	
Copper	%	96			70-130	Pass	
Copper (filtered)	%	93			70-130	Pass	
Lead	%	97			70-130	Pass	
Lead (filtered)	%	93			70-130	Pass	
Mercury	%	93			70-130	Pass	
Mercury (filtered)	%	101			70-130	Pass	
Nickel	%	96			70-130	Pass	
Nickel (filtered)	%	94			70-130	Pass	
Zinc	%	93			70-130	Pass	
Zinc (filtered)	%	97			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	S20-My08289	NCP	%	85			70-130	Pass	
TRH C6-C10	S20-My08289	NCP	%	93			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	S20-My08289	NCP	%	94			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	S20-My08289	NCP	%	77			70-130	Pass	
Toluene	S20-My08289	NCP	%	82			70-130	Pass	
Ethylbenzene	S20-My08289	NCP	%	87			70-130	Pass	
m&p-Xylenes	S20-My08289	NCP	%	100			70-130	Pass	
o-Xylene	S20-My08289	NCP	%	82			70-130	Pass	
Xylenes - Total*	S20-My08289	NCP	%	94			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic (filtered)	S20-My06202	NCP	%	117			70-130	Pass	
Cadmium (filtered)	S20-My06202	NCP	%	91			70-130	Pass	
Chromium (filtered)	S20-My06202	NCP	%	83			70-130	Pass	
Copper (filtered)	S20-My01255	NCP	%	81			70-130	Pass	
Lead (filtered)	S20-My06202	NCP	%	83			70-130	Pass	
Mercury (filtered)	S20-My06202	NCP	%	91			70-130	Pass	
Nickel (filtered)	S20-My06202	NCP	%	77			70-130	Pass	
Zinc (filtered)	S20-My06202	NCP	%	76			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S20-My14887	NCP	%	105			70-130	Pass	
Cadmium	S20-My14887	NCP	%	101			70-130	Pass	
Chromium	S20-My14887	NCP	%	95			70-130	Pass	
Copper	S20-My14887	NCP	%	92			70-130	Pass	
Lead	S20-My14887	NCP	%	95			70-130	Pass	
Mercury	S20-My14887	NCP	%	106			70-130	Pass	
Nickel	S20-My14887	NCP	%	90			70-130	Pass	
Zinc	S20-My14887	NCP	%	91			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S20-My05815	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
TRH C6-C10	S20-My05815	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S20-My05815	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S20-My05815	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Toluene	S20-My05815	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Ethylbenzene	S20-My05815	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
m&p-Xylenes	S20-My05815	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
o-Xylene	S20-My05815	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Xylenes - Total*	S20-My05815	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic (filtered)	S20-My06198	NCP	mg/L	0.003	0.003	9.0	30%	Pass	
Cadmium (filtered)	S20-My06198	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Chromium (filtered)	S20-My06198	NCP	mg/L	0.006	0.005	3.0	30%	Pass	
Copper (filtered)	S20-My06198	NCP	mg/L	0.009	0.009	1.0	30%	Pass	
Lead (filtered)	S20-My06198	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Mercury (filtered)	S20-My06198	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Nickel (filtered)	S20-My06198	NCP	mg/L	0.004	0.004	4.0	30%	Pass	
Zinc (filtered)	S20-My06198	NCP	mg/L	0.052	0.052	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S20-My14756	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Cadmium	S20-My14756	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Chromium	S20-My14756	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Copper	S20-My14756	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Lead	S20-My14756	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Mercury	S20-My14756	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Nickel	S20-My14756	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Zinc	S20-My14756	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	

Comments

This report has been revised (V2) to amend sample ID of S20-My05940.

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
R20	This sample is a Trip Spike and therefore all results are reported as a percentage

Authorised By

Ursula Long	Analytical Services Manager
Gabriele Cordero	Senior Analyst-Metal (NSW)



Glenn Jackson

General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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CHAIN OF CUSTODY RECORD

Eurofins | Environment Testing ABN 50 005 085 521

☐ Sydney Laboratory
Unit F3 Bld F 16 Mars Road Lane Cove West NSW 2066
02 9900 8400 EnviroSampleNSW@eurofins.com

☐ Brisbane Laboratory
Unit 1 21 Smallwood Place Murarrie QLD 4172
07 3902 4600 EnviroSampleQLD@eurofins.com

☐ Perth Laboratory
Unit 2 91 Leach Highway Kewdale WA 6105
08 9251 9600 EnviroSampleWA@eurofins.com

☐ Melbourne Laboratory
6 Monterey Road Dandenong South VIC 3175
03 8564 5000 EnviroSampleVic@eurofins.com

Company	Construction Sciences	Project №	504620067
Address	31 Anvil Rd, Seven Hills, NSW	Project Name	LUDDENHAM ORCHARD HILLS
Contact Name	Beau	Project Manager	Beau Dubois
Phone №	0435860610	EDD Format (Esdat, EQuIS etc)	Esdat
Special Directions		Sampler(s)	Beau Dubois
Purchase Order		Handed over by	Beau Dubois
Quote ID №		Email for Invoice	Be. 11
		Email for Results	Beau.Dubois@Constructionsciences.net

Analyses — Where metals are requested, please specify "Total" or "Filtered". SUITE code must be used to attract SUITE pricing.

Containers — Change container type & size if necessary

Required Turnaround Time (TAT) — Default will be 5 days if not ticked

♦Surcharge will apply

☐ Overnight (reporting by 9am)♦
☐ Same day♦ ☐ 1 day♦
☐ 2 days♦ ☐ 3 days♦
☑ 5 days (Standard)
☐ Other( )

№	Client Sample ID	Sampled Date/Time dd/mm/yy hh:mm	Matrix Solid (S) Water (W)	Asbestos (+/-)	BTEX	M8	TRH	PAH	OCP	OPP	500mL Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
1	TP25-0-0.2	4.5.20	Soil	X	X		X	X	X										
2	TP24-0-0.4			X		X		X											
3	TP23-0-0.1			X		X		X											
4	TP22-0-0.2			X		X		X											
5	TP21-0-0.2			X	X	X	X	X											
6	TP21-ACM-0.3		Solid	X															only analyse large fragment.
7	TP20-0-0.2		Soil	X		X		X	X	X									
8	TP19-0-0.2			X		X		X	X	X									
9/10	TS/TB	29.4.20	Water x2		X														
11/12	RI/RB-1	4.5.20	Water x2			X													
			Total Counts																

Method of Shipment	☑ Courier (#)	☐ Hand Delivered	☐ Postal	Name	Beau	Signature		Date	5.5.20	Time	8am
Laboratory Use Only	Received By	Zach Wallis	SYD / BNE / MEL / PER / ADL / NTL / DRW	Signature		Date	5/05/20	Time	9:23AM	Temperature	6.5°C.
	Received By		SYD / BNE / MEL / PER / ADL / NTL / DRW	Signature		Date		Time		Report №	#177585.

Eurofins Environment Testing Australia Pty Ltd

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QEHSC.F10 Modified by Dr R Symons Approved by G Jackson Approved on 8 August 2019

CHAIN OF CUSTODY RECORD

Eurofins | Environment Testing, ABN 50 005 085 521

☑ Sydney Laboratory — 4/ 179 Magowar Road, Girraween NSW 2145
☐ Brisbane Laboratory — 1/21 Smallwood Place, Murarrie QLD 4172
☐ Perth Laboratory — 46-48 Banksia Road, Welshpool WA 6106
☐ Melbourne Laboratory

Company	Construction Sciences
Address	31 Anvil Rd, Seven Hills,
Contact Name	Beau Dubois
Phone №	0435860610
Special Directions	
Purchase Order	
Quote ID №	
Project №	50462000067
Project Name	Lockleehan Rd, Orchard Hills
Project Manager	Beau Dubois
EDD Format (Excel, EQuIS etc)	Esdat
Sampler(s)	Nicholas Leong
Handed over by	"
Email for Invoice	Beau / Construction Sciences
Email for Results	Beau.dubois@constructionsciences.net.au

Analyses — When ready, pre-preserve, please specify "Total" or "Filtered" BUT be aware that some analytes need to be filtered ASAP after sampling

Containers (Please specify container size and type)

Required Turnaround Time (TAT) — Default will be 5 days if not ticked

☐ Overnight ☐ 2 day ☐ Same day ☐ 4 days ☐ 2 days ☐ 3 days ☑ 5 days (Standard) ☐ Other

№	Client Sample ID	Sampled Date/Time (dd/mm/yy hh:mm)	Matrix Solid (S) Water (W)	BTEX	6TEX /TRH	PAH	OCP	Asbestos (+/-)	Metals (8)	Hold.	OPP	500mL Plastic	250mL Plastic	125mL Plastic	250mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
11	TB/TB	1/5/20	Water	X																
12	TP14-0-0.2	5/5/20	Soil			X	X	X	X		X									
13	TP15-0-0.2					X		X	X											
14	TP16-0-0.2				X	X		X	X											
15	TP17-0-0.2				X	X		X	X											
16	TP18-0-0.2				X	X		X	X											
17	R-2		Water						X											
18	RB-2								X											
19	QC101				X	X			X											
20	QC102				X	X			X											Please forward SDGs per analyte
	Total Counts																			

Method of Shipment: ☐ Courier ☑ Hand Delivered ☐ Postal — Name: Beau Dubois — Signature: — Date: 6/5/20 — Time: 8:30 am

Laboratory Use Only

Received By	Elvis D	BYD ☐ BNE ☐ MEL ☐ PER ☐ ADL ☐ NTL ☐ DRW	Signature		Date	6/5/20	Time	9:16 AM	Temperature: 3.3°C
Received By		BYD ☐ BNE ☐ MEL ☐ PER ☐ ADL ☐ NTL ☐ DRW	Signature		Date		Time		Report № 717918

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1/3

CHAIN OF CUSTODY RECORD

Eurofins | Environment Testing ABN 50 005 085 521

☑ Sydney Laboratory ☐ Brisbane Laboratory ☐ Perth Laboratory ☐ Melbourne Laboratory

Company	Construction Science	Project No	50462000 67	Project Manager	Beau Dubois
Address	36 Annett Rd Seven Hills	Project Name	Luddenham Rd, Orchard Hills	EDD Format	Esdat
Contact Name	Beau Dubois			Sampler(s)	Nicholas Leong
Phone No	0485960610			Handed over by	li
Special Directions				Email for Invoice	Beau / CS
Purchase Order				Email for Results	Beau
Quote ID No					

Analytes (Where metals are required, please specify Total or Filtered. SUITE CODE must be used to select correct testing)

HOLD

Containers (Change container type & size if necessary): 500mL Plastic; 250mL Plastic; 125mL Plastic; 200mL Amber Glass; 40mL VOA vial; 500mL PFAS Bottle; Jar (Glass or HDPE); Other (Asbestos AS4964, WA Guidelines)

Required Turnaround Time (TAT) (Default will be 5 days if not ticked): ☐ ☐ ☐ ☑ ☐

No	Client Sample ID	Sampled Date/Time (dd/mm/yy hh:mm)	Matrix (Soil (S) Water (W))	HOLD	Sample Comments / Dangerous Goods Hazard Warning
21	SP1-1	5/5/20	Soil	X	
22	SP1-2				
23	SP1-3				
24	QC201				
25	QC202				
26	SP2-1				
27	SP2-2				
28	SP2-3				
29	SP3-1				
30	SP3-2				
	Total Counts				

Method of Shipment: ☐ Courier (#) ☑ Hand Delivered ☐ Postal Name: Beau Dubois Signature: Date: 6/5/20 Time: 8:30

Laboratory Use Only											
Received By	Elvis D	SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date	6/5/20	Time	9:16AM	Temperature	3.3°C
Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date		Time		Report No	717915

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CHAIN OF CUSTODY RECORD

Eurofins | Environment Testing ABN 50 005 085 521

☑ Sydney Laboratory ☐ Brisbane Laboratory ☐ Perth Laboratory ☐ Melbourne Laboratory

Company	Construction Surveys	Project No	50462000 67	Project Manager	Beau Dubois
Address	31 Anvil Rd Seven Hills,	Project Name	Luddenham Rd Orchard Hills	EDD Format	Esdat
Contact Name	Beau Dubois			Sampler(s)	Nicholas Leong
Phone No	0435 860 610			Handed over by	
Special Directions				Email for Invoice	Beau/CS Beau.
Purchase Order				Email for Results	
Quote ID No					

Analytes (Where metals are requested, please specify Total or Filtered (0.45 µm filtered sample) and by default Soil samples will be digested prior to analysis)

Containers

Required Turnaround Time (TAT) (Default will be 5 Days if not ticked)

☐ Same Day ☐ 2 Days ☐ 3 Days ☐ 4 Days ☑ 5 Days (Standard) ☐ Other

No	Client Sample ID	Sampled Date/Time (manually for non-soil)	Matrix Soil (S) Water (W)	Hold	500mL Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
21	SP3-3	6/5/20	Soil	X								
22	SP4-1	↓	↓	↓								
23	SP4-2											
24	SP4-3											
25												
26												
27												
28												
29												
30												
	Total Counts											

Method of Shipment: ☐ Courier # ☑ Hand Delivered ☐ Postal Name: Beau Dubois Signature: Date: 4/5/20 Time: 8:30am

Laboratory Use Only								
Received By	Elvis D	SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date 6/5/20	Time 9:16Am	Temperature	3.3°C
Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date	Time	Report No	717918

Eurofins Environment Testing Australia Pty Ltd

Submission of samples to the laboratory will be deemed as acceptance of Eurofins | Environment Testing Standard Terms and Conditions unless agreed otherwise in writing.

3/3

#AU04_Enviro_Sample_NSW

To: Beau Dubois
Subject: RE: Eurofins Sample Receipt Advice - Report 717918 : Site LUDDENHAM RD ORCHARD HILLS (5046200067)

From: Beau Dubois [mailto:beau.dubois@constructionsciences.net]
Sent: Friday, 8 May 2020 9:15 AM
To: #AU04_Enviro_Sample_NSW
Cc: Ursula Long
Subject: RE: Eurofins Sample Receipt Advice - Report 717918 : Site LUDDENHAM RD ORCHARD HILLS (5046200067)

Hi Luca,

Could you please proceed to analyse the following 14 samples (previously on hold):

SP1-1, -2, -3,
SP2-1, -2, -3,
SP3-1, -2, -3,
SP4-1, -2, -3,
QC201,
QC202, (Please forward to SGS lab for analysis)

Analyse all samples (Jars) for B9 soil suite: TRH/BTEX/PAH/OCP/M8
Also analyse all Asbestos (bags) NEPM w/w% (Excluding QC201/QC202)

All standard turnaround time please.

Cheers,

Beau Dubois
SENIOR ENVIRONMENTAL SCIENTIST
CONSTRUCTION SCIENCES

Construction Sciences

Phone Direct
Address 31 Anvil Road, Seven Hills, New South Wales 2147 Australia

Email beau.dubois@www.constructionsciences.net Web www.constructionsciences.net

CONNECT WITH CONSTRUCTION SCIENCES

Construction Sciences management systems are certified to ISO9001 (quality) and ISO45001 (occupational health and safety)

This email and its attachments may contain confidential and/or privileged information for the sole use of the intended recipient(s). All electronically supplied data must be checked against an applicable hardcopy version which shall be the only document which Construction Sciences warrants accuracy. If you are not the intended recipient, any use, distribution or copying of the information contained in this email and its attachments is strictly prohibited. If you have received this email in error, please email the sender by replying to this message and immediately delete and destroy any copies of this email and any attachments. The views or opinions expressed are the author's own and may not reflect the views or opinions of Construction Sciences.

From: EnviroSampleNSW@eurofins.com <EnviroSampleNSW@eurofins.com>
Sent: Thursday, 7 May 2020 12:35 PM
To: Beau Dubois <beau.dubois@constructionsciences.net>
Subject: Eurofins Sample Receipt Advice - Report 717918 : Site LUDDENHAM RD ORCHARD HILLS (5046200067)

Dear Valued Client,

QC102 sent to SGS for analysis.

Please find attached a Sample Receipt Advice (SRA), a Summary Sheet and a scanned copy of your Chain-of-Custody (COC). It is important that you check this documentation to ensure that the details are correct such as the Client Job Number, Turn Around Time, any comments in the Notes section and sample numbers as well as the requested analysis. If there are any irregularities then please contact your Eurofins | mgt Analytical Services Manager as soon as possible to make certain that they get changed.

Regards

Luca Dominici
Sample Receipt

Eurofins | Environmental Testing
Unit F3, Parkview Building
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LANE COVE WEST NSW 2066
AUSTRALIA
Phone: +61 02 9900 8421
Email: EnviroSampleNSW@eurofins.com
Website:environment.eurofins.com.au

EnviroNote 1098 - Melbourne PFAS Accreditation
EnviroNote 1080 - Total Organofluorine Analysis & PFAS Investigations

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Perth
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Phone : +61 8 9251 9600
NATA # 1261 Site # 23736

ABN – 50 005 085 521 e.mail : EnviroSales@eurofins.com web : www.eurofins.com.au

Sample Receipt Advice

Company name:	**Construction Sciences Pty Ltd**
Contact name:	Beau Dubois
Project name:	LUDDENHAM RD ORCHARD HILLS
Project ID:	5046200067
COC number:	Not provided
Turn around time:	5 Day
Date/Time received:	May 6, 2020 9:16 AM
Eurofins reference:	**717918**

Sample information

☑ A detailed list of analytes logged into our LIMS, is included in the attached summary table.

☑ All samples have been received as described on the above COC.

☑ COC has been completed correctly.

☑ Attempt to chill was evident.

☑ Appropriately preserved sample containers have been used.

☑ All samples were received in good condition.

☑ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.

☑ Appropriate sample containers have been used.

☑ Sample containers for volatile analysis received with zero headspace.

☑ Split sample sent to requested external lab.

☒ Some samples have been subcontracted.

N/A Custody Seals intact (if used).

Notes

QC102 and QC202 sent to SGS for analysis.

Contact notes

If you have any questions with respect to these samples please contact:

Ursula Long on Phone : or by e.mail: UrsulaLong@eurofins.com

Results will be delivered electronically via e.mail to Beau Dubois - Beau.Dubois@constructionsciences.net.

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IANZ # 1290

Company Name: Construction Sciences Pty Ltd
Address: 2/4 Kellogg Rd
Glendenning
NSW 2761

Project Name: LUDDENHAM RD ORCHARD HILLS
Project ID: 5046200067

Order No.:
Report #: 717918
Phone: 02 9854 1700
Fax:

Received: May 6, 2020 9:16 AM
Due: May 13, 2020
Priority: 5 Day
Contact Name: Beau Dubois

Eurofins Analytical Services Manager : Ursula Long

Sample Detail						Asbestos - AS4964	Asbestos - WA guidelines	CANCELLED	Polycyclic Aromatic Hydrocarbons	Metals M8	Metals M8 filtered	BTEX	Eurofins | mgt Suite B14	Moisture Set	Eurofins | mgt Suite B7	Eurofins | mgt Suite B9
Melbourne Laboratory - NATA Site # 1254 & 14271																
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																
Perth Laboratory - NATA Site # 23736																
External Laboratory																
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**											
1	TS	May 01, 2020		Water	S20-My08801							X				
2	TB	May 01, 2020		Water	S20-My08802							X				
3	TP14-0-0.2	May 05, 2020		Soil	S20-My08803	X			X	X			X	X		
4	TP15-0-0.2	May 05, 2020		Soil	S20-My08804	X			X	X				X		
5	TP16-0-0.2	May 05, 2020		Soil	S20-My08805	X								X	X	
6	TP17-0-0.2	May 05, 2020		Soil	S20-My08806	X								X	X	
7	TP18-0-0.2	May 05, 2020		Soil	S20-My08807	X								X	X	
8	R-2	May 05, 2020		Water	S20-My08808						X					
9	RB-2	May 05, 2020		Water	S20-My08809						X					
10	QC101	May 05, 2020		Soil	S20-My08810									X	X	

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Company Name: Construction Sciences Pty Ltd
Address: 2/4 Kellogg Rd
Glendenning
NSW 2761

Project Name: LUDDENHAM RD ORCHARD HILLS
Project ID: 5046200067

Order No.:
Report #: 717918
Phone: 02 9854 1700
Fax:

Received: May 6, 2020 9:16 AM
Due: May 13, 2020
Priority: 5 Day
Contact Name: Beau Dubois

Eurofins Analytical Services Manager : Ursula Long

Sample Detail						Asbestos - AS4964	Asbestos - WA guidelines	CANCELLED	Polycyclic Aromatic Hydrocarbons	Metals M8	Metals M8 filtered	BTEX	Eurofins | mgt Suite B14	Moisture Set	Eurofins | mgt Suite B7	Eurofins | mgt Suite B9
Melbourne Laboratory - NATA Site # 1254 & 14271																
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																
Perth Laboratory - NATA Site # 23736																
11	SP1-1	May 05, 2020		Soil	S20-My08811		X							X		X
12	SP1-2	May 05, 2020		Soil	S20-My08812		X							X		X
13	SP1-3	May 05, 2020		Soil	S20-My08813		X							X		X
14	QC201	May 05, 2020		Soil	S20-My08814									X		X
15	QC202	May 05, 2020		Soil	S20-My08815			X								
16	SP2-1	May 05, 2020		Soil	S20-My08816		X							X		X
17	SP2-2	May 05, 2020		Soil	S20-My08817		X							X		X
18	SP2-3	May 05, 2020		Soil	S20-My08818		X							X		X
19	SP3-1	May 05, 2020		Soil	S20-My08819		X							X		X
20	SP3-2	May 05, 2020		Soil	S20-My08820		X							X		X
21	SP3-3	May 05, 2020		Soil	S20-My08821		X							X		X
22	SP4-1	May 05, 2020		Soil	S20-My08822		X							X		X
23	SP4-2	May 05, 2020		Soil	S20-My08823		X							X		X

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Company Name: Construction Sciences Pty Ltd
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Glendenning
NSW 2761

Project Name: LUDDENHAM RD ORCHARD HILLS
Project ID: 5046200067

Order No.:
Report #: 717918
Phone: 02 9854 1700
Fax:

Received: May 6, 2020 9:16 AM
Due: May 13, 2020
Priority: 5 Day
Contact Name: Beau Dubois

Eurofins Analytical Services Manager : Ursula Long

Sample Detail						Asbestos - AS4964	Asbestos - WA guidelines	CANCELLED	Polycyclic Aromatic Hydrocarbons	Metals M8	Metals M8 filtered	BTEX	Eurofins | mgt Suite B14	Moisture Set	Eurofins | mgt Suite B7	Eurofins | mgt Suite B9
Melbourne Laboratory - NATA Site # 1254 & 14271																
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																
Perth Laboratory - NATA Site # 23736																
24	SP4-3	May 05, 2020		Soil	S20-My08824		X							X		X
Test Counts						5	12	1	2	2	2	2	1	19	4	13

Certificate of Analysis

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NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025–Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Construction Sciences Pty Ltd
2/4 Kellogg Rd
Glendenning
NSW 2761

Attention:	Beau Dubois
Report	717918-V2-AID
Project Name	LUDDENHAM RD ORCHARD HILLS
Project ID	5046200067
Received Date	May 06, 2020
Date Reported	May 19, 2020

Methodology:

Asbestos Fibre Identification	Conducted in accordance with the Australian Standard AS 4964 – 2004: Method for the Qualitative Identification of Asbestos in Bulk Samples and in-house Method LTM-ASB-8020 by polarised light microscopy (PLM) and dispersion staining (DS) techniques. *NOTE: Positive Trace Analysis results indicate the sample contains detectable respirable fibres.*
Unknown Mineral Fibres	Mineral fibres of unknown type, as determined by PLM with DS, may require another analytical technique, such as Electron Microscopy, to confirm unequivocal identity. *NOTE: While Actinolite, Anthophyllite and Tremolite asbestos may be detected by PLM with DS, due to variability in the optical properties of these materials, AS4964 requires that these are reported as UMF unless confirmed by an independent technique.*
Subsampling Soil Samples	The whole sample submitted is first dried and then passed through a 10mm sieve followed by a 2mm sieve. All fibrous matter greater than 10mm, greater than 2mm as well as the material passing through the 2mm sieve are retained and analysed for the presence of asbestos. If the sub 2mm fraction is greater than approximately 30 to 60g then a sub-sampling routine based on ISO 3082:2009(E) is employed. *NOTE: Depending on the nature and size of the soil sample, the sub-2 mm residue material may need to be sub-sampled for trace analysis, in accordance with AS 4964-2004.*
Bonded asbestos-containing material (ACM)	The material is first examined and any fibres isolated for identification by PLM and DS. Where required, interfering matrices may be removed by disintegration using a range of heat, chemical or physical treatments, possibly in combination.The resultant material is then further examined in accordance with AS 4964 - 2004. *NOTE: Even after disintegration it may be difficult to detect the presence of asbestos in some asbestos-containing bulk materials using PLM and DS. This is due to the low grade or small length or diameter of the asbestos fibres present in the material, or to the fact that very fine fibres have been distributed intimately throughout the materials. Vinyl/asbestos floor tiles, some asbestos-containing sealants and mastics, asbestos-containing epoxy resins and some ore samples are examples of these types of material, which are difficult to analyse.*
Limit of Reporting	The performance limitation of the AS 4964 (2004) method for non-homogeneous samples is around 0.1 g/kg (equivalent to 0.01% (w/w)). Where no asbestos is found by PLM and DS, including Trace Analysis, this is considered to be at the nominal reporting limit of 0.01% (w/w). The NEPM screening level of 0.001% (w/w) is intended as an on-site determination, not a laboratory Limit of Reporting (LOR), per se. Examination of a large sample size (e.g. 500 mL) may improve the likelihood of detecting asbestos, particularly AF, to aid assessment against the NEPM criteria. Gravimetric determinations to this level of accuracy are outside of AS 4964 and hence NATA Accreditation does not cover the performance of this service (non-NATA results shown with an asterisk). *NOTE: NATA News March 2014, p.7, states in relation to AS 4964: "This is a qualitative method with a nominal reporting limit of 0.01 % " and that currently in Australia "there is no validated method available for the quantification of asbestos".This report is consistent with the analytical procedures and reporting recommendations in the NEPM and the WA DoH.*

Accredited for compliance with ISO/IEC 17025–Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Project Name LUDDENHAM RD ORCHARD HILLS
Project ID 5046200067
Date Sampled May 05, 2020
Report 717918-V2-AID

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
TP14-0-0.2	20-My08803	May 05, 2020	Approximate Sample 491g Sample consisted of: Brown coarse-grained clayey soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
TP15-0-0.2	20-My08804	May 05, 2020	Approximate Sample 315g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
TP16-0-0.2	20-My08805	May 05, 2020	Approximate Sample 328g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
TP17-0-0.2	20-My08806	May 05, 2020	Approximate Sample 672g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
TP18-0-0.2	20-My08807	May 05, 2020	Approximate Sample 742g Sample consisted of: Brown coarse-grained clayey soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
SP1-1	20-My08811	May 05, 2020	Approximate Sample 656g Sample consisted of: Brown fine-grained sandy soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
SP1-2	20-My08812	May 05, 2020	Approximate Sample 637g Sample consisted of: Brown fine-grained sandy soil, bitumen, brick fragments and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
SP1-3	20-My08813	May 05, 2020	Approximate Sample 775g Sample consisted of: Brown fine-grained sandy soil, bitumen fragments and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
SP2-1	20-My08816	May 05, 2020	Approximate Sample 769g Sample consisted of: Brown coarse-grained soil, bitumen fragments and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
SP2-2	20-My08817	May 05, 2020	Approximate Sample 711g Sample consisted of: Brown coarse-grained soil, bitumen fragments and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
SP2-3	20-My08818	May 05, 2020	Approximate Sample 641g Sample consisted of: Brown coarse-grained soil, bitumen fragments and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
SP3-1	20-My08819	May 05, 2020	Approximate Sample 705g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
SP3-2	20-My08820	May 05, 2020	Approximate Sample 706g Sample consisted of: Brown coarse-grained soil, bitumen fragments and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
SP3-3	20-My08821	May 05, 2020	Approximate Sample 756g Sample consisted of: Brown coarse-grained soil, bitumen fragments and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
SP4-1	20-My08822	May 05, 2020	Approximate Sample 692g Sample consisted of: Brown coarse-grained soil, bitumen fragments and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
SP4-2	20-My08823	May 05, 2020	Approximate Sample 656g Sample consisted of: Brown coarse-grained soil, bitumen fragments and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
SP4-3	20-My08824	May 05, 2020	Approximate Sample 608g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Asbestos - LTM-ASB-8020	Sydney	May 08, 2020	Indefinite
Asbestos - LTM-ASB-8020	Sydney	May 08, 2020	Indefinite

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Company Name: Construction Sciences Pty Ltd
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Project Name: LUDDENHAM RD ORCHARD HILLS
Project ID: 5046200067

Order No.:
Report #: 717918
Phone: 02 9854 1700
Fax:

Received: May 6, 2020 9:16 AM
Due: May 13, 2020
Priority: 5 Day
Contact Name: Beau Dubois

Eurofins Analytical Services Manager : Ursula Long

Sample Detail						Asbestos - AS4964	Asbestos - WA guidelines	CANCELLED	Polycyclic Aromatic Hydrocarbons	Metals M8	Metals M8 filtered	BTEX	Eurofins | mgt Suite B14	Moisture Set	Eurofins | mgt Suite B7	Eurofins | mgt Suite B9
Melbourne Laboratory - NATA Site # 1254 & 14271																
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																
Perth Laboratory - NATA Site # 23736																
External Laboratory																
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**											
1	TS	May 01, 2020		Water	S20-My08801							X				
2	TB	May 01, 2020		Water	S20-My08802							X				
3	TP14-0-0.2	May 05, 2020		Soil	S20-My08803	X			X	X			X	X		
4	TP15-0-0.2	May 05, 2020		Soil	S20-My08804	X			X	X				X		
5	TP16-0-0.2	May 05, 2020		Soil	S20-My08805	X								X	X	
6	TP17-0-0.2	May 05, 2020		Soil	S20-My08806	X								X	X	
7	TP18-0-0.2	May 05, 2020		Soil	S20-My08807	X								X	X	
8	R-2	May 05, 2020		Water	S20-My08808						X					
9	RB-2	May 05, 2020		Water	S20-My08809						X					
10	QC101	May 05, 2020		Soil	S20-My08810									X	X	

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Company Name: Construction Sciences Pty Ltd
Address: 2/4 Kellogg Rd
Glendenning
NSW 2761

Project Name: LUDDENHAM RD ORCHARD HILLS
Project ID: 5046200067

Order No.:
Report #: 717918
Phone: 02 9854 1700
Fax:

Received: May 6, 2020 9:16 AM
Due: May 13, 2020
Priority: 5 Day
Contact Name: Beau Dubois

Eurofins Analytical Services Manager : Ursula Long

Sample Detail						Asbestos - AS4964	Asbestos - WA guidelines	CANCELLED	Polycyclic Aromatic Hydrocarbons	Metals M8	Metals M8 filtered	BTEX	Eurofins | mgt Suite B14	Moisture Set	Eurofins | mgt Suite B7	Eurofins | mgt Suite B9
Melbourne Laboratory - NATA Site # 1254 & 14271																
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																
Perth Laboratory - NATA Site # 23736																
11	SP1-1	May 05, 2020		Soil	S20-My08811		X							X		X
12	SP1-2	May 05, 2020		Soil	S20-My08812		X							X		X
13	SP1-3	May 05, 2020		Soil	S20-My08813		X							X		X
14	QC201	May 05, 2020		Soil	S20-My08814									X		X
15	QC202	May 05, 2020		Soil	S20-My08815			X								
16	SP2-1	May 05, 2020		Soil	S20-My08816		X							X		X
17	SP2-2	May 05, 2020		Soil	S20-My08817		X							X		X
18	SP2-3	May 05, 2020		Soil	S20-My08818		X							X		X
19	SP3-1	May 05, 2020		Soil	S20-My08819		X							X		X
20	SP3-2	May 05, 2020		Soil	S20-My08820		X							X		X
21	SP3-3	May 05, 2020		Soil	S20-My08821		X							X		X
22	SP4-1	May 05, 2020		Soil	S20-My08822		X							X		X
23	SP4-2	May 05, 2020		Soil	S20-My08823		X							X		X

eurofins | Environment Testing

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Company Name: Construction Sciences Pty Ltd
Address: 2/4 Kellogg Rd
Glendenning
NSW 2761

Project Name: LUDDENHAM RD ORCHARD HILLS
Project ID: 5046200067

Order No.:
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Received: May 6, 2020 9:16 AM
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Contact Name: Beau Dubois

Eurofins Analytical Services Manager : Ursula Long

Sample Detail						Asbestos - AS4964	Asbestos - WA guidelines	CANCELLED	Polycyclic Aromatic Hydrocarbons	Metals M8	Metals M8 filtered	BTEX	Eurofins | mgt Suite B14	Moisture Set	Eurofins | mgt Suite B7	Eurofins | mgt Suite B9
Melbourne Laboratory - NATA Site # 1254 & 14271																
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																
Perth Laboratory - NATA Site # 23736																
24	SP4-3	May 05, 2020		Soil	S20-My08824		X							X		X
Test Counts						5	12	1	2	2	2	2	1	19	4	13

Internal Quality Control Review and Glossary

General

1. QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Samples were analysed on an 'as received' basis.
4. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
5. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Advice.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

Units

% w/w: weight for weight basis	grams per kilogram
Filter loading:	fibres/100 graticule areas
Reported Concentration:	fibres/mL
Flowrate:	L/min

Terms

Dry	Sample is dried by heating prior to analysis
LOR	Limit of Reporting
COC	Chain of Custody
SRA	Sample Receipt Advice
ISO	International Standards Organisation
AS	Australian Standards
WA DOH	Reference document for the NEPM. Government of Western Australia, Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia (2009), including supporting document Recommended Procedures for Laboratory Analysis of Asbestos in Soil (2011)
NEPM	National Environment Protection (Assessment of Site Contamination) Measure, 2013 (as amended)
ACM	Asbestos Containing Materials. Asbestos contained within a non-asbestos matrix, typically presented in bonded and/or sound condition. For the purposes of the NEPM, ACM is generally restricted to those materials that do not pass a 7mm x 7mm sieve.
AF	Asbestos Fines. Asbestos containing materials, including friable, weathered and bonded materials, able to pass a 7mm x 7mm sieve. Considered under the NEPM as equivalent to “non-bonded / friable”.
FA	Fibrous Asbestos. Asbestos containing materials in a friable and/or severely weathered condition. For the purposes of the NEPM, FA is generally restricted to those materials that do not pass a 7mm x 7mm sieve.
Friable	Asbestos-containing materials of any size that may be broken or crumbled by hand pressure. For the purposes of the NEPM, this includes both AF and FA. It is outside of the laboratory’s remit to assess degree of friability.
Trace Analysis	Analytical procedure used to detect the presence of respirable fibres in the matrix.

Comments

This report has been revised (V2) to report standard PAH LORs for samples S20-My08820 to S20-My08824.

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N/A	Not applicable

Asbestos Counter/Identifier:

Chamath JHM Annakkage	Senior Analyst-Asbestos (NSW)

Authorised by:

Sayeed Abu	Senior Analyst-Asbestos (NSW)



Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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Construction Sciences Pty Ltd
2/4 Kellogg Rd
Glendenning
NSW 2761

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Attention: **Beau Dubois**

Report **717918-S-V2**
Project name LUDDENHAM RD ORCHARD HILLS
Project ID 5046200067
Received Date May 06, 2020

Client Sample ID			[G01]**TP14-0-0.2**	[G01]**TP15-0-0.2**	**TP16-0-0.2**	**TP17-0-0.2**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**S20-My08803**	**S20-My08804**	**S20-My08805**	**S20-My08806**
Date Sampled			**May 05, 2020**	**May 05, 2020**	**May 05, 2020**	**May 05, 2020**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	-	-	< 20	< 20
TRH C10-C14	20	mg/kg	-	-	< 20	< 20
TRH C15-C28	50	mg/kg	-	-	95	< 50
TRH C29-C36	50	mg/kg	-	-	170	< 50
TRH C10-C36 (Total)	50	mg/kg	-	-	265	< 50
BTEX						
Benzene	0.1	mg/kg	-	-	< 0.1	< 0.1
Toluene	0.1	mg/kg	-	-	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	-	-	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	-	-	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	-	-	< 0.1	< 0.1
Xylenes - Total*	0.3	mg/kg	-	-	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	-	-	93	87
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	-	-	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	-	-	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	-	-	< 20	< 20
TRH >C10-C16	50	mg/kg	-	-	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	-	-	< 50	< 50
TRH >C16-C34	100	mg/kg	-	-	250	< 100
TRH >C34-C40	100	mg/kg	-	-	250	< 100
TRH >C10-C40 (total)*	100	mg/kg	-	-	500	< 100
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 2	< 2	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	< 2	< 2	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	2.9	2.9	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 2	< 2	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			[G01]TP14-0-0.2	[G01]TP15-0-0.2	TP16-0-0.2	TP17-0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-My08803	S20-My08804	S20-My08805	S20-My08806
Date Sampled			May 05, 2020	May 05, 2020	May 05, 2020	May 05, 2020
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Dibenz(a.h)anthracene	0.5	mg/kg	< 2	< 2	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 2	< 2	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 2	< 2	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	110	115	83	119
p-Terphenyl-d14 (surr.)	1	%	115	135	76	108
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	-	-	-
4.4'-DDD	0.05	mg/kg	< 0.05	-	-	-
4.4'-DDE	0.05	mg/kg	< 0.05	-	-	-
4.4'-DDT	0.05	mg/kg	< 0.05	-	-	-
a-BHC	0.05	mg/kg	< 0.05	-	-	-
Aldrin	0.05	mg/kg	< 0.05	-	-	-
b-BHC	0.05	mg/kg	< 0.05	-	-	-
d-BHC	0.05	mg/kg	< 0.05	-	-	-
Dieldrin	0.05	mg/kg	< 0.05	-	-	-
Endosulfan I	0.05	mg/kg	< 0.05	-	-	-
Endosulfan II	0.05	mg/kg	< 0.05	-	-	-
Endosulfan sulphate	0.05	mg/kg	< 0.05	-	-	-
Endrin	0.05	mg/kg	< 0.05	-	-	-
Endrin aldehyde	0.05	mg/kg	< 0.05	-	-	-
Endrin ketone	0.05	mg/kg	< 0.05	-	-	-
g-BHC (Lindane)	0.05	mg/kg	< 0.05	-	-	-
Heptachlor	0.05	mg/kg	< 0.05	-	-	-
Heptachlor epoxide	0.05	mg/kg	< 0.05	-	-	-
Hexachlorobenzene	0.05	mg/kg	< 0.05	-	-	-
Methoxychlor	0.2	mg/kg	< 0.2	-	-	-
Toxaphene	1	mg/kg	< 1	-	-	-
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	-	-	-
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	-	-	-
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.2	-	-	-
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.2	-	-	-
Dibutylchlorendate (surr.)	1	%	83	-	-	-
Tetrachloro-m-xylene (surr.)	1	%	110	-	-	-
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	< 0.2	-	-	-
Bolstar	0.2	mg/kg	< 0.2	-	-	-
Chlorfenvinphos	0.2	mg/kg	< 0.2	-	-	-
Chlorpyrifos	0.2	mg/kg	< 0.2	-	-	-
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2	-	-	-
Coumaphos	2	mg/kg	< 2	-	-	-
Demeton-S	0.2	mg/kg	< 0.2	-	-	-
Demeton-O	0.2	mg/kg	< 0.2	-	-	-
Diazinon	0.2	mg/kg	< 0.2	-	-	-
Dichlorvos	0.2	mg/kg	< 0.2	-	-	-

Client Sample ID			[G01]TP14-0-0.2	[G01]TP15-0-0.2	TP16-0-0.2	TP17-0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-My08803	S20-My08804	S20-My08805	S20-My08806
Date Sampled			May 05, 2020	May 05, 2020	May 05, 2020	May 05, 2020
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
Dimethoate	0.2	mg/kg	< 0.2	-	-	-
Disulfoton	0.2	mg/kg	< 0.2	-	-	-
EPN	0.2	mg/kg	< 0.2	-	-	-
Ethion	0.2	mg/kg	< 0.2	-	-	-
Ethoprop	0.2	mg/kg	< 0.2	-	-	-
Ethyl parathion	0.2	mg/kg	< 0.2	-	-	-
Fenitrothion	0.2	mg/kg	< 0.2	-	-	-
Fensulfothion	0.2	mg/kg	< 0.2	-	-	-
Fenthion	0.2	mg/kg	< 0.2	-	-	-
Malathion	0.2	mg/kg	< 0.2	-	-	-
Merphos	0.2	mg/kg	< 0.2	-	-	-
Methyl parathion	0.2	mg/kg	< 0.2	-	-	-
Mevinphos	0.2	mg/kg	< 0.2	-	-	-
Monocrotophos	2	mg/kg	< 2	-	-	-
Naled	0.2	mg/kg	< 1	-	-	-
Omethoate	2	mg/kg	< 2	-	-	-
Phorate	0.2	mg/kg	< 0.2	-	-	-
Pirimiphos-methyl	0.2	mg/kg	< 0.2	-	-	-
Pyrazophos	0.2	mg/kg	< 0.2	-	-	-
Ronnel	0.2	mg/kg	< 0.2	-	-	-
Terbufos	0.2	mg/kg	< 0.2	-	-	-
Tetrachlorvinphos	0.2	mg/kg	< 0.2	-	-	-
Tokuthion	0.2	mg/kg	< 0.2	-	-	-
Trichloronate	0.2	mg/kg	< 0.2	-	-	-
Triphenylphosphate (surr.)	1	%	101	-	-	-
Heavy Metals						
Arsenic	2	mg/kg	15	10.0	15	13
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	78	20	60	63
Copper	5	mg/kg	< 5	14	9.0	< 5
Lead	5	mg/kg	25	19	18	14
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	< 5	6.7	6.1	< 5
Zinc	5	mg/kg	6.3	37	14	6.6
% Moisture	1	%	21	14	7.7	16

Client Sample ID			TP18-0-0.2	QC101	SP1-1	SP1-2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-My08807	S20-My08810	S20-My08811	S20-My08812
Date Sampled			May 05, 2020	May 05, 2020	May 05, 2020	May 05, 2020
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	96	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50	96	< 50	< 50

Client Sample ID			TP18-0-0.2	QC101	SP1-1	SP1-2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-My08807	S20-My08810	S20-My08811	S20-My08812
Date Sampled			May 05, 2020	May 05, 2020	May 05, 2020	May 05, 2020
Test/Reference	LOR	Unit				
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	94	90	90	82
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	140	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	140	< 100	< 100
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	107	89	96	99
p-Terphenyl-d14 (surr.)	1	%	105	79	93	94
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	-	< 0.1	< 0.1
4.4'-DDD	0.05	mg/kg	-	-	< 0.05	< 0.05
4.4'-DDE	0.05	mg/kg	-	-	< 0.05	< 0.05
4.4'-DDT	0.05	mg/kg	-	-	< 0.05	< 0.05
a-BHC	0.05	mg/kg	-	-	< 0.05	< 0.05
Aldrin	0.05	mg/kg	-	-	< 0.05	< 0.05
b-BHC	0.05	mg/kg	-	-	< 0.05	< 0.05
d-BHC	0.05	mg/kg	-	-	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	-	-	< 0.05	< 0.05

Client Sample ID			TP18-0-0.2	QC101	SP1-1	SP1-2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-My08807	S20-My08810	S20-My08811	S20-My08812
Date Sampled			May 05, 2020	May 05, 2020	May 05, 2020	May 05, 2020
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Endosulfan I	0.05	mg/kg	-	-	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	-	-	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	-	-	< 0.05	< 0.05
Endrin	0.05	mg/kg	-	-	< 0.05	< 0.05
Endrin aldehyde	0.05	mg/kg	-	-	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	-	-	< 0.05	< 0.05
g-BHC (Lindane)	0.05	mg/kg	-	-	< 0.05	< 0.05
Heptachlor	0.05	mg/kg	-	-	< 0.05	< 0.05
Heptachlor epoxide	0.05	mg/kg	-	-	< 0.05	< 0.05
Hexachlorobenzene	0.05	mg/kg	-	-	< 0.05	< 0.05
Methoxychlor	0.2	mg/kg	-	-	< 0.2	< 0.2
Toxaphene	1	mg/kg	-	-	< 1	< 1
Aldrin and Dieldrin (Total)*	0.05	mg/kg	-	-	< 0.05	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	-	-	< 0.05	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	-	-	< 0.2	< 0.2
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	-	-	< 0.2	< 0.2
Dibutylchlorendate (surr.)	1	%	-	-	89	110
Tetrachloro-m-xylene (surr.)	1	%	-	-	86	94
Heavy Metals						
Arsenic	2	mg/kg	41	18	< 2	< 2
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	100	88	< 5	< 5
Copper	5	mg/kg	14	6.5	9.6	9.3
Lead	5	mg/kg	46	13	29	26
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	15	< 5	< 5	< 5
Zinc	5	mg/kg	71	7.6	31	24
% Moisture	1	%	9.9	8.5	3.9	2.5

Client Sample ID			SP1-3	QC201	[G01]SP2-1	[G01]SP2-2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-My08813	S20-My08814	S20-My08816	S20-My08817
Date Sampled			May 05, 2020	May 05, 2020	May 05, 2020	May 05, 2020
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	75	110
TRH C29-C36	50	mg/kg	< 50	< 50	310	210
TRH C10-C36 (Total)	50	mg/kg	< 50	< 50	385	320
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	88	84	73	80

Client Sample ID			SP1-3	QC201	[G01]SP2-1	[G01]SP2-2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-My08813	S20-My08814	S20-My08816	S20-My08817
Date Sampled			May 05, 2020	May 05, 2020	May 05, 2020	May 05, 2020
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	280	300
TRH >C34-C40	100	mg/kg	< 100	< 100	650	420
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	930	720
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	80	86	87	87
p-Terphenyl-d14 (surr.)	1	%	83	91	59	87
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	< 1	< 1
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05	< 0.5	< 0.5
4.4'-DDE	0.05	mg/kg	< 0.05	< 0.05	< 0.5	< 0.5
4.4'-DDT	0.05	mg/kg	< 0.05	< 0.05	< 0.5	< 0.5
a-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.5	< 0.5
Aldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.5	< 0.5
b-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.5	< 0.5
d-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.5	< 0.5
Dieldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.5	< 0.5
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	< 0.5	< 0.5
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	< 0.5	< 0.5
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	< 0.5	< 0.5
Endrin	0.05	mg/kg	< 0.05	< 0.05	< 0.5	< 0.5
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	< 0.5	< 0.5
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	< 0.5	< 0.5
g-BHC (Lindane)	0.05	mg/kg	< 0.05	< 0.05	< 0.5	< 0.5
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	< 0.5	< 0.5

Client Sample ID			SP1-3	QC201	[G01]SP2-1	[G01]SP2-2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-My08813	S20-My08814	S20-My08816	S20-My08817
Date Sampled			May 05, 2020	May 05, 2020	May 05, 2020	May 05, 2020
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	< 0.5	< 0.5
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	< 0.5	< 0.5
Methoxychlor	0.2	mg/kg	< 0.2	< 0.2	< 0.5	< 0.5
Toxaphene	1	mg/kg	< 1	< 1	< 10	< 10
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.5	< 0.5
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.5	< 0.5
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.2	< 0.2	< 1	< 1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.2	< 0.2	< 1	< 1
Dibutylchlorendate (surr.)	1	%	79	105	118	INT
Tetrachloro-m-xylene (surr.)	1	%	81	91	72	77
Heavy Metals						
Arsenic	2	mg/kg	< 2	< 2	5.0	4.8
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	0.9
Chromium	5	mg/kg	< 5	< 5	82	35
Copper	5	mg/kg	6.8	9.7	46	48
Lead	5	mg/kg	22	39	16	17
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	< 5	< 5	21	18
Zinc	5	mg/kg	22	28	87	180
% Moisture	1	%	3.9	2.6	5.3	5.3

Client Sample ID			[G01]SP2-3	[G01]SP3-1	SP3-2	SP3-3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-My08818	S20-My08819	S20-My08820	S20-My08821
Date Sampled			May 05, 2020	May 05, 2020	May 05, 2020	May 05, 2020
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	190	60	140	82
TRH C29-C36	50	mg/kg	360	260	280	300
TRH C10-C36 (Total)	50	mg/kg	550	320	420	382
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	85	71	83	90
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	510	230	380	280

Client Sample ID			[G01]SP2-3	[G01]SP3-1	SP3-2	SP3-3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-My08818	S20-My08819	S20-My08820	S20-My08821
Date Sampled			May 05, 2020	May 05, 2020	May 05, 2020	May 05, 2020
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C34-C40	100	mg/kg	690	570	560	650
TRH >C10-C40 (total)*	100	mg/kg	1200	800	940	930
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	79	86	74	71
p-Terphenyl-d14 (surr.)	1	%	76	72	64	65
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 1	< 1	< 1	< 1
4.4'-DDD	0.05	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
4.4'-DDE	0.05	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
4.4'-DDT	0.05	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
a-BHC	0.05	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aldrin	0.05	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
b-BHC	0.05	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
d-BHC	0.05	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dieldrin	0.05	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Endosulfan I	0.05	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Endosulfan II	0.05	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Endosulfan sulphate	0.05	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Endrin	0.05	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Endrin aldehyde	0.05	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Endrin ketone	0.05	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
g-BHC (Lindane)	0.05	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Heptachlor	0.05	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Heptachlor epoxide	0.05	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Hexachlorobenzene	0.05	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Methoxychlor	0.2	mg/kg	< 0.5	< 0.5	< 2	< 2
Toxaphene	1	mg/kg	< 10	< 10	< 10	< 10
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			[G01]SP2-3	[G01]SP3-1	SP3-2	SP3-3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-My08818	S20-My08819	S20-My08820	S20-My08821
Date Sampled			May 05, 2020	May 05, 2020	May 05, 2020	May 05, 2020
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 1	< 1	< 2	< 2
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 1	< 1	< 2	< 2
Dibutylchlorendate (surr.)	1	%	58	INT	83	76
Tetrachloro-m-xylene (surr.)	1	%	79	74	83	89
Heavy Metals						
Arsenic	2	mg/kg	4.4	7.1	6.2	5.1
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	93	120	110	92
Copper	5	mg/kg	49	38	46	37
Lead	5	mg/kg	15	18	17	15
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	22	21	24	24
Zinc	5	mg/kg	78	73	82	78
% Moisture	1	%	8.3	7.6	6.9	4.7

Client Sample ID			SP4-1	SP4-2	SP4-3
Sample Matrix			Soil	Soil	Soil
Eurofins Sample No.			S20-My08822	S20-My08823	S20-My08824
Date Sampled			May 05, 2020	May 05, 2020	May 05, 2020
Test/Reference	LOR	Unit			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions					
TRH C6-C9	20	mg/kg	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	130	55	130
TRH C29-C36	50	mg/kg	230	220	240
TRH C10-C36 (Total)	50	mg/kg	360	275	370
BTEX					
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	83	87	85
Total Recoverable Hydrocarbons - 2013 NEPM Fractions					
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	310	200	330
TRH >C34-C40	100	mg/kg	480	510	530
TRH >C10-C40 (total)*	100	mg/kg	790	710	860

Client Sample ID			SP4-1	SP4-2	SP4-3
Sample Matrix			Soil	Soil	Soil
Eurofins Sample No.			S20-My08822	S20-My08823	S20-My08824
Date Sampled			May 05, 2020	May 05, 2020	May 05, 2020
Test/Reference	LOR	Unit			
Polycyclic Aromatic Hydrocarbons					
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	0.6	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	0.6	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	82	127	70
p-Terphenyl-d14 (surr.)	1	%	59	139	68
Organochlorine Pesticides					
Chlordanes - Total	0.1	mg/kg	< 1	< 1	< 1
4.4'-DDD	0.05	mg/kg	< 0.5	< 0.5	< 0.5
4.4'-DDE	0.05	mg/kg	< 0.5	< 0.5	< 0.5
4.4'-DDT	0.05	mg/kg	< 0.5	< 0.5	< 0.5
a-BHC	0.05	mg/kg	< 0.5	< 0.5	< 0.5
Aldrin	0.05	mg/kg	< 0.5	< 0.5	< 0.5
b-BHC	0.05	mg/kg	< 0.5	< 0.5	< 0.5
d-BHC	0.05	mg/kg	< 0.5	< 0.5	< 0.5
Dieldrin	0.05	mg/kg	< 0.5	< 0.5	< 0.5
Endosulfan I	0.05	mg/kg	< 0.5	< 0.5	< 0.5
Endosulfan II	0.05	mg/kg	< 0.5	< 0.5	< 0.5
Endosulfan sulphate	0.05	mg/kg	< 0.5	< 0.5	< 0.5
Endrin	0.05	mg/kg	< 0.5	< 0.5	< 0.5
Endrin aldehyde	0.05	mg/kg	< 0.5	< 0.5	< 0.5
Endrin ketone	0.05	mg/kg	< 0.5	< 0.5	< 0.5
g-BHC (Lindane)	0.05	mg/kg	< 0.5	< 0.5	< 0.5
Heptachlor	0.05	mg/kg	< 0.5	< 0.5	< 0.5
Heptachlor epoxide	0.05	mg/kg	< 0.5	< 0.5	< 0.5
Hexachlorobenzene	0.05	mg/kg	< 0.5	< 0.5	< 0.5
Methoxychlor	0.2	mg/kg	< 2	< 2	< 2
Toxaphene	1	mg/kg	< 10	< 10	< 10
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.5	< 0.5	< 0.5
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.5	< 0.5	< 0.5
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 2	< 2	< 2
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 2	< 2	< 2
Dibutylchlorendate (surr.)	1	%	INT	INT	INT
Tetrachloro-m-xylene (surr.)	1	%	113	INT	140

Client Sample ID			SP4-1	SP4-2	SP4-3
Sample Matrix			Soil	Soil	Soil
Eurofins Sample No.			S20-My08822	S20-My08823	S20-My08824
Date Sampled			May 05, 2020	May 05, 2020	May 05, 2020
Test/Reference	LOR	Unit			
Heavy Metals					
Arsenic	2	mg/kg	4.1	3.9	6.7
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	37	63	89
Copper	5	mg/kg	30	19	46
Lead	5	mg/kg	11	12	18
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	19	16	26
Zinc	5	mg/kg	48	57	82
% Moisture	1	%	5.8	7.2	6.1

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Eurofins | mgt Suite B9			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Sydney	May 12, 2020	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
BTEX	Sydney	May 12, 2020	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	May 12, 2020	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	May 12, 2020	
- Method: LTM-ORG-2010 TRH C6-C40			
Polycyclic Aromatic Hydrocarbons	Sydney	May 12, 2020	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Organochlorine Pesticides	Sydney	May 12, 2020	14 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Metals M8	Sydney	May 12, 2020	180 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Organophosphorus Pesticides	Sydney	May 12, 2020	14 Days
- Method: LTM-ORG-2200 Organophosphorus Pesticides by GC-MS			
% Moisture	Sydney	May 08, 2020	14 Days
- Method: LTM-GEN-7080 Moisture			

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NATA # 1261 Site # 18217

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NATA # 1261 Site # 20794

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IANZ # 1290

Company Name: Construction Sciences Pty Ltd
Address: 2/4 Kellogg Rd
Glendenning
NSW 2761

Project Name: LUDDENHAM RD ORCHARD HILLS
Project ID: 5046200067

Order No.:
Report #: 717918
Phone: 02 9854 1700
Fax:

Received: May 6, 2020 9:16 AM
Due: May 13, 2020
Priority: 5 Day
Contact Name: Beau Dubois

Eurofins Analytical Services Manager : Ursula Long

Sample Detail						Asbestos - AS4964	Asbestos - WA guidelines	CANCELLED	Polycyclic Aromatic Hydrocarbons	Metals M8	Metals M8 filtered	BTEX	Eurofins | mgt Suite B14	Moisture Set	Eurofins | mgt Suite B7	Eurofins | mgt Suite B9
Melbourne Laboratory - NATA Site # 1254 & 14271																
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																
Perth Laboratory - NATA Site # 23736																
External Laboratory																
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**											
1	TS	May 01, 2020		Water	S20-My08801							X				
2	TB	May 01, 2020		Water	S20-My08802							X				
3	TP14-0-0.2	May 05, 2020		Soil	S20-My08803	X			X	X			X	X		
4	TP15-0-0.2	May 05, 2020		Soil	S20-My08804	X			X	X				X		
5	TP16-0-0.2	May 05, 2020		Soil	S20-My08805	X								X	X	
6	TP17-0-0.2	May 05, 2020		Soil	S20-My08806	X								X	X	
7	TP18-0-0.2	May 05, 2020		Soil	S20-My08807	X								X	X	
8	R-2	May 05, 2020		Water	S20-My08808						X					
9	RB-2	May 05, 2020		Water	S20-My08809						X					
10	QC101	May 05, 2020		Soil	S20-My08810									X	X	

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Melbourne Laboratory - NATA Site # 1254 & 14271																
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																
Perth Laboratory - NATA Site # 23736																
11	SP1-1	May 05, 2020		Soil	S20-My08811		X							X		X
12	SP1-2	May 05, 2020		Soil	S20-My08812		X							X		X
13	SP1-3	May 05, 2020		Soil	S20-My08813		X							X		X
14	QC201	May 05, 2020		Soil	S20-My08814									X		X
15	QC202	May 05, 2020		Soil	S20-My08815			X								
16	SP2-1	May 05, 2020		Soil	S20-My08816		X							X		X
17	SP2-2	May 05, 2020		Soil	S20-My08817		X							X		X
18	SP2-3	May 05, 2020		Soil	S20-My08818		X							X		X
19	SP3-1	May 05, 2020		Soil	S20-My08819		X							X		X
20	SP3-2	May 05, 2020		Soil	S20-My08820		X							X		X
21	SP3-3	May 05, 2020		Soil	S20-My08821		X							X		X
22	SP4-1	May 05, 2020		Soil	S20-My08822		X							X		X
23	SP4-2	May 05, 2020		Soil	S20-My08823		X							X		X

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Melbourne Laboratory - NATA Site # 1254 & 14271																
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																
Perth Laboratory - NATA Site # 23736																
24	SP4-3	May 05, 2020		Soil	S20-My08824		X							X		X
Test Counts						5	12	1	2	2	2	2	1	19	4	13

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.3
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 20-130% Phenols & 50-150% PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.3 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/kg	< 20			20	Pass	
TRH C10-C14	mg/kg	< 20			20	Pass	
TRH C15-C28	mg/kg	< 50			50	Pass	
TRH C29-C36	mg/kg	< 50			50	Pass	
Method Blank							
BTEX							
Benzene	mg/kg	< 0.1			0.1	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Xylenes - Total*	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g.h.i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a.h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/kg	< 0.1			0.1	Pass	
4.4'-DDD	mg/kg	< 0.05			0.05	Pass	
4.4'-DDE	mg/kg	< 0.05			0.05	Pass	
4.4'-DDT	mg/kg	< 0.05			0.05	Pass	
a-BHC	mg/kg	< 0.05			0.05	Pass	
Aldrin	mg/kg	< 0.05			0.05	Pass	
b-BHC	mg/kg	< 0.05			0.05	Pass	
d-BHC	mg/kg	< 0.05			0.05	Pass	
Dieldrin	mg/kg	< 0.05			0.05	Pass	
Endosulfan I	mg/kg	< 0.05			0.05	Pass	
Endosulfan II	mg/kg	< 0.05			0.05	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endosulfan sulphate	mg/kg	< 0.05			0.05	Pass	
Endrin	mg/kg	< 0.05			0.05	Pass	
Endrin aldehyde	mg/kg	< 0.05			0.05	Pass	
Endrin ketone	mg/kg	< 0.05			0.05	Pass	
g-BHC (Lindane)	mg/kg	< 0.05			0.05	Pass	
Heptachlor	mg/kg	< 0.05			0.05	Pass	
Heptachlor epoxide	mg/kg	< 0.05			0.05	Pass	
Hexachlorobenzene	mg/kg	< 0.05			0.05	Pass	
Methoxychlor	mg/kg	< 0.2			0.2	Pass	
Toxaphene	mg/kg	< 1			1	Pass	
Method Blank							
Organophosphorus Pesticides							
Azinphos-methyl	mg/kg	< 0.2			0.2	Pass	
Bolstar	mg/kg	< 0.2			0.2	Pass	
Chlorfenvinphos	mg/kg	< 0.2			0.2	Pass	
Chlorpyrifos	mg/kg	< 0.2			0.2	Pass	
Chlorpyrifos-methyl	mg/kg	< 0.2			0.2	Pass	
Coumaphos	mg/kg	< 2			2	Pass	
Demeton-S	mg/kg	< 0.2			0.2	Pass	
Demeton-O	mg/kg	< 0.2			0.2	Pass	
Diazinon	mg/kg	< 0.2			0.2	Pass	
Dichlorvos	mg/kg	< 0.2			0.2	Pass	
Dimethoate	mg/kg	< 0.2			0.2	Pass	
Disulfoton	mg/kg	< 0.2			0.2	Pass	
EPN	mg/kg	< 0.2			0.2	Pass	
Ethion	mg/kg	< 0.2			0.2	Pass	
Ethoprop	mg/kg	< 0.2			0.2	Pass	
Ethyl parathion	mg/kg	< 0.2			0.2	Pass	
Fenitrothion	mg/kg	< 0.2			0.2	Pass	
Fensulfothion	mg/kg	< 0.2			0.2	Pass	
Fenthion	mg/kg	< 0.2			0.2	Pass	
Malathion	mg/kg	< 0.2			0.2	Pass	
Merphos	mg/kg	< 0.2			0.2	Pass	
Methyl parathion	mg/kg	< 0.2			0.2	Pass	
Mevinphos	mg/kg	< 0.2			0.2	Pass	
Monocrotophos	mg/kg	< 2			2	Pass	
Naled	mg/kg	< 0.2			0.2	Pass	
Omethoate	mg/kg	< 2			2	Pass	
Phorate	mg/kg	< 0.2			0.2	Pass	
Pirimiphos-methyl	mg/kg	< 0.2			0.2	Pass	
Pyrazophos	mg/kg	< 0.2			0.2	Pass	
Ronnel	mg/kg	< 0.2			0.2	Pass	
Terbufos	mg/kg	< 0.2			0.2	Pass	
Tetrachlorvinphos	mg/kg	< 0.2			0.2	Pass	
Tokuthion	mg/kg	< 0.2			0.2	Pass	
Trichloronate	mg/kg	< 0.2			0.2	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	99			70-130	Pass	
TRH C10-C14	%	79			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	89			70-130	Pass	
Toluene	%	105			70-130	Pass	
Ethylbenzene	%	110			70-130	Pass	
m&p-Xylenes	%	110			70-130	Pass	
o-Xylene	%	110			70-130	Pass	
Xylenes - Total*	%	110			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	103			70-130	Pass	
TRH C6-C10	%	100			70-130	Pass	
TRH >C10-C16	%	79			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	72			70-130	Pass	
Acenaphthylene	%	80			70-130	Pass	
Anthracene	%	81			70-130	Pass	
Benz(a)anthracene	%	72			70-130	Pass	
Benzo(a)pyrene	%	81			70-130	Pass	
Benzo(b&j)fluoranthene	%	80			70-130	Pass	
Benzo(g.h.i)perylene	%	81			70-130	Pass	
Benzo(k)fluoranthene	%	85			70-130	Pass	
Chrysene	%	81			70-130	Pass	
Dibenz(a.h)anthracene	%	72			70-130	Pass	
Fluoranthene	%	82			70-130	Pass	
Fluorene	%	84			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	70			70-130	Pass	
Naphthalene	%	78			70-130	Pass	
Phenanthrene	%	78			70-130	Pass	
Pyrene	%	85			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
Chlordanes - Total	%	84			70-130	Pass	
4.4'-DDD	%	71			70-130	Pass	
4.4'-DDE	%	84			70-130	Pass	
4.4'-DDT	%	78			70-130	Pass	
a-BHC	%	80			70-130	Pass	
Aldrin	%	81			70-130	Pass	
b-BHC	%	84			70-130	Pass	
d-BHC	%	83			70-130	Pass	
Dieldrin	%	73			70-130	Pass	
Endosulfan I	%	87			70-130	Pass	
Endosulfan II	%	83			70-130	Pass	
Endosulfan sulphate	%	82			70-130	Pass	
Endrin	%	74			70-130	Pass	
Endrin aldehyde	%	75			70-130	Pass	
Endrin ketone	%	78			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
g-BHC (Lindane)	%	84			70-130	Pass	
Heptachlor	%	70			70-130	Pass	
Heptachlor epoxide	%	79			70-130	Pass	
Hexachlorobenzene	%	71			70-130	Pass	
Methoxychlor	%	82			70-130	Pass	
LCS - % Recovery							
Organophosphorus Pesticides							
Diazinon	%	81			70-130	Pass	
Dimethoate	%	87			70-130	Pass	
Ethion	%	91			70-130	Pass	
Fenitrothion	%	93			70-130	Pass	
Methyl parathion	%	98			70-130	Pass	
Mevinphos	%	84			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	104			70-130	Pass	
Cadmium	%	99			70-130	Pass	
Chromium	%	98			70-130	Pass	
Copper	%	97			70-130	Pass	
Lead	%	98			70-130	Pass	
Mercury	%	96			70-130	Pass	
Nickel	%	97			70-130	Pass	
Zinc	%	96			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	S20-My10402	NCP	%	95			70-130	Pass	
Acenaphthylene	S20-My10402	NCP	%	89			70-130	Pass	
Anthracene	S20-My10402	NCP	%	97			70-130	Pass	
Benz(a)anthracene	S20-My10402	NCP	%	88			70-130	Pass	
Benzo(a)pyrene	S20-My10402	NCP	%	97			70-130	Pass	
Benzo(b&j)fluoranthene	S20-My10402	NCP	%	95			70-130	Pass	
Benzo(g.h.i)perylene	S20-My23116	NCP	%	72			70-130	Pass	
Benzo(k)fluoranthene	S20-My10402	NCP	%	108			70-130	Pass	
Chrysene	S20-My10402	NCP	%	93			70-130	Pass	
Dibenz(a.h)anthracene	S20-My23116	NCP	%	87			70-130	Pass	
Fluoranthene	S20-My10402	NCP	%	97			70-130	Pass	
Fluorene	S20-My10402	NCP	%	99			70-130	Pass	
Indeno(1.2.3-cd)pyrene	S20-My23116	NCP	%	88			70-130	Pass	
Naphthalene	S20-My10402	NCP	%	96			70-130	Pass	
Phenanthrene	S20-My10402	NCP	%	94			70-130	Pass	
Pyrene	S20-My10402	NCP	%	98			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
Chlordanes - Total	S20-My23116	NCP	%	86			70-130	Pass	
4.4'-DDD	S20-My23116	NCP	%	86			70-130	Pass	
4.4'-DDE	S20-My23116	NCP	%	86			70-130	Pass	
4.4'-DDT	S20-My23116	NCP	%	84			70-130	Pass	
a-BHC	S20-My23116	NCP	%	86			70-130	Pass	
Aldrin	S20-My23116	NCP	%	85			70-130	Pass	
b-BHC	S20-My23116	NCP	%	80			70-130	Pass	
d-BHC	S20-My23116	NCP	%	85			70-130	Pass	
Dieldrin	S20-My23116	NCP	%	82			70-130	Pass	
Endosulfan I	S20-My23116	NCP	%	92			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endosulfan II	S20-My23116	NCP	%	82			70-130	Pass	
Endosulfan sulphate	S20-My23116	NCP	%	86			70-130	Pass	
Endrin	S20-My23116	NCP	%	79			70-130	Pass	
Endrin ketone	S20-My23116	NCP	%	89			70-130	Pass	
g-BHC (Lindane)	S20-My23116	NCP	%	84			70-130	Pass	
Heptachlor	S20-My23116	NCP	%	95			70-130	Pass	
Heptachlor epoxide	S20-My23116	NCP	%	91			70-130	Pass	
Hexachlorobenzene	S20-My23116	NCP	%	90			70-130	Pass	
Methoxychlor	S20-My23116	NCP	%	88			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C10-C14	S20-My10402	NCP	%	90			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH C6-C10	S20-My10539	NCP	%	74			70-130	Pass	
TRH >C10-C16	S20-My10402	NCP	%	90			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	S20-My15782	NCP	%	89			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
Endrin aldehyde	S20-My08758	NCP	%	86			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	S20-My08812	CP	%	105			70-130	Pass	
Toluene	S20-My08812	CP	%	81			70-130	Pass	
Ethylbenzene	S20-My08812	CP	%	78			70-130	Pass	
m&p-Xylenes	S20-My08812	CP	%	78			70-130	Pass	
o-Xylene	S20-My08812	CP	%	79			70-130	Pass	
Xylenes - Total*	S20-My08812	CP	%	78			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	S20-My08812	CP	%	98			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S20-My08814	CP	%	112			70-130	Pass	
Cadmium	S20-My08814	CP	%	107			70-130	Pass	
Chromium	S20-My08814	CP	%	106			70-130	Pass	
Copper	S20-My08814	CP	%	107			70-130	Pass	
Lead	S20-My08814	CP	%	92			70-130	Pass	
Mercury	S20-My08814	CP	%	111			70-130	Pass	
Nickel	S20-My08814	CP	%	104			70-130	Pass	
Zinc	S20-My08814	CP	%	106			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Organophosphorus Pesticides				Result 1	Result 2	RPD			
Azinphos-methyl	S20-My15252	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Bolstar	S20-My15252	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorfenvinphos	S20-My15252	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorpyrifos	S20-My15252	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorpyrifos-methyl	S20-My15252	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Coumaphos	S20-My15252	NCP	mg/kg	< 2	< 2	<1	30%	Pass	
Demeton-S	S20-My15252	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Demeton-O	S20-My15252	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Organophosphorus Pesticides				Result 1	Result 2	RPD			
Diazinon	S20-My15252	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Dichlorvos	S20-My15252	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Dimethoate	S20-My15252	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Disulfoton	S20-My15252	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
EPN	S20-My15252	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethion	S20-My15252	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethoprop	S20-My15252	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethyl parathion	S20-My15252	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fenitrothion	S20-My15252	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fensulfothion	S20-My15252	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fenthion	S20-My15252	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Malathion	S20-My15252	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Merphos	S20-My15252	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Methyl parathion	S20-My15252	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Mevinphos	S20-My15252	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Monocrotophos	S20-My15252	NCP	mg/kg	< 2	< 2	<1	30%	Pass	
Naled	S20-My15252	NCP	mg/kg	< 2	< 2	<1	30%	Pass	
Omethoate	S20-My15252	NCP	mg/kg	< 2	< 2	<1	30%	Pass	
Phorate	S20-My15252	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Pirimiphos-methyl	S20-My15252	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Pyrazophos	S20-My15252	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ronnel	S20-My15252	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Terbufos	S20-My15252	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tetrachlorvinphos	S20-My15252	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tokuthion	S20-My15252	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Trichloronate	S20-My15252	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S20-My08811	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S20-My08811	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S20-My08811	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S20-My08811	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S20-My08811	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S20-My08811	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total*	S20-My08811	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S20-My08811	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	S20-My08811	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C10-C14	S20-My08812	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	S20-My08812	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	S20-My08812	CP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	S20-My08812	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	S20-My08812	CP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	S20-My08812	CP	mg/kg	< 100	< 100	<1	30%	Pass	

Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S20-My08812	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S20-My08812	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S20-My08812	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S20-My08812	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	S20-My08812	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	S20-My08812	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	S20-My08812	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	S20-My08812	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	S20-My08812	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	S20-My08812	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S20-My08812	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	S20-My08812	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	S20-My08812	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	S20-My08812	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	S20-My08812	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	S20-My08812	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	S20-My08812	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	S20-My08812	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	S20-My08812	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	S20-My08812	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-BHC	S20-My08812	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	S20-My08812	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-BHC	S20-My08812	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-BHC	S20-My08812	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	S20-My08812	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	S20-My08812	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	S20-My08812	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	S20-My08812	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	S20-My08812	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	S20-My08812	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	S20-My08812	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-BHC (Lindane)	S20-My08812	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	S20-My08812	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	S20-My08812	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	S20-My08812	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	S20-My08812	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S20-My08812	CP	%	2.5	3.5	33	30%	Fail	Q15
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S20-My08813	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Cadmium	S20-My08813	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S20-My08813	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Copper	S20-My08813	CP	mg/kg	6.8	6.7	1.0	30%	Pass	
Lead	S20-My08813	CP	mg/kg	22	21	4.0	30%	Pass	
Mercury	S20-My08813	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	S20-My08813	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Zinc	S20-My08813	CP	mg/kg	22	21	7.0	30%	Pass	

Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C10-C14	S20-My08823	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	S20-My08823	CP	mg/kg	55	< 50	26	30%	Pass	
TRH C29-C36	S20-My08823	CP	mg/kg	220	180	23	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	S20-My08823	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	S20-My08823	CP	mg/kg	200	160	23	30%	Pass	
TRH >C34-C40	S20-My08823	CP	mg/kg	510	410	21	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S20-My08823	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S20-My08823	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S20-My08823	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S20-My08823	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	S20-My08823	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	S20-My08823	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	S20-My08823	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	S20-My08823	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	S20-My08823	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	S20-My08823	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S20-My08823	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	S20-My08823	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	S20-My08823	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	S20-My08823	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	S20-My08823	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	S20-My08823	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	S20-My08823	CP	mg/kg	< 1	< 1	<1	30%	Pass	
4.4'-DDD	S20-My08823	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
4.4'-DDE	S20-My08823	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
4.4'-DDT	S20-My08823	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
a-BHC	S20-My08823	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aldrin	S20-My08823	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
b-BHC	S20-My08823	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
d-BHC	S20-My08823	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dieldrin	S20-My08823	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Endosulfan I	S20-My08823	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Endosulfan II	S20-My08823	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Endosulfan sulphate	S20-My08823	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Endrin	S20-My08823	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Endrin aldehyde	S20-My08823	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Endrin ketone	S20-My08823	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
g-BHC (Lindane)	S20-My08823	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Heptachlor	S20-My08823	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Heptachlor epoxide	S20-My08823	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Hexachlorobenzene	S20-My08823	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Methoxychlor	S20-My08823	CP	mg/kg	< 2	< 0.5	<1	30%	Pass	
Toxaphene	S20-My08823	CP	mg/kg	< 10	< 10	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S20-My08823	CP	%	7.2	6.9	5.0	30%	Pass	

Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S20-My08824	CP	mg/kg	6.7	5.1	28	30%	Pass	
Cadmium	S20-My08824	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S20-My08824	CP	mg/kg	89	140	43	30%	Fail	Q02
Copper	S20-My08824	CP	mg/kg	46	59	24	30%	Pass	
Lead	S20-My08824	CP	mg/kg	18	18	5.0	30%	Pass	
Mercury	S20-My08824	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	S20-My08824	CP	mg/kg	26	23	12	30%	Pass	
Zinc	S20-My08824	CP	mg/kg	82	97	17	30%	Pass	

Comments

This report has been revised (V2) to report standard PAH LORs for samples S20-My08820 to S20-My08824.

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
G01	The LORs have been raised due to matrix interference
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
Q02	The duplicate %RPD is outside the recommended acceptance criteria. Further analysis indicates sample heterogeneity as the cause
Q15	The RPD reported passes Eurofins Environment Testing's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.

Authorised By

Ursula Long	Analytical Services Manager
Andrew Sullivan	Senior Analyst-Organic (NSW)
Gabriele Cordero	Senior Analyst-Metal (NSW)
Nibha Vaidya	Senior Analyst-Asbestos (NSW)



Glenn Jackson

General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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Construction Sciences Pty Ltd
2/4 Kellogg Rd
Glendenning
NSW 2761

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Attention: **Beau Dubois**

Report **717918-W-V2**
Project name LUDDENHAM RD ORCHARD HILLS
Project ID 5046200067
Received Date May 06, 2020

Client Sample ID			R20 **TS**	**TB**	**R-2**	**RB-2**
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins Sample No.			**S20-My08801**	**S20-My08802**	**S20-My08808**	**S20-My08809**
Date Sampled			**May 01, 2020**	**May 01, 2020**	**May 05, 2020**	**May 05, 2020**
Test/Reference	LOR	Unit				
BTEX						
Benzene	0.001	mg/L	92	< 0.001	-	-
Toluene	0.001	mg/L	88	< 0.001	-	-
Ethylbenzene	0.001	mg/L	85	< 0.001	-	-
m&p-Xylenes	0.002	mg/L	79	< 0.002	-	-
o-Xylene	0.001	mg/L	87	< 0.001	-	-
Xylenes - Total*	0.003	mg/L	82	< 0.003	-	-
4-Bromofluorobenzene (surr.)	1	%	103	96	-	-
Heavy Metals						
Arsenic (filtered)	0.001	mg/L	-	-	< 0.001	< 0.001
Cadmium (filtered)	0.0002	mg/L	-	-	< 0.0002	< 0.0002
Chromium (filtered)	0.001	mg/L	-	-	< 0.001	< 0.001
Copper (filtered)	0.001	mg/L	-	-	< 0.001	< 0.001
Lead (filtered)	0.001	mg/L	-	-	< 0.001	< 0.001
Mercury (filtered)	0.0001	mg/L	-	-	< 0.0001	< 0.0001
Nickel (filtered)	0.001	mg/L	-	-	< 0.001	< 0.001
Zinc (filtered)	0.005	mg/L	-	-	< 0.005	< 0.005

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Eurofins | mgt Suite B9			
BTEX	Sydney	May 07, 2020	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Metals M8 filtered	Sydney	May 13, 2020	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			

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IANZ # 1290

Company Name: Construction Sciences Pty Ltd
Address: 2/4 Kellogg Rd
Glendenning
NSW 2761

Project Name: LUDDENHAM RD ORCHARD HILLS
Project ID: 5046200067

Order No.:
Report #: 717918
Phone: 02 9854 1700
Fax:

Received: May 6, 2020 9:16 AM
Due: May 13, 2020
Priority: 5 Day
Contact Name: Beau Dubois

Eurofins Analytical Services Manager : Ursula Long

Sample Detail						Asbestos - AS4964	Asbestos - WA guidelines	CANCELLED	Polycyclic Aromatic Hydrocarbons	Metals M8	Metals M8 filtered	BTEX	Eurofins | mgt Suite B14	Moisture Set	Eurofins | mgt Suite B7	Eurofins | mgt Suite B9
Melbourne Laboratory - NATA Site # 1254 & 14271																
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																
Perth Laboratory - NATA Site # 23736																
External Laboratory																
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**											
1	TS	May 01, 2020		Water	S20-My08801							X				
2	TB	May 01, 2020		Water	S20-My08802							X				
3	TP14-0-0.2	May 05, 2020		Soil	S20-My08803	X			X	X			X	X		
4	TP15-0-0.2	May 05, 2020		Soil	S20-My08804	X			X	X				X		
5	TP16-0-0.2	May 05, 2020		Soil	S20-My08805	X								X	X	
6	TP17-0-0.2	May 05, 2020		Soil	S20-My08806	X								X	X	
7	TP18-0-0.2	May 05, 2020		Soil	S20-My08807	X								X	X	
8	R-2	May 05, 2020		Water	S20-My08808						X					
9	RB-2	May 05, 2020		Water	S20-My08809						X					
10	QC101	May 05, 2020		Soil	S20-My08810									X	X	

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Address: 2/4 Kellogg Rd
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NSW 2761

Project Name: LUDDENHAM RD ORCHARD HILLS
Project ID: 5046200067

Order No.:
Report #: 717918
Phone: 02 9854 1700
Fax:

Received: May 6, 2020 9:16 AM
Due: May 13, 2020
Priority: 5 Day
Contact Name: Beau Dubois

Eurofins Analytical Services Manager : Ursula Long

Sample Detail						Asbestos - AS4964	Asbestos - WA guidelines	CANCELLED	Polycyclic Aromatic Hydrocarbons	Metals M8	Metals M8 filtered	BTEX	Eurofins | mgt Suite B14	Moisture Set	Eurofins | mgt Suite B7	Eurofins | mgt Suite B9
Melbourne Laboratory - NATA Site # 1254 & 14271																
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																
Perth Laboratory - NATA Site # 23736																
11	SP1-1	May 05, 2020		Soil	S20-My08811		X							X		X
12	SP1-2	May 05, 2020		Soil	S20-My08812		X							X		X
13	SP1-3	May 05, 2020		Soil	S20-My08813		X							X		X
14	QC201	May 05, 2020		Soil	S20-My08814									X		X
15	QC202	May 05, 2020		Soil	S20-My08815			X								
16	SP2-1	May 05, 2020		Soil	S20-My08816		X							X		X
17	SP2-2	May 05, 2020		Soil	S20-My08817		X							X		X
18	SP2-3	May 05, 2020		Soil	S20-My08818		X							X		X
19	SP3-1	May 05, 2020		Soil	S20-My08819		X							X		X
20	SP3-2	May 05, 2020		Soil	S20-My08820		X							X		X
21	SP3-3	May 05, 2020		Soil	S20-My08821		X							X		X
22	SP4-1	May 05, 2020		Soil	S20-My08822		X							X		X
23	SP4-2	May 05, 2020		Soil	S20-My08823		X							X		X

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Project ID: 5046200067

Order No.:
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Phone: 02 9854 1700
Fax:

Received: May 6, 2020 9:16 AM
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Priority: 5 Day
Contact Name: Beau Dubois

Eurofins Analytical Services Manager : Ursula Long

Sample Detail						Asbestos - AS4964	Asbestos - WA guidelines	CANCELLED	Polycyclic Aromatic Hydrocarbons	Metals M8	Metals M8 filtered	BTEX	Eurofins | mgt Suite B14	Moisture Set	Eurofins | mgt Suite B7	Eurofins | mgt Suite B9
Melbourne Laboratory - NATA Site # 1254 & 14271																
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																
Perth Laboratory - NATA Site # 23736																
24	SP4-3	May 05, 2020		Soil	S20-My08824		X							X		X
Test Counts						5	12	1	2	2	2	2	1	19	4	13

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.3
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 20-130% Phenols & 50-150% PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.3 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
BTEX							
Benzene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
m&p-Xylenes	mg/L	< 0.002			0.002	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	
Xylenes - Total*	mg/L	< 0.003			0.003	Pass	
Method Blank							
Heavy Metals							
Arsenic (filtered)	mg/L	< 0.001			0.001	Pass	
Cadmium (filtered)	mg/L	< 0.0002			0.0002	Pass	
Chromium (filtered)	mg/L	< 0.001			0.001	Pass	
Copper (filtered)	mg/L	< 0.001			0.001	Pass	
Lead (filtered)	mg/L	< 0.001			0.001	Pass	
Mercury (filtered)	mg/L	< 0.0001			0.0001	Pass	
Nickel (filtered)	mg/L	< 0.001			0.001	Pass	
Zinc (filtered)	mg/L	< 0.005			0.005	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	95			70-130	Pass	
Toluene	%	92			70-130	Pass	
Ethylbenzene	%	97			70-130	Pass	
m&p-Xylenes	%	93			70-130	Pass	
o-Xylene	%	93			70-130	Pass	
Xylenes - Total*	%	93			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic (filtered)	%	102			70-130	Pass	
Cadmium (filtered)	%	100			70-130	Pass	
Chromium (filtered)	%	95			70-130	Pass	
Copper (filtered)	%	94			70-130	Pass	
Lead (filtered)	%	95			70-130	Pass	
Mercury (filtered)	%	105			70-130	Pass	
Nickel (filtered)	%	98			70-130	Pass	
Zinc (filtered)	%	97			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
BTEX				Result 1					
Benzene	S20-My14241	NCP	%	103			70-130	Pass	
Toluene	S20-My14241	NCP	%	99			70-130	Pass	
Ethylbenzene	S20-My14241	NCP	%	90			70-130	Pass	
m&p-Xylenes	S20-My14241	NCP	%	93			70-130	Pass	
o-Xylene	S20-My14241	NCP	%	94			70-130	Pass	
Xylenes - Total*	S20-My14241	NCP	%	93			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic (filtered)	S20-My08980	NCP	%	98			70-130	Pass	
Cadmium (filtered)	S20-My08980	NCP	%	97			70-130	Pass	
Chromium (filtered)	S20-My08980	NCP	%	87			70-130	Pass	
Copper (filtered)	S20-My08980	NCP	%	85			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Lead (filtered)	S20-My08980	NCP	%	90			70-130	Pass	
Mercury (filtered)	S20-My08980	NCP	%	103			70-130	Pass	
Nickel (filtered)	S20-My08980	NCP	%	88			70-130	Pass	
Zinc (filtered)	S20-My08980	NCP	%	88			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S20-My14240	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Toluene	S20-My14240	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Ethylbenzene	S20-My14240	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
m&p-Xylenes	S20-My14240	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
o-Xylene	S20-My14240	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Xylenes - Total*	S20-My14240	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic (filtered)	S20-My08981	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Cadmium (filtered)	S20-My08981	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Chromium (filtered)	S20-My08981	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Copper (filtered)	S20-My08981	NCP	mg/L	0.002	0.002	1.0	30%	Pass	
Lead (filtered)	S20-My08981	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Mercury (filtered)	S20-My08981	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Nickel (filtered)	S20-My08981	NCP	mg/L	0.002	0.002	13	30%	Pass	
Zinc (filtered)	S20-My08981	NCP	mg/L	0.028	0.020	33	30%	Fail	Q15

Comments

This report has been revised (V2) to report standard PAH LORs for samples S20-My08820 to S20-My08824.

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
Q15	The RPD reported passes Eurofins Environment Testing's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.
R20	This sample is a Trip Spike and therefore all results are reported as a percentage

Authorised By

Ursula Long	Analytical Services Manager
Gabriele Cordero	Senior Analyst-Metal (NSW)



Glenn Jackson
General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

Eurofins shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

CHAIN OF CUSTODY RECORD

☑ Sydney Laboratory ☐ Brisbane Laboratory ☐ Perth Laboratory ☐ Melbourne Laboratory

Company	Construction Sciences	Project №	50462000067
Address	31 Anvil Rd, Seven Hills.	Project Name	Luddenham Rd, Orchard Hills
Contact Name	Beau Dubois	Project Manager	Beau Dubois
Phone №	0435 860 610	EDD Format	Esdat
Special Directions		Sampler(s)	Nick Leong
Purchase Order		Handed over by	"
Quote ID №		Email for Invoice	Beau
		Email for Results	Beau.Dubois@ConstructionSciences.net.au

Analytes (Where metals are required, please specify Total or Filtered? NOTE: data must be used to assess ASC NEPM screening)

Containers (Change container type & size if necessary)

Required Turnaround Time (TAT) (Default will be 5 days if not ticked)

☐ 1 day* ☐ 2 day* ☐ 3 day* ☐ 4 day* ☑ 5 day ☐ Other* ☐ ONGA

№	Client Sample ID	Sampled Date/Time (dd/mm/yy hh:mm)	Matrix Solid (S) Water (W)	Asbestos (+/-)	BTEX / TRH	PAH	OCP	Metals (8)	OPP	500mL Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
21	TP08-0-0.2	6/5/20	Soil	X	X	X		X								/	/	
22	TP09-0-0.2																	
23	TP10-0-0.2																	
24	TP11-0-0.2				X		X		X									
25	TP12-0-0.2			X														
26	TP13-0-0.2	↓		X	X	X	X	X	X									
27																		
28																		
29																		
30																		
	Total Counts																	

Method of Shipment: ☐ Courier ☑ Hand Delivered ☐ Postal Name: Beau Dubois Signature: Date: 6/5/20 Time: 4:30pm

Laboratory Use Only						
Received By	KATH	SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature	Date 6/5/20	Time 4.45PM	Temperature 14:83
Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature	Date	Time	Report № 718206

Eurofins Environment Testing Australia Pty Ltd

Base copy of samples to the laboratory will be deemed as acceptance of Eurofins | Environment Testing Standard Terms and Conditions unless agreed otherwise. A copy is available on request

#AU04_Enviro_Sample_NSW

To: Beau Dubois
Subject: RE: Eurofins Sample Receipt Advice - Report 718206 : Site LUDDENHAM RD ORCHARD HILLS (5046200067)

From: Beau Dubois [mailto:beau.dubois@constructionsciences.net]
Sent: Friday, 8 May 2020 10:27 AM
To: #AU04_Enviro_Sample_NSW
Subject: RE: Eurofins Sample Receipt Advice - Report 718206 : Site LUDDENHAM RD ORCHARD HILLS (5046200067)

Please analyse TS/TB for BTEX/vTRH - STD TAT

Beau Dubois
SENIOR ENVIRONMENTAL SCIENTIST
CONSTRUCTION SCIENCES

Construction Sciences

Phone Direct
Address 31 Anvil Road, Seven Hills, New South Wales 2147 Australia

Email beau.dubois@www.constructionsciences.net Web www.constructionsciences.net

CONNECT WITH CONSTRUCTION SCIENCES

Construction Sciences management systems are certified to ISO9001 (quality) and ISO45001 (occupational health and safety)

This email and its attachments may contain confidential and/or privileged information for the sole use of the intended recipient(s). All electronically supplied data must be checked against an applicable hardcopy version which shall be the only document which Construction Sciences warrants accuracy. If you are not the intended recipient, any use, distribution or copying of the information contained in this email and its attachments is strictly prohibited. If you have received this email in error, please email the sender by replying to this message and immediately delete and destroy any copies of this email and any attachments. The views or opinions expressed are the author's own and may not reflect the views or opinions of Construction Sciences.

From: EnviroSampleNSW@eurofins.com <EnviroSampleNSW@eurofins.com>
Sent: Friday, 8 May 2020 10:15 AM
To: Beau Dubois <beau.dubois@constructionsciences.net>
Subject: Eurofins Sample Receipt Advice - Report 718206 : Site LUDDENHAM RD ORCHARD HILLS (5046200067)

Dear Valued Client,

Extra samples TS, TB on hold

Please find attached a Sample Receipt Advice (SRA), a Summary Sheet and a scanned copy of your Chain-of-Custody (COC). It is important that you check this documentation to ensure that the details are correct such as the Client Job Number, Turn Around Time, any comments in the Notes section and sample numbers as well as the requested analysis. If there are any irregularities then please contact your Eurofins | mgt Analytical Services Manager as soon as possible to make certain that they get changed.

Regards

Luca Dominici
Sample Receipt

Eurofins | Environmental Testing
Unit F3, Parkview Building
16 Mars Road
LANE COVE WEST NSW 2066
AUSTRALIA
Phone: +61 02 9900 8421
Email: EnviroSampleNSW@eurofins.com
Website:environment.eurofins.com.au

EnviroNote 1098 - Melbourne PFAS Accreditation
EnviroNote 1080 - Total Organofluorine Analysis & PFAS Investigations

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eurofins | Environment Testing

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Site # 1254 & 14271

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NATA # 1261 Site # 18217

Brisbane
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Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261 Site # 23736

ABN – 50 005 085 521 e.mail : EnviroSales@eurofins.com web : www.eurofins.com.au

Sample Receipt Advice

Company name:	**Construction Sciences Pty Ltd**
Contact name:	Beau Dubois
Project name:	LUDDENHAM RD ORCHARD HILLS
Project ID:	5046200067
COC number:	Not provided
Turn around time:	5 Day
Date/Time received:	May 6, 2020 4:45 PM
Eurofins reference:	**718206**

Sample information

☑ A detailed list of analytes logged into our LIMS, is included in the attached summary table.

☑ All samples have been received as described on the above COC.

☑ COC has been completed correctly.

☑ Attempt to chill was evident.

☑ Appropriately preserved sample containers have been used.

☑ All samples were received in good condition.

☑ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.

☑ Appropriate sample containers have been used.

☑ Sample containers for volatile analysis received with zero headspace.

☒ Split sample sent to requested external lab.

☒ Some samples have been subcontracted.

N/A Custody Seals intact (if used).

Contact notes

If you have any questions with respect to these samples please contact:

Ursula Long on Phone : or by e.mail: UrsulaLong@eurofins.com

Results will be delivered electronically via e.mail to Beau Dubois - Beau.Dubois@constructionsciences.net.

eurofins | Environment Testing

ABN – 50 005 085 521 web : www.eurofins.com.au e.mail : EnviroSales@eurofins.com

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Site # 1254 & 14271

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NATA # 1261 Site # 18217

Brisbane
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Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

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NATA # 1261
Site # 23736

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Phone : +64 9 526 45 51
IANZ # 1327

Christchurch
43 Detroit Drive
Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

Company Name: Construction Sciences Pty Ltd
Address: 2/4 Kellogg Rd
Glendenning
NSW 2761

Project Name: LUDDENHAM RD ORCHARD HILLS
Project ID: 5046200067

Order No.:
Report #: 718206
Phone: 02 9854 1700
Fax:

Received: May 6, 2020 4:45 PM
Due: May 13, 2020
Priority: 5 Day
Contact Name: Beau Dubois

Eurofins Analytical Services Manager : Ursula Long

Sample Detail						Asbestos - AS4964	Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	Organophosphorus Pesticides	Metals M8	Moisture Set	Eurofins | mgt Suite B1	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271													
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794													
Perth Laboratory - NATA Site # 23736													
External Laboratory													
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**								
1	TP08-0-0.2	May 06, 2020		Soil	S20-My10816	X	X			X	X	X	
2	TP09-0-0.2	May 06, 2020		Soil	S20-My10817	X	X			X	X		
3	TP10-0-0.2	May 06, 2020		Soil	S20-My10818	X	X			X	X		
4	TP11-0-0.2	May 06, 2020		Soil	S20-My10819	X	X	X	X	X	X	X	
5	TP012-0-0.2	May 06, 2020		Soil	S20-My10820	X	X			X	X		
6	TP13-0-0.2	May 06, 2020		Soil	S20-My10821	X	X	X	X	X	X	X	
7	TS	May 06, 2020		Water	S20-My10825								X
8	TB	May 06, 2020		Water	S20-My10826								X
Test Counts						6	6	2	2	6	6	3	2

Certificate of Analysis

eurofins | Environment Testing

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025–Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Construction Sciences Pty Ltd
2/4 Kellogg Rd
Glendenning
NSW 2761

Attention:	Beau Dubois
Report	718206-AID
Project Name	LUDDENHAM RD ORCHARD HILLS
Project ID	5046200067
Received Date	May 06, 2020
Date Reported	May 13, 2020

Methodology:

Asbestos Fibre Identification	Conducted in accordance with the Australian Standard AS 4964 – 2004: Method for the Qualitative Identification of Asbestos in Bulk Samples and in-house Method LTM-ASB-8020 by polarised light microscopy (PLM) and dispersion staining (DS) techniques. *NOTE: Positive Trace Analysis results indicate the sample contains detectable respirable fibres.*
Unknown Mineral Fibres	Mineral fibres of unknown type, as determined by PLM with DS, may require another analytical technique, such as Electron Microscopy, to confirm unequivocal identity. *NOTE: While Actinolite, Anthophyllite and Tremolite asbestos may be detected by PLM with DS, due to variability in the optical properties of these materials, AS4964 requires that these are reported as UMF unless confirmed by an independent technique.*
Subsampling Soil Samples	The whole sample submitted is first dried and then passed through a 10mm sieve followed by a 2mm sieve. All fibrous matter greater than 10mm, greater than 2mm as well as the material passing through the 2mm sieve are retained and analysed for the presence of asbestos. If the sub 2mm fraction is greater than approximately 30 to 60g then a sub-sampling routine based on ISO 3082:2009(E) is employed. *NOTE: Depending on the nature and size of the soil sample, the sub-2 mm residue material may need to be sub-sampled for trace analysis, in accordance with AS 4964-2004.*
Bonded asbestos-containing material (ACM)	The material is first examined and any fibres isolated for identification by PLM and DS. Where required, interfering matrices may be removed by disintegration using a range of heat, chemical or physical treatments, possibly in combination.The resultant material is then further examined in accordance with AS 4964 - 2004. *NOTE: Even after disintegration it may be difficult to detect the presence of asbestos in some asbestos-containing bulk materials using PLM and DS. This is due to the low grade or small length or diameter of the asbestos fibres present in the material, or to the fact that very fine fibres have been distributed intimately throughout the materials. Vinyl/asbestos floor tiles, some asbestos-containing sealants and mastics, asbestos-containing epoxy resins and some ore samples are examples of these types of material, which are difficult to analyse.*
Limit of Reporting	The performance limitation of the AS 4964 (2004) method for non-homogeneous samples is around 0.1 g/kg (equivalent to 0.01% (w/w)). Where no asbestos is found by PLM and DS, including Trace Analysis, this is considered to be at the nominal reporting limit of 0.01% (w/w). The NEPM screening level of 0.001% (w/w) is intended as an on-site determination, not a laboratory Limit of Reporting (LOR), per se. Examination of a large sample size (e.g. 500 mL) may improve the likelihood of detecting asbestos, particularly AF, to aid assessment against the NEPM criteria. Gravimetric determinations to this level of accuracy are outside of AS 4964 and hence NATA Accreditation does not cover the performance of this service (non-NATA results shown with an asterisk). *NOTE: NATA News March 2014, p.7, states in relation to AS 4964: "This is a qualitative method with a nominal reporting limit of 0.01 % " and that currently in Australia "there is no validated method available for the quantification of asbestos".This report is consistent with the analytical procedures and reporting recommendations in the NEPM and the WA DoH.*

Accredited for compliance with ISO/IEC 17025–Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Project Name LUDDENHAM RD ORCHARD HILLS
Project ID 5046200067
Date Sampled May 06, 2020
Report 718206-AID

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
TP08-0-0.2	20-My10816	May 06, 2020	Approximate Sample 529g Sample consisted of: Brown coarse-grained sandy soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
TP09-0-0.2	20-My10817	May 06, 2020	Approximate Sample 573g Sample consisted of: Brown coarse-grained sandy soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
TP10-0-0.2	20-My10818	May 06, 2020	Approximate Sample 630g Sample consisted of: Brown coarse-grained sandy soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
TP11-0-0.2	20-My10819	May 06, 2020	Approximate Sample 577g Sample consisted of: Brown coarse-grained sandy soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
TP012-0-0.2	20-My10820	May 06, 2020	Approximate Sample 350g Sample consisted of: Brown coarse-grained sandy soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
TP13-0-0.2	20-My10821	May 06, 2020	Approximate Sample 486g Sample consisted of: Brown coarse-grained sandy soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Asbestos - LTM-ASB-8020	Sydney	May 08, 2020	Indefinite

eurofins | Environment Testing

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NATA # 1261 Site # 18217

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NATA # 1261 Site # 20794

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Site # 23736

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Phone : +64 9 526 45 51
IANZ # 1327

Christchurch
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Phone : 0800 856 450
IANZ # 1290

Company Name: Construction Sciences Pty Ltd
Address: 2/4 Kellogg Rd
Glendenning
NSW 2761

Project Name: LUDDENHAM RD ORCHARD HILLS
Project ID: 5046200067

Order No.:
Report #: 718206
Phone: 02 9854 1700
Fax:

Received: May 6, 2020 4:45 PM
Due: May 13, 2020
Priority: 5 Day
Contact Name: Beau Dubois

Eurofins Analytical Services Manager : Ursula Long

Sample Detail						Asbestos - AS4964	Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	Organophosphorus Pesticides	Metals M8	Moisture Set	Eurofins | mgt Suite B1	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271													
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794													
Perth Laboratory - NATA Site # 23736													
External Laboratory													
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**								
1	TP08-0-0.2	May 06, 2020		Soil	S20-My10816	X	X			X	X	X	
2	TP09-0-0.2	May 06, 2020		Soil	S20-My10817	X	X			X	X		
3	TP10-0-0.2	May 06, 2020		Soil	S20-My10818	X	X			X	X		
4	TP11-0-0.2	May 06, 2020		Soil	S20-My10819	X	X	X	X	X	X	X	
5	TP012-0-0.2	May 06, 2020		Soil	S20-My10820	X	X			X	X		
6	TP13-0-0.2	May 06, 2020		Soil	S20-My10821	X	X	X	X	X	X	X	
7	TB (A)	May 06, 2020		Water	S20-My10825								X
8	TB (B)	May 06, 2020		Water	S20-My10826								X
Test Counts						6	6	2	2	6	6	3	2

Internal Quality Control Review and Glossary

General

1. QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Samples were analysed on an 'as received' basis.
4. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
5. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Advice.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

Units

% w/w: weight for weight basis	grams per kilogram
Filter loading:	fibres/100 graticule areas
Reported Concentration:	fibres/mL
Flowrate:	L/min

Terms

Dry	Sample is dried by heating prior to analysis
LOR	Limit of Reporting
COC	Chain of Custody
SRA	Sample Receipt Advice
ISO	International Standards Organisation
AS	Australian Standards
WA DOH	Reference document for the NEPM. Government of Western Australia, Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia (2009), including supporting document Recommended Procedures for Laboratory Analysis of Asbestos in Soil (2011)
NEPM	National Environment Protection (Assessment of Site Contamination) Measure, 2013 (as amended)
ACM	Asbestos Containing Materials. Asbestos contained within a non-asbestos matrix, typically presented in bonded and/or sound condition. For the purposes of the NEPM, ACM is generally restricted to those materials that do not pass a 7mm x 7mm sieve.
AF	Asbestos Fines. Asbestos containing materials, including friable, weathered and bonded materials, able to pass a 7mm x 7mm sieve. Considered under the NEPM as equivalent to “non-bonded / friable”.
FA	Fibrous Asbestos. Asbestos containing materials in a friable and/or severely weathered condition. For the purposes of the NEPM, FA is generally restricted to those materials that do not pass a 7mm x 7mm sieve.
Friable	Asbestos-containing materials of any size that may be broken or crumbled by hand pressure. For the purposes of the NEPM, this includes both AF and FA. It is outside of the laboratory’s remit to assess degree of friability.
Trace Analysis	Analytical procedure used to detect the presence of respirable fibres in the matrix.

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N/A	Not applicable

Asbestos Counter/Identifier:

Chamath JHM Annakkage	Senior Analyst-Asbestos (NSW)

Authorised by:

Laxman Dias	Senior Analyst-Asbestos (NSW)



Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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Construction Sciences Pty Ltd
2/4 Kellogg Rd
Glendenning
NSW 2761

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Attention: **Beau Dubois**

Report **718206-S**
Project name LUDDENHAM RD ORCHARD HILLS
Project ID 5046200067
Received Date May 06, 2020

Client Sample ID			**TP08-0-0.2**	**TP09-0-0.2**	**TP10-0-0.2**	**TP11-0-0.2**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**S20-My10816**	**S20-My10817**	**S20-My10818**	**S20-My10819**
Date Sampled			**May 06, 2020**	**May 06, 2020**	**May 06, 2020**	**May 06, 2020**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	-	-	< 20
TRH C10-C14	20	mg/kg	< 20	-	-	< 20
TRH C15-C28	50	mg/kg	< 50	-	-	< 50
TRH C29-C36	50	mg/kg	< 50	-	-	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50	-	-	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	-	-	< 0.1
Toluene	0.1	mg/kg	< 0.1	-	-	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	-	-	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	-	-	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	-	-	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3	-	-	< 0.3
4-Bromofluorobenzene (surr.)	1	%	78	-	-	84
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	-	-	< 0.5
TRH C6-C10	20	mg/kg	< 20	-	-	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	-	-	< 20
TRH >C10-C16	50	mg/kg	< 50	-	-	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	-	-	< 50
TRH >C16-C34	100	mg/kg	< 100	-	-	< 100
TRH >C34-C40	100	mg/kg	< 100	-	-	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	-	-	< 100
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			TP08-0-0.2	TP09-0-0.2	TP10-0-0.2	TP11-0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-My10816	S20-My10817	S20-My10818	S20-My10819
Date Sampled			May 06, 2020	May 06, 2020	May 06, 2020	May 06, 2020
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	93	94	91	89
p-Terphenyl-d14 (surr.)	1	%	119	110	100	100
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	-	-	< 0.1
4.4'-DDD	0.05	mg/kg	-	-	-	< 0.05
4.4'-DDE	0.05	mg/kg	-	-	-	< 0.05
4.4'-DDT	0.05	mg/kg	-	-	-	< 0.05
a-BHC	0.05	mg/kg	-	-	-	< 0.05
Aldrin	0.05	mg/kg	-	-	-	< 0.05
b-BHC	0.05	mg/kg	-	-	-	< 0.05
d-BHC	0.05	mg/kg	-	-	-	< 0.05
Dieldrin	0.05	mg/kg	-	-	-	< 0.05
Endosulfan I	0.05	mg/kg	-	-	-	< 0.05
Endosulfan II	0.05	mg/kg	-	-	-	< 0.05
Endosulfan sulphate	0.05	mg/kg	-	-	-	< 0.05
Endrin	0.05	mg/kg	-	-	-	< 0.05
Endrin aldehyde	0.05	mg/kg	-	-	-	< 0.05
Endrin ketone	0.05	mg/kg	-	-	-	< 0.05
g-BHC (Lindane)	0.05	mg/kg	-	-	-	< 0.05
Heptachlor	0.05	mg/kg	-	-	-	< 0.05
Heptachlor epoxide	0.05	mg/kg	-	-	-	< 0.05
Hexachlorobenzene	0.05	mg/kg	-	-	-	< 0.05
Methoxychlor	0.2	mg/kg	-	-	-	< 0.2
Toxaphene	1	mg/kg	-	-	-	< 1
Aldrin and Dieldrin (Total)*	0.05	mg/kg	-	-	-	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	-	-	-	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	-	-	-	< 0.2
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	-	-	-	< 0.2
Dibutylchlorendate (surr.)	1	%	-	-	-	113
Tetrachloro-m-xylene (surr.)	1	%	-	-	-	106
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	-	-	-	< 0.2
Bolstar	0.2	mg/kg	-	-	-	< 0.2
Chlorfenvinphos	0.2	mg/kg	-	-	-	< 0.2
Chlorpyrifos	0.2	mg/kg	-	-	-	< 0.2
Chlorpyrifos-methyl	0.2	mg/kg	-	-	-	< 0.2
Coumaphos	2	mg/kg	-	-	-	< 2
Demeton-S	0.2	mg/kg	-	-	-	< 0.2
Demeton-O	0.2	mg/kg	-	-	-	< 0.2
Diazinon	0.2	mg/kg	-	-	-	< 0.2
Dichlorvos	0.2	mg/kg	-	-	-	< 0.2

Client Sample ID			TP08-0-0.2	TP09-0-0.2	TP10-0-0.2	TP11-0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-My10816	S20-My10817	S20-My10818	S20-My10819
Date Sampled			May 06, 2020	May 06, 2020	May 06, 2020	May 06, 2020
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
Dimethoate	0.2	mg/kg	-	-	-	< 0.2
Disulfoton	0.2	mg/kg	-	-	-	< 0.2
EPN	0.2	mg/kg	-	-	-	< 0.2
Ethion	0.2	mg/kg	-	-	-	< 0.2
Ethoprop	0.2	mg/kg	-	-	-	< 0.2
Ethyl parathion	0.2	mg/kg	-	-	-	< 0.2
Fenitrothion	0.2	mg/kg	-	-	-	< 0.2
Fensulfothion	0.2	mg/kg	-	-	-	< 0.2
Fenthion	0.2	mg/kg	-	-	-	< 0.2
Malathion	0.2	mg/kg	-	-	-	< 0.2
Merphos	0.2	mg/kg	-	-	-	< 0.2
Methyl parathion	0.2	mg/kg	-	-	-	< 0.2
Mevinphos	0.2	mg/kg	-	-	-	< 0.2
Monocrotophos	2	mg/kg	-	-	-	< 2
Naled	0.2	mg/kg	-	-	-	< 0.2
Omethoate	2	mg/kg	-	-	-	< 2
Phorate	0.2	mg/kg	-	-	-	< 0.2
Pirimiphos-methyl	0.2	mg/kg	-	-	-	< 0.2
Pyrazophos	0.2	mg/kg	-	-	-	< 0.2
Ronnel	0.2	mg/kg	-	-	-	< 0.2
Terbufos	0.2	mg/kg	-	-	-	< 0.2
Tetrachlorvinphos	0.2	mg/kg	-	-	-	< 0.2
Tokuthion	0.2	mg/kg	-	-	-	< 0.2
Trichloronate	0.2	mg/kg	-	-	-	< 0.2
Triphenylphosphate (surr.)	1	%	-	-	-	104
Heavy Metals						
Arsenic	2	mg/kg	19	37	4.7	7.5
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	76	200	14	37
Copper	5	mg/kg	6.3	< 5	6.4	< 5
Lead	5	mg/kg	32	41	13	15
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	0.3
Nickel	5	mg/kg	8.8	7.6	< 5	< 5
Zinc	5	mg/kg	30	9.0	17	9.7
% Moisture	1	%	20	7.6	8.4	16

Client Sample ID			TP012-0-0.2	TP13-0-0.2
Sample Matrix			Soil	Soil
Eurofins Sample No.			S20-My10820	S20-My10821
Date Sampled			May 06, 2020	May 06, 2020
Test/Reference	LOR	Unit		
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				
TRH C6-C9	20	mg/kg	-	< 20
TRH C10-C14	20	mg/kg	-	< 20
TRH C15-C28	50	mg/kg	-	63
TRH C29-C36	50	mg/kg	-	< 50
TRH C10-C36 (Total)	50	mg/kg	-	63

Client Sample ID			TP012-0-0.2	TP13-0-0.2
Sample Matrix			Soil	Soil
Eurofins Sample No.			S20-My10820	S20-My10821
Date Sampled			May 06, 2020	May 06, 2020
Test/Reference	LOR	Unit		
BTEX				
Benzene	0.1	mg/kg	-	< 0.1
Toluene	0.1	mg/kg	-	< 0.1
Ethylbenzene	0.1	mg/kg	-	< 0.1
m&p-Xylenes	0.2	mg/kg	-	< 0.2
o-Xylene	0.1	mg/kg	-	< 0.1
Xylenes - Total*	0.3	mg/kg	-	< 0.3
4-Bromofluorobenzene (surr.)	1	%	-	72
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				
Naphthalene[N02]	0.5	mg/kg	-	< 0.5
TRH C6-C10	20	mg/kg	-	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	-	< 20
TRH >C10-C16	50	mg/kg	-	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	-	< 50
TRH >C16-C34	100	mg/kg	-	< 100
TRH >C34-C40	100	mg/kg	-	< 100
TRH >C10-C40 (total)*	100	mg/kg	-	< 100
Polycyclic Aromatic Hydrocarbons				
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	97	97
p-Terphenyl-d14 (surr.)	1	%	106	106
Organochlorine Pesticides				
Chlordanes - Total	0.1	mg/kg	-	< 0.1
4.4'-DDD	0.05	mg/kg	-	< 0.05
4.4'-DDE	0.05	mg/kg	-	< 0.05
4.4'-DDT	0.05	mg/kg	-	< 0.05
a-BHC	0.05	mg/kg	-	< 0.05
Aldrin	0.05	mg/kg	-	< 0.05
b-BHC	0.05	mg/kg	-	< 0.05
d-BHC	0.05	mg/kg	-	< 0.05
Dieldrin	0.05	mg/kg	-	< 0.05

Client Sample ID			TP012-0-0.2	TP13-0-0.2
Sample Matrix			Soil	Soil
Eurofins Sample No.			S20-My10820	S20-My10821
Date Sampled			May 06, 2020	May 06, 2020
Test/Reference	LOR	Unit		
Organochlorine Pesticides				
Endosulfan I	0.05	mg/kg	-	< 0.05
Endosulfan II	0.05	mg/kg	-	< 0.05
Endosulfan sulphate	0.05	mg/kg	-	< 0.05
Endrin	0.05	mg/kg	-	< 0.05
Endrin aldehyde	0.05	mg/kg	-	< 0.05
Endrin ketone	0.05	mg/kg	-	< 0.05
g-BHC (Lindane)	0.05	mg/kg	-	< 0.05
Heptachlor	0.05	mg/kg	-	< 0.05
Heptachlor epoxide	0.05	mg/kg	-	< 0.05
Hexachlorobenzene	0.05	mg/kg	-	< 0.05
Methoxychlor	0.2	mg/kg	-	< 0.2
Toxaphene	1	mg/kg	-	< 1
Aldrin and Dieldrin (Total)*	0.05	mg/kg	-	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	-	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	-	< 0.2
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	-	< 0.2
Dibutylchlorendate (surr.)	1	%	-	114
Tetrachloro-m-xylene (surr.)	1	%	-	90
Organophosphorus Pesticides				
Azinphos-methyl	0.2	mg/kg	-	< 0.2
Bolstar	0.2	mg/kg	-	< 0.2
Chlorfenvinphos	0.2	mg/kg	-	< 0.2
Chlorpyrifos	0.2	mg/kg	-	< 0.2
Chlorpyrifos-methyl	0.2	mg/kg	-	< 0.2
Coumaphos	2	mg/kg	-	< 2
Demeton-S	0.2	mg/kg	-	< 0.2
Demeton-O	0.2	mg/kg	-	< 0.2
Diazinon	0.2	mg/kg	-	< 0.2
Dichlorvos	0.2	mg/kg	-	< 0.2
Dimethoate	0.2	mg/kg	-	< 0.2
Disulfoton	0.2	mg/kg	-	< 0.2
EPN	0.2	mg/kg	-	< 0.2
Ethion	0.2	mg/kg	-	< 0.2
Ethoprop	0.2	mg/kg	-	< 0.2
Ethyl parathion	0.2	mg/kg	-	< 0.2
Fenitrothion	0.2	mg/kg	-	< 0.2
Fensulfothion	0.2	mg/kg	-	< 0.2
Fenthion	0.2	mg/kg	-	< 0.2
Malathion	0.2	mg/kg	-	< 0.2
Merphos	0.2	mg/kg	-	< 0.2
Methyl parathion	0.2	mg/kg	-	< 0.2
Mevinphos	0.2	mg/kg	-	< 0.2
Monocrotophos	2	mg/kg	-	< 2
Naled	0.2	mg/kg	-	< 0.2
Omethoate	2	mg/kg	-	< 2
Phorate	0.2	mg/kg	-	< 0.2
Pirimiphos-methyl	0.2	mg/kg	-	< 0.2
Pyrazophos	0.2	mg/kg	-	< 0.2
Ronnel	0.2	mg/kg	-	< 0.2

Client Sample ID			TP012-0-0.2	TP13-0-0.2
Sample Matrix			Soil	Soil
Eurofins Sample No.			S20-My10820	S20-My10821
Date Sampled			May 06, 2020	May 06, 2020
Test/Reference	LOR	Unit		
Organophosphorus Pesticides				
Terbufos	0.2	mg/kg	-	< 0.2
Tetrachlorvinphos	0.2	mg/kg	-	< 0.2
Tokuthion	0.2	mg/kg	-	< 0.2
Trichloronate	0.2	mg/kg	-	< 0.2
Triphenylphosphate (surr.)	1	%	-	104
Heavy Metals				
Arsenic	2	mg/kg	7.4	9.4
Cadmium	0.4	mg/kg	< 0.4	< 0.4
Chromium	5	mg/kg	43	21
Copper	5	mg/kg	6.4	12
Lead	5	mg/kg	15	17
Mercury	0.1	mg/kg	< 0.1	< 0.1
Nickel	5	mg/kg	< 5	< 5
Zinc	5	mg/kg	20	16
% Moisture	1	%	13	14

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Sydney	May 12, 2020	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
BTEX	Sydney	May 12, 2020	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	May 12, 2020	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Eurofins | mgt Suite B1			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	May 12, 2020	
- Method: LTM-ORG-2010 TRH C6-C40			
Polycyclic Aromatic Hydrocarbons	Sydney	May 12, 2020	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Organochlorine Pesticides	Sydney	May 12, 2020	14 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Organophosphorus Pesticides	Sydney	May 12, 2020	14 Days
- Method: LTM-ORG-2200 Organophosphorus Pesticides by GC-MS			
Metals M8	Sydney	May 12, 2020	180 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
% Moisture	Sydney	May 08, 2020	14 Days
- Method: LTM-GEN-7080 Moisture			

eurofins | Environment Testing

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NSW 2761

Project Name: LUDDENHAM RD ORCHARD HILLS
Project ID: 5046200067

Order No.:
Report #: 718206
Phone: 02 9854 1700
Fax:

Received: May 6, 2020 4:45 PM
Due: May 13, 2020
Priority: 5 Day
Contact Name: Beau Dubois

Eurofins Analytical Services Manager : Ursula Long

Sample Detail						Asbestos - AS4964	Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	Organophosphorus Pesticides	Metals M8	Moisture Set	Eurofins | mgt Suite B1	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271													
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794													
Perth Laboratory - NATA Site # 23736													
External Laboratory													
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**								
1	TP08-0-0.2	May 06, 2020		Soil	S20-My10816	X	X			X	X	X	
2	TP09-0-0.2	May 06, 2020		Soil	S20-My10817	X	X			X	X		
3	TP10-0-0.2	May 06, 2020		Soil	S20-My10818	X	X			X	X		
4	TP11-0-0.2	May 06, 2020		Soil	S20-My10819	X	X	X	X	X	X	X	
5	TP012-0-0.2	May 06, 2020		Soil	S20-My10820	X	X			X	X		
6	TP13-0-0.2	May 06, 2020		Soil	S20-My10821	X	X	X	X	X	X	X	
7	TB (A)	May 06, 2020		Water	S20-My10825								X
8	TB (B)	May 06, 2020		Water	S20-My10826								X
Test Counts						6	6	2	2	6	6	3	2

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.3
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 20-130% Phenols & 50-150% PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.3 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/kg	< 20			20	Pass	
TRH C10-C14	mg/kg	< 20			20	Pass	
TRH C15-C28	mg/kg	< 50			50	Pass	
TRH C29-C36	mg/kg	< 50			50	Pass	
Method Blank							
BTEX							
Benzene	mg/kg	< 0.1			0.1	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Xylenes - Total*	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g.h.i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a.h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/kg	< 0.1			0.1	Pass	
4.4'-DDD	mg/kg	< 0.05			0.05	Pass	
4.4'-DDE	mg/kg	< 0.05			0.05	Pass	
4.4'-DDT	mg/kg	< 0.05			0.05	Pass	
a-BHC	mg/kg	< 0.05			0.05	Pass	
Aldrin	mg/kg	< 0.05			0.05	Pass	
b-BHC	mg/kg	< 0.05			0.05	Pass	
d-BHC	mg/kg	< 0.05			0.05	Pass	
Dieldrin	mg/kg	< 0.05			0.05	Pass	
Endosulfan I	mg/kg	< 0.05			0.05	Pass	
Endosulfan II	mg/kg	< 0.05			0.05	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endosulfan sulphate	mg/kg	< 0.05			0.05	Pass	
Endrin	mg/kg	< 0.05			0.05	Pass	
Endrin aldehyde	mg/kg	< 0.05			0.05	Pass	
Endrin ketone	mg/kg	< 0.05			0.05	Pass	
g-BHC (Lindane)	mg/kg	< 0.05			0.05	Pass	
Heptachlor	mg/kg	< 0.05			0.05	Pass	
Heptachlor epoxide	mg/kg	< 0.05			0.05	Pass	
Hexachlorobenzene	mg/kg	< 0.05			0.05	Pass	
Methoxychlor	mg/kg	< 0.2			0.2	Pass	
Toxaphene	mg/kg	< 1			1	Pass	
Method Blank							
Organophosphorus Pesticides							
Azinphos-methyl	mg/kg	< 0.2			0.2	Pass	
Bolstar	mg/kg	< 0.2			0.2	Pass	
Chlorfenvinphos	mg/kg	< 0.2			0.2	Pass	
Chlorpyrifos	mg/kg	< 0.2			0.2	Pass	
Chlorpyrifos-methyl	mg/kg	< 0.2			0.2	Pass	
Coumaphos	mg/kg	< 2			2	Pass	
Demeton-S	mg/kg	< 0.2			0.2	Pass	
Demeton-O	mg/kg	< 0.2			0.2	Pass	
Diazinon	mg/kg	< 0.2			0.2	Pass	
Dichlorvos	mg/kg	< 0.2			0.2	Pass	
Dimethoate	mg/kg	< 0.2			0.2	Pass	
Disulfoton	mg/kg	< 0.2			0.2	Pass	
EPN	mg/kg	< 0.2			0.2	Pass	
Ethion	mg/kg	< 0.2			0.2	Pass	
Ethoprop	mg/kg	< 0.2			0.2	Pass	
Ethyl parathion	mg/kg	< 0.2			0.2	Pass	
Fenitrothion	mg/kg	< 0.2			0.2	Pass	
Fensulfothion	mg/kg	< 0.2			0.2	Pass	
Fenthion	mg/kg	< 0.2			0.2	Pass	
Malathion	mg/kg	< 0.2			0.2	Pass	
Merphos	mg/kg	< 0.2			0.2	Pass	
Methyl parathion	mg/kg	< 0.2			0.2	Pass	
Mevinphos	mg/kg	< 0.2			0.2	Pass	
Monocrotophos	mg/kg	< 2			2	Pass	
Naled	mg/kg	< 0.2			0.2	Pass	
Omethoate	mg/kg	< 2			2	Pass	
Phorate	mg/kg	< 0.2			0.2	Pass	
Pirimiphos-methyl	mg/kg	< 0.2			0.2	Pass	
Pyrazophos	mg/kg	< 0.2			0.2	Pass	
Ronnel	mg/kg	< 0.2			0.2	Pass	
Terbufos	mg/kg	< 0.2			0.2	Pass	
Tetrachlorvinphos	mg/kg	< 0.2			0.2	Pass	
Tokuthion	mg/kg	< 0.2			0.2	Pass	
Trichloronate	mg/kg	< 0.2			0.2	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	77			70-130	Pass	
TRH C10-C14	%	77			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	91			70-130	Pass	
Toluene	%	82			70-130	Pass	
Ethylbenzene	%	81			70-130	Pass	
m&p-Xylenes	%	77			70-130	Pass	
o-Xylene	%	77			70-130	Pass	
Xylenes - Total*	%	77			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	89			70-130	Pass	
TRH C6-C10	%	80			70-130	Pass	
TRH >C10-C16	%	80			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	105			70-130	Pass	
Acenaphthylene	%	112			70-130	Pass	
Anthracene	%	116			70-130	Pass	
Benz(a)anthracene	%	110			70-130	Pass	
Benzo(a)pyrene	%	121			70-130	Pass	
Benzo(b&j)fluoranthene	%	119			70-130	Pass	
Benzo(g.h.i)perylene	%	101			70-130	Pass	
Benzo(k)fluoranthene	%	108			70-130	Pass	
Chrysene	%	122			70-130	Pass	
Dibenz(a.h)anthracene	%	118			70-130	Pass	
Fluoranthene	%	115			70-130	Pass	
Fluorene	%	121			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	101			70-130	Pass	
Naphthalene	%	109			70-130	Pass	
Phenanthrene	%	116			70-130	Pass	
Pyrene	%	122			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
Chlordanes - Total	%	85			70-130	Pass	
4.4'-DDD	%	86			70-130	Pass	
4.4'-DDE	%	84			70-130	Pass	
4.4'-DDT	%	81			70-130	Pass	
a-BHC	%	88			70-130	Pass	
Aldrin	%	86			70-130	Pass	
b-BHC	%	87			70-130	Pass	
d-BHC	%	107			70-130	Pass	
Dieldrin	%	86			70-130	Pass	
Endosulfan I	%	84			70-130	Pass	
Endosulfan II	%	86			70-130	Pass	
Endosulfan sulphate	%	92			70-130	Pass	
Endrin	%	85			70-130	Pass	
Endrin aldehyde	%	83			70-130	Pass	
Endrin ketone	%	89			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
g-BHC (Lindane)	%	88			70-130	Pass	
Heptachlor	%	86			70-130	Pass	
Heptachlor epoxide	%	87			70-130	Pass	
Hexachlorobenzene	%	87			70-130	Pass	
Methoxychlor	%	88			70-130	Pass	
Toxaphene	%	89			70-130	Pass	
LCS - % Recovery							
Organophosphorus Pesticides							
Diazinon	%	123			70-130	Pass	
Dimethoate	%	82			70-130	Pass	
Ethion	%	87			70-130	Pass	
Fenitrothion	%	85			70-130	Pass	
Methyl parathion	%	95			70-130	Pass	
Mevinphos	%	90			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	93			70-130	Pass	
Cadmium	%	96			70-130	Pass	
Chromium	%	94			70-130	Pass	
Copper	%	97			70-130	Pass	
Lead	%	96			70-130	Pass	
Mercury	%	95			70-130	Pass	
Nickel	%	99			70-130	Pass	
Zinc	%	96			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C10-C14	S20-My08753	NCP	%	82			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	S20-My08646	NCP	%	96			70-130	Pass	
Toluene	S20-My08646	NCP	%	73			70-130	Pass	
Ethylbenzene	S20-My08646	NCP	%	76			70-130	Pass	
m&p-Xylenes	S20-My08646	NCP	%	77			70-130	Pass	
o-Xylene	S20-My08646	NCP	%	76			70-130	Pass	
Xylenes - Total*	S20-My08646	NCP	%	77			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	S20-My08646	NCP	%	93			70-130	Pass	
TRH C6-C10	S20-My06372	NCP	%	77			70-130	Pass	
TRH >C10-C16	S20-My08753	NCP	%	84			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
Chlordanes - Total	S20-My10402	NCP	%	92			70-130	Pass	
4.4'-DDD	S20-My10402	NCP	%	126			70-130	Pass	
4.4'-DDE	S20-My10402	NCP	%	97			70-130	Pass	
a-BHC	S20-My10402	NCP	%	101			70-130	Pass	
Aldrin	S20-My10402	NCP	%	99			70-130	Pass	
b-BHC	S20-My10402	NCP	%	82			70-130	Pass	
d-BHC	S20-My10402	NCP	%	113			70-130	Pass	
Dieldrin	S20-My10402	NCP	%	97			70-130	Pass	
Endosulfan I	S20-My10402	NCP	%	95			70-130	Pass	
Endosulfan II	S20-My10402	NCP	%	89			70-130	Pass	
Endosulfan sulphate	S20-My10402	NCP	%	98			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endrin	S20-My10402	NCP	%	80			70-130	Pass	
Endrin aldehyde	S20-My10402	NCP	%	84			70-130	Pass	
Endrin ketone	S20-My06205	NCP	%	85			70-130	Pass	
g-BHC (Lindane)	S20-My10402	NCP	%	82			70-130	Pass	
Heptachlor	S20-My06205	NCP	%	80			70-130	Pass	
Heptachlor epoxide	S20-My10402	NCP	%	96			70-130	Pass	
Hexachlorobenzene	S20-My10402	NCP	%	101			70-130	Pass	
Methoxychlor	S20-My06205	NCP	%	82			70-130	Pass	
Spike - % Recovery									
Organophosphorus Pesticides				Result 1					
Diazinon	S20-My06219	NCP	%	102			70-130	Pass	
Mevinphos	S20-My06219	NCP	%	109			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	S20-My10821	CP	%	96			70-130	Pass	
Acenaphthylene	S20-My10821	CP	%	98			70-130	Pass	
Anthracene	S20-My10821	CP	%	98			70-130	Pass	
Benz(a)anthracene	S20-My10821	CP	%	123			70-130	Pass	
Benzo(a)pyrene	S20-My10821	CP	%	117			70-130	Pass	
Benzo(b&j)fluoranthene	S20-My10821	CP	%	129			70-130	Pass	
Benzo(g.h.i)perylene	S20-My10821	CP	%	111			70-130	Pass	
Benzo(k)fluoranthene	S20-My10821	CP	%	109			70-130	Pass	
Chrysene	S20-My10821	CP	%	111			70-130	Pass	
Dibenz(a.h)anthracene	S20-My10821	CP	%	110			70-130	Pass	
Fluoranthene	S20-My10821	CP	%	108			70-130	Pass	
Fluorene	S20-My10821	CP	%	97			70-130	Pass	
Indeno(1.2.3-cd)pyrene	S20-My10821	CP	%	111			70-130	Pass	
Naphthalene	S20-My10821	CP	%	97			70-130	Pass	
Phenanthrene	S20-My10821	CP	%	101			70-130	Pass	
Pyrene	S20-My10821	CP	%	105			70-130	Pass	
Spike - % Recovery									
Organophosphorus Pesticides				Result 1					
Dimethoate	S20-My10821	CP	%	122			70-130	Pass	
Ethion	S20-My10821	CP	%	118			70-130	Pass	
Fenitrothion	S20-My10821	CP	%	115			70-130	Pass	
Methyl parathion	S20-My10821	CP	%	125			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S20-My10821	CP	%	97			70-130	Pass	
Cadmium	S20-My10821	CP	%	95			70-130	Pass	
Chromium	S20-My10821	CP	%	105			70-130	Pass	
Copper	S20-My10821	CP	%	90			70-130	Pass	
Lead	S20-My10821	CP	%	98			70-130	Pass	
Mercury	S20-My10821	CP	%	98			70-130	Pass	
Nickel	S20-My10821	CP	%	93			70-130	Pass	
Zinc	S20-My10821	CP	%	86			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S20-My08645	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	S20-My10318	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	S20-My10318	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	S20-My10318	NCP	mg/kg	< 50	< 50	<1	30%	Pass	

Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S20-My08645	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S20-My08645	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S20-My08645	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S20-My08645	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S20-My08645	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total*	S20-My08645	NCP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S20-My08645	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	S20-My08645	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH >C10-C16	S20-My10318	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	S20-My10318	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	S20-My10318	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S20-My10688	NCP	%	16	17	9.0	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S20-My10819	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S20-My10819	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S20-My10819	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S20-My10819	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	S20-My10819	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	S20-My10819	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	S20-My10819	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	S20-My10819	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	S20-My10819	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	S20-My10819	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S20-My10819	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	S20-My10819	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	S20-My10819	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	S20-My10819	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	S20-My10819	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	S20-My10819	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	S20-My10819	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	S20-My10819	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	S20-My10819	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	S20-My10819	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-BHC	S20-My10819	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	S20-My10819	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-BHC	S20-My10819	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-BHC	S20-My10819	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	S20-My10819	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	S20-My10819	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	S20-My10819	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	S20-My10819	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	S20-My10819	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	S20-My10819	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	S20-My10819	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-BHC (Lindane)	S20-My10819	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	S20-My10819	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	S20-My10819	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	

Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Hexachlorobenzene	S20-My10819	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	S20-My10819	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Toxaphene	S20-My10819	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Duplicate									
Organophosphorus Pesticides				Result 1	Result 2	RPD			
Azinphos-methyl	S20-My10819	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Bolstar	S20-My10819	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorfenvinphos	S20-My10819	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorpyrifos	S20-My10819	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorpyrifos-methyl	S20-My10819	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Coumaphos	S20-My10819	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Demeton-S	S20-My10819	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Demeton-O	S20-My10819	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Diazinon	S20-My10819	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Dichlorvos	S20-My10819	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Dimethoate	S20-My10819	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Disulfoton	S20-My10819	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
EPN	S20-My10819	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethion	S20-My10819	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethoprop	S20-My10819	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethyl parathion	S20-My10819	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fenitrothion	S20-My10819	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fensulfothion	S20-My10819	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fenthion	S20-My10819	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Malathion	S20-My10819	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Merphos	S20-My10819	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Methyl parathion	S20-My10819	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Mevinphos	S20-My10819	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Monocrotophos	S20-My10819	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Naled	S20-My10819	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Omethoate	S20-My10819	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Phorate	S20-My10819	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Pirimiphos-methyl	S20-My10819	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Pyrazophos	S20-My10819	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ronnel	S20-My10819	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Terbufos	S20-My10819	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tetrachlorvinphos	S20-My10819	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tokuthion	S20-My10819	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Trichloronate	S20-My10819	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S20-My10820	CP	mg/kg	7.4	7.6	4.0	30%	Pass	
Cadmium	S20-My10820	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S20-My10820	CP	mg/kg	43	30	35	30%	Fail	Q15
Copper	S20-My10820	CP	mg/kg	6.4	5.7	11	30%	Pass	
Lead	S20-My10820	CP	mg/kg	15	13	17	30%	Pass	
Mercury	S20-My10820	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	S20-My10820	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Zinc	S20-My10820	CP	mg/kg	20	15	31	30%	Fail	Q15

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
Q15	The RPD reported passes Eurofins Environment Testing's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.

Authorised By

Ursula Long	Analytical Services Manager
Andrew Sullivan	Senior Analyst-Organic (NSW)
Gabriele Cordero	Senior Analyst-Metal (NSW)
Nibha Vaidya	Senior Analyst-Asbestos (NSW)



Glenn Jackson

General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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Construction Sciences Pty Ltd
2/4 Kellogg Rd
Glendenning
NSW 2761

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Attention: **Beau Dubois**

Report **718206-W**
Project name LUDDENHAM RD ORCHARD HILLS
Project ID 5046200067
Received Date May 06, 2020

Client Sample ID			**TB (A)**	**TB (B)**
Sample Matrix			**Water**	**Water**
Eurofins Sample No.			**S20-My10825**	**S20-My10826**
Date Sampled			**May 06, 2020**	**May 06, 2020**
Test/Reference	LOR	Unit		
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				
Naphthalene[N02]	0.01	mg/L	< 0.01	< 0.01
TRH C6-C10	0.02	mg/L	< 0.02	< 0.02
TRH C6-C10 less BTEX (F1)[N04]	0.02	mg/L	< 0.02	< 0.02
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				
TRH C6-C9	0.02	mg/L	< 0.02	< 0.02
BTEX				
Benzene	0.001	mg/L	< 0.001	< 0.001
Toluene	0.001	mg/L	< 0.001	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002	< 0.002
o-Xylene	0.001	mg/L	< 0.001	< 0.001
Xylenes - Total*	0.003	mg/L	< 0.003	< 0.003
4-Bromofluorobenzene (surr.)	1	%	105	100

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Total Recoverable Hydrocarbons	Sydney	May 08, 2020	7 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Sydney	May 08, 2020	7 Days
- Method: LTM-ORG-2010 TRH C6-C40			
BTEX	Sydney	May 08, 2020	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			

eurofins | Environment Testing

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IANZ # 1290

Company Name: Construction Sciences Pty Ltd
Address: 2/4 Kellogg Rd
Glendenning
NSW 2761

Project Name: LUDDENHAM RD ORCHARD HILLS
Project ID: 5046200067

Order No.:
Report #: 718206
Phone: 02 9854 1700
Fax:

Received: May 6, 2020 4:45 PM
Due: May 13, 2020
Priority: 5 Day
Contact Name: Beau Dubois

Eurofins Analytical Services Manager : Ursula Long

Sample Detail						Asbestos - AS4964	Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	Organophosphorus Pesticides	Metals M8	Moisture Set	Eurofins | mgt Suite B1	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271													
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794													
Perth Laboratory - NATA Site # 23736													
External Laboratory													
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**								
1	TP08-0-0.2	May 06, 2020		Soil	S20-My10816	X	X			X	X	X	
2	TP09-0-0.2	May 06, 2020		Soil	S20-My10817	X	X			X	X		
3	TP10-0-0.2	May 06, 2020		Soil	S20-My10818	X	X			X	X		
4	TP11-0-0.2	May 06, 2020		Soil	S20-My10819	X	X	X	X	X	X	X	
5	TP012-0-0.2	May 06, 2020		Soil	S20-My10820	X	X			X	X		
6	TP13-0-0.2	May 06, 2020		Soil	S20-My10821	X	X	X	X	X	X	X	
7	TB (A)	May 06, 2020		Water	S20-My10825								X
8	TB (B)	May 06, 2020		Water	S20-My10826								X
Test Counts						6	6	2	2	6	6	3	2

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.3
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 20-130% Phenols & 50-150% PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.3 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/L	< 0.01			0.01	Pass	
TRH C6-C10	mg/L	< 0.02			0.02	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/L	< 0.02			0.02	Pass	
Method Blank							
BTEX							
Benzene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
m&p-Xylenes	mg/L	< 0.002			0.002	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	
Xylenes - Total*	mg/L	< 0.003			0.003	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	71			70-130	Pass	
TRH C6-C10	%	72			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	72			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	85			70-130	Pass	
Toluene	%	90			70-130	Pass	
Ethylbenzene	%	108			70-130	Pass	
m&p-Xylenes	%	99			70-130	Pass	
o-Xylene	%	101			70-130	Pass	
Xylenes - Total*	%	99			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	S20-My14241	NCP	%	93			70-130	Pass	
TRH C6-C10	S20-My14241	NCP	%	95			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	S20-My14241	NCP	%	94			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	S20-My14241	NCP	%	103			70-130	Pass	
Toluene	S20-My14241	NCP	%	99			70-130	Pass	
Ethylbenzene	S20-My14241	NCP	%	90			70-130	Pass	
m&p-Xylenes	S20-My14241	NCP	%	93			70-130	Pass	
o-Xylene	S20-My14241	NCP	%	94			70-130	Pass	
Xylenes - Total*	S20-My14241	NCP	%	93			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S20-My14240	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
TRH C6-C10	S20-My14240	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	

Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S20-My14240	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S20-My14240	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Toluene	S20-My14240	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Ethylbenzene	S20-My14240	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
m&p-Xylenes	S20-My14240	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
o-Xylene	S20-My14240	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Xylenes - Total*	S20-My14240	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.

Authorised By

Ursula Long Analytical Services Manager



Glenn Jackson
General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

Eurofins shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

CHAIN OF CUSTODY RECORD

Eurofins | Environment Testing ABN 50 005 085 521

☑ Sydney Laboratory
Unit F3, Building F, 16 Mars Road, Lane Cove West NSW 2066
02 9900 8400 Environment@EurofinsET.com

☐ Brisbane Laboratory
Unit 1, 21 Smallwood Place, Murarrie QLD 4172
07 3902 4600 EnvironmentQLD@EurofinsET.com

☐ Perth Laboratory
10 Hod Way, Malaga WA 6090
08 9251 9600 EnvironmentWA@EurofinsET.com

☐ Melbourne Laboratory
6 Monterey Road, Dandenong South VIC 3175
03 8564 5000 EnvironmentVIC@EurofinsET.com

Company	Construction Sciences	Project №	50462000 67
Address	31 Anvil Rd, Seven Hills,	Project Name	Luddenham Rd, Orchard Hills
Contact Name	Beau Dubois	Project Manager	Beau Dubois
Phone №	0435 860 610	EDD Format (ESdat, EQuIS etc)	Esdat
Special Directions		Sampler(s)	Nicholas Leong
Purchase Order		Handed over by	"
Quote ID №		Email for Invoice	Beau / CS
		Email for Results	Beau.dubois@ConstructionSciences.net.au

Analyses — Where metals are requested, please specify "Total" or "Filtered". SUITE code must be used to attract SUITE pricing

Containers — Change container type & size if necessary

Required Turnaround Time (TAT) — Default will be 5 days if not ticked

☐ Overnight (reported by 9am) ☐ Same Day ☐ 1 day ☐ 2 days ☐ 3 days ☑ 5 days (Standard) ☐ Other

№	Client Sample ID	Sampled Date/Time dd/mm/yy hh:mm	Matrix Solid (S) Water (W)	TRH/BTEX	PAH	OCP	Asbestos (+/-)	Metals (8)	500mL Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
1	TP01-0-0.2	7/5/20	Soil	X	X	X	X	X							✓	✓	
2	TP02-0-0.2				X												
3	TP03-0-0.2			X	X												
4	TP04-0-0.2				X												
5	TP05-0-0.2				X	X											
6	TP06-0-0.2				X	X											
7	TP07-0-0.2				X												
8	QC 301				X												
9	QC 302				X												Please forward to SGS for analysis
10	TS/TB	6/5/20	Water	X													
		Total Counts		2													

Method of Shipment: ☐ Courier (#) ☑ Hand Delivered ☐ Postal

Name: Beau Dubois Signature: Date: 7/5/20 Time: 5:30pm

Laboratory Use Only						
Received By	Jenna B	SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature	Date: 08/05	Time: 10:03 AM	Temperature: 6.2°C
Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature	Date:	Time:	Report № TB468

Eurofins Environment Testing Australia Pty Ltd

Submission of samples to the laboratory will be deemed as acceptance of Eurofins | Environment Testing Standard Terms and Conditions unless agreed otherwise. A copy is available on request.

eurofins | Environment Testing

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NATA # 1261 Site # 20794

Perth
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Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261 Site # 23736

ABN – 50 005 085 521 e.mail : EnviroSales@eurofins.com web : www.eurofins.com.au

Sample Receipt Advice

Company name:	**Construction Sciences Pty Ltd**
Contact name:	Beau Dubois
Project name:	LUDDENHAM RD ORCHARD HILLS
Project ID:	5046200067
COC number:	Not provided
Turn around time:	5 Day
Date/Time received:	May 8, 2020 10:03 AM
Eurofins reference:	**718468**

Sample information

☑ A detailed list of analytes logged into our LIMS, is included in the attached summary table.

☑ All samples have been received as described on the above COC.

☑ COC has been completed correctly.

☑ Attempt to chill was evident.

☑ Appropriately preserved sample containers have been used.

☑ All samples were received in good condition.

☑ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.

☑ Appropriate sample containers have been used.

☑ Sample containers for volatile analysis received with zero headspace.

☒ Split sample sent to requested external lab.

☒ Some samples have been subcontracted.

N/A Custody Seals intact (if used).

Contact notes

If you have any questions with respect to these samples please contact:

Ursula Long on Phone : or by e.mail: UrsulaLong@eurofins.com

Results will be delivered electronically via e.mail to Beau Dubois - Beau.Dubois@constructionsciences.net.

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IANZ # 1290

Company Name: Construction Sciences Pty Ltd
Address: 2/4 Kellogg Rd
Glendenning
NSW 2761

Project Name: LUDDENHAM RD ORCHARD HILLS
Project ID: 5046200067

Order No.:
Report #: 718468
Phone: 02 9854 1700
Fax:

Received: May 8, 2020 10:03 AM
Due: May 15, 2020
Priority: 5 Day
Contact Name: Beau Dubois

Eurofins Analytical Services Manager : Ursula Long

Sample Detail						Asbestos - AS4964	Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	Metals M8	Moisture Set	Eurofins | mgt Suite B7	Eurofins | mgt Suite B9	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271													
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794													
Perth Laboratory - NATA Site # 23736													
External Laboratory													
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**								
1	TP01-0-0.2	May 07, 2020		Soil	S20-My12909	X				X		X	
2	TP02-0-0.2	May 07, 2020		Soil	S20-My12910	X	X		X	X			
3	TP03-0-0.2	May 07, 2020		Soil	S20-My12911	X				X	X		
4	TP04-0-0.2	May 07, 2020		Soil	S20-My12912	X	X		X	X			
5	TP05-0-0.2	May 07, 2020		Soil	S20-My12913	X	X	X	X	X			
6	TP06-0-0.2	May 07, 2020		Soil	S20-My12914	X	X	X	X	X			
7	TP07-0-0.2	May 07, 2020		Soil	S20-My12915	X	X		X	X			
8	QC301	May 07, 2020		Soil	S20-My12916		X		X	X			
9	QC302	May 07, 2020		Soil	S20-My12917		X		X	X			
10	TS	May 07, 2020		Water	S20-My12918								X

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Company Name: Construction Sciences Pty Ltd
Address: 2/4 Kellogg Rd
Glendenning
NSW 2761

Project Name: LUDDENHAM RD ORCHARD HILLS
Project ID: 5046200067

Order No.:
Report #: 718468
Phone: 02 9854 1700
Fax:

Received: May 8, 2020 10:03 AM
Due: May 15, 2020
Priority: 5 Day
Contact Name: Beau Dubois

Eurofins Analytical Services Manager : Ursula Long

Sample Detail						Asbestos - AS4964	Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	Metals M8	Moisture Set	Eurofins | mgt Suite B7	Eurofins | mgt Suite B9	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271													
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794													
Perth Laboratory - NATA Site # 23736													
11	TB	May 07, 2020		Water	S20-My12919								X
Test Counts						7	7	2	7	9	1	1	2

Certificate of Analysis

eurofins | Environment Testing

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025–Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Construction Sciences Pty Ltd
2/4 Kellogg Rd
Glendenning
NSW 2761

Attention:	Beau Dubois
Report	718468-AID
Project Name	LUDDENHAM RD ORCHARD HILLS
Project ID	5046200067
Received Date	May 08, 2020
Date Reported	May 15, 2020

Methodology:

Asbestos Fibre Identification	Conducted in accordance with the Australian Standard AS 4964 – 2004: Method for the Qualitative Identification of Asbestos in Bulk Samples and in-house Method LTM-ASB-8020 by polarised light microscopy (PLM) and dispersion staining (DS) techniques. *NOTE: Positive Trace Analysis results indicate the sample contains detectable respirable fibres.*
Unknown Mineral Fibres	Mineral fibres of unknown type, as determined by PLM with DS, may require another analytical technique, such as Electron Microscopy, to confirm unequivocal identity. *NOTE: While Actinolite, Anthophyllite and Tremolite asbestos may be detected by PLM with DS, due to variability in the optical properties of these materials, AS4964 requires that these are reported as UMF unless confirmed by an independent technique.*
Subsampling Soil Samples	The whole sample submitted is first dried and then passed through a 10mm sieve followed by a 2mm sieve. All fibrous matter greater than 10mm, greater than 2mm as well as the material passing through the 2mm sieve are retained and analysed for the presence of asbestos. If the sub 2mm fraction is greater than approximately 30 to 60g then a sub-sampling routine based on ISO 3082:2009(E) is employed. *NOTE: Depending on the nature and size of the soil sample, the sub-2 mm residue material may need to be sub-sampled for trace analysis, in accordance with AS 4964-2004.*
Bonded asbestos-containing material (ACM)	The material is first examined and any fibres isolated for identification by PLM and DS. Where required, interfering matrices may be removed by disintegration using a range of heat, chemical or physical treatments, possibly in combination.The resultant material is then further examined in accordance with AS 4964 - 2004. *NOTE: Even after disintegration it may be difficult to detect the presence of asbestos in some asbestos-containing bulk materials using PLM and DS. This is due to the low grade or small length or diameter of the asbestos fibres present in the material, or to the fact that very fine fibres have been distributed intimately throughout the materials. Vinyl/asbestos floor tiles, some asbestos-containing sealants and mastics, asbestos-containing epoxy resins and some ore samples are examples of these types of material, which are difficult to analyse.*
Limit of Reporting	The performance limitation of the AS 4964 (2004) method for non-homogeneous samples is around 0.1 g/kg (equivalent to 0.01% (w/w)). Where no asbestos is found by PLM and DS, including Trace Analysis, this is considered to be at the nominal reporting limit of 0.01% (w/w). The NEPM screening level of 0.001% (w/w) is intended as an on-site determination, not a laboratory Limit of Reporting (LOR), per se. Examination of a large sample size (e.g. 500 mL) may improve the likelihood of detecting asbestos, particularly AF, to aid assessment against the NEPM criteria. Gravimetric determinations to this level of accuracy are outside of AS 4964 and hence NATA Accreditation does not cover the performance of this service (non-NATA results shown with an asterisk). *NOTE: NATA News March 2014, p.7, states in relation to AS 4964: "This is a qualitative method with a nominal reporting limit of 0.01 % " and that currently in Australia "there is no validated method available for the quantification of asbestos".This report is consistent with the analytical procedures and reporting recommendations in the NEPM and the WA DoH.*

Project Name LUDDENHAM RD ORCHARD HILLS
Project ID 5046200067
Date Sampled May 07, 2020
Report 718468-AID

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
TP01-0-0.2	20-My12909	May 07, 2020	Approximate Sample 564g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
TP02-0-0.2	20-My12910	May 07, 2020	Approximate Sample 535g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
TP03-0-0.2	20-My12911	May 07, 2020	Approximate Sample 395g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
TP04-0-0.2	20-My12912	May 07, 2020	Approximate Sample 545g Sample consisted of: Brown coarse-grained soil, rocks and tile material	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
TP05-0-0.2	20-My12913	May 07, 2020	Approximate Sample 495g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
TP06-0-0.2	20-My12914	May 07, 2020	Approximate Sample 512g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
TP07-0-0.2	20-My12915	May 07, 2020	Approximate Sample 541g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Asbestos - LTM-ASB-8020	Sydney	May 08, 2020	Indefinite

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IANZ # 1290

Company Name: Construction Sciences Pty Ltd
Address: 2/4 Kellogg Rd
Glendenning
NSW 2761

Project Name: LUDDENHAM RD ORCHARD HILLS
Project ID: 5046200067

Order No.:
Report #: 718468
Phone: 02 9854 1700
Fax:

Received: May 8, 2020 10:03 AM
Due: May 15, 2020
Priority: 5 Day
Contact Name: Beau Dubois

Eurofins Analytical Services Manager : Ursula Long

Sample Detail						Asbestos - AS4964	Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	Metals M8	Moisture Set	Eurofins | mgt Suite B7	Eurofins | mgt Suite B9	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271													
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794													
Perth Laboratory - NATA Site # 23736													
External Laboratory													
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**								
1	TP01-0-0.2	May 07, 2020		Soil	S20-My12909	X				X		X	
2	TP02-0-0.2	May 07, 2020		Soil	S20-My12910	X	X		X	X			
3	TP03-0-0.2	May 07, 2020		Soil	S20-My12911	X				X	X		
4	TP04-0-0.2	May 07, 2020		Soil	S20-My12912	X	X		X	X			
5	TP05-0-0.2	May 07, 2020		Soil	S20-My12913	X	X	X	X	X			
6	TP06-0-0.2	May 07, 2020		Soil	S20-My12914	X	X	X	X	X			
7	TP07-0-0.2	May 07, 2020		Soil	S20-My12915	X	X		X	X			
8	QC301	May 07, 2020		Soil	S20-My12916		X		X	X			
9	QC302	May 07, 2020		Soil	S20-My12917		X		X	X			
10	TS	May 07, 2020		Water	S20-My12918								X

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Project Name: LUDDENHAM RD ORCHARD HILLS
Project ID: 5046200067

Order No.:
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Phone: 02 9854 1700
Fax:

Received: May 8, 2020 10:03 AM
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Contact Name: Beau Dubois

Eurofins Analytical Services Manager : Ursula Long

Sample Detail						Asbestos - AS4964	Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	Metals M8	Moisture Set	Eurofins | mgt Suite B7	Eurofins | mgt Suite B9	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271													
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794													
Perth Laboratory - NATA Site # 23736													
11	TB	May 07, 2020		Water	S20-My12919								X
Test Counts						7	7	2	7	9	1	1	2

Internal Quality Control Review and Glossary

General

1. QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Samples were analysed on an 'as received' basis.
4. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
5. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Advice.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

Units

% w/w: weight for weight basis	grams per kilogram
Filter loading:	fibres/100 graticule areas
Reported Concentration:	fibres/mL
Flowrate:	L/min

Terms

Dry	Sample is dried by heating prior to analysis
LOR	Limit of Reporting
COC	Chain of Custody
SRA	Sample Receipt Advice
ISO	International Standards Organisation
AS	Australian Standards
WA DOH	Reference document for the NEPM. Government of Western Australia, Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia (2009), including supporting document Recommended Procedures for Laboratory Analysis of Asbestos in Soil (2011)
NEPM	National Environment Protection (Assessment of Site Contamination) Measure, 2013 (as amended)
ACM	Asbestos Containing Materials. Asbestos contained within a non-asbestos matrix, typically presented in bonded and/or sound condition. For the purposes of the NEPM, ACM is generally restricted to those materials that do not pass a 7mm x 7mm sieve.
AF	Asbestos Fines. Asbestos containing materials, including friable, weathered and bonded materials, able to pass a 7mm x 7mm sieve. Considered under the NEPM as equivalent to “non-bonded / friable”.
FA	Fibrous Asbestos. Asbestos containing materials in a friable and/or severely weathered condition. For the purposes of the NEPM, FA is generally restricted to those materials that do not pass a 7mm x 7mm sieve.
Friable	Asbestos-containing materials of any size that may be broken or crumbled by hand pressure. For the purposes of the NEPM, this includes both AF and FA. It is outside of the laboratory’s remit to assess degree of friability.
Trace Analysis	Analytical procedure used to detect the presence of respirable fibres in the matrix.

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N/A	Not applicable

Asbestos Counter/Identifier:

Sayeed Abu	Senior Analyst-Asbestos (NSW)

Authorised by:

Chamath JHM Annakkage	Senior Analyst-Asbestos (NSW)



Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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Glendenning
NSW 2761

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Attention: **Beau Dubois**

Report **718468-S**
Project name LUDDENHAM RD ORCHARD HILLS
Project ID 5046200067
Received Date May 08, 2020

Client Sample ID			**TP01-0-0.2**	**TP02-0-0.2**	**TP03-0-0.2**	**TP04-0-0.2**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**S20-My12909**	**S20-My12910**	**S20-My12911**	**S20-My12912**
Date Sampled			**May 07, 2020**	**May 07, 2020**	**May 07, 2020**	**May 07, 2020**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	-	< 20	-
TRH C10-C14	20	mg/kg	< 20	-	< 20	-
TRH C15-C28	50	mg/kg	< 50	-	< 50	-
TRH C29-C36	50	mg/kg	< 50	-	< 50	-
TRH C10-C36 (Total)	50	mg/kg	< 50	-	< 50	-
BTEX						
Benzene	0.1	mg/kg	< 0.1	-	< 0.1	-
Toluene	0.1	mg/kg	< 0.1	-	< 0.1	-
Ethylbenzene	0.1	mg/kg	< 0.1	-	< 0.1	-
m&p-Xylenes	0.2	mg/kg	< 0.2	-	< 0.2	-
o-Xylene	0.1	mg/kg	< 0.1	-	< 0.1	-
Xylenes - Total*	0.3	mg/kg	< 0.3	-	< 0.3	-
4-Bromofluorobenzene (surr.)	1	%	69	-	61	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	-	< 0.5	-
TRH C6-C10	20	mg/kg	< 20	-	< 20	-
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	-	< 20	-
TRH >C10-C16	50	mg/kg	< 50	-	< 50	-
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	-	< 50	-
TRH >C16-C34	100	mg/kg	< 100	-	< 100	-
TRH >C34-C40	100	mg/kg	< 100	-	< 100	-
TRH >C10-C40 (total)*	100	mg/kg	< 100	-	< 100	-
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			TP01-0-0.2	TP02-0-0.2	TP03-0-0.2	TP04-0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-My12909	S20-My12910	S20-My12911	S20-My12912
Date Sampled			May 07, 2020	May 07, 2020	May 07, 2020	May 07, 2020
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	88	78	89	86
p-Terphenyl-d14 (surr.)	1	%	92	89	94	88
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	-	-	-
4.4'-DDD	0.05	mg/kg	< 0.05	-	-	-
4.4'-DDE	0.05	mg/kg	< 0.05	-	-	-
4.4'-DDT	0.05	mg/kg	< 0.05	-	-	-
a-BHC	0.05	mg/kg	< 0.05	-	-	-
Aldrin	0.05	mg/kg	< 0.05	-	-	-
b-BHC	0.05	mg/kg	< 0.05	-	-	-
d-BHC	0.05	mg/kg	< 0.05	-	-	-
Dieldrin	0.05	mg/kg	< 0.05	-	-	-
Endosulfan I	0.05	mg/kg	< 0.05	-	-	-
Endosulfan II	0.05	mg/kg	< 0.05	-	-	-
Endosulfan sulphate	0.05	mg/kg	< 0.05	-	-	-
Endrin	0.05	mg/kg	< 0.05	-	-	-
Endrin aldehyde	0.05	mg/kg	< 0.05	-	-	-
Endrin ketone	0.05	mg/kg	< 0.05	-	-	-
g-BHC (Lindane)	0.05	mg/kg	< 0.05	-	-	-
Heptachlor	0.05	mg/kg	< 0.05	-	-	-
Heptachlor epoxide	0.05	mg/kg	< 0.05	-	-	-
Hexachlorobenzene	0.05	mg/kg	< 0.05	-	-	-
Methoxychlor	0.2	mg/kg	< 0.2	-	-	-
Toxaphene	1	mg/kg	< 1	-	-	-
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	-	-	-
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	-	-	-
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.2	-	-	-
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.2	-	-	-
Dibutylchlorendate (surr.)	1	%	75	-	-	-
Tetrachloro-m-xylene (surr.)	1	%	96	-	-	-
Heavy Metals						
Arsenic	2	mg/kg	5.0	7.3	12	26
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	17	19	49	64
Copper	5	mg/kg	7.4	8.7	8.2	26
Lead	5	mg/kg	18	18	17	43
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	< 5	5.2	8.3	12
Zinc	5	mg/kg	15	17	17	96
% Moisture	1	%	9.7	8.6	33	19

Client Sample ID			TP05-0-0.2	TP06-0-0.2	TP07-0-0.2	QC301
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-My12913	S20-My12914	S20-My12915	S20-My12916
Date Sampled			May 07, 2020	May 07, 2020	May 07, 2020	May 07, 2020
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	99	91	83	87
p-Terphenyl-d14 (surr.)	1	%	96	82	104	96
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	-	-
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05	-	-
4.4'-DDE	0.05	mg/kg	< 0.05	< 0.05	-	-
4.4'-DDT	0.05	mg/kg	< 0.05	< 0.05	-	-
a-BHC	0.05	mg/kg	< 0.05	< 0.05	-	-
Aldrin	0.05	mg/kg	< 0.05	< 0.05	-	-
b-BHC	0.05	mg/kg	< 0.05	< 0.05	-	-
d-BHC	0.05	mg/kg	< 0.05	< 0.05	-	-
Dieldrin	0.05	mg/kg	< 0.05	< 0.05	-	-
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	-	-
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	-	-
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	-	-
Endrin	0.05	mg/kg	< 0.05	< 0.05	-	-
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	-	-
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	-	-
g-BHC (Lindane)	0.05	mg/kg	< 0.05	< 0.05	-	-
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	-	-
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	-	-
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	-	-
Methoxychlor	0.2	mg/kg	< 0.2	< 0.2	-	-
Toxaphene	1	mg/kg	< 1	< 1	-	-
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	< 0.05	-	-
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	< 0.05	-	-
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.2	< 0.2	-	-
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.2	< 0.2	-	-
Dibutylchlorendate (surr.)	1	%	114	96	-	-
Tetrachloro-m-xylene (surr.)	1	%	101	96	-	-

Client Sample ID			TP05-0-0.2	TP06-0-0.2	TP07-0-0.2	QC301
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-My12913	S20-My12914	S20-My12915	S20-My12916
Date Sampled			May 07, 2020	May 07, 2020	May 07, 2020	May 07, 2020
Test/Reference	LOR	Unit				
Heavy Metals						
Arsenic	2	mg/kg	20	4.9	9.4	18
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	71	20	28	58
Copper	5	mg/kg	8.6	5.3	7.2	7.2
Lead	5	mg/kg	21	13	20	23
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	5.2	< 5	< 5	6.4
Zinc	5	mg/kg	6.2	5.5	29	7.2
% Moisture	1	%	9.4	13	16	19

Client Sample ID			QC302
Sample Matrix			Soil
Eurofins Sample No.			S20-My12917
Date Sampled			May 07, 2020
Test/Reference	LOR	Unit	
Polycyclic Aromatic Hydrocarbons			
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2
Acenaphthene	0.5	mg/kg	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5
Anthracene	0.5	mg/kg	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5
Chrysene	0.5	mg/kg	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5
Fluorene	0.5	mg/kg	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5
Naphthalene	0.5	mg/kg	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5
Pyrene	0.5	mg/kg	< 0.5
Total PAH*	0.5	mg/kg	< 0.5
2-Fluorobiphenyl (surr.)	1	%	92
p-Terphenyl-d14 (surr.)	1	%	88
Heavy Metals			
Arsenic	2	mg/kg	14
Cadmium	0.4	mg/kg	< 0.4
Chromium	5	mg/kg	44
Copper	5	mg/kg	6.9
Lead	5	mg/kg	22
Mercury	0.1	mg/kg	< 0.1
Nickel	5	mg/kg	6.0
Zinc	5	mg/kg	7.1

Client Sample ID			QC302
Sample Matrix			Soil
Eurofins Sample No.			S20-My12917
Date Sampled			May 07, 2020
Test/Reference	LOR	Unit	
% Moisture	1	%	18

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Sydney	May 13, 2020	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
BTEX	Sydney	May 13, 2020	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	May 13, 2020	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Eurofins | mgt Suite B9			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	May 13, 2020	
- Method: LTM-ORG-2010 TRH C6-C40			
Polycyclic Aromatic Hydrocarbons	Sydney	May 13, 2020	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Organochlorine Pesticides	Sydney	May 13, 2020	14 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Metals M8	Sydney	May 13, 2020	180 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
% Moisture	Sydney	May 08, 2020	14 Days
- Method: LTM-GEN-7080 Moisture			

eurofins | Environment Testing

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Company Name: Construction Sciences Pty Ltd
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Glendenning
NSW 2761

Project Name: LUDDENHAM RD ORCHARD HILLS
Project ID: 5046200067

Order No.:
Report #: 718468
Phone: 02 9854 1700
Fax:

Received: May 8, 2020 10:03 AM
Due: May 15, 2020
Priority: 5 Day
Contact Name: Beau Dubois

Eurofins Analytical Services Manager : Ursula Long

Sample Detail						Asbestos - AS4964	Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	Metals M8	Moisture Set	Eurofins | mgt Suite B7	Eurofins | mgt Suite B9	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271													
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794													
Perth Laboratory - NATA Site # 23736													
External Laboratory													
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**								
1	TP01-0-0.2	May 07, 2020		Soil	S20-My12909	X				X		X	
2	TP02-0-0.2	May 07, 2020		Soil	S20-My12910	X	X		X	X			
3	TP03-0-0.2	May 07, 2020		Soil	S20-My12911	X				X	X		
4	TP04-0-0.2	May 07, 2020		Soil	S20-My12912	X	X		X	X			
5	TP05-0-0.2	May 07, 2020		Soil	S20-My12913	X	X	X	X	X			
6	TP06-0-0.2	May 07, 2020		Soil	S20-My12914	X	X	X	X	X			
7	TP07-0-0.2	May 07, 2020		Soil	S20-My12915	X	X		X	X			
8	QC301	May 07, 2020		Soil	S20-My12916		X		X	X			
9	QC302	May 07, 2020		Soil	S20-My12917		X		X	X			
10	TS	May 07, 2020		Water	S20-My12918								X

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Company Name: Construction Sciences Pty Ltd
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Glendenning
NSW 2761

Project Name: LUDDENHAM RD ORCHARD HILLS
Project ID: 5046200067

Order No.:
Report #: 718468
Phone: 02 9854 1700
Fax:

Received: May 8, 2020 10:03 AM
Due: May 15, 2020
Priority: 5 Day
Contact Name: Beau Dubois

Eurofins Analytical Services Manager : Ursula Long

Sample Detail						Asbestos - AS4964	Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	Metals M8	Moisture Set	Eurofins | mgt Suite B7	Eurofins | mgt Suite B9	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271													
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794													
Perth Laboratory - NATA Site # 23736													
11	TB	May 07, 2020		Water	S20-My12919								X
Test Counts						7	7	2	7	9	1	1	2

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.3
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 20-130% Phenols & 50-150% PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.3 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/kg	< 20			20	Pass	
TRH C10-C14	mg/kg	< 20			20	Pass	
TRH C15-C28	mg/kg	< 50			50	Pass	
TRH C29-C36	mg/kg	< 50			50	Pass	
Method Blank							
BTEX							
Benzene	mg/kg	< 0.1			0.1	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Xylenes - Total*	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g.h.i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a.h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/kg	< 0.1			0.1	Pass	
4.4'-DDD	mg/kg	< 0.05			0.05	Pass	
4.4'-DDE	mg/kg	< 0.05			0.05	Pass	
4.4'-DDT	mg/kg	< 0.05			0.05	Pass	
a-BHC	mg/kg	< 0.05			0.05	Pass	
Aldrin	mg/kg	< 0.05			0.05	Pass	
b-BHC	mg/kg	< 0.05			0.05	Pass	
d-BHC	mg/kg	< 0.05			0.05	Pass	
Dieldrin	mg/kg	< 0.05			0.05	Pass	
Endosulfan I	mg/kg	< 0.05			0.05	Pass	
Endosulfan II	mg/kg	< 0.05			0.05	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endosulfan sulphate	mg/kg	< 0.05			0.05	Pass	
Endrin	mg/kg	< 0.05			0.05	Pass	
Endrin aldehyde	mg/kg	< 0.05			0.05	Pass	
Endrin ketone	mg/kg	< 0.05			0.05	Pass	
g-BHC (Lindane)	mg/kg	< 0.05			0.05	Pass	
Heptachlor	mg/kg	< 0.05			0.05	Pass	
Heptachlor epoxide	mg/kg	< 0.05			0.05	Pass	
Hexachlorobenzene	mg/kg	< 0.05			0.05	Pass	
Methoxychlor	mg/kg	< 0.2			0.2	Pass	
Toxaphene	mg/kg	< 1			1	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	85			70-130	Pass	
TRH C10-C14	%	87			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	97			70-130	Pass	
Toluene	%	94			70-130	Pass	
Ethylbenzene	%	97			70-130	Pass	
m&p-Xylenes	%	91			70-130	Pass	
o-Xylene	%	95			70-130	Pass	
Xylenes - Total*	%	93			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	93			70-130	Pass	
TRH C6-C10	%	84			70-130	Pass	
TRH >C10-C16	%	95			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	109			70-130	Pass	
Acenaphthylene	%	111			70-130	Pass	
Anthracene	%	99			70-130	Pass	
Benz(a)anthracene	%	94			70-130	Pass	
Benzo(a)pyrene	%	91			70-130	Pass	
Benzo(b&j)fluoranthene	%	90			70-130	Pass	
Benzo(g.h.i)perylene	%	129			70-130	Pass	
Benzo(k)fluoranthene	%	104			70-130	Pass	
Chrysene	%	98			70-130	Pass	
Dibenz(a.h)anthracene	%	101			70-130	Pass	
Fluoranthene	%	99			70-130	Pass	
Fluorene	%	106			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	101			70-130	Pass	
Naphthalene	%	107			70-130	Pass	
Phenanthrene	%	103			70-130	Pass	

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Pyrene			%	97			70-130	Pass	
LCS - % Recovery									
Organochlorine Pesticides									
Chlordanes - Total			%	116			70-130	Pass	
4.4'-DDD			%	127			70-130	Pass	
4.4'-DDE			%	113			70-130	Pass	
4.4'-DDT			%	101			70-130	Pass	
a-BHC			%	106			70-130	Pass	
Aldrin			%	106			70-130	Pass	
b-BHC			%	107			70-130	Pass	
d-BHC			%	113			70-130	Pass	
Dieldrin			%	123			70-130	Pass	
Endosulfan I			%	114			70-130	Pass	
Endosulfan II			%	108			70-130	Pass	
Endosulfan sulphate			%	119			70-130	Pass	
Endrin			%	106			70-130	Pass	
Endrin aldehyde			%	89			70-130	Pass	
Endrin ketone			%	109			70-130	Pass	
g-BHC (Lindane)			%	101			70-130	Pass	
Heptachlor			%	115			70-130	Pass	
Heptachlor epoxide			%	103			70-130	Pass	
Hexachlorobenzene			%	126			70-130	Pass	
Methoxychlor			%	104			70-130	Pass	
LCS - % Recovery									
Heavy Metals									
Arsenic			%	93			70-130	Pass	
Cadmium			%	89			70-130	Pass	
Chromium			%	95			70-130	Pass	
Copper			%	96			70-130	Pass	
Lead			%	94			70-130	Pass	
Mercury			%	97			70-130	Pass	
Nickel			%	98			70-130	Pass	
Zinc			%	96			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Spike - % Recovery									
BTEX				Result 1					
Benzene	S20-My08892	NCP	%	82			70-130	Pass	
Toluene	S20-My08892	NCP	%	81			70-130	Pass	
Ethylbenzene	S20-My08892	NCP	%	86			70-130	Pass	
m&p-Xylenes	S20-My08892	NCP	%	83			70-130	Pass	
o-Xylene	S20-My08892	NCP	%	88			70-130	Pass	
Xylenes - Total*	S20-My08892	NCP	%	85			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	S20-My08892	NCP	%	86			70-130	Pass	
TRH C6-C10	S20-My08861	NCP	%	70			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	S20-My13854	NCP	%	108			70-130	Pass	
Acenaphthylene	S20-My13854	NCP	%	108			70-130	Pass	
Anthracene	S20-My13854	NCP	%	73			70-130	Pass	
Benz(a)anthracene	S20-My13854	NCP	%	94			70-130	Pass	
Benzo(a)pyrene	S20-My13854	NCP	%	89			70-130	Pass	
Benzo(b&j)fluoranthene	S20-My13854	NCP	%	89			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Benzo(g.h.i)perylene	S20-My13854	NCP	%	81			70-130	Pass	
Benzo(k)fluoranthene	S20-My13854	NCP	%	98			70-130	Pass	
Chrysene	S20-My13854	NCP	%	94			70-130	Pass	
Dibenz(a.h)anthracene	S20-My13854	NCP	%	73			70-130	Pass	
Fluoranthene	S20-My13854	NCP	%	95			70-130	Pass	
Fluorene	S20-My13854	NCP	%	103			70-130	Pass	
Indeno(1.2.3-cd)pyrene	S20-My13854	NCP	%	71			70-130	Pass	
Naphthalene	S20-My13854	NCP	%	104			70-130	Pass	
Phenanthrene	S20-My13854	NCP	%	98			70-130	Pass	
Pyrene	S20-My13854	NCP	%	94			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
Chlordanes - Total	S20-My13854	NCP	%	111			70-130	Pass	
4.4'-DDD	S20-My18941	NCP	%	100			70-130	Pass	
4.4'-DDE	S20-My13854	NCP	%	112			70-130	Pass	
4.4'-DDT	S20-My18941	NCP	%	89			70-130	Pass	
a-BHC	S20-My13854	NCP	%	95			70-130	Pass	
Aldrin	S20-My13854	NCP	%	112			70-130	Pass	
b-BHC	S20-My13854	NCP	%	99			70-130	Pass	
d-BHC	S20-My13854	NCP	%	112			70-130	Pass	
Dieldrin	S20-My13854	NCP	%	97			70-130	Pass	
Endosulfan I	S20-My13854	NCP	%	121			70-130	Pass	
Endosulfan II	S20-My13854	NCP	%	105			70-130	Pass	
Endosulfan sulphate	S20-My13854	NCP	%	116			70-130	Pass	
Endrin	S20-My13854	NCP	%	97			70-130	Pass	
Endrin aldehyde	S20-My18941	NCP	%	100			70-130	Pass	
Endrin ketone	S20-My18941	NCP	%	111			70-130	Pass	
g-BHC (Lindane)	S20-My13854	NCP	%	95			70-130	Pass	
Heptachlor	S20-My18941	NCP	%	105			70-130	Pass	
Heptachlor epoxide	S20-My13854	NCP	%	106			70-130	Pass	
Methoxychlor	S20-My18941	NCP	%	91			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S20-My19064	NCP	%	99			70-130	Pass	
Cadmium	S20-My19064	NCP	%	102			70-130	Pass	
Chromium	S20-My19064	NCP	%	97			70-130	Pass	
Copper	S20-My19064	NCP	%	103			70-130	Pass	
Lead	S20-My19064	NCP	%	102			70-130	Pass	
Mercury	S20-My19064	NCP	%	110			70-130	Pass	
Nickel	S20-My19064	NCP	%	104			70-130	Pass	
Zinc	S20-My19064	NCP	%	90			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S20-My17033	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	S20-My13067	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	S20-My13067	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	S20-My13067	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S20-My17033	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S20-My17033	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S20-My17033	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S20-My17033	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	

Duplicate									
BTEX				Result 1	Result 2	RPD			
o-Xylene	S20-My17033	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total*	S20-My17033	NCP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S20-My17033	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	S20-My17033	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH >C10-C16	S20-My13067	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	S20-My13067	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	S20-My13067	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S20-My08924	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S20-My08924	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S20-My08924	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S20-My08924	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	S20-My08924	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	S20-My08924	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	S20-My08924	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	S20-My08924	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	S20-My08924	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	S20-My08924	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S20-My08924	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	S20-My08924	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	S20-My08924	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	S20-My08924	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	S20-My08924	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	S20-My08924	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	S20-My08924	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	S20-My08924	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	S20-My08924	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	S20-My08924	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-BHC	S20-My08924	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	S20-My08924	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-BHC	S20-My08924	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-BHC	S20-My08924	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	S20-My08924	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	S20-My08924	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	S20-My08924	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	S20-My08924	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	S20-My08924	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	S20-My08924	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	S20-My08924	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-BHC (Lindane)	S20-My08924	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	S20-My08924	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	S20-My08924	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	S20-My08924	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	S20-My08924	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	

Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S20-My12921	NCP	mg/kg	6.0	5.2	14	30%	Pass	
Cadmium	S20-My12921	NCP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S20-My12921	NCP	mg/kg	44	52	17	30%	Pass	
Copper	S20-My12921	NCP	mg/kg	29	26	9.0	30%	Pass	
Lead	S20-My12921	NCP	mg/kg	41	30	32	30%	Fail	Q02
Mercury	S20-My12921	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	S20-My12921	NCP	mg/kg	44	52	18	30%	Pass	
Zinc	S20-My12921	NCP	mg/kg	86	90	5.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S20-My12921	NCP	%	18	21	15	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
Q02	The duplicate %RPD is outside the recommended acceptance criteria. Further analysis indicates sample heterogeneity as the cause

Authorised By

Ursula Long	Analytical Services Manager
Andrew Sullivan	Senior Analyst-Organic (NSW)
Gabriele Cordero	Senior Analyst-Metal (NSW)
Nibha Vaidya	Senior Analyst-Asbestos (NSW)



Glenn Jackson

General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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Construction Sciences Pty Ltd
2/4 Kellogg Rd
Glendenning
NSW 2761

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Attention: **Beau Dubois**

Report **718468-W**
Project name LUDDENHAM RD ORCHARD HILLS
Project ID 5046200067
Received Date May 08, 2020

Client Sample ID			R20 **TS**	**TB**
Sample Matrix			**Water**	**Water**
Eurofins Sample No.			**S20-My12918**	**S20-My12919**
Date Sampled			**May 07, 2020**	**May 07, 2020**
Test/Reference	LOR	Unit		
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				
Naphthalene N02	0.01	mg/L	120	< 0.01
TRH C6-C10	0.02	mg/L	83	< 0.02
TRH C6-C10 less BTEX (F1) N04	0.02	mg/L	-	< 0.02
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				
TRH C6-C9	0.02	mg/L	71	< 0.02
BTEX				
Benzene	0.001	mg/L	100	< 0.001
Toluene	0.001	mg/L	100	< 0.001
Ethylbenzene	0.001	mg/L	95	< 0.001
m&p-Xylenes	0.002	mg/L	89	< 0.002
o-Xylene	0.001	mg/L	110	< 0.001
Xylenes - Total*	0.003	mg/L	96	< 0.003
4-Bromofluorobenzene (surr.)	1	%	97	88

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Total Recoverable Hydrocarbons	Sydney	May 08, 2020	7 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Sydney	May 08, 2020	7 Days
- Method: LTM-ORG-2010 TRH C6-C40			
BTEX	Sydney	May 08, 2020	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			

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ABN – 50 005 085 521 web : www.eurofins.com.au e.mail : EnviroSales@eurofins.com

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Site # 1254 & 14271

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Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
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Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

New Zealand

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Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

Christchurch
43 Detroit Drive
Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

Company Name: Construction Sciences Pty Ltd
Address: 2/4 Kellogg Rd
Glendenning
NSW 2761

Project Name: LUDDENHAM RD ORCHARD HILLS
Project ID: 5046200067

Order No.:
Report #: 718468
Phone: 02 9854 1700
Fax:

Received: May 8, 2020 10:03 AM
Due: May 15, 2020
Priority: 5 Day
Contact Name: Beau Dubois

Eurofins Analytical Services Manager : Ursula Long

Sample Detail						Asbestos - AS4964	Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	Metals M8	Moisture Set	Eurofins | mgt Suite B7	Eurofins | mgt Suite B9	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271													
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794													
Perth Laboratory - NATA Site # 23736													
External Laboratory													
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**								
1	TP01-0-0.2	May 07, 2020		Soil	S20-My12909	X				X		X	
2	TP02-0-0.2	May 07, 2020		Soil	S20-My12910	X	X		X	X			
3	TP03-0-0.2	May 07, 2020		Soil	S20-My12911	X				X	X		
4	TP04-0-0.2	May 07, 2020		Soil	S20-My12912	X	X		X	X			
5	TP05-0-0.2	May 07, 2020		Soil	S20-My12913	X	X	X	X	X			
6	TP06-0-0.2	May 07, 2020		Soil	S20-My12914	X	X	X	X	X			
7	TP07-0-0.2	May 07, 2020		Soil	S20-My12915	X	X		X	X			
8	QC301	May 07, 2020		Soil	S20-My12916		X		X	X			
9	QC302	May 07, 2020		Soil	S20-My12917		X		X	X			
10	TS	May 07, 2020		Water	S20-My12918								X

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ABN – 50 005 085 521 web : www.eurofins.com.au e.mail : EnviroSales@eurofins.com

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IANZ # 1290

Company Name: Construction Sciences Pty Ltd
Address: 2/4 Kellogg Rd
Glendenning
NSW 2761

Project Name: LUDDENHAM RD ORCHARD HILLS
Project ID: 5046200067

Order No.:
Report #: 718468
Phone: 02 9854 1700
Fax:

Received: May 8, 2020 10:03 AM
Due: May 15, 2020
Priority: 5 Day
Contact Name: Beau Dubois

Eurofins Analytical Services Manager : Ursula Long

Sample Detail						Asbestos - AS4964	Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	Metals M8	Moisture Set	Eurofins | mgt Suite B7	Eurofins | mgt Suite B9	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271													
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794													
Perth Laboratory - NATA Site # 23736													
11	TB	May 07, 2020		Water	S20-My12919								X
Test Counts						7	7	2	7	9	1	1	2

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.3
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 20-130% Phenols & 50-150% PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.3 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/L	< 0.01			0.01	Pass	
TRH C6-C10	mg/L	< 0.02			0.02	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/L	< 0.02			0.02	Pass	
Method Blank							
BTEX							
Benzene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
m&p-Xylenes	mg/L	< 0.002			0.002	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	
Xylenes - Total*	mg/L	< 0.003			0.003	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	98			70-130	Pass	
TRH C6-C10	%	99			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	97			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	91			70-130	Pass	
Toluene	%	96			70-130	Pass	
Ethylbenzene	%	98			70-130	Pass	
m&p-Xylenes	%	90			70-130	Pass	
o-Xylene	%	100			70-130	Pass	
Xylenes - Total*	%	93			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	S20-My11174	NCP	%	98			70-130	Pass	
TRH C6-C10	S20-My11174	NCP	%	96			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	S20-My11174	NCP	%	95			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	S20-My11174	NCP	%	94			70-130	Pass	
Toluene	S20-My11174	NCP	%	92			70-130	Pass	
Ethylbenzene	S20-My11174	NCP	%	95			70-130	Pass	
m&p-Xylenes	S20-My11174	NCP	%	96			70-130	Pass	
o-Xylene	S20-My11174	NCP	%	103			70-130	Pass	
Xylenes - Total*	S20-My11174	NCP	%	99			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1	Result 2	RPD	Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S20-My17042	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
TRH C6-C10	S20-My17042	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	

Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S20-My17042	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S20-My17042	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Toluene	S20-My17042	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Ethylbenzene	S20-My17042	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
m&p-Xylenes	S20-My17042	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
o-Xylene	S20-My17042	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Xylenes - Total*	S20-My17042	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
R20	This sample is a Trip Spike and therefore all results are reported as a percentage

Authorised By

Ursula Long Analytical Services Manager



Glenn Jackson

General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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#AU04_Enviro_Sample_NSW

To: Asim Khan
Subject: RE: Eurofins Test Results, Invoice - Report 717585 : Site LUDDENHAM ORCHARD HILLS (5046200067)

From: Beau Dubois [mailto:beau.dubois@constructionsciences.net]
Sent: Wednesday, 13 May 2020 9:28 AM
To: #AU04_Enviro_Sample_NSW
Cc: Ursula Long
Subject: RE: Eurofins Test Results, Invoice - Report 717585 : Site LUDDENHAM ORCHARD HILLS (5046200067)

Please proceed to analyse sample no.1-TP25-0-0.2 for metals (8)

Cheers,

Beau Dubois
SENIOR ENVIRONMENTAL SCIENTIST
CONSTRUCTION SCIENCES

Construction Sciences

Phone Direct
Address 31 Anvil Road, Seven Hills, New South Wales 2147 Australia

Email beau.dubois@www.constructionsciences.net Web www.constructionsciences.net
CONNECT WITH CONSTRUCTION SCIENCES

Construction Sciences management systems are certified to ISO9001 (quality) and ISO45001 (occupational health and safety)
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From: UrsulaLong@eurofins.com <UrsulaLong@eurofins.com>
Sent: Tuesday, 12 May 2020 8:43 PM
To: Beau Dubois <beau.dubois@constructionsciences.net>
Subject: Eurofins Test Results, Invoice - Report 717585 : Site LUDDENHAM ORCHARD HILLS (5046200067)

Please find attached results and invoice for your project in the subject header.

Regards

Ursula Long

Eurofins
Unit F3, Parkview Building
16 Mars Road
LANE COVE WEST NSW 2066
AUSTRALIA
Phone: +61 299 008 420
Email: UrsulaLong@eurofins.com
Website:environment.eurofins.com.au
EnviroNote 1098 - Melbourne PFAS Accreditation
EnviroNote 1080 - Total Organofluorine Analysis & PFAS Investigations

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NATA # 1261 Site # 23736

ABN – 50 005 085 521 e.mail : EnviroSales@eurofins.com web : www.eurofins.com.au

Sample Receipt Advice

Company name:	**Construction Sciences Pty Ltd**
Contact name:	Beau Dubois
Project name:	ADDITIONAL - LUDDENHAM ORCHARD HILLS
Project ID:	5046200067
COC number:	Not provided
Turn around time:	3 Day
Date/Time received:	May 13, 2020 10:31 AM
Eurofins reference:	**719163**

Sample information

☑ A detailed list of analytes logged into our LIMS, is included in the attached summary table.

☑ All samples have been received as described on the above COC.

☑ COC has been completed correctly.

☑ Attempt to chill was evident.

☑ Appropriately preserved sample containers have been used.

☑ All samples were received in good condition.

☑ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.

☑ Appropriate sample containers have been used.

☒ Split sample sent to requested external lab.

☒ Some samples have been subcontracted.

N/A Custody Seals intact (if used).

Contact notes

If you have any questions with respect to these samples please contact:

Ursula Long on Phone : or by e.mail: UrsulaLong@eurofins.com

Results will be delivered electronically via e.mail to Beau Dubois - Beau.Dubois@constructionsciences.net.

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IANZ # 1327

Christchurch
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Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

Company Name: Construction Sciences Pty Ltd
Address: 2/4 Kellogg Rd
Glendenning
NSW 2761

Project Name: ADDITIONAL - LUDDENHAM ORCHARD HILLS
Project ID: 5046200067

Order No.:
Report #: 719163
Phone: 02 9854 1700
Fax:

Received: May 13, 2020 10:31 AM
Due: May 18, 2020
Priority: 3 Day
Contact Name: Beau Dubois

Eurofins Analytical Services Manager : Ursula Long

Sample Detail						Metals M8	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271							
Sydney Laboratory - NATA Site # 18217						X	X
Brisbane Laboratory - NATA Site # 20794							
Perth Laboratory - NATA Site # 23736							
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	TP25-0-0.2	May 04, 2020		Soil	S20-My18551	X	X
Test Counts						1	1

eurofins | Environment Testing

Certificate of Analysis

Construction Sciences Pty Ltd
2/4 Kellogg Rd
Glendenning
NSW 2761

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Attention: **Beau Dubois**

Report **719163-S**
Project name ADDITIONAL - LUDDENHAM ORCHARD HILLS
Project ID 5046200067
Received Date May 13, 2020

Client Sample ID			**TP25-0-0.2**
Sample Matrix			**Soil**
Eurofins Sample No.			**S20-My18551**
Date Sampled			**May 04, 2020**
Test/Reference	LOR	Unit	
Heavy Metals			
Arsenic	2	mg/kg	11
Cadmium	0.4	mg/kg	< 0.4
Chromium	5	mg/kg	20
Copper	5	mg/kg	15
Lead	5	mg/kg	26
Mercury	0.1	mg/kg	< 0.1
Nickel	5	mg/kg	10
Zinc	5	mg/kg	32
% Moisture	1	%	21

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Metals M8	Sydney	May 15, 2020	180 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
% Moisture	Sydney	May 13, 2020	14 Days
- Method: LTM-GEN-7080 Moisture			

eurofins | Environment Testing

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Company Name: Construction Sciences Pty Ltd
Address: 2/4 Kellogg Rd
Glendenning
NSW 2761

Project Name: ADDITIONAL - LUDDENHAM ORCHARD HILLS
Project ID: 5046200067

Order No.:
Report #: 719163
Phone: 02 9854 1700
Fax:

Received: May 13, 2020 10:31 AM
Due: May 19, 2020
Priority: 5 Day
Contact Name: Beau Dubois

Eurofins Analytical Services Manager : Ursula Long

Sample Detail						Metals M8	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271							
Sydney Laboratory - NATA Site # 18217						X	X
Brisbane Laboratory - NATA Site # 20794							
Perth Laboratory - NATA Site # 23736							
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	TP25-0-0.2	May 04, 2020		Soil	S20-My18551	X	X
Test Counts						1	1

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram | **mg/L:** milligrams per litre | **ug/L:** micrograms per litre

ppm: Parts per million | **ppb:** Parts per billion | **%:** Percentage

org/100mL: Organisms per 100 millilitres | **NTU:** Nephelometric Turbidity Units | **MPN/100mL:** Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.3
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 20-130% Phenols & 50-150% PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.3 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	102			70-130	Pass	
Cadmium	%	110			70-130	Pass	
Chromium	%	101			70-130	Pass	
Copper	%	98			70-130	Pass	
Lead	%	98			70-130	Pass	
Mercury	%	98			70-130	Pass	
Nickel	%	101			70-130	Pass	
Zinc	%	98			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S20-My15276	NCP	%	118			70-130	Pass	
Cadmium	S20-My22063	NCP	%	120			70-130	Pass	
Chromium	S20-My15276	NCP	%	117			70-130	Pass	
Copper	S20-My15276	NCP	%	115			70-130	Pass	
Lead	S20-My15276	NCP	%	117			70-130	Pass	
Mercury	S20-My18450	NCP	%	124			70-130	Pass	
Nickel	S20-My15276	NCP	%	114			70-130	Pass	
Zinc	S20-My15276	NCP	%	115			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S20-My15052	NCP	mg/kg	8.5	7.8	9.0	30%	Pass	
Cadmium	S20-My15052	NCP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S20-My15052	NCP	mg/kg	8.6	8.9	4.0	30%	Pass	
Copper	S20-My15052	NCP	mg/kg	11	13	19	30%	Pass	
Lead	S20-My15052	NCP	mg/kg	29	29	<1	30%	Pass	
Mercury	S20-My15052	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	S20-My15052	NCP	mg/kg	< 5	< 5	<1	30%	Pass	
Zinc	S20-My15052	NCP	mg/kg	< 5	25	150	30%	Fail	Q02
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S20-My19736	NCP	%	57	59	4.0	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
Q02	The duplicate %RPD is outside the recommended acceptance criteria. Further analysis indicates sample heterogeneity as the cause

Authorised By

Ursula Long	Analytical Services Manager
Gabriele Cordero	Senior Analyst-Metal (NSW)



Glenn Jackson
General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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ANALYTICAL REPORT

Accreditation No. 2562

CLIENT DETAILS

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Project	**5046200067 Luddenham Rd, Orchard Hills**
Order Number	**5046200067**
Samples	1

LABORATORY DETAILS

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SGS Reference	**SE206019 R0**
Date Received	8/5/2020
Date Reported	15/5/2020

COMMENTS

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

SIGNATORIES

Dong LIANG
Metals/Inorganics Team Leader

Ly Kim HA
Organic Section Head

VOC's in Soil [AN433] Tested: 11/5/2020

PARAMETER	UOM	LOR	QC102 SOIL - 5/5/2020 SE206019.001
Benzene	mg/kg	0.1	<0.1
Toluene	mg/kg	0.1	<0.1
Ethylbenzene	mg/kg	0.1	<0.1
m/p-xylene	mg/kg	0.2	<0.2
o-xylene	mg/kg	0.1	<0.1
Total Xylenes	mg/kg	0.3	<0.3
Total BTEX	mg/kg	0.6	<0.6
Naphthalene	mg/kg	0.1	<0.1

Volatile Petroleum Hydrocarbons in Soil [AN433] Tested: 11/5/2020

PARAMETER	UOM	LOR	QC102 SOIL - 5/5/2020 SE206019.001
Benzene (F0)	mg/kg	0.1	<0.1
TRH C6-C9	mg/kg	20	<20
TRH C6-C10	mg/kg	25	<25
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25

TRH (Total Recoverable Hydrocarbons) in Soil [AN403] Tested: 11/5/2020

PARAMETER	UOM	LOR	QC102 SOIL - 5/5/2020 SE206019.001
TRH C10-C14	mg/kg	20	<20
TRH C15-C28	mg/kg	45	<45
TRH C29-C36	mg/kg	45	<45
TRH C37-C40	mg/kg	100	<100
TRH >C10-C16	mg/kg	25	<25
TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25
TRH >C16-C34 (F3)	mg/kg	90	<90
TRH >C34-C40 (F4)	mg/kg	120	<120
TRH C10-C36 Total	mg/kg	110	<110
TRH >C10-C40 Total (F bands)	mg/kg	210	<210

PAH (Polynuclear Aromatic Hydrocarbons) in Soil [AN420] Tested: 11/5/2020

PARAMETER	UOM	LOR	QC102 SOIL - 5/5/2020 SE206019.001
Naphthalene	mg/kg	0.1	<0.1
2-methylnaphthalene	mg/kg	0.1	<0.1
1-methylnaphthalene	mg/kg	0.1	<0.1
Acenaphthylene	mg/kg	0.1	<0.1
Acenaphthene	mg/kg	0.1	<0.1
Fluorene	mg/kg	0.1	<0.1
Phenanthrene	mg/kg	0.1	<0.1
Anthracene	mg/kg	0.1	<0.1
Fluoranthene	mg/kg	0.1	**0.2**
Pyrene	mg/kg	0.1	**0.3**
Benzo(a)anthracene	mg/kg	0.1	**0.2**
Chrysene	mg/kg	0.1	**0.1**
Benzo(b&j)fluoranthene	mg/kg	0.1	**0.2**
Benzo(k)fluoranthene	mg/kg	0.1	<0.1
Benzo(a)pyrene	mg/kg	0.1	**0.2**
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	**0.2**
Dibenzo(ah)anthracene	mg/kg	0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.1	**0.2**
Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.2	**0.3**
Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	**0.4**
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	**0.3**
Total PAH (18)	mg/kg	0.8	**1.6**
Total PAH (NEPM/WHO 16)	mg/kg	0.8	**1.6**

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES [AN040/AN320] Tested: 12/5/2020

PARAMETER	UOM	LOR	QC102 SOIL - 5/5/2020 SE206019.001
Arsenic, As	mg/kg	1	**5**
Cadmium, Cd	mg/kg	0.3	<0.3
Chromium, Cr	mg/kg	0.5	**21**
Copper, Cu	mg/kg	0.5	**12**
Lead, Pb	mg/kg	1	**10**
Nickel, Ni	mg/kg	0.5	**5.3**
Zinc, Zn	mg/kg	2	**12**

Mercury in Soil [AN312] Tested: 12/5/2020

PARAMETER	UOM	LOR	QC102 SOIL - 5/5/2020 SE206019.001
Mercury	mg/kg	0.05	<0.05

Moisture Content [AN002] Tested: 11/5/2020

PARAMETER	UOM	LOR	QC102 SOIL - 5/5/2020 SE206019.001
% Moisture	%w/w	1	**7.9**

METHOD	METHODOLOGY SUMMARY
AN002	The test is carried out by drying (at either 40°C or 105°C) a known mass of sample in a weighed evaporating basin. After fully dry the sample is re-weighed. Samples such as sludge and sediment having high percentages of moisture will take some time in a drying oven for complete removal of water.
AN040/AN320	A portion of sample is digested with nitric acid to decompose organic matter and hydrochloric acid to complete the digestion of metals. The digest is then analysed by ICP OES with metals results reported on the dried sample basis. Based on USEPA method 200.8 and 6010C.
AN040	A portion of sample is digested with Nitric acid to decompose organic matter and Hydrochloric acid to complete the digestion of metals and then filtered for analysis by ASS or ICP as per USEPA Method 200.8.
AN312	Mercury by Cold Vapour AAS in Soils: After digestion with nitric acid, hydrogen peroxide and hydrochloric acid , mercury ions are reduced by stannous chloride reagent in acidic solution to elemental mercury. This mercury vapour is purged by nitrogen into a cold cell in an atomic absorption spectrometer or mercury analyser . Quantification is made by comparing absorbances to those of the calibration standards. Reference APHA 3112/3500
AN403	Total Recoverable Hydrocarbons: Determination of Hydrocarbons by gas chromatography after a solvent extraction. Detection is by flame ionisation detector (FID) that produces an electronic signal in proportion to the combustible matter passing through it. Total Recoverable Hydrocarbons (TRH) are routinely reported as four alkane groupings based on the carbon chain length of the compounds: C6-C9, C10-C14, C15-C28 and C29-C36 and in recognition of the NEPM 1999 (2013), >C10-C16 (F2), >C16-C34 (F3) and >C34-C40 (F4). F2 is reported directly and also corrected by subtracting Naphthalene (from VOC method AN433) where available.
AN403	Additionally, the volatile C6-C9 fraction may be determined by a purge and trap technique and GC/MS because of the potential for volatiles loss. Total Recoverable Hydrocarbons - Silica (TRH-Si) follows the same method of analysis after silica gel cleanup of the solvent extract. Aliphatic/Aromatic Speciation follows the same method of analysis after fractionation of the solvent extract over silica with differential polarity of the eluent solvents .
AN403	The GC/FID method is not well suited to the analysis of refined high boiling point materials (ie lubricating oils or greases) but is particularly suited for measuring diesel, kerosene and petrol if care to control volatility is taken. This method will detect naturally occurring hydrocarbons, lipids, animal fats, phenols and PAHs if they are present at sufficient levels, dependent on the use of specific cleanup/fractionation techniques. Reference USEPA 3510B, 8015B.
AN420	(SVOCs) including OC, OP, PCB, Herbicides, PAH, Phthalates and Speciated Phenols (etc) in soils, sediments and waters are determined by GCMS/ECD technique following appropriate solvent extraction process (Based on USEPA 3500C and 8270D).
AN420	Carcinogenic PAHs may be expressed as Benzo(a)pyrene equivalents by applying the BaP toxicity equivalence factor (NEPM 1999, June 2013, B7). These can be reported as the individual PAHs and as a sum of carcinogenic PAHs. The sum is reported three ways, the first assuming all <LOR results are zero, the second assuming all < LOR results are half the LOR and the third assuming all <LOR results are the LOR.
AN433	VOCs and C6-C9 Hydrocarbons by GC-MS P&T: VOC`s are volatile organic compounds. The sample is presented to a gas chromatograph via a purge and trap (P&T) concentrator and autosampler and is detected with a Mass Spectrometer (MSD). Solid samples are initially extracted with methanol whilst liquid samples are processed directly. References: USEPA 5030B, 8020A, 8260.

FOOTNOTES

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

Unless it is reported that sampling has been performed by SGS, the samples have been analysed as received.
Solid samples expressed on a dry weight basis.

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

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

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

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

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

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

The QC and MU criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here: www.sgs.com.au/en-gb/environment-health-and-safety.

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STATEMENT OF QA/QC PERFORMANCE

SE206019 R0

CLIENT DETAILS

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Project	**5046200067 Luddenham Rd, Orchard Hills**
Order Number	**5046200067**
Samples	1

LABORATORY DETAILS

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SGS Reference	**SE206019 R0**
Date Received	08 May 2020
Date Reported	15 May 2020

COMMENTS

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

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

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

Duplicate	Mercury in Soil	1 item

SAMPLE SUMMARY

Samples clearly labelled	Yes	Complete documentation received	Yes
Sample container provider	SGS	Sample cooling method	Ice Bricks
Samples received in correct containers	Yes	Sample counts by matrix	1 Soil
Date documentation received	8/5/2020	Type of documentation received	COC
Samples received in good order	Yes	Samples received without headspace	Yes
Sample temperature upon receipt	5.3°C	Sufficient sample for analysis	Yes
Turnaround time requested	Standard		

HOLDING TIME SUMMARY

SE206019 R0

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

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

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

Mercury in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
QC102	SE206019.001	LB199284	05 May 2020	08 May 2020	02 Jun 2020	12 May 2020	02 Jun 2020	14 May 2020

Moisture Content

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
QC102	SE206019.001	LB199209	05 May 2020	08 May 2020	19 May 2020	11 May 2020	16 May 2020	14 May 2020

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
QC102	SE206019.001	LB199208	05 May 2020	08 May 2020	19 May 2020	11 May 2020	20 Jun 2020	15 May 2020

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

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
QC102	SE206019.001	LB199276	05 May 2020	08 May 2020	01 Nov 2020	12 May 2020	01 Nov 2020	14 May 2020

TRH (Total Recoverable Hydrocarbons) in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
QC102	SE206019.001	LB199208	05 May 2020	08 May 2020	19 May 2020	11 May 2020	20 Jun 2020	15 May 2020

VOC's in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
QC102	SE206019.001	LB199206	05 May 2020	08 May 2020	19 May 2020	11 May 2020	20 Jun 2020	14 May 2020

Volatile Petroleum Hydrocarbons in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
QC102	SE206019.001	LB199206	05 May 2020	08 May 2020	19 May 2020	11 May 2020	20 Jun 2020	14 May 2020

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

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

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2-fluorobiphenyl (Surrogate)	QC102	SE206019.001	%	70 - 130%	84
d14-p-terphenyl (Surrogate)	QC102	SE206019.001	%	70 - 130%	108
d5-nitrobenzene (Surrogate)	QC102	SE206019.001	%	70 - 130%	90

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	QC102	SE206019.001	%	60 - 130%	74
d4-1,2-dichloroethane (Surrogate)	QC102	SE206019.001	%	60 - 130%	95
d8-toluene (Surrogate)	QC102	SE206019.001	%	60 - 130%	94

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	QC102	SE206019.001	%	60 - 130%	74
d4-1,2-dichloroethane (Surrogate)	QC102	SE206019.001	%	60 - 130%	95
d8-toluene (Surrogate)	QC102	SE206019.001	%	60 - 130%	94

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

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

Mercury in Soil

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

Sample Number	Parameter	Units	LOR	Result
LB199284.001	Mercury	mg/kg	0.05	<0.05

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Sample Number		Parameter	Units	LOR	Result
LB199208.001		Naphthalene	mg/kg	0.1	<0.1
		2-methylnaphthalene	mg/kg	0.1	<0.1
		1-methylnaphthalene	mg/kg	0.1	<0.1
		Acenaphthylene	mg/kg	0.1	<0.1
		Acenaphthene	mg/kg	0.1	<0.1
		Fluorene	mg/kg	0.1	<0.1
		Phenanthrene	mg/kg	0.1	<0.1
		Anthracene	mg/kg	0.1	<0.1
		Fluoranthene	mg/kg	0.1	<0.1
		Pyrene	mg/kg	0.1	<0.1
		Benzo(a)anthracene	mg/kg	0.1	<0.1
		Chrysene	mg/kg	0.1	<0.1
		Benzo(a)pyrene	mg/kg	0.1	<0.1
		Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1
		Dibenzo(ah)anthracene	mg/kg	0.1	<0.1
		Benzo(ghi)perylene	mg/kg	0.1	<0.1
		Total PAH (18)	mg/kg	0.8	<0.8
	Surrogates	d5-nitrobenzene (Surrogate)	%	-	98
		2-fluorobiphenyl (Surrogate)	%	-	90
		d14-p-terphenyl (Surrogate)	%	-	114

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

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

Sample Number	Parameter	Units	LOR	Result
LB199276.001	Arsenic, As	mg/kg	1	<1
	Cadmium, Cd	mg/kg	0.3	<0.3
	Chromium, Cr	mg/kg	0.5	<0.5
	Copper, Cu	mg/kg	0.5	<0.5
	Nickel, Ni	mg/kg	0.5	<0.5
	Lead, Pb	mg/kg	1	<1
	Zinc, Zn	mg/kg	2	<2.0

TRH (Total Recoverable Hydrocarbons) in Soil

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

Sample Number	Parameter	Units	LOR	Result
LB199208.001	TRH C10-C14	mg/kg	20	<20
	TRH C15-C28	mg/kg	45	<45
	TRH C29-C36	mg/kg	45	<45
	TRH C37-C40	mg/kg	100	<100
	TRH C10-C36 Total	mg/kg	110	<110

VOC's in Soil

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

Sample Number		Parameter	Units	LOR	Result
LB199206.001	Monocyclic Aromatic	Benzene	mg/kg	0.1	<0.1
	Hydrocarbons	Toluene	mg/kg	0.1	<0.1
		Ethylbenzene	mg/kg	0.1	<0.1
		m/p-xylene	mg/kg	0.2	<0.2
		o-xylene	mg/kg	0.1	<0.1
	Polycyclic VOCs	Naphthalene	mg/kg	0.1	<0.1
	Surrogates	d4-1,2-dichloroethane (Surrogate)	%	-	101
		d8-toluene (Surrogate)	%	-	100
		Bromofluorobenzene (Surrogate)	%	-	76
	Totals	Total BTEX	mg/kg	0.6	<0.3

Volatile Petroleum Hydrocarbons in Soil

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

Sample Number		Parameter	Units	LOR	Result
LB199206.001		TRH C6-C9	mg/kg	20	<20
	Surrogates	d4-1,2-dichloroethane (Surrogate)	%	-	101

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

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

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

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

Mercury in Soil

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE206018.027	LB199284.014	Mercury	mg/kg	0.05	2.6	1.9	32	32 †
SE206019.001	LB199284.023	Mercury	mg/kg	0.05	<0.05	<0.05	200	0

Moisture Content

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE206062.007	LB199209.011	% Moisture	%w/w	1	10.6080206988	11.0963455149	39	5

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE206062.002	LB199208.025		Naphthalene	mg/kg	0.1	0	0	200	0
			2-methylnaphthalene	mg/kg	0.1	0	0	200	0
			1-methylnaphthalene	mg/kg	0.1	0	0	200	0
			Acenaphthylene	mg/kg	0.1	0	0	200	0
			Acenaphthene	mg/kg	0.1	0	0	200	0
			Fluorene	mg/kg	0.1	0	0	200	0
			Phenanthrene	mg/kg	0.1	0.01	0.01	200	0
			Anthracene	mg/kg	0.1	0.02	0.01	200	0
			Fluoranthene	mg/kg	0.1	0.02	0.02	200	0
			Pyrene	mg/kg	0.1	0.02	0.02	200	0
			Benzo(a)anthracene	mg/kg	0.1	0.03	0.02	200	0
			Chrysene	mg/kg	0.1	0.02	0.01	200	0
			Benzo(b&j)fluoranthene	mg/kg	0.1	0.02	0.02	200	0
			Benzo(k)fluoranthene	mg/kg	0.1	0.01	0.02	200	0
			Benzo(a)pyrene	mg/kg	0.1	0.01	0.01	200	0
			Indeno(1,2,3-cd)pyrene	mg/kg	0.1	0.01	0.01	200	0
			Dibenzo(ah)anthracene	mg/kg	0.1	0	0	200	0
			Benzo(ghi)perylene	mg/kg	0.1	0.01	0.01	200	0
			Carcinogenic PAHs, BaP TEQ <LOR=0	mg/kg	0.2	0	0	200	0
			Carcinogenic PAHs, BaP TEQ <LOR=LOR	mg/kg	0.3	0.242	0.242	134	0
			Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	mg/kg	0.2	0.121	0.121	175	0
			Total PAH (18)	mg/kg	0.8	0	0	200	0
		Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.45	0.43	30	5
			2-fluorobiphenyl (Surrogate)	mg/kg	-	0.43	0.42	30	2
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.59	0.58	30	2
SE206062.009	LB199208.026		Naphthalene	mg/kg	0.1	0.08	0.08	155	0
			2-methylnaphthalene	mg/kg	0.1	0.17	0.15	93	13
			1-methylnaphthalene	mg/kg	0.1	0.11	0.09	130	10
			Acenaphthylene	mg/kg	0.1	0.01	0.01	200	0
			Acenaphthene	mg/kg	0.1	0	0.01	200	0
			Fluorene	mg/kg	0.1	0.05	0.04	200	0
			Phenanthrene	mg/kg	0.1	0.15	0.11	107	31
			Anthracene	mg/kg	0.1	0.02	0.02	200	0
			Fluoranthene	mg/kg	0.1	0.06	0.03	200	0
			Pyrene	mg/kg	0.1	0.08	0.05	184	0
			Benzo(a)anthracene	mg/kg	0.1	0.04	0.03	200	0
			Chrysene	mg/kg	0.1	0.03	0.02	200	0
			Benzo(b&j)fluoranthene	mg/kg	0.1	0.04	0.03	200	0
			Benzo(k)fluoranthene	mg/kg	0.1	0.04	0.03	200	0
			Benzo(a)pyrene	mg/kg	0.1	0.01	0.01	200	0
			Indeno(1,2,3-cd)pyrene	mg/kg	0.1	0.01	0.01	200	0
			Dibenzo(ah)anthracene	mg/kg	0.1	0	0	200	0
			Benzo(ghi)perylene	mg/kg	0.1	0.02	0.01	200	0
			Carcinogenic PAHs, BaP TEQ <LOR=0	mg/kg	0.2	0	0	200	0
			Carcinogenic PAHs, BaP TEQ <LOR=LOR	mg/kg	0.3	0.242	0.242	134	0
			Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	mg/kg	0.2	0.121	0.121	175	0
			Total PAH (18)	mg/kg	0.8	0.43	0.26	200	0
		Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.44	0.47	30	7
			2-fluorobiphenyl (Surrogate)	mg/kg	-	0.44	0.47	30	7

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

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

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

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

PAH (Polynuclear Aromatic Hydrocarbons) in Soil (continued)

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE206062.009	LB199208.026	Surrogates	d14-p-terphenyl (Surrogate)	mg/kg	-	0.57	0.57	30	0

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

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE206018.027	LB199276.014		Arsenic, As	mg/kg	1	29	34	33	14
			Cadmium, Cd	mg/kg	0.3	0.7	1.3	59	55
			Chromium, Cr	mg/kg	0.5	530	440	30	19
			Copper, Cu	mg/kg	0.5	60	50	31	19
			Nickel, Ni	mg/kg	0.5	420	330	30	25
			Lead, Pb	mg/kg	1	150	200	31	28
			Zinc, Zn	mg/kg	2	560	750	30	28
SE206019.001	LB199276.023		Arsenic, As	mg/kg	1	5	4	53	23
			Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	200	0
			Chromium, Cr	mg/kg	0.5	21	17	33	20
			Copper, Cu	mg/kg	0.5	12	8.5	35	31
			Nickel, Ni	mg/kg	0.5	5.3	5.3	40	0
			Lead, Pb	mg/kg	1	10	11	39	2
			Zinc, Zn	mg/kg	2	12	12	46	1

TRH (Total Recoverable Hydrocarbons) in Soil

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE206062.002	LB199208.025		TRH C10-C14	mg/kg	20	0	0	200	0
			TRH C15-C28	mg/kg	45	0	0	200	0
			TRH C29-C36	mg/kg	45	0	0	200	0
			TRH C37-C40	mg/kg	100	0	0	200	0
			TRH C10-C36 Total	mg/kg	110	0	0	200	0
			TRH >C10-C40 Total (F bands)	mg/kg	210	0	0	200	0
		TRH F Bands	TRH >C10-C16	mg/kg	25	0	0	200	0
			TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	0	0	200	0
			TRH >C16-C34 (F3)	mg/kg	90	0	0	200	0
			TRH >C34-C40 (F4)	mg/kg	120	0	0	200	0
SE206062.009	LB199208.026		TRH C10-C14	mg/kg	20	0	0	200	0
			TRH C15-C28	mg/kg	45	84	79	85	6
			TRH C29-C36	mg/kg	45	0	0	200	0
			TRH C37-C40	mg/kg	100	0	0	200	0
			TRH C10-C36 Total	mg/kg	110	84	79	165	0
			TRH >C10-C40 Total (F bands)	mg/kg	210	128	31	200	0
		TRH F Bands	TRH >C10-C16	mg/kg	25	30	31	112	3
			TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	30	31	112	3
			TRH >C16-C34 (F3)	mg/kg	90	98	82	130	9
			TRH >C34-C40 (F4)	mg/kg	120	0	0	200	0

VOC's in Soil

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE206059.001	LB199206.026	Monocyclic Aromatic	Benzene	mg/kg	0.1	<0.1	0.0045608187	200	0
			Toluene	mg/kg	0.1	<0.1	0.0381894415	200	0
			Ethylbenzene	mg/kg	0.1	<0.1	0.0271402899	200	0
			m/p-xylene	mg/kg	0.2	<0.2	0.0481169818	200	0
			o-xylene	mg/kg	0.1	<0.1	0.0093053050	200	0
		Polycyclic	Naphthalene	mg/kg	0.1	<0.1	0.0294406154	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	8.9	9.5393468020	50	7
			d8-toluene (Surrogate)	mg/kg	-	9.1	9.4648729653	50	4
			Bromofluorobenzene (Surrogate)	mg/kg	-	7.2	7.6780949399	50	6
		Totals	Total Xylenes	mg/kg	0.3	<0.3	0.0574222869	200	0
			Total BTEX	mg/kg	0.6	<0.6	0	200	0
SE206062.009	LB199206.014	Monocyclic Aromatic	Benzene	mg/kg	0.1	0.005234331	40.0049976763	200	0
			Toluene	mg/kg	0.1	0.039853087	80.0389990393	200	0
			Ethylbenzene	mg/kg	0.1	0.027647666	30.0275556289	200	0
			m/p-xylene	mg/kg	0.2	0.079091297	60.0613856098	200	0
			o-xylene	mg/kg	0.1	0.015742538	60.0124629100	200	0
		Polycyclic	Naphthalene	mg/kg	0.1	0.015709379	90.0317346793	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	8.983744310	99.2620704107	50	3

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

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

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

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

VOC's in Soil (continued)

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE206062.009	LB199206.014	Surrogates	d8-toluene (Surrogate)	mg/kg	-	9.085093237	09.4040160474	50	3
			Bromofluorobenzene (Surrogate)	mg/kg	-	7.194600518	27.6385140018	50	6
		Totals	Total Xylenes	mg/kg	0.3	0.094833836	20.0738485198	200	0
			Total BTEX	mg/kg	0.6	0	0	200	0

Volatile Petroleum Hydrocarbons in Soil

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE206059.001	LB199206.026		TRH C6-C10	mg/kg	25	<25	1.7119505597	200	0
			TRH C6-C9	mg/kg	20	<20	1.1301111809	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	8.9	9.5393468020	30	7
			d8-toluene (Surrogate)	mg/kg	-	9.1	9.4648729653	30	4
			Bromofluorobenzene (Surrogate)	mg/kg	-	7.2	7.6780949399	30	6
		VPH F Bands	Benzene (F0)	mg/kg	0.1	<0.1	0.0045608187	200	0
			TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	1.7119505597	200	0
SE206062.009	LB199206.014		TRH C6-C10	mg/kg	25	0	6.2251463820	200	0
			TRH C6-C9	mg/kg	20	0.018765164	84.3766330154	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	8.983744310	99.2620704107	30	3
			d8-toluene (Surrogate)	mg/kg	-	9.085093237	09.4040160474	30	3
			Bromofluorobenzene (Surrogate)	mg/kg	-	7.194600518	27.6385140018	30	6
		VPH F Bands	Benzene (F0)	mg/kg	0.1	0.005234331	40.0049976763	200	0
			TRH C6-C10 minus BTEX (F1)	mg/kg	25	0	6.2251463820	200	0

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

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

Mercury in Soil

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB199284.002	Mercury	mg/kg	0.05	0.16	0.2	70 - 130	78

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB199208.002		Naphthalene	mg/kg	0.1	3.9	4	60 - 140	98
		Acenaphthylene	mg/kg	0.1	4.6	4	60 - 140	114
		Acenaphthene	mg/kg	0.1	4.1	4	60 - 140	102
		Phenanthrene	mg/kg	0.1	3.7	4	60 - 140	93
		Anthracene	mg/kg	0.1	3.9	4	60 - 140	98
		Fluoranthene	mg/kg	0.1	4.1	4	60 - 140	104
		Pyrene	mg/kg	0.1	4.4	4	60 - 140	110
		Benzo(a)pyrene	mg/kg	0.1	4.4	4	60 - 140	111
	Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.5	0.5	40 - 130	92
		2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.5	40 - 130	88
		d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	40 - 130	102

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

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB199276.002	Arsenic, As	mg/kg	1	280	318.22	80 - 120	89
	Cadmium, Cd	mg/kg	0.3	4.5	5.41	80 - 120	84
	Chromium, Cr	mg/kg	0.5	33	38.31	80 - 120	87
	Copper, Cu	mg/kg	0.5	260	290	80 - 120	88
	Nickel, Ni	mg/kg	0.5	160	187	80 - 120	85
	Lead, Pb	mg/kg	1	83	89.9	80 - 120	92
	Zinc, Zn	mg/kg	2	240	273	80 - 120	87

TRH (Total Recoverable Hydrocarbons) in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB199208.002		TRH C10-C14	mg/kg	20	46	40	60 - 140	115
		TRH C15-C28	mg/kg	45	<45	40	60 - 140	110
		TRH C29-C36	mg/kg	45	<45	40	60 - 140	103
	TRH F Bands	TRH >C10-C16	mg/kg	25	46	40	60 - 140	115
		TRH >C16-C34 (F3)	mg/kg	90	<90	40	60 - 140	108
		TRH >C34-C40 (F4)	mg/kg	120	<120	20	60 - 140	110

VOC's in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB199206.002	Monocyclic	Benzene	mg/kg	0.1	4.1	5	60 - 140	83
	Aromatic	Toluene	mg/kg	0.1	4.2	5	60 - 140	84
		Ethylbenzene	mg/kg	0.1	4.3	5	60 - 140	86
		m/p-xylene	mg/kg	0.2	8.4	10	60 - 140	84
		o-xylene	mg/kg	0.1	4.3	5	60 - 140	85
	Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	11.0	10	70 - 130	110
		d8-toluene (Surrogate)	mg/kg	-	11.0	10	70 - 130	110
		Bromofluorobenzene (Surrogate)	mg/kg	-	7.4	10	70 - 130	74

Volatile Petroleum Hydrocarbons in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB199206.002		TRH C6-C10	mg/kg	25	76	92.5	60 - 140	82
		TRH C6-C9	mg/kg	20	66	80	60 - 140	82
	Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	11.0	10	70 - 130	110
		Bromofluorobenzene (Surrogate)	mg/kg	-	7.4	10	70 - 130	74
	VPH F Bands	TRH C6-C10 minus BTEX (F1)	mg/kg	25	50	62.5	60 - 140	81

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

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

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE206062.001	LB199208.024		Naphthalene	mg/kg	0.1	4.1	0.01	4	103
			2-methylnaphthalene	mg/kg	0.1	<0.1	0	-	-
			1-methylnaphthalene	mg/kg	0.1	<0.1	0	-	-
			Acenaphthylene	mg/kg	0.1	4.7	0.03	4	117
			Acenaphthene	mg/kg	0.1	4.2	0	4	105
			Fluorene	mg/kg	0.1	<0.1	0.01	-	-
			Phenanthrene	mg/kg	0.1	3.8	0.06	4	94
			Anthracene	mg/kg	0.1	4.0	0.05	4	99
			Fluoranthene	mg/kg	0.1	4.5	0.16	4	107
			Pyrene	mg/kg	0.1	4.7	0.16	4	114
			Benzo(a)anthracene	mg/kg	0.1	<0.1	0.1	-	-
			Chrysene	mg/kg	0.1	<0.1	0.08	-	-
			Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	0.1	-	-
			Benzo(k)fluoranthene	mg/kg	0.1	<0.1	0.05	-	-
			Benzo(a)pyrene	mg/kg	0.1	4.6	0.1	4	112
			Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	0.07	-	-
			Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	0.01	-	-
			Benzo(ghi)perylene	mg/kg	0.1	<0.1	0.07	-	-
			Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.2	4.6	0.11	-	-
			Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	4.7	0.242	-	-
			Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	4.7	0.176	-	-
			Total PAH (18)	mg/kg	0.8	35	0.52	-	-
		Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.5	0.47	-	92
			2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.45	-	92
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.58	-	108

TRH (Total Recoverable Hydrocarbons) in Soil

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

QC Sample	Sample Number		Parameter	Units	LOR	Original	Spike	Recovery%
SE206062.001	LB199208.024		TRH C10-C14	mg/kg	20	2	40	135
			TRH C15-C28	mg/kg	45	5	40	130
			TRH C29-C36	mg/kg	45	17	40	68
			TRH C37-C40	mg/kg	100	0	-	-
			TRH C10-C36 Total	mg/kg	110	0	-	-
			TRH >C10-C40 Total (F bands)	mg/kg	210	0	-	-
		TRH F Bands	TRH >C10-C16	mg/kg	25	2	40	138
			TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	0	-	-
			TRH >C16-C34 (F3)	mg/kg	90	19	40	85
			TRH >C34-C40 (F4)	mg/kg	120	4	-	-

VOC's in Soil

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE206019.001	LB199206.004	Monocyclic	Benzene	mg/kg	0.1	4.0	<0.1	5	80
		Aromatic	Toluene	mg/kg	0.1	4.1	<0.1	5	81
			Ethylbenzene	mg/kg	0.1	4.2	<0.1	5	83
			m/p-xylene	mg/kg	0.2	8.3	<0.2	10	82
			o-xylene	mg/kg	0.1	4.1	<0.1	5	82
		Polycyclic	Naphthalene	mg/kg	0.1	<0.1	<0.1	-	-
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	10.4	9.5	10	104
			d8-toluene (Surrogate)	mg/kg	-	10.3	9.4	10	103
			Bromofluorobenzene (Surrogate)	mg/kg	-	7.2	7.4	10	72
		Totals	Total Xylenes	mg/kg	0.3	12	<0.3	-	-
			Total BTEX	mg/kg	0.6	25	<0.6	-	-

Volatile Petroleum Hydrocarbons in Soil

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE206019.001	LB199206.004		TRH C6-C10	mg/kg	25	69	<25	92.5	74
			TRH C6-C9	mg/kg	20	60	<20	80	75
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	10.4	9.5	10	104
			d8-toluene (Surrogate)	mg/kg	-	10.3	9.4	10	103
			Bromofluorobenzene (Surrogate)	mg/kg	-	7.2	7.4	-	72
		VPH F	Benzene (F0)	mg/kg	0.1	4.0	<0.1	-	-
		Bands	TRH C6-C10 minus BTEX (F1)	mg/kg	25	44	<25	62.5	70

MATRIX SPIKE DUPLICATES

SE206019 R0

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

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

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

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

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

No matrix spike duplicates were required for this job.

Samples analysed as received.

Solid samples expressed on a dry weight basis.

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

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

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

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CHAIN OF CUSTODY RECORD

Eurofins | Environment Testing ABN 50 005 085 521

☑ Sydney Laboratory ☐ Brisbane Laboratory ☐ Perth Laboratory ☐ Melbourne Laboratory

Company	Construction Scenes	Project №	50402000067
Address	31 Anvil Rd, Seven Hills,	Project Name	Lucklandview Rd, Orchard Hills
Contact Name	Beau Dubois	Project Manager	Beau Dubois
Phone №	0435860610	EDD Format (ESdat, EQuIS etc)	Esdat
Special Directions		Sampler(s)	NICHOLAS LEONG
Purchase Order		Handed over by	LL
Quote ID №		Email for Invoice	Beau/Construction Scenes
		Email for Results	Beau.dubois@constructionscenes.com.au

Analyses (Where metals are requested, please specify "Total" or "Filtered". SUITE codes must be listed to ensure correct analytes are performed)

№	Client Sample ID	Sampled Date/Time (dd/mm/yy hh:mm)	Matrix Solid (S) Water (W)	BTEX	BTEX/TRH	PAH	OCP	Asbestos (+/-)	Metals (8)	Hold.	OPP
11	TS/TB	1/5/20	water	X							
12	TP14-0-0.2	5/5/20	soil		X	X	X	X	X		X
13	TP15-0-0.2				X			X	X		
14	TP16-0-0.2			X	X			X	X		
15	TP17-0-0.2			X	X			X	X		
16	TP18-0-0.2			X	X			X	X		
17	R-2		water						X		
18	RB-2								X		
19	QC101			X	X				X		
20	QC102			X	X				X		

Containers (Change container type & size if necessary): 500mL Plastic; 250mL Plastic; 125mL Plastic; 200mL Amber Glass; 40mL VOA vial; 500mL PFAS Bottle; Jar (Glass or HDPE); Other (Asbestos ASK=4, WA Guidelines)

Required Turnaround Time (TAT) (Default will be 5 days if not ticked)

☐ Overnight ☐ 2 Day ☐ 3 Day ☐ Standard ☐ Other

Sample Comments / Dangerous Goods Hazard Warning

SE206019

Total Counts

Please forward SDS for analytes

Method of Shipment: ☐ Courier ☑ Hand Delivered ☐ Postal Name: Beau Dubois Signature: Date: 6/5/20 Time: 8:30 am

Laboratory Use Only												
Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date		Time		Temperature	
Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date	08/05	Time	12:35	Report №	

Eurofins Environment Testing Australia Pty Ltd

Submission of samples to the laboratory will be deemed acceptance of Eurofins | Environment Testing Standard Terms and Conditions unless agreed otherwise. A copy is available on request.

CIP-5.3 AB

1/3

SAMPLE RECEIPT ADVICE

SE206019

CLIENT DETAILS

Contact	Beau Dubois
Client	CONSTRUCTION SCIENCES PTY LTD
Address	31 ANVIL ROAD SEVEN HILLS NSW 2147
Telephone	0435 860 610
Facsimile	61 7 33208599
Email	beau.dubois@constructionsciences.net
Project	**5046200067 Luddenham Rd, Orchard Hills**
Order Number	**5046200067**
Samples	1

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
Samples Received	Fri 8/5/2020
Report Due	Fri 15/5/2020
SGS Reference	**SE206019**

SUBMISSION DETAILS

This is to confirm that 1 sample was received on Friday 8/5/2020. Results are expected to be ready by COB Friday 15/5/2020. Please quote SGS reference SE206019 when making enquiries. Refer below for details relating to sample integrity upon receipt.

Samples clearly labelled	Yes	Complete documentation received	Yes
Sample container provider	SGS	Sample cooling method	Ice Bricks
Samples received in correct containers	Yes	Sample counts by matrix	1 Soil
Date documentation received	8/5/2020	Type of documentation received	COC
Samples received in good order	Yes	Samples received without headspace	Yes
Sample temperature upon receipt	5.3°C	Sufficient sample for analysis	Yes
Turnaround time requested	Standard		

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

COMMENTS

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SAMPLE RECEIPT ADVICE

SE206019

CLIENT DETAILS

Client CONSTRUCTION SCIENCES PTY LTD

Project 5046200067 Luddenham Rd, Orchard Hills

SUMMARY OF ANALYSIS

No.	Sample ID	Mercury in Soil	PAH (Polynuclear Aromatic Hydrocarbons) in Soil	Total Recoverable Elements in Soil/Waste	TRH (Total Recoverable Hydrocarbons) in Soil	VOC's in Soil	Volatile Petroleum Hydrocarbons in Soil
001	QC102	1	26	7	10	11	7

CONTINUED OVERLEAF

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

SAMPLE RECEIPT ADVICE

SE206019

CLIENT DETAILS

Client CONSTRUCTION SCIENCES PTY LTD

Project 5046200067 Luddenham Rd, Orchard Hills

SUMMARY OF ANALYSIS

No.	Sample ID	Moisture Content
001	QC102	1

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

ANALYTICAL REPORT

Accreditation No. 2562

CLIENT DETAILS

Contact	Beau Dubois
Client	CONSTRUCTION SCIENCES PTY LTD
Address	31 ANVIL ROAD SEVEN HILLS NSW 2147
Telephone	0435 860 610
Facsimile	61 7 33208599
Email	beau.dubois@constructionsciences.net
Project	**5046200067 Luddenham Rd Orchard Hills**
Order Number	(Not specified)
Samples	1

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
SGS Reference	**SE206102 R0**
Date Received	11/5/2020
Date Reported	18/5/2020

COMMENTS

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

SIGNATORIES

Dong LIANG
Metals/Inorganics Team Leader

Ly Kim HA
Organic Section Head

VOC's in Soil [AN433] Tested: 12/5/2020

PARAMETER	UOM	LOR	QC202 SOIL - 5/5/2020 SE206102.001
Benzene	mg/kg	0.1	<0.1
Toluene	mg/kg	0.1	<0.1
Ethylbenzene	mg/kg	0.1	<0.1
m/p-xylene	mg/kg	0.2	<0.2
o-xylene	mg/kg	0.1	<0.1
Total Xylenes	mg/kg	0.3	<0.3
Total BTEX	mg/kg	0.6	<0.6
Naphthalene	mg/kg	0.1	<0.1

Volatile Petroleum Hydrocarbons in Soil [AN433] Tested: 12/5/2020

PARAMETER	UOM	LOR	QC202 SOIL - 5/5/2020 SE206102.001
TRH C6-C9	mg/kg	20	<20
Benzene (F0)	mg/kg	0.1	<0.1
TRH C6-C10	mg/kg	25	<25
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25

TRH (Total Recoverable Hydrocarbons) in Soil [AN403] Tested: 12/5/2020

PARAMETER	UOM	LOR	QC202 SOIL - 5/5/2020 SE206102.001
TRH C10-C14	mg/kg	20	<20
TRH C15-C28	mg/kg	45	<45
TRH C29-C36	mg/kg	45	<45
TRH C37-C40	mg/kg	100	<100
TRH >C10-C16	mg/kg	25	<25
TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25
TRH >C16-C34 (F3)	mg/kg	90	<90
TRH >C34-C40 (F4)	mg/kg	120	<120
TRH C10-C36 Total	mg/kg	110	<110
TRH >C10-C40 Total (F bands)	mg/kg	210	<210

PAH (Polynuclear Aromatic Hydrocarbons) in Soil [AN420] Tested: 12/5/2020

PARAMETER	UOM	LOR	QC202 SOIL - 5/5/2020 SE206102.001
Naphthalene	mg/kg	0.1	<0.1
2-methylnaphthalene	mg/kg	0.1	<0.1
1-methylnaphthalene	mg/kg	0.1	<0.1
Acenaphthylene	mg/kg	0.1	<0.1
Acenaphthene	mg/kg	0.1	<0.1
Fluorene	mg/kg	0.1	<0.1
Phenanthrene	mg/kg	0.1	<0.1
Anthracene	mg/kg	0.1	<0.1
Fluoranthene	mg/kg	0.1	<0.1
Pyrene	mg/kg	0.1	<0.1
Benzo(a)anthracene	mg/kg	0.1	<0.1
Chrysene	mg/kg	0.1	<0.1
Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1
Benzo(k)fluoranthene	mg/kg	0.1	<0.1
Benzo(a)pyrene	mg/kg	0.1	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1
Dibenzo(ah)anthracene	mg/kg	0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.1	<0.1
Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.2	<0.2
Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	<0.3
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	<0.2
Total PAH (18)	mg/kg	0.8	<0.8
Total PAH (NEPM/WHO 16)	mg/kg	0.8	<0.8

OC Pesticides in Soil [AN420] Tested: 12/5/2020

PARAMETER	UOM	LOR	QC202 SOIL - 5/5/2020 SE206102.001
Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1
Alpha BHC	mg/kg	0.1	<0.1
Lindane	mg/kg	0.1	<0.1
Heptachlor	mg/kg	0.1	<0.1
Aldrin	mg/kg	0.1	<0.1
Beta BHC	mg/kg	0.1	<0.1
Delta BHC	mg/kg	0.1	<0.1
Heptachlor epoxide	mg/kg	0.1	<0.1
o,p'-DDE	mg/kg	0.1	<0.1
Alpha Endosulfan	mg/kg	0.2	<0.2
Gamma Chlordane	mg/kg	0.1	<0.1
Alpha Chlordane	mg/kg	0.1	<0.1
trans-Nonachlor	mg/kg	0.1	<0.1
p,p'-DDE	mg/kg	0.1	<0.1
Dieldrin	mg/kg	0.2	<0.2
Endrin	mg/kg	0.2	<0.2
o,p'-DDD	mg/kg	0.1	<0.1
o,p'-DDT	mg/kg	0.1	<0.1
Beta Endosulfan	mg/kg	0.2	<0.2
p,p'-DDD	mg/kg	0.1	<0.1
p,p'-DDT	mg/kg	0.1	<0.1
Endosulfan sulphate	mg/kg	0.1	<0.1
Endrin Aldehyde	mg/kg	0.1	<0.1
Methoxychlor	mg/kg	0.1	<0.1
Endrin Ketone	mg/kg	0.1	<0.1
Isodrin	mg/kg	0.1	<0.1
Mirex	mg/kg	0.1	<0.1
Total CLP OC Pesticides	mg/kg	1	<1

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES [AN040/AN320] Tested: 12/5/2020

PARAMETER	UOM	LOR	QC202 SOIL - 5/5/2020 SE206102.001
Arsenic, As	mg/kg	1	<1
Cadmium, Cd	mg/kg	0.3	<0.3
Chromium, Cr	mg/kg	0.5	**1.5**
Copper, Cu	mg/kg	0.5	**8.2**
Lead, Pb	mg/kg	1	**28**
Nickel, Ni	mg/kg	0.5	**1.6**
Zinc, Zn	mg/kg	2	**37**

Mercury in Soil [AN312] Tested: 12/5/2020

PARAMETER	UOM	LOR	QC202 SOIL - 5/5/2020 SE206102.001
Mercury	mg/kg	0.05	<0.05

Moisture Content [AN002] Tested: 12/5/2020

PARAMETER	UOM	LOR	QC202 SOIL - 5/5/2020 SE206102.001
% Moisture	%w/w	1	**4.1**

METHOD	METHODOLOGY SUMMARY
AN002	The test is carried out by drying (at either 40°C or 105°C) a known mass of sample in a weighed evaporating basin. After fully dry the sample is re-weighed. Samples such as sludge and sediment having high percentages of moisture will take some time in a drying oven for complete removal of water.
AN040/AN320	A portion of sample is digested with nitric acid to decompose organic matter and hydrochloric acid to complete the digestion of metals. The digest is then analysed by ICP OES with metals results reported on the dried sample basis. Based on USEPA method 200.8 and 6010C.
AN040	A portion of sample is digested with Nitric acid to decompose organic matter and Hydrochloric acid to complete the digestion of metals and then filtered for analysis by ASS or ICP as per USEPA Method 200.8.
AN312	Mercury by Cold Vapour AAS in Soils: After digestion with nitric acid, hydrogen peroxide and hydrochloric acid, mercury ions are reduced by stannous chloride reagent in acidic solution to elemental mercury. This mercury vapour is purged by nitrogen into a cold cell in an atomic absorption spectrometer or mercury analyser. Quantification is made by comparing absorbances to those of the calibration standards. Reference APHA 3112/3500
AN403	Total Recoverable Hydrocarbons: Determination of Hydrocarbons by gas chromatography after a solvent extraction. Detection is by flame ionisation detector (FID) that produces an electronic signal in proportion to the combustible matter passing through it. Total Recoverable Hydrocarbons (TRH) are routinely reported as four alkane groupings based on the carbon chain length of the compounds: C6-C9, C10-C14, C15-C28 and C29-C36 and in recognition of the NEPM 1999 (2013), >C10-C16 (F2), >C16-C34 (F3) and >C34-C40 (F4). F2 is reported directly and also corrected by subtracting Naphthalene (from VOC method AN433) where available.
AN403	Additionally, the volatile C6-C9 fraction may be determined by a purge and trap technique and GC/MS because of the potential for volatiles loss. Total Recoverable Hydrocarbons - Silica (TRH-Si) follows the same method of analysis after silica gel cleanup of the solvent extract. Aliphatic/Aromatic Speciation follows the same method of analysis after fractionation of the solvent extract over silica with differential polarity of the eluent solvents .
AN403	The GC/FID method is not well suited to the analysis of refined high boiling point materials (ie lubricating oils or greases) but is particularly suited for measuring diesel, kerosene and petrol if care to control volatility is taken. This method will detect naturally occurring hydrocarbons, lipids, animal fats, phenols and PAHs if they are present at sufficient levels, dependent on the use of specific cleanup/fractionation techniques. Reference USEPA 3510B, 8015B.
AN420	(SVOCs) including OC, OP, PCB, Herbicides, PAH, Phthalates and Speciated Phenols (etc) in soils, sediments and waters are determined by GCMS/ECD technique following appropriate solvent extraction process (Based on USEPA 3500C and 8270D).
AN420	SVOC Compounds: Semi-Volatile Organic Compounds (SVOCs) including OC, OP, PCB, Herbicides, PAH, Phthalates and Speciated Phenols in soils, sediments and waters are determined by GCMS/ECD technique following appropriate solvent extraction process (Based on USEPA 3500C and 8270D).
AN433	VOCs and C6-C9 Hydrocarbons by GC-MS P&T: VOC`s are volatile organic compounds. The sample is presented to a gas chromatograph via a purge and trap (P&T) concentrator and autosampler and is detected with a Mass Spectrometer (MSD). Solid samples are initially extracted with methanol whilst liquid samples are processed directly. References: USEPA 5030B, 8020A, 8260.

FOOTNOTES

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

Unless it is reported that sampling has been performed by SGS, the samples have been analysed as received.
Solid samples expressed on a dry weight basis.

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

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

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

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

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

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

The QC and MU criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here: www.sgs.com.au/en-gb/environment-health-and-safety.

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STATEMENT OF QA/QC PERFORMANCE

SE206102 R0

CLIENT DETAILS

Contact	Beau Dubois
Client	CONSTRUCTION SCIENCES PTY LTD
Address	31 ANVIL ROAD SEVEN HILLS NSW 2147
Telephone	0435 860 610
Facsimile	61 7 33208599
Email	beau.dubois@constructionsciences.net
Project	**5046200067 Luddenham Rd Orchard Hills**
Order Number	(Not specified)
Samples	1

LABORATORY DETAILS

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Laboratory	SGS Alexandria Environmental
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Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
SGS Reference	**SE206102 R0**
Date Received	11 May 2020
Date Reported	18 May 2020

COMMENTS

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

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

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

Matrix Spike	Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES	1 item

SAMPLE SUMMARY

HOLDING TIME SUMMARY

SE206102 R0

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

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

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

Mercury in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
QC202	SE206102.001	LB199322	05 May 2020	11 May 2020	02 Jun 2020	12 May 2020	02 Jun 2020	15 May 2020

Moisture Content

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
QC202	SE206102.001	LB199266	05 May 2020	11 May 2020	19 May 2020	12 May 2020	17 May 2020	15 May 2020

OC Pesticides in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
QC202	SE206102.001	LB199259	05 May 2020	11 May 2020	19 May 2020	12 May 2020	21 Jun 2020	18 May 2020

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
QC202	SE206102.001	LB199259	05 May 2020	11 May 2020	19 May 2020	12 May 2020	21 Jun 2020	18 May 2020

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

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
QC202	SE206102.001	LB199317	05 May 2020	11 May 2020	01 Nov 2020	12 May 2020	01 Nov 2020	15 May 2020

TRH (Total Recoverable Hydrocarbons) in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
QC202	SE206102.001	LB199259	05 May 2020	11 May 2020	19 May 2020	12 May 2020	21 Jun 2020	18 May 2020

VOC's in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
QC202	SE206102.001	LB199255	05 May 2020	11 May 2020	19 May 2020	12 May 2020	21 Jun 2020	15 May 2020

Volatile Petroleum Hydrocarbons in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
QC202	SE206102.001	LB199255	05 May 2020	11 May 2020	19 May 2020	12 May 2020	21 Jun 2020	15 May 2020

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

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

OC Pesticides in Soil

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Tetrachloro-m-xylene (TCMX) (Surrogate)	QC202	SE206102.001	%	60 - 130%	92

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2-fluorobiphenyl (Surrogate)	QC202	SE206102.001	%	70 - 130%	76
d14-p-terphenyl (Surrogate)	QC202	SE206102.001	%	70 - 130%	72
d5-nitrobenzene (Surrogate)	QC202	SE206102.001	%	70 - 130%	74

VOC's in Soil

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	QC202	SE206102.001	%	60 - 130%	101
d4-1,2-dichloroethane (Surrogate)	QC202	SE206102.001	%	60 - 130%	113
d8-toluene (Surrogate)	QC202	SE206102.001	%	60 - 130%	114

Volatile Petroleum Hydrocarbons in Soil

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	QC202	SE206102.001	%	60 - 130%	101
d4-1,2-dichloroethane (Surrogate)	QC202	SE206102.001	%	60 - 130%	113
d8-toluene (Surrogate)	QC202	SE206102.001	%	60 - 130%	114

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

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

Mercury in Soil

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

Sample Number	Parameter	Units	LOR	Result
LB199322.001	Mercury	mg/kg	0.05	<0.05

OC Pesticides in Soil

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

Sample Number		Parameter	Units	LOR	Result
LB199259.001		Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1
		Alpha BHC	mg/kg	0.1	<0.1
		Lindane	mg/kg	0.1	<0.1
		Heptachlor	mg/kg	0.1	<0.1
		Aldrin	mg/kg	0.1	<0.1
		Beta BHC	mg/kg	0.1	<0.1
		Delta BHC	mg/kg	0.1	<0.1
		Heptachlor epoxide	mg/kg	0.1	<0.1
		Alpha Endosulfan	mg/kg	0.2	<0.2
		Gamma Chlordane	mg/kg	0.1	<0.1
		Alpha Chlordane	mg/kg	0.1	<0.1
		p,p'-DDE	mg/kg	0.1	<0.1
		Dieldrin	mg/kg	0.2	<0.2
		Endrin	mg/kg	0.2	<0.2
		Beta Endosulfan	mg/kg	0.2	<0.2
		p,p'-DDD	mg/kg	0.1	<0.1
		p,p'-DDT	mg/kg	0.1	<0.1
		Endosulfan sulphate	mg/kg	0.1	<0.1
		Endrin Aldehyde	mg/kg	0.1	<0.1
		Methoxychlor	mg/kg	0.1	<0.1
		Endrin Ketone	mg/kg	0.1	<0.1
		Isodrin	mg/kg	0.1	<0.1
		Mirex	mg/kg	0.1	<0.1
	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	93

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Sample Number		Parameter	Units	LOR	Result
LB199259.001		Naphthalene	mg/kg	0.1	<0.1
		2-methylnaphthalene	mg/kg	0.1	<0.1
		1-methylnaphthalene	mg/kg	0.1	<0.1
		Acenaphthylene	mg/kg	0.1	<0.1
		Acenaphthene	mg/kg	0.1	<0.1
		Fluorene	mg/kg	0.1	<0.1
		Phenanthrene	mg/kg	0.1	<0.1
		Anthracene	mg/kg	0.1	<0.1
		Fluoranthene	mg/kg	0.1	<0.1
		Pyrene	mg/kg	0.1	<0.1
		Benzo(a)anthracene	mg/kg	0.1	<0.1
		Chrysene	mg/kg	0.1	<0.1
		Benzo(a)pyrene	mg/kg	0.1	<0.1
		Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1
		Dibenzo(ah)anthracene	mg/kg	0.1	<0.1
		Benzo(ghi)perylene	mg/kg	0.1	<0.1
		Total PAH (18)	mg/kg	0.8	<0.8
	Surrogates	d5-nitrobenzene (Surrogate)	%	-	85
		2-fluorobiphenyl (Surrogate)	%	-	88
		d14-p-terphenyl (Surrogate)	%	-	88

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

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

Sample Number	Parameter	Units	LOR	Result
LB199317.001	Arsenic, As	mg/kg	1	<1
	Cadmium, Cd	mg/kg	0.3	<0.3
	Chromium, Cr	mg/kg	0.5	<0.5
	Copper, Cu	mg/kg	0.5	<0.5
	Nickel, Ni	mg/kg	0.5	<0.5
	Lead, Pb	mg/kg	1	<1

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

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

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

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

Sample Number	Parameter	Units	LOR	Result
LB199317.001	Zinc, Zn	mg/kg	2	<2.0

TRH (Total Recoverable Hydrocarbons) in Soil

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

Sample Number	Parameter	Units	LOR	Result
LB199259.001	TRH C10-C14	mg/kg	20	<20
	TRH C15-C28	mg/kg	45	<45
	TRH C29-C36	mg/kg	45	<45
	TRH C37-C40	mg/kg	100	<100
	TRH C10-C36 Total	mg/kg	110	<110

VOC's in Soil

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

Sample Number		Parameter	Units	LOR	Result
LB199255.001	Monocyclic Aromatic	Benzene	mg/kg	0.1	<0.1
	Hydrocarbons	Toluene	mg/kg	0.1	<0.1
		Ethylbenzene	mg/kg	0.1	<0.1
		m/p-xylene	mg/kg	0.2	<0.2
		o-xylene	mg/kg	0.1	<0.1
	Polycyclic VOCs	Naphthalene	mg/kg	0.1	<0.1
	Surrogates	d4-1,2-dichloroethane (Surrogate)	%	-	119
		d8-toluene (Surrogate)	%	-	119
		Bromofluorobenzene (Surrogate)	%	-	109
	Totals	Total BTEX	mg/kg	0.6	<0.6

Volatile Petroleum Hydrocarbons in Soil

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

Sample Number		Parameter	Units	LOR	Result
LB199255.001		TRH C6-C9	mg/kg	20	<20
	Surrogates	d4-1,2-dichloroethane (Surrogate)	%	-	119

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

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

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

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

Mercury in Soil

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE206058.008	LB199322.010	Mercury	mg/kg	0.05	<0.05	<0.05	200	0

Moisture Content

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE206058.008	LB199266.027	% Moisture	%w/w	1	17.0	15.8	36	8
SE206098.003	LB199266.011	% Moisture	%w/w	1	17.7	16.7	36	6

OC Pesticides in Soil

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE206058.006	LB199259.030		Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	200	0
			Alpha BHC	mg/kg	0.1	<0.1	<0.1	200	0
			Lindane	mg/kg	0.1	<0.1	<0.1	200	0
			Heptachlor	mg/kg	0.1	<0.1	<0.1	200	0
			Aldrin	mg/kg	0.1	<0.1	<0.1	200	0
			Beta BHC	mg/kg	0.1	<0.1	<0.1	200	0
			Delta BHC	mg/kg	0.1	<0.1	<0.1	200	0
			Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	200	0
			o,p'-DDE	mg/kg	0.1	<0.1	<0.1	200	0
			Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	200	0
			Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	200	0
			Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	200	0
			trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	200	0
			p,p'-DDE	mg/kg	0.1	<0.1	<0.1	200	0
			Dieldrin	mg/kg	0.2	<0.2	<0.2	200	0
			Endrin	mg/kg	0.2	<0.2	<0.2	200	0
			o,p'-DDD	mg/kg	0.1	<0.1	<0.1	200	0
			o,p'-DDT	mg/kg	0.1	<0.1	<0.1	200	0
			Beta Endosulfan	mg/kg	0.2	<0.2	<0.2	200	0
			p,p'-DDD	mg/kg	0.1	<0.1	<0.1	200	0
			p,p'-DDT	mg/kg	0.1	<0.1	<0.1	200	0
			Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	200	0
			Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1	200	0
			Methoxychlor	mg/kg	0.1	<0.1	<0.1	200	0
			Endrin Ketone	mg/kg	0.1	<0.1	<0.1	200	0
			Isodrin	mg/kg	0.1	<0.1	<0.1	200	0
			Mirex	mg/kg	0.1	<0.1	<0.1	200	0
			Total CLP OC Pesticides	mg/kg	1	<1	<1	200	0
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.18	0.16	30	8

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE206098.009	LB199259.031	Naphthalene	mg/kg	0.1	<0.1	0.0074675035	200	0
		2-methylnaphthalene	mg/kg	0.1	<0.1	0.0078156865	200	0
		1-methylnaphthalene	mg/kg	0.1	<0.1	0.0066038826	200	0
		Acenaphthylene	mg/kg	0.1	<0.1	0.0106412576	200	0
		Acenaphthene	mg/kg	0.1	<0.1	0.0029230085	200	0
		Fluorene	mg/kg	0.1	<0.1	0.0048127504	200	0
		Phenanthrene	mg/kg	0.1	0.1	0.0442194130	145	26
		Anthracene	mg/kg	0.1	<0.1	0.0424204492	200	0
		Fluoranthene	mg/kg	0.1	0.2	0.1237818289	87	60
		Pyrene	mg/kg	0.1	0.2	0.1336264993	85	53
		Benzo(a)anthracene	mg/kg	0.1	0.1	0.0897649420	135	0
		Chrysene	mg/kg	0.1	<0.1	0.0931189447	139	0
		Benzo(b&j)fluoranthene	mg/kg	0.1	0.2	0.1224127594	103	20
		Benzo(k)fluoranthene	mg/kg	0.1	<0.1	0.0464792363	188	0
		Benzo(a)pyrene	mg/kg	0.1	0.1	0.1039680514	115	22
		Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	0.0719953739	158	0
		Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	0.0092248599	200	0

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

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

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

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

PAH (Polynuclear Aromatic Hydrocarbons) in Soil (continued)

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE206098.009	LB199259.031		Benzo(ghi)perylene	mg/kg	0.1	0.1	0.0660026987	149	2
			Carcinogenic PAHs, BaP TEQ <LOR=0	mg/kg	0.2	<0.2	0.1039680514	159	0
			Carcinogenic PAHs, BaP TEQ <LOR=LOR	mg/kg	0.3	<0.3	0.2459680514	125	0
			Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	mg/kg	0.2	0.2	0.1749680514	111	9
			Total PAH (18)	mg/kg	0.8	1.2	0.3613763797	136	36
		Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.4	0.3882620977	30	6
			2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.4025509981	30	3
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.4	0.4130394634	30	7
SE206098.011	LB199259.032		Naphthalene	mg/kg	0.1	<0.1	0.0035336474	200	0
			2-methylnaphthalene	mg/kg	0.1	<0.1	0.0046302861	200	0
			1-methylnaphthalene	mg/kg	0.1	<0.1	0.0054935610	200	0
			Acenaphthylene	mg/kg	0.1	<0.1	0	200	0
			Acenaphthene	mg/kg	0.1	<0.1	0	200	0
			Fluorene	mg/kg	0.1	<0.1	0.0030650237	200	0
			Phenanthrene	mg/kg	0.1	<0.1	0.0238831302	200	0
			Anthracene	mg/kg	0.1	<0.1	0.0232707480	200	0
			Fluoranthene	mg/kg	0.1	<0.1	0.0177417210	200	0
			Pyrene	mg/kg	0.1	<0.1	0.0172388643	200	0
			Benzo(a)anthracene	mg/kg	0.1	<0.1	0.0300263734	200	0
			Chrysene	mg/kg	0.1	<0.1	0.0321663301	200	0
			Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	0.0200921846	200	0
			Benzo(k)fluoranthene	mg/kg	0.1	<0.1	0.0139940156	200	0
			Benzo(a)pyrene	mg/kg	0.1	<0.1	0.0078718326	200	0
			Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	0.0044097175	200	0
			Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	0	200	0
			Benzo(ghi)perylene	mg/kg	0.1	<0.1	0.0063833913	200	0
			Carcinogenic PAHs, BaP TEQ <LOR=0	mg/kg	0.2	<0.2	0	200	0
			Carcinogenic PAHs, BaP TEQ <LOR=LOR	mg/kg	0.3	<0.3	0.242	134	0
			Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	mg/kg	0.2	<0.2	0.121	175	0
			Total PAH (18)	mg/kg	0.8	<0.8	0	200	0
		Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.4	0.3847815587	30	3
			2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.4163516338	30	1
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.4	0.3944032980	30	1

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

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE206058.008	LB199317.024	Arsenic, As	mg/kg	1	7	7	45	6
		Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	200	0
		Chromium, Cr	mg/kg	0.5	13	14	34	8
		Copper, Cu	mg/kg	0.5	17	19	33	12
		Nickel, Ni	mg/kg	0.5	8.8	10	35	16
		Lead, Pb	mg/kg	1	19	20	35	9
		Zinc, Zn	mg/kg	2	41	49	34	17
SE206098.008	LB199317.014	Lead, Pb	mg/kg	1	22	22	35	0

TRH (Total Recoverable Hydrocarbons) in Soil

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE206098.009	LB199259.031		TRH C10-C14	mg/kg	20	<20	0	200	0
			TRH C15-C28	mg/kg	45	<45	0	200	0
			TRH C29-C36	mg/kg	45	<45	0	200	0
			TRH C37-C40	mg/kg	100	<100	0	200	0
			TRH C10-C36 Total	mg/kg	110	<110	0	200	0
			TRH >C10-C40 Total (F bands)	mg/kg	210	<210	0	200	0
		TRH F Bands	TRH >C10-C16	mg/kg	25	<25	0	200	0
			TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25	0	200	0
			TRH >C16-C34 (F3)	mg/kg	90	<90	0	200	0
			TRH >C34-C40 (F4)	mg/kg	120	<120	0	200	0
SE206098.011	LB199259.032		TRH C10-C14	mg/kg	20	<20	0	200	0
			TRH C15-C28	mg/kg	45	<45	0	200	0
			TRH C29-C36	mg/kg	45	<45	0	200	0
			TRH C37-C40	mg/kg	100	<100	0	200	0
			TRH C10-C36 Total	mg/kg	110	<110	0	200	0

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

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

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

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

TRH (Total Recoverable Hydrocarbons) in Soil (continued)

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE206098.011	LB199259.032		TRH >C10-C40 Total (F bands)	mg/kg	210	<210	0	200	0
		TRH F Bands	TRH >C10-C16	mg/kg	25	<25	0	200	0
			TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25	0	200	0
			TRH >C16-C34 (F3)	mg/kg	90	<90	0	200	0
			TRH >C34-C40 (F4)	mg/kg	120	<120	0	200	0

VOC's in Soil

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE206058.008	LB199255.023	Monocyclic	Benzene	mg/kg	0.1	<0.1	<0.1	200	0
		Aromatic	Toluene	mg/kg	0.1	<0.1	<0.1	200	0
			Ethylbenzene	mg/kg	0.1	<0.1	<0.1	200	0
			m/p-xylene	mg/kg	0.2	<0.2	<0.2	200	0
			o-xylene	mg/kg	0.1	<0.1	<0.1	200	0
		Polycyclic	Naphthalene	mg/kg	0.1	<0.1	<0.1	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	10.0	11.5	50	14
			d8-toluene (Surrogate)	mg/kg	-	10.0	11.5	50	14
			Bromofluorobenzene (Surrogate)	mg/kg	-	9.1	10.1	50	10
		Totals	Total Xylenes	mg/kg	0.3	<0.3	<0.3	200	0
			Total BTEX	mg/kg	0.6	<0.6	<0.6	200	0
SE206098.009	LB199255.014	Monocyclic	Benzene	mg/kg	0.1	<0.1	<0.1	200	0
		Aromatic	Toluene	mg/kg	0.1	<0.1	<0.1	200	0
			Ethylbenzene	mg/kg	0.1	<0.1	<0.1	200	0
			m/p-xylene	mg/kg	0.2	<0.2	<0.2	200	0
			o-xylene	mg/kg	0.1	<0.1	<0.1	200	0
		Polycyclic	Naphthalene	mg/kg	0.1	<0.1	<0.1	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	11.6	10.5	50	10
			d8-toluene (Surrogate)	mg/kg	-	11.5	10.4	50	11
			Bromofluorobenzene (Surrogate)	mg/kg	-	10.0	9.1	50	10
		Totals	Total Xylenes	mg/kg	0.3	<0.3	<0.3	200	0
			Total BTEX	mg/kg	0.6	<0.6	<0.6	200	0

Volatile Petroleum Hydrocarbons in Soil

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE206058.008	LB199255.023		TRH C6-C10	mg/kg	25	<25	<25	200	0
			TRH C6-C9	mg/kg	20	<20	<20	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	10.0	11.5	30	14
			d8-toluene (Surrogate)	mg/kg	-	10.0	11.5	30	14
			Bromofluorobenzene (Surrogate)	mg/kg	-	9.1	10.1	30	10
		VPH F Bands	Benzene (F0)	mg/kg	0.1	<0.1	<0.1	200	0
			TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	200	0
SE206098.009	LB199255.014		TRH C6-C10	mg/kg	25	<25	<25	200	0
			TRH C6-C9	mg/kg	20	<20	<20	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	11.6	10.5	30	10
			d8-toluene (Surrogate)	mg/kg	-	11.5	10.4	30	11
			Bromofluorobenzene (Surrogate)	mg/kg	-	10.0	9.1	30	10
		VPH F Bands	Benzene (F0)	mg/kg	0.1	<0.1	<0.1	200	0
			TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	200	0

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

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

Mercury in Soil

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB199322.002	Mercury	mg/kg	0.05	0.19	0.2	70 - 130	95

OC Pesticides in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB199259.002		Heptachlor	mg/kg	0.1	0.2	0.2	60 - 140	111
		Aldrin	mg/kg	0.1	0.2	0.2	60 - 140	117
		Delta BHC	mg/kg	0.1	0.2	0.2	60 - 140	115
		Dieldrin	mg/kg	0.2	0.2	0.2	60 - 140	114
		Endrin	mg/kg	0.2	0.2	0.2	60 - 140	117
		p,p'-DDT	mg/kg	0.1	0.1	0.2	60 - 140	74
	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.15	0.15	40 - 130	97

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB199259.002		Naphthalene	mg/kg	0.1	3.9	4	60 - 140	96
		Acenaphthylene	mg/kg	0.1	4.0	4	60 - 140	101
		Acenaphthene	mg/kg	0.1	3.9	4	60 - 140	97
		Phenanthrene	mg/kg	0.1	3.8	4	60 - 140	95
		Anthracene	mg/kg	0.1	3.6	4	60 - 140	90
		Fluoranthene	mg/kg	0.1	3.6	4	60 - 140	89
		Pyrene	mg/kg	0.1	3.9	4	60 - 140	97
		Benzo(a)pyrene	mg/kg	0.1	4.3	4	60 - 140	106
	Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.4	0.5	40 - 130	84
		2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.5	40 - 130	82
		d14-p-terphenyl (Surrogate)	mg/kg	-	0.4	0.5	40 - 130	84

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

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB199317.002	Arsenic, As	mg/kg	1	350	318.22	80 - 120	109
	Cadmium, Cd	mg/kg	0.3	5.4	5.41	80 - 120	100
	Chromium, Cr	mg/kg	0.5	43	38.31	80 - 120	112
	Copper, Cu	mg/kg	0.5	300	290	80 - 120	105
	Nickel, Ni	mg/kg	0.5	190	187	80 - 120	103
	Lead, Pb	mg/kg	1	95	89.9	80 - 120	105
	Zinc, Zn	mg/kg	2	280	273	80 - 120	104

TRH (Total Recoverable Hydrocarbons) in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB199259.002		TRH C10-C14	mg/kg	20	48	40	60 - 140	120
		TRH C15-C28	mg/kg	45	<45	40	60 - 140	105
		TRH C29-C36	mg/kg	45	<45	40	60 - 140	78
	TRH F Bands	TRH >C10-C16	mg/kg	25	48	40	60 - 140	120
		TRH >C16-C34 (F3)	mg/kg	90	<90	40	60 - 140	90
		TRH >C34-C40 (F4)	mg/kg	120	<120	20	60 - 140	70

VOC's in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB199255.002	Monocyclic	Benzene	mg/kg	0.1	3.8	5	60 - 140	76
	Aromatic	Toluene	mg/kg	0.1	4.0	5	60 - 140	79
		Ethylbenzene	mg/kg	0.1	4.2	5	60 - 140	84
		m/p-xylene	mg/kg	0.2	8.4	10	60 - 140	84
		o-xylene	mg/kg	0.1	4.2	5	60 - 140	84
	Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	11.2	10	70 - 130	112
		d8-toluene (Surrogate)	mg/kg	-	11.5	10	70 - 130	115
		Bromofluorobenzene (Surrogate)	mg/kg	-	10.4	10	70 - 130	104

Volatile Petroleum Hydrocarbons in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB199255.002		TRH C6-C10	mg/kg	25	77	92.5	60 - 140	83
		TRH C6-C9	mg/kg	20	68	80	60 - 140	85
	Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	11.2	10	70 - 130	112
		Bromofluorobenzene (Surrogate)	mg/kg	-	10.4	10	70 - 130	104

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

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

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB199255.002	VPH F Bands	TRH C6-C10 minus BTEX (F1)	mg/kg	25	53	62.5	60 - 140	84

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

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

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE206098.001	LB199259.030		Naphthalene	mg/kg	0.1	3.7	<0.1	4	93
			2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	-	-
			1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	-	-
			Acenaphthylene	mg/kg	0.1	3.9	<0.1	4	98
			Acenaphthene	mg/kg	0.1	3.8	<0.1	4	95
			Fluorene	mg/kg	0.1	<0.1	<0.1	-	-
			Phenanthrene	mg/kg	0.1	3.8	<0.1	4	94
			Anthracene	mg/kg	0.1	3.5	<0.1	4	85
			Fluoranthene	mg/kg	0.1	3.5	<0.1	4	87
			Pyrene	mg/kg	0.1	3.8	<0.1	4	93
			Benzo(a)anthracene	mg/kg	0.1	<0.1	<0.1	-	-
			Chrysene	mg/kg	0.1	<0.1	<0.1	-	-
			Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	<0.1	-	-
			Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	-	-
			Benzo(a)pyrene	mg/kg	0.1	4.2	<0.1	4	105
			Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	-	-
			Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1	-	-
			Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	-	-
			Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.2	4.2	<0.2	-	-
			Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	4.4	<0.3	-	-
			Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	4.3	<0.2	-	-
			Total PAH (18)	mg/kg	0.8	30	<0.8	-	-
		Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.4	0.4	-	75
			2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.4	-	78
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.4	0.4	-	73

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

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

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE206073.001	LB199317.004	Arsenic, As	mg/kg	1	53	5	50	96
		Cadmium, Cd	mg/kg	0.3	44	<0.3	50	87
		Chromium, Cr	mg/kg	0.5	55	7.2	50	95
		Copper, Cu	mg/kg	0.5	67	22	50	90
		Nickel, Ni	mg/kg	0.5	50	3.2	50	94
		Lead, Pb	mg/kg	1	130	110	50	42 ⑨
		Zinc, Zn	mg/kg	2	180	150	50	74

TRH (Total Recoverable Hydrocarbons) in Soil

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE206098.001	LB199259.030		TRH C10-C14	mg/kg	20	35	<20	40	88
			TRH C15-C28	mg/kg	45	49	<45	40	123
			TRH C29-C36	mg/kg	45	<45	<45	40	70
			TRH C37-C40	mg/kg	100	<100	<100	-	-
			TRH C10-C36 Total	mg/kg	110	<110	<110	-	-
			TRH >C10-C40 Total (F bands)	mg/kg	210	<210	<210	-	-
		TRH F Bands	TRH >C10-C16	mg/kg	25	35	<25	40	88
			TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	35	<25	-	-
			TRH >C16-C34 (F3)	mg/kg	90	<90	<90	40	123
			TRH >C34-C40 (F4)	mg/kg	120	<120	<120	-	-

VOC's in Soil

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE206102.001	LB199255.004	Monocyclic Aromatic	Benzene	mg/kg	0.1	3.5	<0.1	5	71
			Toluene	mg/kg	0.1	3.8	<0.1	5	74
			Ethylbenzene	mg/kg	0.1	4.0	<0.1	5	79
			m/p-xylene	mg/kg	0.2	8.0	<0.2	10	79
			o-xylene	mg/kg	0.1	4.0	<0.1	5	79
		Polycyclic	Naphthalene	mg/kg	0.1	<0.1	<0.1	-	-
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	10.7	11.3	10	107
			d8-toluene (Surrogate)	mg/kg	-	10.9	11.4	10	109
			Bromofluorobenzene (Surrogate)	mg/kg	-	10.0	10.1	10	100
		Totals	Total Xylenes	mg/kg	0.3	12	<0.3	-	-
			Total BTEX	mg/kg	0.6	23	<0.6	-	-

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

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

Volatile Petroleum Hydrocarbons in Soil

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE206102.001	LB199255.004		TRH C6-C10	mg/kg	25	72	<25	92.5	77
			TRH C6-C9	mg/kg	20	65	<20	80	80
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	10.7	11.3	10	107
			d8-toluene (Surrogate)	mg/kg	-	10.9	11.4	10	109
			Bromofluorobenzene (Surrogate)	mg/kg	-	10.0	10.1	-	100
		VPH F	Benzene (F0)	mg/kg	0.1	3.5	<0.1	-	-
		Bands	TRH C6-C10 minus BTEX (F1)	mg/kg	25	48	<25	62.5	76

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

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

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

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

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

No matrix spike duplicates were required for this job.

Samples analysed as received.

Solid samples expressed on a dry weight basis.

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

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

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

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source: [Untitled].pdf page: 1 SGS Ref: SE206102_COC

#AU04_Enviro_Sample_NSW

From: Beau Dubois <beau.dubois@constructionsciences.net>
Sent: Friday, 8 May 2020 9:15 AM
To: #AU04_Enviro_Sample_NSW
Cc: Ursula Long
Subject: RE: Eurofins Sample Receipt Advice - Report 717918 : Site LUDDENHAM RD ORCHARD HILLS (5046200067)

Follow Up Flag: Follow up
Flag Status: Completed

Hi Luca,

Could you please proceed to analyse the following 14 samples (previously on hold):

SP1-1, -2, -3,
SP2-1, -2, -3,
SP3-1, -2, -3,
SP4-1, -2, -3,
QC201,
QC202, (Please forward to SGS lab for analysis)

Analyse all samples (Jars) for B9 soil suite: TRH/BTEX/PAH/OCP/M8
Also analyse all Asbestos (bags) NEPM w/w% (Excluding QC201/QC202)

All standard turnaround time please.

Cheers,

Beau Dubois
SENIOR ENVIRONMENTAL SCIENTIST
CONSTRUCTION SCIENCES

SGS EHS Alexandria Laboratory
SE206102 COC
Received: 11 – May – 2020

Construction Sciences

Phone Direct
Address 31 Anvil Road, Seven Hills, New South Wales 2147 Australia

Email beau.dubois@www.constructionsciences.net Web www.constructionsciences.net

CONNECT WITH CONSTRUCTION SCIENCES

Construction Sciences management systems are certified to ISO9001 (quality) and ISO45001 (occupational health and safety)

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From: EnviroSampleNSW@eurofins.com <EnviroSampleNSW@eurofins.com>
Sent: Thursday, 7 May 2020 12:35 PM
To: Beau Dubois <beau.dubois@constructionsciences.net>
Subject: Eurofins Sample Receipt Advice - Report 717918 : Site LUDDENHAM RD ORCHARD HILLS (5046200067)

Dear Valued Client,

SAMPLE RECEIPT ADVICE

SE206102

CLIENT DETAILS

Contact	Beau Dubois
Client	CONSTRUCTION SCIENCES PTY LTD
Address	31 ANVIL ROAD SEVEN HILLS NSW 2147
Telephone	0435 860 610
Facsimile	61 7 33208599
Email	beau.dubois@constructionsciences.net
Project	**5046200067 Luddenham Rd Orchard Hills**
Order Number	(Not specified)
Samples	1

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
Samples Received	Mon 11/5/2020
Report Due	Mon 18/5/2020
SGS Reference	**SE206102**

SUBMISSION DETAILS

This is to confirm that 1 sample was received on Monday 11/5/2020. Results are expected to be ready by COB Monday 18/5/2020. Please quote SGS reference SE206102 when making enquiries. Refer below for details relating to sample integrity upon receipt.

Samples clearly labelled	Yes	Complete documentation received	Yes
Sample container provider	Other Lab	Sample cooling method	Ice Bricks
Samples received in correct containers	Yes	Sample counts by matrix	1 Soil
Date documentation received	11/5/2020	Type of documentation received	Email
Samples received in good order	Yes	Samples received without headspace	Yes
Sample temperature upon receipt	12°C	Sufficient sample for analysis	Yes
Turnaround time requested	Standard		

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

COMMENTS

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SAMPLE RECEIPT ADVICE

SE206102

CLIENT DETAILS

Client CONSTRUCTION SCIENCES PTY LTD

Project 5046200067 Luddenham Rd Orchard Hills

SUMMARY OF ANALYSIS

No.	Sample ID	Mercury in Soil	OC Pesticides in Soil	PAH (Polynuclear Aromatic Hydrocarbons) in Soil	Total Recoverable Elements in Soil/Waste	TRH (Total Recoverable Hydrocarbons) in Soil	VOC's in Soil	Volatile Petroleum Hydrocarbons in Soil
001	QC202	1	29	26	7	10	11	7

CONTINUED OVERLEAF

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

SAMPLE RECEIPT ADVICE

SE206102

CLIENT DETAILS

Client CONSTRUCTION SCIENCES PTY LTD

Project 5046200067 Luddenham Rd Orchard Hills

SUMMARY OF ANALYSIS

No.	Sample ID	Moisture Content
001	QC202	1

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

221-227 and 289-311
Luddenham Road,
Orchard Hill, NSW, 2748

APPENDIX
M

95% UCL

5046200067

Stockpile Results 95% UCL Calculations

UCL Statistics for Uncensored Full Data Sets

User Selected Options	
Date/Time of Computation	ProUCL 5.126/05/2020 2:06:58 PM
From File	WorkSheet.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

F3

General Statistics

Total Number of Observations	12	Number of Distinct Observations	9
		Number of Missing Observations	0
Minimum	50	Mean	247.5
Maximum	510	Median	280
SD	141.9	Std. Error of Mean	40.98
Coefficient of Variation	0.574	Skewness	-0.0683

Normal GOF Test

Shapiro Wilk Test Statistic	0.919	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.859	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.174	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.243	Data appear Normal at 5% Significance Level

Data appear Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	321.1	95% Adjusted-CLT UCL (Chen-1995)	314
		95% Modified-t UCL (Johnson-1978)	321

Gamma GOF Test

A-D Test Statistic	0.999	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.741	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.243	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.248	Detected data appear Gamma Distributed at 5% Significance Level

Detected data follow Appr. Gamma Distribution at 5% Significance Level

Gamma Statistics

k hat (MLE)	2.165	k star (bias corrected MLE)	1.679
Theta hat (MLE)	114.3	Theta star (bias corrected MLE)	147.4
nu hat (MLE)	51.95	nu star (bias corrected)	40.3
MLE Mean (bias corrected)	247.5	MLE Sd (bias corrected)	191
		Approximate Chi Square Value (0.05)	26.75
Adjusted Level of Significance	0.029	Adjusted Chi Square Value	25.08

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	372.8	95% Adjusted Gamma UCL (use when n<50)	397.7

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.781	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.859	Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.267	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.243	Data Not Lognormal at 5% Significance Level

Data Not Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	3.912	Mean of logged Data	5.263
Maximum of Logged Data	6.234	SD of logged Data	0.847

Assuming Lognormal Distribution

95% H-UCL	543.4	90% Chebyshev (MVUE) UCL	472.2
95% Chebyshev (MVUE) UCL	565.6	97.5% Chebyshev (MVUE) UCL	695.2
99% Chebyshev (MVUE) UCL	949.7		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	314.9	95% Jackknife UCL	321.1
95% Standard Bootstrap UCL	311.3	95% Bootstrap-t UCL	323.1
95% Hall's Bootstrap UCL	315	95% Percentile Bootstrap UCL	313.3
95% BCA Bootstrap UCL	309.2		
90% Chebyshev(Mean, Sd) UCL	370.4	95% Chebyshev(Mean, Sd) UCL	426.1
97.5% Chebyshev(Mean, Sd) UCL	503.4	99% Chebyshev(Mean, Sd) UCL	655.2

Suggested UCL to Use

95% Student's-t UCL 321.1

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.

5046200067

Stockpile Results 95% UCL Calculations

F4

General Statistics

Total Number of Observations	12	Number of Distinct Observations	9
		Number of Missing Observations	0
Minimum	50	Mean	434.2
Maximum	690	Median	520
SD	243.6	Std. Error of Mean	70.33
Coefficient of Variation	0.561	Skewness	-0.961

Normal GOF Test

Shapiro Wilk Test Statistic	0.8	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.859	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.241	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.243	Data appear Normal at 5% Significance Level

Data appear Approximate Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	560.5	95% Adjusted-CLT UCL (Chen-1995)	529
		95% Modified-t UCL (Johnson-1978)	557.2

Gamma GOF Test

A-D Test Statistic	1.814	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.745	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.341	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.249	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.554	k star (bias corrected MLE)	1.221
Theta hat (MLE)	279.3	Theta star (bias corrected MLE)	355.5
nu hat (MLE)	37.3	nu star (bias corrected)	29.31
MLE Mean (bias corrected)	434.2	MLE Sd (bias corrected)	392.9
		Approximate Chi Square Value (0.05)	17.95
Adjusted Level of Significance	0.029	Adjusted Chi Square Value	16.61

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	708.9	95% Adjusted Gamma UCL (use when n<50)	766.3

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.659	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.859	Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.365	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.243	Data Not Lognormal at 5% Significance Level

Data Not Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	3.912	Mean of logged Data	5.718
Maximum of Logged Data	6.537	SD of logged Data	1.098

Assuming Lognormal Distribution

95% H-UCL	1550	90% Chebyshev (MVUE) UCL	1048
95% Chebyshev (MVUE) UCL	1288	97.5% Chebyshev (MVUE) UCL	1621
99% Chebyshev (MVUE) UCL	2276		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	549.8	95% Jackknife UCL	560.5
95% Standard Bootstrap UCL	545.1	95% Bootstrap-t UCL	537.2
95% Hall's Bootstrap UCL	527.7	95% Percentile Bootstrap UCL	540.8
95% BCA Bootstrap UCL	532.5		
90% Chebyshev(Mean, Sd) UCL	645.2	95% Chebyshev(Mean, Sd) UCL	740.7
97.5% Chebyshev(Mean, Sd) UCL	873.4	99% Chebyshev(Mean, Sd) UCL	1134

Suggested UCL to Use

95% Student's-t UCL 560.5

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test

When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.

5046200067

Stockpile Results 95% UCL Calculations

Arsenic

General Statistics

Total Number of Observations	12	Number of Distinct Observations	10
		Number of Missing Observations	0
Minimum	1	Mean	4.192
Maximum	7.1	Median	4.6
SD	2.16	Std. Error of Mean	0.624
Coefficient of Variation	0.515	Skewness	-0.515

Normal GOF Test

Shapiro Wilk Test Statistic	0.885	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.859	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.196	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.243	Data appear Normal at 5% Significance Level

Data appear Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	5.312	95% Adjusted-CLT UCL (Chen-1995)	5.118
		95% Modified-t UCL (Johnson-1978)	5.296

Gamma GOF Test

A-D Test Statistic	1.14	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.74	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.288	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.248	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	2.604	k star (bias corrected MLE)	2.009
Theta hat (MLE)	1.61	Theta star (bias corrected MLE)	2.087
nu hat (MLE)	62.5	nu star (bias corrected)	48.21
MLE Mean (bias corrected)	4.192	MLE Sd (bias corrected)	2.958
		Approximate Chi Square Value (0.05)	33.27
Adjusted Level of Significance	0.029	Adjusted Chi Square Value	31.38

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	6.074	95% Adjusted Gamma UCL (use when n<50)	6.438

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.753	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.859	Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.319	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.243	Data Not Lognormal at 5% Significance Level

Data Not Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	0	Mean of logged Data	1.229
Maximum of Logged Data	1.96	SD of logged Data	0.763

Assuming Lognormal Distribution

95% H-UCL	8.151	90% Chebyshev (MVUE) UCL	7.516
95% Chebyshev (MVUE) UCL	8.909	97.5% Chebyshev (MVUE) UCL	10.84
99% Chebyshev (MVUE) UCL	14.64		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	5.217	95% Jackknife UCL	5.312
95% Standard Bootstrap UCL	5.184	95% Bootstrap-t UCL	5.147
95% Hall's Bootstrap UCL	5.104	95% Percentile Bootstrap UCL	5.1
95% BCA Bootstrap UCL	5.083		
90% Chebyshev(Mean, Sd) UCL	6.062	95% Chebyshev(Mean, Sd) UCL	6.91
97.5% Chebyshev(Mean, Sd) UCL	8.086	99% Chebyshev(Mean, Sd) UCL	10.4

Suggested UCL to Use

95% Student's-t UCL 5.312

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.

5046200067

Stockpile Results 95% UCL Calculations

Cadmium

General Statistics

Total Number of Observations	12	Number of Distinct Observations	2
		Number of Missing Observations	0
Minimum	0.2	Mean	0.258
Maximum	0.9	Median	0.2
SD	0.202	Std. Error of Mean	0.0583
Coefficient of Variation	0.782	Skewness	3.464

Normal GOF Test

Shapiro Wilk Test Statistic	0.327	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.859	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.53	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.243	Data Not Normal at 5% Significance Level	

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	0.363	95% Adjusted-CLT UCL (Chen-1995)	0.417
		95% Modified-t UCL (Johnson-1978)	0.373

Gamma GOF Test

A-D Test Statistic	4.125	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.736	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.542	**Kolmogorov-Smirnov Gamma GOF Test**	
5% K-S Critical Value	0.246	Data Not Gamma Distributed at 5% Significance Level	

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	3.988	k star (bias corrected MLE)	3.046
Theta hat (MLE)	0.0648	Theta star (bias corrected MLE)	0.0848
nu hat (MLE)	95.71	nu star (bias corrected)	73.11
MLE Mean (bias corrected)	0.258	MLE Sd (bias corrected)	0.148
		Approximate Chi Square Value (0.05)	54.42
Adjusted Level of Significance	0.029	Adjusted Chi Square Value	51.97

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	0.347	95% Adjusted Gamma UCL (use when n<50)	0.363

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.327	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.859	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.53	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.243	Data Not Lognormal at 5% Significance Level	

Data Not Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	-1.609	Mean of logged Data	-1.484
Maximum of Logged Data	-0.105	SD of logged Data	0.434

Assuming Lognormal Distribution

95% H-UCL	0.326	90% Chebyshev (MVUE) UCL	0.342
95% Chebyshev (MVUE) UCL	0.384	97.5% Chebyshev (MVUE) UCL	0.444
99% Chebyshev (MVUE) UCL	0.561		

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution (0.05)

Nonparametric Distribution Free UCLs

95% CLT UCL	0.354	95% Jackknife UCL	N/A
95% Standard Bootstrap UCL	N/A	95% Bootstrap-t UCL	N/A
95% Hall's Bootstrap UCL	N/A	95% Percentile Bootstrap UCL	N/A
95% BCA Bootstrap UCL	N/A		
90% Chebyshev(Mean, Sd) UCL	0.433	95% Chebyshev(Mean, Sd) UCL	0.513
97.5% Chebyshev(Mean, Sd) UCL	0.623	99% Chebyshev(Mean, Sd) UCL	0.839

Suggested UCL to Use

95% Student's-t UCL	0.363	or 95% Modified-t UCL	0.373

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

5046200067

Stockpile Results 95% UCL Calculations

Chromium

General Statistics

Total Number of Observations	12	Number of Distinct Observations	10
		Number of Missing Observations	0
Minimum	2.5	Mean	60.71
Maximum	120	Median	72.5
SD	43.29	Std. Error of Mean	12.5
Coefficient of Variation	0.713	Skewness	-0.265

Normal GOF Test

Shapiro Wilk Test Statistic	0.894	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.859	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.189	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.243	Data appear Normal at 5% Significance Level

Data appear Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	83.15	95% Adjusted-CLT UCL (Chen-1995)	80.24
		95% Modified-t UCL (Johnson-1978)	82.99

Gamma GOF Test

A-D Test Statistic	1.185	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.76	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.242	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.253	Detected data appear Gamma Distributed at 5% Significance Level

Detected data follow Appr. Gamma Distribution at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.902	k star (bias corrected MLE)	0.732
Theta hat (MLE)	67.32	Theta star (bias corrected MLE)	82.94
nu hat (MLE)	21.64	nu star (bias corrected)	17.57
MLE Mean (bias corrected)	60.71	MLE Sd (bias corrected)	70.96
		Approximate Chi Square Value (0.05)	9.078
Adjusted Level of Significance	0.029	Adjusted Chi Square Value	8.162

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	117.5	95% Adjusted Gamma UCL (use when n<50)	130.7

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.728	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.859	Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.275	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.243	Data Not Lognormal at 5% Significance Level

Data Not Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	0.916	Mean of logged Data	3.458
Maximum of Logged Data	4.787	SD of logged Data	1.58

Assuming Lognormal Distribution

95% H-UCL	764.7	90% Chebyshev (MVUE) UCL	228.9
95% Chebyshev (MVUE) UCL	291.1	97.5% Chebyshev (MVUE) UCL	377.4
99% Chebyshev (MVUE) UCL	546.9		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	81.26	95% Jackknife UCL	83.15
95% Standard Bootstrap UCL	80.25	95% Bootstrap-t UCL	81.54
95% Hall's Bootstrap UCL	78.87	95% Percentile Bootstrap UCL	80.04
95% BCA Bootstrap UCL	79.21		
90% Chebyshev(Mean, Sd) UCL	98.2	95% Chebyshev(Mean, Sd) UCL	115.2
97.5% Chebyshev(Mean, Sd) UCL	138.7	99% Chebyshev(Mean, Sd) UCL	185

Suggested UCL to Use

95% Student's-t UCL 83.15

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.

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Stockpile Results 95% UCL Calculations

Copper

General Statistics

Total Number of Observations	12	Number of Distinct Observations	10
		Number of Missing Observations	0
Minimum	6.8	Mean	32.06
Maximum	49	Median	37.5
SD	16.57	Std. Error of Mean	4.782
Coefficient of Variation	0.517	Skewness	-0.578

Normal GOF Test

Shapiro Wilk Test Statistic	0.838	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.859	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.217	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.243	Data appear Normal at 5% Significance Level

Data appear Approximate Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	40.65	95% Adjusted-CLT UCL (Chen-1995)	39.07
		95% Modified-t UCL (Johnson-1978)	40.51

Gamma GOF Test

A-D Test Statistic	1.057	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.74	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.255	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.248	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	2.699	k star (bias corrected MLE)	2.08
Theta hat (MLE)	11.88	Theta star (bias corrected MLE)	15.42
nu hat (MLE)	64.77	nu star (bias corrected)	49.91
MLE Mean (bias corrected)	32.06	MLE Sd (bias corrected)	22.23
		Approximate Chi Square Value (0.05)	34.69
Adjusted Level of Significance	0.029	Adjusted Chi Square Value	32.76

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	46.13	95% Adjusted Gamma UCL (use when n<50)	48.84

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.79	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.859	Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.261	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.243	Data Not Lognormal at 5% Significance Level

Data Not Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	1.917	Mean of logged Data	3.271
Maximum of Logged Data	3.892	SD of logged Data	0.738

Assuming Lognormal Distribution

95% H-UCL	59.92	90% Chebyshev (MVUE) UCL	56.12
95% Chebyshev (MVUE) UCL	66.3	97.5% Chebyshev (MVUE) UCL	80.43
99% Chebyshev (MVUE) UCL	108.2		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	39.92	95% Jackknife UCL	40.65
95% Standard Bootstrap UCL	39.81	95% Bootstrap-t UCL	39.68
95% Hall's Bootstrap UCL	38.79	95% Percentile Bootstrap UCL	39.03
95% BCA Bootstrap UCL	39.01		
90% Chebyshev(Mean, Sd) UCL	46.41	95% Chebyshev(Mean, Sd) UCL	52.9
97.5% Chebyshev(Mean, Sd) UCL	61.92	99% Chebyshev(Mean, Sd) UCL	79.64

Suggested UCL to Use

95% Student's-t UCL 40.65

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test

When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.

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Stockpile Results 95% UCL Calculations

Lead

General Statistics

Total Number of Observations	12	Number of Distinct Observations	9
		Number of Missing Observations	0
Minimum	11	Mean	18
Maximum	29	Median	17
SD	5.309	Std. Error of Mean	1.532
Coefficient of Variation	0.295	Skewness	0.936

Normal GOF Test

Shapiro Wilk Test Statistic	0.912	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.859	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.25	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.243	Data Not Normal at 5% Significance Level

Data appear Approximate Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	20.75	95% Adjusted-CLT UCL (Chen-1995)	20.96
		95% Modified-t UCL (Johnson-1978)	20.82

Gamma GOF Test

A-D Test Statistic	0.365	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.731	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.214	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.245	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	13.52	k star (bias corrected MLE)	10.19
Theta hat (MLE)	1.332	Theta star (bias corrected MLE)	1.766
nu hat (MLE)	324.4	nu star (bias corrected)	244.6
MLE Mean (bias corrected)	18	MLE Sd (bias corrected)	5.638
		Approximate Chi Square Value (0.05)	209.4
Adjusted Level of Significance	0.029	Adjusted Chi Square Value	204.5

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	21.03	95% Adjusted Gamma UCL (use when n<50)	21.54

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.957	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.859	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.197	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.243	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	2.398	Mean of logged Data	2.853
Maximum of Logged Data	3.367	SD of logged Data	0.283

Assuming Lognormal Distribution

95% H-UCL	21.24	90% Chebyshev (MVUE) UCL	22.43
95% Chebyshev (MVUE) UCL	24.44	97.5% Chebyshev (MVUE) UCL	27.23
99% Chebyshev (MVUE) UCL	32.71		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	20.52	95% Jackknife UCL	20.75
95% Standard Bootstrap UCL	20.45	95% Bootstrap-t UCL	21.94
95% Hall's Bootstrap UCL	23.01	95% Percentile Bootstrap UCL	20.58
95% BCA Bootstrap UCL	20.5		
90% Chebyshev(Mean, Sd) UCL	22.6	95% Chebyshev(Mean, Sd) UCL	24.68
97.5% Chebyshev(Mean, Sd) UCL	27.57	99% Chebyshev(Mean, Sd) UCL	33.25

Suggested UCL to Use

95% Student's-t UCL 20.75

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test

When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

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Stockpile Results 95% UCL Calculations

Nickel

General Statistics

Total Number of Observations	12	Number of Distinct Observations	8
		Number of Missing Observations	0
Minimum	2.5	Mean	16.54
Maximum	26	Median	20
SD	8.894	Std. Error of Mean	2.568
Coefficient of Variation	0.538	Skewness	-0.972

Normal GOF Test

Shapiro Wilk Test Statistic	0.798	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.859	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.232	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.243	Data appear Normal at 5% Significance Level

Data appear Approximate Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	21.15	95% Adjusted-CLT UCL (Chen-1995)	19.99
		95% Modified-t UCL (Johnson-1978)	21.03

Gamma GOF Test

A-D Test Statistic	1.76	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.743	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.33	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.249	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.854	k star (bias corrected MLE)	1.446
Theta hat (MLE)	8.923	Theta star (bias corrected MLE)	11.44
nu hat (MLE)	44.49	nu star (bias corrected)	34.7
MLE Mean (bias corrected)	16.54	MLE Sd (bias corrected)	13.76
		Approximate Chi Square Value (0.05)	22.23
Adjusted Level of Significance	0.029	Adjusted Chi Square Value	20.71

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	25.83	95% Adjusted Gamma UCL (use when n<50)	27.71

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.668	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.859	Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.356	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.243	Data Not Lognormal at 5% Significance Level

Data Not Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	0.916	Mean of logged Data	2.513
Maximum of Logged Data	3.258	SD of logged Data	0.972

Assuming Lognormal Distribution

95% H-UCL	45.76	90% Chebyshev (MVUE) UCL	35.6
95% Chebyshev (MVUE) UCL	43.23	97.5% Chebyshev (MVUE) UCL	53.82
99% Chebyshev (MVUE) UCL	74.62		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	20.77	95% Jackknife UCL	21.15
95% Standard Bootstrap UCL	20.72	95% Bootstrap-t UCL	20.35
95% Hall's Bootstrap UCL	20.03	95% Percentile Bootstrap UCL	20.33
95% BCA Bootstrap UCL	19.96		
90% Chebyshev(Mean, Sd) UCL	24.24	95% Chebyshev(Mean, Sd) UCL	27.73
97.5% Chebyshev(Mean, Sd) UCL	32.58	99% Chebyshev(Mean, Sd) UCL	42.09

Suggested UCL to Use

95% Student's-t UCL 21.15

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test

When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.

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Stockpile Results 95% UCL Calculations

Zinc

General Statistics

Total Number of Observations	12	Number of Distinct Observations	10
		Number of Missing Observations	0
Minimum	22	Mean	70.17
Maximum	180	Median	75.5
SD	42	Std. Error of Mean	12.13
Coefficient of Variation	0.599	Skewness	1.547

Normal GOF Test

Shapiro Wilk Test Statistic	0.83	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.859	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.261	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.243	Data Not Normal at 5% Significance Level

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	91.94	95% Adjusted-CLT UCL (Chen-1995)	95.9
		95% Modified-t UCL (Johnson-1978)	92.84

Gamma GOF Test

A-D Test Statistic	0.535	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.738	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.196	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.247	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	3.287	k star (bias corrected MLE)	2.521
Theta hat (MLE)	21.35	Theta star (bias corrected MLE)	27.83
nu hat (MLE)	78.89	nu star (bias corrected)	60.5
MLE Mean (bias corrected)	70.17	MLE Sd (bias corrected)	44.19
		Approximate Chi Square Value (0.05)	43.62
Adjusted Level of Significance	0.029	Adjusted Chi Square Value	41.44

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50)	97.33	95% Adjusted Gamma UCL (use when n<50)	102.5

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.913	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.859	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.212	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.243	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	3.091	Mean of logged Data	4.091
Maximum of Logged Data	5.193	SD of logged Data	0.607

Assuming Lognormal Distribution

95% H-UCL	109.1	90% Chebyshev (MVUE) UCL	109
95% Chebyshev (MVUE) UCL	126.4	97.5% Chebyshev (MVUE) UCL	150.5
99% Chebyshev (MVUE) UCL	197.9		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	90.11	95% Jackknife UCL	91.94
95% Standard Bootstrap UCL	89	95% Bootstrap-t UCL	99.22
95% Hall's Bootstrap UCL	188	95% Percentile Bootstrap UCL	91.33
95% BCA Bootstrap UCL	95.33		
90% Chebyshev(Mean, Sd) UCL	106.5	95% Chebyshev(Mean, Sd) UCL	123
97.5% Chebyshev(Mean, Sd) UCL	145.9	99% Chebyshev(Mean, Sd) UCL	190.8

Suggested UCL to Use

95% Adjusted Gamma UCL 102.5

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

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Stockpile Results 95% UCL Calculations

PAH Total

General Statistics

Total Number of Observations	12	Number of Distinct Observations	2
		Number of Missing Observations	0
Minimum	0.25	Mean	0.279
Maximum	0.6	Median	0.25
SD	0.101	Std. Error of Mean	0.0292
Coefficient of Variation	0.362	Skewness	3.464

Normal GOF Test

Shapiro Wilk Test Statistic	0.327	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.859	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.53	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.243	Data Not Normal at 5% Significance Level	

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	0.332	95% Adjusted-CLT UCL (Chen-1995)	0.358
		95% Modified-t UCL (Johnson-1978)	0.336

Gamma GOF Test

A-D Test Statistic	4.097	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.731	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.537	**Kolmogorov-Smirnov Gamma GOF Test**	
5% K-S Critical Value	0.245	Data Not Gamma Distributed at 5% Significance Level	

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	13.54	k star (bias corrected MLE)	10.21
Theta hat (MLE)	0.0206	Theta star (bias corrected MLE)	0.0273
nu hat (MLE)	324.9	nu star (bias corrected)	245
MLE Mean (bias corrected)	0.279	MLE Sd (bias corrected)	0.0874
		Approximate Chi Square Value (0.05)	209.7
Adjusted Level of Significance	0.029	Adjusted Chi Square Value	204.8

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	0.326	95% Adjusted Gamma UCL (use when n<50)	0.334

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.327	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.859	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.53	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.243	Data Not Lognormal at 5% Significance Level	

Data Not Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	-1.386	Mean of logged Data	-1.313
Maximum of Logged Data	-0.511	SD of logged Data	0.253

Assuming Lognormal Distribution

95% H-UCL	0.321	90% Chebyshev (MVUE) UCL	0.338
95% Chebyshev (MVUE) UCL	0.366	97.5% Chebyshev (MVUE) UCL	0.404
99% Chebyshev (MVUE) UCL	0.479		

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution (0.05)

Nonparametric Distribution Free UCLs

95% CLT UCL	0.327	95% Jackknife UCL	N/A
95% Standard Bootstrap UCL	N/A	95% Bootstrap-t UCL	N/A
95% Hall's Bootstrap UCL	N/A	95% Percentile Bootstrap UCL	N/A
95% BCA Bootstrap UCL	N/A		
90% Chebyshev(Mean, Sd) UCL	0.367	95% Chebyshev(Mean, Sd) UCL	0.406
97.5% Chebyshev(Mean, Sd) UCL	0.461	99% Chebyshev(Mean, Sd) UCL	0.569

Suggested UCL to Use

95% Student's-t UCL	0.332	or 95% Modified-t UCL	0.336

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

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Stage 1 PSI Orchard Hills - Test Pit 95% UCL

95% UCL Statistics for Uncensored Full Data Sets

User Selected Options	
Date/Time of Computation	ProUCL 5.126/05/2020 11:12:14 AM
From File	WorkSheet.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

F3

General Statistics

Total Number of Observations	10	Number of Distinct Observations	2
		Number of Missing Observations	16
Minimum	50	Mean	70
Maximum	250	Median	50
SD	63.25	Std. Error of Mean	20
Coefficient of Variation	0.904	Skewness	3.162

Normal GOF Test

Shapiro Wilk Test Statistic	0.366	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.842	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.524	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.262	Data Not Normal at 5% Significance Level

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	106.7	95% Adjusted-CLT UCL (Chen-1995)	124.3
		95% Modified-t UCL (Johnson-1978)	110

Gamma GOF Test

A-D Test Statistic	3.333	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.732	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.538	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.268	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	3.005	k star (bias corrected MLE)	2.17
Theta hat (MLE)	23.3	Theta star (bias corrected MLE)	32.26
nu hat (MLE)	60.1	nu star (bias corrected)	43.4
MLE Mean (bias corrected)	70	MLE Sd (bias corrected)	47.52
		Approximate Chi Square Value (0.05)	29.29
Adjusted Level of Significance	0.0267	Adjusted Chi Square Value	27.29

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	103.7	95% Adjusted Gamma UCL (use when n<50)	111.3

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.366	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.842	Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.524	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.262	Data Not Lognormal at 5% Significance Level

Data Not Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	3.912	Mean of logged Data	4.073
Maximum of Logged Data	5.521	SD of logged Data	0.509

Assuming Lognormal Distribution

95% H-UCL	97.63	90% Chebyshev (MVUE) UCL	98.32
95% Chebyshev (MVUE) UCL	113	97.5% Chebyshev (MVUE) UCL	133.4
99% Chebyshev (MVUE) UCL	173.4		

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution (0.05)

Nonparametric Distribution Free UCLs

95% CLT UCL	102.9	95% Jackknife UCL	N/A
95% Standard Bootstrap UCL	N/A	95% Bootstrap-t UCL	N/A
95% Hall's Bootstrap UCL	N/A	95% Percentile Bootstrap UCL	N/A
95% BCA Bootstrap UCL	N/A		
90% Chebyshev(Mean, Sd) UCL	130	95% Chebyshev(Mean, Sd) UCL	157.2
97.5% Chebyshev(Mean, Sd) UCL	194.9	99% Chebyshev(Mean, Sd) UCL	269

Suggested UCL to Use

95% Chebyshev (Mean, Sd) UCL	157.2

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

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Stage 1 PSI Orchard Hills - Test Pit 95% UCL

F4

General Statistics

Total Number of Observations	10	Number of Distinct Observations	2
		Number of Missing Observations	16
Minimum	50	Mean	70
Maximum	250	Median	50
SD	63.25	Std. Error of Mean	20
Coefficient of Variation	0.904	Skewness	3.162

Normal GOF Test

Shapiro Wilk Test Statistic	0.366	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.842	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.524	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.262	Data Not Normal at 5% Significance Level

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	106.7	95% Adjusted-CLT UCL (Chen-1995)	124.3
		95% Modified-t UCL (Johnson-1978)	110

Gamma GOF Test

A-D Test Statistic	3.333	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.732	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.538	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.268	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	3.005	k star (bias corrected MLE)	2.17
Theta hat (MLE)	23.3	Theta star (bias corrected MLE)	32.26
nu hat (MLE)	60.1	nu star (bias corrected)	43.4
MLE Mean (bias corrected)	70	MLE Sd (bias corrected)	47.52
		Approximate Chi Square Value (0.05)	29.29
Adjusted Level of Significance	0.0267	Adjusted Chi Square Value	27.29

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	103.7	95% Adjusted Gamma UCL (use when n<50)	111.3

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.366	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.842	Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.524	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.262	Data Not Lognormal at 5% Significance Level

Data Not Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	3.912	Mean of logged Data	4.073
Maximum of Logged Data	5.521	SD of logged Data	0.509

Assuming Lognormal Distribution

95% H-UCL	97.63	90% Chebyshev (MVUE) UCL	98.32
95% Chebyshev (MVUE) UCL	113	97.5% Chebyshev (MVUE) UCL	133.4
99% Chebyshev (MVUE) UCL	173.4		

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution (0.05)

Nonparametric Distribution Free UCLs

95% CLT UCL	102.9	95% Jackknife UCL	N/A
95% Standard Bootstrap UCL	N/A	95% Bootstrap-t UCL	N/A
95% Hall's Bootstrap UCL	N/A	95% Percentile Bootstrap UCL	N/A
95% BCA Bootstrap UCL	N/A		
90% Chebyshev(Mean, Sd) UCL	130	95% Chebyshev(Mean, Sd) UCL	157.2
97.5% Chebyshev(Mean, Sd) UCL	194.9	99% Chebyshev(Mean, Sd) UCL	269

Suggested UCL to Use

95% Chebyshev (Mean, Sd) UCL	157.2

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

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Stage 1 PSI Orchard Hills - Test Pit 95% UCL

Arsenic

General Statistics

Total Number of Observations	25	Number of Distinct Observations	19
		Number of Missing Observations	1
Minimum	3.6	Mean	13.78
Maximum	41	Median	12
SD	9.339	Std. Error of Mean	1.868
Coefficient of Variation	0.678	Skewness	1.695

Normal GOF Test

Shapiro Wilk Test Statistic	0.827	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.918	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.173	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.173	Data Not Normal at 5% Significance Level	

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	16.98	95% Adjusted-CLT UCL (Chen-1995)	17.53
		95% Modified-t UCL (Johnson-1978)	17.08

Gamma GOF Test

A-D Test Statistic	0.359	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.752	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.0988	**Kolmogorov-Smirnov Gamma GOF Test**	
5% K-S Critical Value	0.176	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	2.83	k star (bias corrected MLE)	2.517
Theta hat (MLE)	4.87	Theta star (bias corrected MLE)	5.475
nu hat (MLE)	141.5	nu star (bias corrected)	125.8
MLE Mean (bias corrected)	13.78	MLE Sd (bias corrected)	8.686
		Approximate Chi Square Value (0.05)	100.9
Adjusted Level of Significance	0.0395	Adjusted Chi Square Value	99.42

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50)	17.18	95% Adjusted Gamma UCL (use when n<50)	17.44

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.979	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.918	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.0739	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.173	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	1.281	Mean of logged Data	2.436
Maximum of Logged Data	3.714	SD of logged Data	0.617

Assuming Lognormal Distribution

95% H-UCL	17.94	90% Chebyshev (MVUE) UCL	19.09
95% Chebyshev (MVUE) UCL	21.53	97.5% Chebyshev (MVUE) UCL	24.92
99% Chebyshev (MVUE) UCL	31.57		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	16.85	95% Jackknife UCL	16.98
95% Standard Bootstrap UCL	16.81	95% Bootstrap-t UCL	18.27
95% Hall's Bootstrap UCL	19.77	95% Percentile Bootstrap UCL	17.01
95% BCA Bootstrap UCL	17.48		
90% Chebyshev(Mean, Sd) UCL	19.38	95% Chebyshev(Mean, Sd) UCL	21.92
97.5% Chebyshev(Mean, Sd) UCL	25.44	99% Chebyshev(Mean, Sd) UCL	32.36

Suggested UCL to Use

95% Adjusted Gamma UCL	17.44

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

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Stage 1 PSI Orchard Hills - Test Pit 95% UCL

Cadmium

General Statistics

Total Number of Observations	25	Number of Distinct Observations	2
		Number of Missing Observations	1
Minimum	0.2	Mean	0.272
Maximum	2	Median	0.2
SD	0.36	Std. Error of Mean	0.072
Coefficient of Variation	1.324	Skewness	5

Normal GOF Test

Shapiro Wilk Test Statistic	0.206	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.918	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.539	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.173	Data Not Normal at 5% Significance Level	

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	0.395	95% Adjusted-CLT UCL (Chen-1995)	0.467
		95% Modified-t UCL (Johnson-1978)	0.407

Gamma GOF Test

A-D Test Statistic	9.357	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.754	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.556	**Kolmogorov-Smirnov Gamma GOF Test**	
5% K-S Critical Value	0.176	Data Not Gamma Distributed at 5% Significance Level	

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	2.475	k star (bias corrected MLE)	2.205
Theta hat (MLE)	0.11	Theta star (bias corrected MLE)	0.123
nu hat (MLE)	123.8	nu star (bias corrected)	110.3
MLE Mean (bias corrected)	0.272	MLE Sd (bias corrected)	0.183
		Approximate Chi Square Value (0.05)	87.01
Adjusted Level of Significance	0.0395	Adjusted Chi Square Value	85.61

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	0.345	95% Adjusted Gamma UCL (use when n<50)	0.35

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.206	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.918	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.539	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.173	Data Not Lognormal at 5% Significance Level	

Data Not Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	-1.609	Mean of logged Data	-1.517
Maximum of Logged Data	0.693	SD of logged Data	0.461

Assuming Lognormal Distribution

95% H-UCL	0.292	90% Chebyshev (MVUE) UCL	0.312
95% Chebyshev (MVUE) UCL	0.344	97.5% Chebyshev (MVUE) UCL	0.387
99% Chebyshev (MVUE) UCL	0.473		

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution (0.05)

Nonparametric Distribution Free UCLs

95% CLT UCL	0.39	95% Jackknife UCL	N/A
95% Standard Bootstrap UCL	N/A	95% Bootstrap-t UCL	N/A
95% Hall's Bootstrap UCL	N/A	95% Percentile Bootstrap UCL	N/A
95% BCA Bootstrap UCL	N/A		
90% Chebyshev(Mean, Sd) UCL	0.488	95% Chebyshev(Mean, Sd) UCL	0.586
97.5% Chebyshev(Mean, Sd) UCL	0.722	99% Chebyshev(Mean, Sd) UCL	0.988

Suggested UCL to Use

95% Student's-t UCL	0.395	or 95% Modified-t UCL	0.407

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

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Stage 1 PSI Orchard Hills - Test Pit 95% UCL

Chromium

General Statistics

Total Number of Observations	25	Number of Distinct Observations	21
		Number of Missing Observations	1
Minimum	11	Mean	47.88
Maximum	200	Median	37
SD	39.98	Std. Error of Mean	7.995
Coefficient of Variation	0.835	Skewness	2.456

Normal GOF Test

Shapiro Wilk Test Statistic	0.753	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.918	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.178	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.173	Data Not Normal at 5% Significance Level	

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	61.56	95% Adjusted-CLT UCL (Chen-1995)	65.23
		95% Modified-t UCL (Johnson-1978)	62.21

Gamma GOF Test

A-D Test Statistic	0.578	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.756	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.152	**Kolmogorov-Smirnov Gamma GOF Test**	
5% K-S Critical Value	0.177	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	2.118	k star (bias corrected MLE)	1.89
Theta hat (MLE)	22.61	Theta star (bias corrected MLE)	25.33
nu hat (MLE)	105.9	nu star (bias corrected)	94.52
MLE Mean (bias corrected)	47.88	MLE Sd (bias corrected)	34.82
		Approximate Chi Square Value (0.05)	73.1
Adjusted Level of Significance	0.0395	Adjusted Chi Square Value	71.82

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50)	61.91	95% Adjusted Gamma UCL (use when n<50)	63.02

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.961	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.918	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.149	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.173	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	2.398	Mean of logged Data	3.614
Maximum of Logged Data	5.298	SD of logged Data	0.71

Assuming Lognormal Distribution

95% H-UCL	65.32	90% Chebyshev (MVUE) UCL	68.88
95% Chebyshev (MVUE) UCL	78.7	97.5% Chebyshev (MVUE) UCL	92.32
99% Chebyshev (MVUE) UCL	119.1		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	61.03	95% Jackknife UCL	61.56
95% Standard Bootstrap UCL	60.94	95% Bootstrap-t UCL	68.18
95% Hall's Bootstrap UCL	118.4	95% Percentile Bootstrap UCL	62.08
95% BCA Bootstrap UCL	65.2		
90% Chebyshev(Mean, Sd) UCL	71.87	95% Chebyshev(Mean, Sd) UCL	82.73
97.5% Chebyshev(Mean, Sd) UCL	97.81	99% Chebyshev(Mean, Sd) UCL	127.4

Suggested UCL to Use

95% Adjusted Gamma UCL	63.02

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

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Stage 1 PSI Orchard Hills - Test Pit 95% UCL

Copper

General Statistics

Total Number of Observations	25	Number of Distinct Observations	17
		Number of Missing Observations	1
Minimum	2.5	Mean	9.06
Maximum	26	Median	8.2
SD	5.858	Std. Error of Mean	1.172
Coefficient of Variation	0.647	Skewness	1.057

Normal GOF Test

Shapiro Wilk Test Statistic	0.901	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.918	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.144	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.173	Data appear Normal at 5% Significance Level	

Data appear Approximate Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	11.06	95% Adjusted-CLT UCL (Chen-1995)	11.25
		95% Modified-t UCL (Johnson-1978)	11.11

Gamma GOF Test

A-D Test Statistic	0.595	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.754	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.162	**Kolmogorov-Smirnov Gamma GOF Test**	
5% K-S Critical Value	0.176	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	2.422	k star (bias corrected MLE)	2.158
Theta hat (MLE)	3.741	Theta star (bias corrected MLE)	4.198
nu hat (MLE)	121.1	nu star (bias corrected)	107.9
MLE Mean (bias corrected)	9.06	MLE Sd (bias corrected)	6.167
		Approximate Chi Square Value (0.05)	84.93
Adjusted Level of Significance	0.0395	Adjusted Chi Square Value	83.54

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	11.51	95% Adjusted Gamma UCL (use when n<50)	11.7

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.905	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.918	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.173	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.173	Data appear Lognormal at 5% Significance Level	

Data appear Approximate Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	0.916	Mean of logged Data	1.983
Maximum of Logged Data	3.258	SD of logged Data	0.714

Assuming Lognormal Distribution

95% H-UCL	12.84	90% Chebyshev (MVUE) UCL	13.54
95% Chebyshev (MVUE) UCL	15.48	97.5% Chebyshev (MVUE) UCL	18.16
99% Chebyshev (MVUE) UCL	23.45		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	10.99	95% Jackknife UCL	11.06
95% Standard Bootstrap UCL	10.93	95% Bootstrap-t UCL	11.38
95% Hall's Bootstrap UCL	11.61	95% Percentile Bootstrap UCL	11.08
95% BCA Bootstrap UCL	11.26		
90% Chebyshev(Mean, Sd) UCL	12.57	95% Chebyshev(Mean, Sd) UCL	14.17
97.5% Chebyshev(Mean, Sd) UCL	16.38	99% Chebyshev(Mean, Sd) UCL	20.72

Suggested UCL to Use

95% Student's-t UCL	11.06

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test

When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

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Stage 1 PSI Orchard Hills - Test Pit 95% UCL

Lead

General Statistics

Total Number of Observations	25	Number of Distinct Observations	17
		Number of Missing Observations	1
Minimum	12	Mean	22.52
Maximum	46	Median	19
SD	9.87	Std. Error of Mean	1.974
Coefficient of Variation	0.438	Skewness	1.279

Normal GOF Test

Shapiro Wilk Test Statistic	0.829	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.918	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.241	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.173	Data Not Normal at 5% Significance Level

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	25.9	95% Adjusted-CLT UCL (Chen-1995)	26.31
		95% Modified-t UCL (Johnson-1978)	25.98

Gamma GOF Test

A-D Test Statistic	1.014	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.746	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.198	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.175	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	6.564	k star (bias corrected MLE)	5.803
Theta hat (MLE)	3.431	Theta star (bias corrected MLE)	3.881
nu hat (MLE)	328.2	nu star (bias corrected)	290.2
MLE Mean (bias corrected)	22.52	MLE Sd (bias corrected)	9.348
		Approximate Chi Square Value (0.05)	251.7
Adjusted Level of Significance	0.0395	Adjusted Chi Square Value	249.3

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	25.96	95% Adjusted Gamma UCL (use when n<50)	26.21

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.919	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.918	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.172	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.173	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	2.485	Mean of logged Data	3.036
Maximum of Logged Data	3.829	SD of logged Data	0.389

Assuming Lognormal Distribution

95% H-UCL	26.06	90% Chebyshev (MVUE) UCL	27.74
95% Chebyshev (MVUE) UCL	30.17	97.5% Chebyshev (MVUE) UCL	33.53
99% Chebyshev (MVUE) UCL	40.14		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	25.77	95% Jackknife UCL	25.9
95% Standard Bootstrap UCL	25.69	95% Bootstrap-t UCL	26.51
95% Hall's Bootstrap UCL	26.11	95% Percentile Bootstrap UCL	25.6
95% BCA Bootstrap UCL	26.24		
90% Chebyshev(Mean, Sd) UCL	28.44	95% Chebyshev(Mean, Sd) UCL	31.12
97.5% Chebyshev(Mean, Sd) UCL	34.85	99% Chebyshev(Mean, Sd) UCL	42.16

Suggested UCL to Use

95% Student's-t UCL	25.9	or 95% Modified-t UCL	25.98
or 95% H-UCL	26.06		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

ProUCL computes and outputs H-statistic based UCLs for historical reasons only.

H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.

It is therefore recommended to avoid the use of H-statistic based 95% UCLs.

Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.

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Stage 1 PSI Orchard Hills - Test Pit 95% UCL

Mercury

General Statistics

Total Number of Observations	25	Number of Distinct Observations	2
		Number of Missing Observations	1
Minimum	0.05	Mean	0.06
Maximum	0.3	Median	0.05
SD	0.05	Std. Error of Mean	0.01
Coefficient of Variation	0.833	Skewness	5

Normal GOF Test

Shapiro Wilk Test Statistic	0.206	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.918	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.539	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.173	Data Not Normal at 5% Significance Level	

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	0.0771	95% Adjusted-CLT UCL (Chen-1995)	0.0871
		95% Modified-t UCL (Johnson-1978)	0.0788

Gamma GOF Test

A-D Test Statistic	9.276	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.748	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.549	**Kolmogorov-Smirnov Gamma GOF Test**	
5% K-S Critical Value	0.175	Data Not Gamma Distributed at 5% Significance Level	

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	4.679	k star (bias corrected MLE)	4.144
Theta hat (MLE)	0.0128	Theta star (bias corrected MLE)	0.0145
nu hat (MLE)	233.9	nu star (bias corrected)	207.2
MLE Mean (bias corrected)	0.06	MLE Sd (bias corrected)	0.0295
		Approximate Chi Square Value (0.05)	174.9
Adjusted Level of Significance	0.0395	Adjusted Chi Square Value	172.9

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	0.0711	95% Adjusted Gamma UCL (use when n<50)	0.0719

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.206	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.918	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.539	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.173	Data Not Lognormal at 5% Significance Level	

Data Not Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	-2.996	Mean of logged Data	-2.924
Maximum of Logged Data	-1.204	SD of logged Data	0.358

Assuming Lognormal Distribution

95% H-UCL	0.0656	90% Chebyshev (MVUE) UCL	0.0697
95% Chebyshev (MVUE) UCL	0.0754	97.5% Chebyshev (MVUE) UCL	0.0832
99% Chebyshev (MVUE) UCL	0.0987		

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution (0.05)

Nonparametric Distribution Free UCLs

95% CLT UCL	0.0764	95% Jackknife UCL	N/A
95% Standard Bootstrap UCL	N/A	95% Bootstrap-t UCL	N/A
95% Hall's Bootstrap UCL	N/A	95% Percentile Bootstrap UCL	N/A
95% BCA Bootstrap UCL	N/A		
90% Chebyshev(Mean, Sd) UCL	0.09	95% Chebyshev(Mean, Sd) UCL	0.104
97.5% Chebyshev(Mean, Sd) UCL	0.122	99% Chebyshev(Mean, Sd) UCL	0.159

Suggested UCL to Use

95% Student's-t UCL	0.0771	or 95% Modified-t UCL	0.0788

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

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Stage 1 PSI Orchard Hills - Test Pit 95% UCL

Nickel

General Statistics

Total Number of Observations	25	Number of Distinct Observations	13
		Number of Missing Observations	1
Minimum	2.5	Mean	5.544
Maximum	15	Median	5.2
SD	3.557	Std. Error of Mean	0.711
Coefficient of Variation	0.642	Skewness	0.98

Normal GOF Test

Shapiro Wilk Test Statistic	0.821	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.918	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.284	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.173	Data Not Normal at 5% Significance Level	

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	6.761	95% Adjusted-CLT UCL (Chen-1995)	6.863
		95% Modified-t UCL (Johnson-1978)	6.784

Gamma GOF Test

A-D Test Statistic	1.977	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.753	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.31	**Kolmogorov-Smirnov Gamma GOF Test**	
5% K-S Critical Value	0.176	Data Not Gamma Distributed at 5% Significance Level	

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	2.757	k star (bias corrected MLE)	2.453
Theta hat (MLE)	2.011	Theta star (bias corrected MLE)	2.26
nu hat (MLE)	137.9	nu star (bias corrected)	122.6
MLE Mean (bias corrected)	5.544	MLE Sd (bias corrected)	3.54
		Approximate Chi Square Value (0.05)	98.07
Adjusted Level of Significance	0.0395	Adjusted Chi Square Value	96.57

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	6.933	95% Adjusted Gamma UCL (use when n<50)	7.041

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.806	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.918	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.311	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.173	Data Not Lognormal at 5% Significance Level	

Data Not Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	0.916	Mean of logged Data	1.521
Maximum of Logged Data	2.708	SD of logged Data	0.63

Assuming Lognormal Distribution

95% H-UCL	7.289	90% Chebyshev (MVUE) UCL	7.75
95% Chebyshev (MVUE) UCL	8.756	97.5% Chebyshev (MVUE) UCL	10.15
99% Chebyshev (MVUE) UCL	12.9		

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution (0.05)

Nonparametric Distribution Free UCLs

95% CLT UCL	6.714	95% Jackknife UCL	6.761
95% Standard Bootstrap UCL	6.683	95% Bootstrap-t UCL	7.025
95% Hall's Bootstrap UCL	6.836	95% Percentile Bootstrap UCL	6.744
95% BCA Bootstrap UCL	6.892		
90% Chebyshev(Mean, Sd) UCL	7.678	95% Chebyshev(Mean, Sd) UCL	8.645
97.5% Chebyshev(Mean, Sd) UCL	9.987	99% Chebyshev(Mean, Sd) UCL	12.62

Suggested UCL to Use

95% Chebyshev (Mean, Sd) UCL	8.645

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
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Stage 1 PSI Orchard Hills - Test Pit 95% UCL

Zinc

General Statistics

Total Number of Observations	25	Number of Distinct Observations	23
		Number of Missing Observations	1
Minimum	5.5	Mean	24.99
Maximum	96	Median	17
SD	24.44	Std. Error of Mean	4.888
Coefficient of Variation	0.978	Skewness	2.003

Normal GOF Test

Shapiro Wilk Test Statistic	0.72	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.918	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.227	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.173	Data Not Normal at 5% Significance Level	

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	33.35	95% Adjusted-CLT UCL (Chen-1995)	35.12
		95% Modified-t UCL (Johnson-1978)	33.68

Gamma GOF Test

A-D Test Statistic	0.856	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.761	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.14	**Kolmogorov-Smirnov Gamma GOF Test**	
5% K-S Critical Value	0.178	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data follow Appr. Gamma Distribution at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.593	k star (bias corrected MLE)	1.428
Theta hat (MLE)	15.69	Theta star (bias corrected MLE)	17.5
nu hat (MLE)	79.63	nu star (bias corrected)	71.41
MLE Mean (bias corrected)	24.99	MLE Sd (bias corrected)	20.91
		Approximate Chi Square Value (0.05)	52.95
Adjusted Level of Significance	0.0395	Adjusted Chi Square Value	51.87

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50)	33.7	95% Adjusted Gamma UCL (use when n<50)	34.41

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.94	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.918	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.101	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.173	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	1.705	Mean of logged Data	2.873
Maximum of Logged Data	4.564	SD of logged Data	0.817

Assuming Lognormal Distribution

95% H-UCL	36.08	90% Chebyshev (MVUE) UCL	37.34
95% Chebyshev (MVUE) UCL	43.27	97.5% Chebyshev (MVUE) UCL	51.48
99% Chebyshev (MVUE) UCL	67.63		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	33.03	95% Jackknife UCL	33.35
95% Standard Bootstrap UCL	32.65	95% Bootstrap-t UCL	37.32
95% Hall's Bootstrap UCL	35.35	95% Percentile Bootstrap UCL	32.96
95% BCA Bootstrap UCL	35.46		
90% Chebyshev(Mean, Sd) UCL	39.66	95% Chebyshev(Mean, Sd) UCL	46.3
97.5% Chebyshev(Mean, Sd) UCL	55.52	99% Chebyshev(Mean, Sd) UCL	73.62

Suggested UCL to Use

95% Adjusted Gamma UCL	34.41

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test

When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

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