

Proposed Redevelopment of Cessnock Hospital 24 View St, Cessnock NSW 2325

Detailed Site Investigation

Health Infrastructure c/o Turner & Townsend



Reference: 754-NTLEN347071-R02

11 October 2024

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PREPARED FOR

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Restriction on Disclosure and Use of Data

This DSI should be read in conjunction with the attached sheets 'Important Information about your Tetra Tech Coffey Report'.

EXECUTIVE SUMMARY¹

Tetra Tech Coffey Pty Ltd (Tetra Tech) was engaged by Turner & Townsend Pty Ltd (Turner Townsend) on behalf of Health Infrastructure to complete a Detailed Site Investigation (DSI) for part of Cessnock Hospital (Part of Lot 2 DP1173784, Part Lot 11 SP 882585), located at 24 View Street, Cessnock New South Wales (NSW) (the Site) to inform planning for the proposed redevelopment including a new clinical services building at the hospital. The purpose of the DSI was to conduct additional assessment to meet the sampling density requirements of NSW EPA contaminated land guidelines and close out the data gaps identified in the Preliminary Site Investigation (PSI) (*'Preliminary Site Investigation (Limited Sampling), Proposed Redevelopment of Cessnock Hospital'* 24 View St, Cessnock NSW 2325, 9 July 2024 (Tetra Tech report reference: 754-NTLEN347071 R01) pertaining to:

- Quantity and quality of fill of unknown origin across the Site.
- Suspected asbestos in fill in the vicinity of the former incinerator, workshop buildings and yard maintenance shed.
- The reported PAH and petroleum hydrocarbon (as TRH) impacts in the vicinity of the incinerator and workshop buildings.
- Potential TRH/BTEXN impacts from use of the hoist in the yard maintenance shed.

Tetra Tech completed additional investigations comprising six additional boreholes drilled to natural soils beneath fill material (approximately 2m below ground level (BGL)) at targeted locations, which resulted in six locations being sampled at the site. Samples were collected at the surface and intervals in the subsurface for assessment of the contaminants of potential concern (COPCs):

- Metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc),
- Total recoverable hydrocarbons (TRHs),
- Benzene, toluene, ethylbenzene and xylenes (BTEX)
- Polyaromatic hydrocarbons (PAHs),
- Polychlorinated biphenyls (PCBs),
- Organochlorine pesticides (OCPs) and organophosphate pesticides (OPPs).
- Asbestos

A monitoring well was installed at the borehole downgradient of the yard maintenance shed to assess groundwater. A groundwater monitoring event (GME) was conducted on the newly installed monitoring well including gauging of the standing water level (SWL), measurement of water quality parameters and collection of samples for analysis of COPCs.

Fill soil was observed to be present across the site during the PSI. A fill mound was present in the grassed area behind the workshops, which sloped downward to the north, and the depth of the fill mound was observed to decrease to the west. A fill mound was also observed behind the pathology building and also sloped downward to the north. Fill was encountered to a depth of between approximately 0.5 to 1.6m BGL. The nature of the fill including observations of anthropogenic materials was consistent with the PSI. Fragments of asbestos were observed in BH01A (near the pathology building) and in BH5A behind the workshops. Waste items including plastic, tile and nails were reported in fill in BH2A.

The yard maintenance shed had moderate localised staining on the concrete slab and deterioration of the surface (cracks etc) was not evident. No stains or odours were observed in the soil.

Soil analytical results reported individual exceedances of ecological assessment criteria for Zinc, TRH F2 (C₁₀-C₁₆) and TRH F3 (C₁₆ - C₃₄) and human health criteria for carcinogenic PAHs (as benzo(a)pyrene TEQ).

¹ This executive summary must be read in the context of the full report and the attached limitations.

No COPCs with individual exceedances of criteria reported 95% UCL_{AVERAGE} above criteria. Two samples for Zinc were above EIL criteria (BH2A_1.0-1.1, BH4A_0.1-0.2). Additional samples analysed from the boreholes were below criteria. Benzo(a)pyrene (TEQ) in QC1A (BH4A_0.1-0.2) was >250% of the HIL criteria. The concentration reported in the sample from lower in the borehole (1.0-1.1m) was below criteria.

Based on the in-situ investigation, fill material, should it be required to be managed offsite, was assessed as General Solid Waste, except for fill mounds in the grassed area where asbestos has been reported in BH01A, BH05A, BH06 and BH09, which was classified as Special Solid Waste –Asbestos. Please note that this insitu classification is only indicative and any material excavated during site remediation and/or redevelopment will require to be properly waste classified at the time.

Asbestos in the form of bonded ACM was reported in fill from the grassed area behind the workshops and yard maintenance shed and the pathology building. The potential for asbestos debris also exists beneath the footprints of these buildings. Some of the asbestos was reported in the surface soils therefore would be considered to not meet the HSL requirement for no visible forms of asbestos (applicable to the top 10cm of soil).

Groundwater was encountered at >6mbgl and the concentrations reported from MW01 of TRH, BTEX, PAHs and phenols were below the laboratory limit of reporting (LOR). Arsenic and Copper were detected at the LOR and Nickel and Zinc were reported at 15 and 60 µg/L respectively, above the freshwater ANZG Freshwater Water 95% protection level.

Exceedances of assessment criteria for the site were isolated and considered to be generally related to uncontrolled fill and buried waste materials. The risk of contamination to human health and ecological receptors for the current and proposed ongoing land uses arising from chemical contaminants of concern has been assessed as low based on the findings of the PSI and this DSI. However, asbestos in the form of bonded ACM was identified in the fill which represents a risk to human health, particularly maintenance and construction workers conducting subsurface excavations. Groundwater was not indicated to be impacted by top-down contamination from the site.

On the basis of these findings, Tetra Tech concludes that the Site can be made suitable for the proposed redevelopment works of the hospital, subject to management of asbestos impacted fill. A remediation action plan (RAP) including an unexpected finds protocol needs to be developed for this activity.

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ACRONYMS/ABBREVIATIONS

Acronyms/Abbreviations	Definition
ACM	Asbestos Containing Material
AF	Asbestos Fines
AHIMS	Aboriginal Heritage Information Management System
AS	Australian Standard
ASC	Assessment of Site Contamination
BTEX	Benzene, toluene, ethylbenzene and xylenes
BYDA	Before-You-Dig-Australia
CEC	Cation exchange capacity
CCME	Canadian Council of Ministers of the Environment
COPCs	contaminants of potential concern
CLM	Contaminated Land Management
CRC CARE	Cooperative Research Centre for the Contamination Assessment and Remediation of the Environment
CSM	Conceptual Site Model
CT	Contaminant threshold
DDT	Dichloro-diphenyl-trichloroethane
DPI	Department of Primary Industries
EILs	Ecological Investigation Levels
EPA	Environment Protection Authority
ESLs	Ecological Screening Levels
Eurofins	Eurofins Environment Testing Australia Pty Ltd
FA	Fibrous Asbestos
HILs	Health Investigation Levels
HSLs	Health screening levels
LNAPL	Light non-aqueous phase liquid
mAHD	Metres in Australian Height Datum
NATA	National Association of Testing Authorities
NEPC	National Environment Protection Council
NEPM	National Environmental Protection Measure
NSW	New South Wales
OCPs	Organochlorine pesticides
OPPs	Organophosphate pesticides
PAHs	Polycyclic Aromatic Hydrocarbons
PCBs	Polychlorinated biphenyls
PID	Photo-Ionisation Detector
PFAS	Per- and Poly-Fluoroalkyl Substances

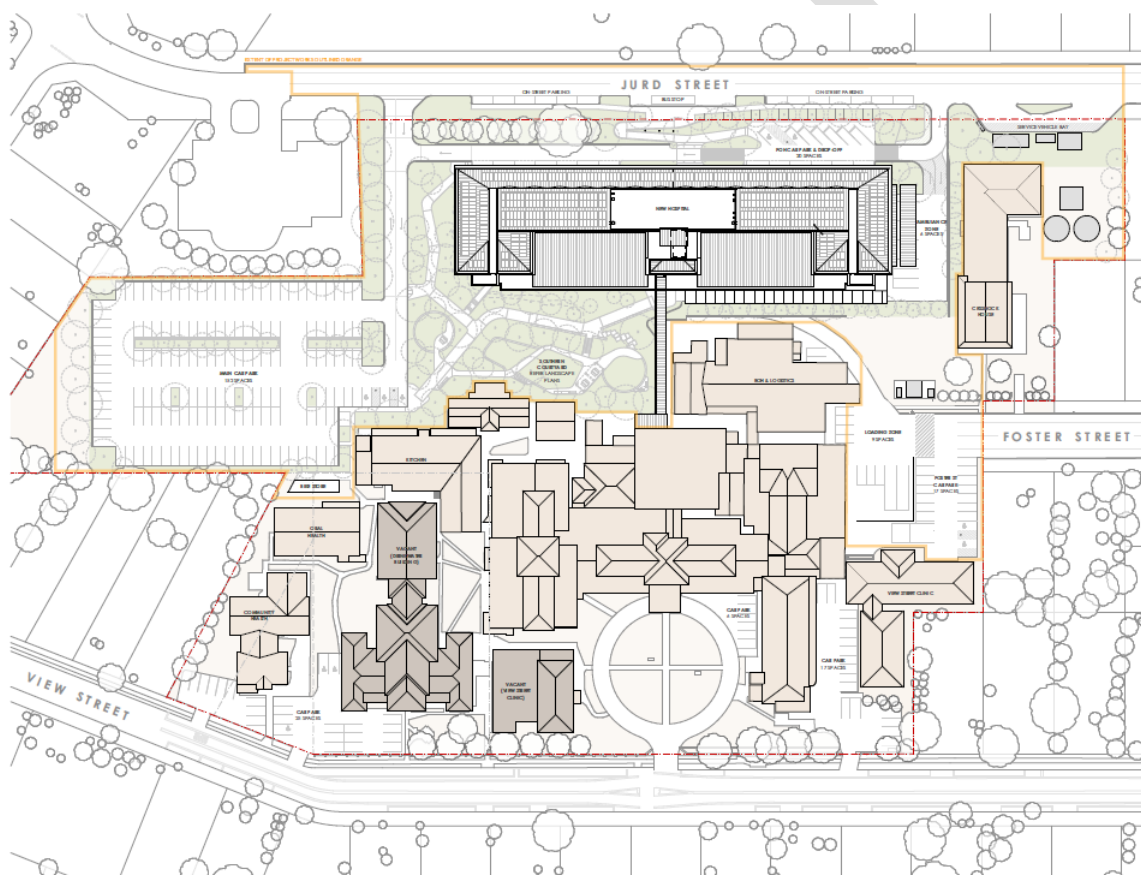
POEO	Protection of the Environment Operations
PSI	Preliminary Site Investigation
QA	Quality Assurance
QC	Quality Control
RSH	Resilience and Hazards
SCC	Specific Contaminant Concentration
SEPP	State Environmental Planning Policy
SOP	Standard Operating Procedures
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxicity Equivalence
TRH	Total Recoverable Hydrocarbons
VOCs	Volatile Organic Compounds

1. INTRODUCTION

1.1 BACKGROUND

Tetra Tech Coffey Pty Ltd (Tetra Tech) was engaged by Turner & Townsend Pty Ltd (Turner Townsend) on behalf of Health Infrastructure to complete a Detailed Site Investigation (DSI) for part of Cessnock Hospital (Part of Lot 2 DP1173784, Part Lot 11 SP 882585), located at 24 View Street, Cessnock New South Wales (NSW) (the Site) to inform planning for the proposed redevelopment of the hospital. Refer to Figure 1 of Appendix A for the Site locality plan. The proposed redevelopment concept is for a new, clinical services building on the northern portion of the Site (Figure 1-1).

Figure 1-1: Proposed Cessnock Hospital Redevelopment Concept Design



Tetra Tech previously completed a preliminary site investigation (PSI) with limited sampling ('*Proposed Redevelopment of Cessnock Hospital*' 24 View St, Cessnock NSW 2325, 9 July 2024 (Tetra Tech report reference: 754-NTLEN347071 R01)). The risk of contamination to human health for the current and ongoing land uses was assessed as low to moderate and the risk to ecological receptors as low based on the findings of the PSI. However, data gaps were identified related to suspected asbestos in fill and reported polyaromatic hydrocarbon (PAH) and petroleum hydrocarbon (as TRH) impacts in the vicinity of the incinerator and workshop buildings at BH13 and BH15 and the hoist (potential TRH/BTEXN impacts).

The purpose of the DSI was to conduct additional assessment to meet the sampling density requirements of NSW EPA contaminated land guidelines and close out the identified data gaps pertaining to chemical characterisation of soils / asbestos on-site.

1.2 OBJECTIVES

The primary objective of the DSI was to characterise the Site with respect to potential soil and groundwater contamination, in accordance with the relevant NSW EPA guidelines and legislation. More specifically, the objectives of the DSI were to:

- Undertake the additional investigations recommended in the PSI.
- Provide a preliminary in situ waste classification of the assessed soils.
- Provide an opinion on the suitability of the Site from a contamination perspective for the proposed development based on a commercial/industrial-zoned land use.
- Provide recommendations for further assessment and / or remediation and management, as required.

1.3 SCOPE OF WORKS

- Fieldworks consisting of:
 - Service clearance of proposed borehole locations by an experienced and suitably qualified service locating subcontractor, including review of BYDA plans.
 - Borehole advancement using solid-flight augers (200mm) on a track-mounted drill rig, across six borehole locations to the depth of natural material underlying fill (generally <2m BGL)
 - Screening soil for volatile organic compounds (VOCs) using a photo-ionisation detector (PID).
 - Soil sampling from depth intervals in the soil profile from the fill and underlying natural material including at the surface (0-0.1 mBGL), at approximately 0.5 mBGL, 1 mBGL and 1.5 – 2.0m.
 - Quantitative NEPM asbestos sampling. Including collection of 500ml soil samples and sieving of 10 L of fill/soil through a 7 mm sieve for sample locations in the grassed area.
 - Installation of a groundwater monitoring well at a downgradient location using slotted PVC pipe with a 2-3 mm sand annulus backfill, 0.5 m bentonite plug at the top of the sand pack and finished with a flush-mounted cover.
- Preparation of this DSI report in accordance with the NSW EPA Consultants reporting on contaminated land: Contaminated land guidelines (2020) including:

The report includes:

- A summary of the desktop study information reviewed by Tetra Tech.
- A summary of the site walkover and intrusive field work methodology, rationale and observations.
- Data quality objectives, data quality indicators and quality assurance and quality control.
- Comparison of analytical results against the relevant health and ecological criteria from Schedule B1 of the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended in 2013 (ASC NEPM), CRC CARE Technical Report 10 and ANZG DGVs.
- An updated preliminary in situ waste classification of the assessed soils.
- A discussion of results and an updated conceptual site model using the risk-based source-pathway-receptor model with respect to potential sources of contamination
- Statement of limitations regarding the nature of the assessment and recognised areas of uncertainty.
- A clear statement on the suitability of the Site for the proposed development and recommendations for further assessment / remedial action / management will be included in the report, as required.
- Figures, results summary tables, borehole logs, laboratory certificates and equipment calibration certificates as appendices.

1.4 APPLICABLE LEGISLATION AND GUIDELINES

The DSI was carried out with reference to the following legislation and guidelines:

- NSW *Contaminated Land Management Act 1997* (CLM Act 1997).
- Protection of the Environment Operations Act 1997.
- New South Wales Environment Protection Authority (NSW EPA) *Managing Land Contamination: Planning Guidelines; SEPP55-Remediation of Land 1998*
- *Chapter 4, State Environmental Planning Policy (Resilience and Hazards) 2021* (SEPP RSH, 2021).
- National Environment Protection Council (NEPC) (2013) *The National Environmental Protection (Assessment of Site Contamination) Measure 1999*, as amended 2013 (ASC NEPM, 2013).
- NSW EPA (2020) *Consultants Reporting on Contaminated Land Guidelines (Contaminated Land Guidelines, 2020)*.
- NSW EPA (2022) *Sampling design part 1 – application. Contaminated Land Guidelines. (NSW EPA SDGs)*
- NSW EPA (2022) *Sampling design part 2 – interpretation Contaminated Land Guidelines. (NSW EPA SDGs)*
- NSW EPA (2014) *Waste Classification Guidelines Part 1: Classifying waste*.
- Australian Standard AS 4964 – 2004: *Method for the Qualitative Identification of Asbestos in Bulk Samples (AS4964-2004)*.
- Canadian Council of Ministers of the Environment *Canadian Soil Quality Guidelines for the Protection of Environmental and Human Health – Polycyclic Aromatic Hydrocarbons* (CCME, 2010).
- Cooperative Research Centre for the Contamination Assessment and Remediation of the Environment (CRC CARE) 2011 *Technical Report 10, Health Screening Levels for Petroleum Hydrocarbons in Soil and Groundwater Part 1: Technical Development Document*
- US EPA *Guidance on Systematic Planning Using the Data Quality Objectives Process* (2006).

2. SITE INFORMATION

2.1 SITE IDENTIFICATION

Site identification and details including adjacent land use is summarised in Table 2-1.

Table 2-1: Summary of Site Details

Street Address	24 View Street Cessnock NSW 2325
Site Area	Approximately 1.38 hectares
Cadastral	Part of Lot 2 DP1173784, Part Lot 11 SP 882585
Current Zoning	SP2: Infrastructure under the Cessnock Local Environmental Plan 2011
Proposed Site Use	Continued use as a Health Services Facility
Local Government Area	Cessnock Council
Local Aboriginal Land Council	Mindaribba
Site co-ordinates	345276.339 m E 6366667.276 m N (north-western corner)
Adjacent Land Use	The remainder of Cessnock Hospital is present to the south, east and west of the Site with medium density residential properties beyond. A commercial property (Mountain View Lodge Hostel) is present to the north of the Site, over Jurd Street, followed by low density residential properties beyond.

2.2 SITE CONDITION

During the site assessment works the Site was observed to be an operational hospital. A site plan is presented in Figure 2 of Appendix A.

The Site consists of a grassed area with helicopter pad and old mortuary building in the northern portion of site. To the immediate south of the grassed area were old workshop buildings, a building which formerly housed an incinerator is now used for waste storage (in lined waste bins) and a yard maintenance shed. The yard maintenance shed contained a hoist for maintenance of ride on mowers and small amounts of chemicals (fuel, herbicides). The yard maintenance shed had only moderate staining on the concrete slab and not deterioration of the surface (cracks etc) was evident.

To the east is the pathology clinic building and in the central southern portion of the Site a workshop and services building and adjacent supply building, dangerous goods store and old bunded fuel above ground storage tank (AST).

The old buildings were noted to contain hazardous materials including asbestos fibre sheeting and lead paint. A fill mound was present in the grassed area behind the workshops, which sloped downward to the north, and the depth of the fill mound was observed to decrease to the west. A fill mound was also observed behind the pathology building and also sloped downward to the north.

Asphalt sealed roads enter the site from Jurd Street and Foster Street and runs through the centre of the Site. A large asphalt sealed car park area is present in the southwestern portion of Site.

To the south of the Site is the main hospital building and auxiliary buildings.

2.3 PREVIOUS REPORTS

Tetra Tech previously undertook a Preliminary Site Investigation (*'Preliminary Site Investigation (Limited Sampling), Proposed Redevelopment of Cessnock Hospital' 24 View St, Cessnock NSW 2325, 9 July 2024* (Tetra Tech report reference: 754-NTLEN347071 R01)) at the Site. This report is summarised in Table 2-2.

Tetra Tech also completed hazardous materials (Hazmat) survey of the 22 hospital buildings (*'Asbestos and Hazardous Materials Pre-Demolition Assessment', Cessnock Hospital, 24 View Street, 23 August 2024*) Tetra Tech report reference: 754-NTLEN347071-1 R01). The survey identified the presence of hazardous materials in the former incinerator, workshop buildings, pathology Building and old mortuary. Hazardous materials identified included asbestos fibre cement sheeting and other forms of asbestos including friable ASBESTOS (lagging), lead based paint, PCBs (in metal capacitors and refrigerants (Hydrochlorofluorocarbon (HCFC))).

Table 2-2: Summary of Tetra Tech PSI

Objectives	The primary objective of the PSI was to assess the Site with respect to potential contamination, in accordance with the relevant NSW Environment Protection Authority (EPA) guidelines and legislation. The objectives of the PSI included: • Examine potential contamination from previous land uses, identifying known or possible sources and contaminants of concern. • Assess potential risks to human and ecological health based on current and proposed land use. • Provide recommendations for further investigation, remediation, and management if needed. • Determine if the Site is suitable for continued use as a Health Facility, considering the planned redevelopment.
Scope	The scope of work undertaken for the PSI included: • A desktop review of: ▪ Site environmental setting ▪ A search of NSW EPA regulatory databases under the Contaminated Land Management Act 1997 or the Protection of the Environment Operations (POEO) Act 1997 for the Site and nearby properties. ▪ Historical aerial photographs for the Site and surrounds. ▪ Section 10.7 ((2) and (5)) planning certificate. ▪ Safework NSW Schedule 11 Hazardous chemicals on premises search. ▪ Historical land titles for the Site. • A site walkover to observe site conditions and visually inspect evidence of potential contamination. • Anecdotal evidence of potential historical contamination from the Site facilities manager • The intrusive fieldworks comprising: ▪ Boreholes advanced using solid-flight augers on a track-mounted mini loader, across 19 locations and hand auger at one location (BH01) to a maximum depth of about 1.5 metres. ▪ Screening soil for volatile organic compounds (VOCs) using a photo-ionisation detector (PID). ▪ Soil sampling from both fill and natural soil profiles, ▪ Submission of samples to a National Association of Testing Authorities (NATA) accredited laboratory for analysis of identified contaminants of potential concern (COPCs): Total recoverable hydrocarbons (TRH), Benzene, toluene, ethylbenzene and xylenes (BTEX) Polycyclic aromatic hydrocarbons (PAHs), Metals (arsenic, cadmium, chromium, copper, lead, nickel and zinc), Polychlorinated biphenyls (PCBs), Organochlorine pesticides (OCPs) and organophosphate pesticides (OPPs), Asbestos.

	Preparation of this PSI report documenting the findings of the scope of work including Development of a risk-based preliminary Conceptual Site Model (CSM), assessment of analytical results, and conclusion and recommendations based on the findings.
Environment Setting	- Topography - The Site is situated at approximately 85 – 87m Australian Height Datum (AHD) and features a gradual slope from south to north. - Geology - The Site is underlain by Permian sedimentary rock including Sandstone, siltstone and mudstone and the Greta Coal Measures - Acid Sulfate Soils - The Site is an area of no known occurrence for acid sulfate soils. - Surface Water Hydrology - No surface water body is present on the Site. - Rain fall runoff is expected to follow the topography to the north and enter site stormwater drains. - An unnamed ephemeral creek line is present across Jurd Street to the north, that appears to drain to a wetlands system approximately 470 m north of the Site. - Hydrogeology - Regional or perched groundwater at the Site is anticipated to flow in a north-easterly direction based on the local topography and flow direction of the surrounding surface waters. - Ecology - An area along the northern boundary of the Site corresponds to the tree line is identified on the NSW Government Biodiversity Values Map as “Threatened species or communities with potential for serious and irreversible impacts”. This area and was suspected to be connected to the northern ephemeral creek and wetlands system.
Contaminated Land Records	- A search NSW EPA’s contaminated land record of notices or list of notified sites was undertaken for the PSI on 27 June 2024. At the time of searching: - The site was not listed. - There were no sites listed within 500m of the Site. - A review of the NSW EPA POEO public register was undertaken on 1 July 2024. At the time of review four licenced premises were reported within 2 km of the Site. - There were no records identified with implications for the current investigation of the Site. - Other contamination and waste records were reviewed. In summary: - There were no sites listed on the EPA PFAS investigation program within 10km. - No sites in Cessnock were listed on the NSW DPI Cattle dip locator. - A former gasworks site was located on Maitland Road, Cessnock NSW.
SafeWork NSW Schedule 11 Hazardous Chemicals on Premises	The Schedule 11 dangerous goods search returned “no result”
Historical Aerial Imagery	The PSI Desktop search assessed historical aerial images dating from 1963 to 2022. In summary: 1963 - The Site was largely grassed with structures in the north-eastern and southern-central portion. The main hospital was present to the south of the Site. 1976 – The Site had been developed with buildings related to the hospital in the southern portion, including those to the immediate south of the grassed area 1984 – Development of the site had expanded to the west with additional buildings present and two buildings removed 1994 – The maintenance shed was the helicopter pad are visible on Site. An above ground storage tank (AST) corresponding to the current liquid oxygen tank is

	present. Land to the north of the Site has some residential development and the adjoining building to the east of the Site has been expanded. • 2007 – There appear to be ASTs adjacent the main hospital workshop and services building. The building to the southeast of the main hospital appears to have been redeveloped. • 2017 – The identified potential ASTs adjacent the main hospital workshop and services building are no longer visible. • 2022 – Several structures in the southwestern portion have been removed with the space used for car parking
Title Search	Titles were obtained for the lots making up Cessnock Hospital. • The tile search indicated Lot 1 and part Lot 2 DP1173784 was acquired for use as a hospital in 1941 and part Lot 2 DP1173784 and Lot 11 DP 882585 from 1954. • Prior to use as a hospital Lot 1 and part Lot 2 DP1173784 dating from 14th February 1913 was privately owned by miners • For part Lot 2 DP1173784 and Lot 11 DP 882585 dating from 01 September 1920 was privately owned by a Labourer from 1926 to 1945 and was privately owned by a dry cleaner from 11 April 1945.
Section 10.7 (2) & (5) Planning Certificate	The section 10.7 (2) & (5) Planning Certificate for the Site was obtained and reviewed. The following was noted: • The land is not land that includes or comprises biodiversity conservation under the Biodiversity Conservation Act 2016 or a conservation area under the Cessnock Local Environmental Plan 2011. • The Cessnock Hospital is identified as an item of environmental heritage (I54) in schedule 5 Local Environmental Plan 2011 is situated on the land. • There was no landslip, bush fire mine subsidence, tidal inundation or flooding hazard risk restrictions identified.
Aboriginal Heritage	No items were identified at the Site on an Aboriginal Heritage Information Management System (AHIMS) search
Site Walkover	The Site walkover included inspection of land use, topography, ground cover, site features, stormwater drainage, chemical and waste storage and potential sources of contamination and discussion with the facilities manager. Potential sources of contamination identified were: • A hoist and apparent vehicle maintenance within the yard maintenance shed. • Storage of minor amounts of chemicals (fuel, herbicides) within the yard maintenance shed. • Incinerator waste was indicated to have been buried within the grassed area on site. The incinerator was no longer used. • Suspected burial of asbestos waste within fill materials in the grassed area • An above ground storage tank (AST) was present on site. • Hazardous materials in old buildings including asbestos and lead paint
Results	Analytical results from soil samples for COPCs were assessed against the adopted (commercial/industrial) site criteria from the ASC NEPM 2013 Key results reported were: • The identification of asbestos fragments in fill material from two boreholes (BH06 and BH09) • TRH was detected in samples collected from within the carpark at the Site. ▪ The concentration of TRH F3 (C₁₆ - C₃₄) in the BH13 sample from a depth of 0.0-0.2 mBGL of 3,000 mg/kg exceeded the adopted ESL criteria. ▪ The concentration of TRH F2 C₁₀ - C₁₆ (minus Naphthalene) in BH15 sample of 350 mg/kg from a depth of 1.0-1.2 mBGL exceeded the adopted ESL criteria. ▪ The criteria exceedance was isolated to this sample in the borehole • Benzo(a)pyrene TEQ was also reported for sample BH13_0.0-0.2 at 92 mg/kg; this is above the HIL (40 mg/kg); however, it is below 250% of the HIL and considered to be a localised and possibly attributed to asphalt from the carpark.

	Samples were also assessed against the NSW EPA 2014 Waste Classification Criteria for in-situ waste classification. - The in-situ waste classification reported exceedance of the Tier 1 CT1 criteria for the classification of general solid waste (non-putrescible) for: - Benzo(a) pyrene (BH02_0.0-0.2, BH03_0.0-0.2, BH09_0.0-0.2, BH13_0.0-0.2, BH13_1.0-1.2, BH15_0.0-0.2 and BH15_1.0-1.2.) - Total PAHs (BH13_0.0-0.2) - Lead (BH09_0.0-0.2, BH13_0.0-0.2 and BH07_0.5-0.7) - Nickel (BH07_0.5-0.7, BH17_0.0-0.2, BH18_0.0-0.2 and BH19_0.0-0.2) - The samples with the highest reported concentrations of these contaminants were analysed for leachability (Toxicity Characteristic Leaching Procedure (TCLP) analysis) to assess the samples against the Tier 2 criteria (SCC1 and TCLP1). The TCLP1 and SCC1 criteria were met. - The fill was assessed as general solid waste (non-putrescible) with the locations of BH06 and BH09 being classed as general solid waste (non-putrescible) – asbestos.
Conclusions and Recommendations	A preliminary CSM was developed findings of the PSI (including the limited soil investigation). - The risk of contamination to human health for the current and ongoing land uses was assessed as low to moderate. - For ecological receptors, the exposure pathways were assessed as potentially incomplete and the risk from contamination for both the current and proposed land uses, was assessed as low to moderate. Tetra Tech recommended a Detailed Site Investigation (DSI) to address: - Data gaps related to the quantity and quality of fill of unknown origin across the Site. - Groundwater conditions. - Further assessment of the suspected asbestos, the reported PAH and petroleum hydrocarbon (as TRH) impacts in the vicinity of the incinerator and workshop buildings at BH13 and BH15 and the hoist (potential TRH/BTEXN impacts). On the basis of the findings of the PSI, Tetra Tech concluded that the Site can be made suitable for the proposed redevelopment by undertaking a DSI and by removal of any asbestos impacted fill/ soil during redevelopment.

3. DATA QUALITY OBJECTIVES

Data Quality Objectives (DQOs) have been developed accordance with the seven-step process outlined within the Appendix C of the Schedule B2 in the NEPM (2013) and are outlined in Table 3-1.

Table 3-1: Data Quality Objectives

Step 1: State the Problem	Data gaps were identified as part of the PSI conducted to assess the suitability of the Site for the proposed Cessnock Hospital redevelopment from a contaminated land perspective and management options (if required). In order to address the data gaps and meet the requirements for minimum sampling density of part 1 of the NSW EPA SDGs a DSI was required.
Step 2: Identify the Decision	Decision Questions: - Is the Site suitable or can it be made suitable from a contamination perspective for the proposed use (redevelopment and continued hospital use which is equivalent to commercial/ industrial land use)? - What is the nature and extent of contamination on the Site? - Does the contamination, if identified, pose an unacceptable risk to human health and the environment in the context of the proposed land use? - Are there any direct exposure pathways? - Is there a potential risk for offsite migration of contamination? - What is the likely classification of the contaminated soil, should it be excavated for remediation and/or site development purposes
Step 3: Identify Inputs to the Decision	The following inputs to the decision are: - What media should be assessed? - Is systematic or judgemental sampling suitable for the project objectives? - Do the number of samples analysed for each chemical of concern provide an adequate dataset to complete a statistical appraisal? - Does the data adequately represent the conditions on-site or will findings from the assessment lead into additional assessments which require more rigorous sampling patterns? The information inputs required to assess compliance within Schedules B1 and B2 of the ASC NEPM and the NSW EPA (2020) Contaminated Land Guidelines include: - Quality Assurance/ Quality Control (QA/QC) documentation and review of data quality indicators (DQIs). - Data to be collected by Tetra Tech including field observations and laboratory analytical results. - Assessment criteria outlined in this document (see Section 5). - Environmental variables to be measured. - Concentrations of chemicals of concern within soil and surface water at the Site. Media to be sampled and monitored: - Fill materials. - Natural soil material. - Groundwater
Step 4: Define the Boundaries of the Study	The study boundary is defined as: - The Site boundary occupies approximately 1.38 ha; - The assessment boundary and sample locations are shown in Figure 3 of Appendix A; - The vertical site boundary is to the depth of natural material beneath the fill any field observed odours/ soil staining at each of the proposed sample locations (<2m BGL) for soil assessment and to the depth of monitoring well installation for groundwater (8m BGL).

Step 5: Develop the Analytic Approach	The decision rule for soil for each chemical/ media to assess the suitability of the Site based on the adopted assessment criteria (Section 8) will be as follows: • QA/QC assessment and DQIs indicate that the data is usable. • The 95% upper confidence limit arithmetic mean to be $\leq$ the adopted assessment criteria. • No individual sample to exceed 250% of the adopted assessment criteria (HILs/HSLs). • The standard deviation to be $<50\%$ of the adopted assessment criteria. If the statistical parameters of the sampling data for a chemical/media exceed the adopted assessment criteria in Section 5, then remediation and/ or Human Health and Ecological Risk Assessment (HHERA) may be required.
Step 6: Specify Performance or Acceptance Criteria	The DSI decision rule as a statistical hypothesis: • The null hypothesis (H_0) is that contaminant concentrations exceed the adopted assessment criteria. ▪ The 95% $UCL_{AVERAGE}$, and other requirements, are $>$ criteria. • The alternative hypothesis (H_A) is that the contaminant concentrations do not exceed the adopted assessment criteria. • the 95% $UCL_{AVERAGE}$, and other requirements, are $\leq$ criteria. Potential outcomes of decision errors include Type I and Type II errors: • Type I error of determining the material is acceptable for the proposed land use when it is not (wrongly rejects true H_0), thereby potentially risking human health or environmental impacts. • Type II error of determining the material is unacceptable for the proposed land use when it is acceptable (wrongly accepts false H_0), potentially resulting in incorrect decisions regarding remediation and/or management of soils incurring potential financial and resource burdens on the development project. The acceptable limits on the likelihood of making decision errors are nominated as α risk = 0.05 (Type I error) and β risk = 0.2 (Type II error). An assessment will be made of data quality and its impact on decision error, based on the data quality indicators (DQIs) of precision, accuracy, representativeness, comparability and completeness. Data quality assessment will be in accordance with the ASC NEPM and Sampling Design Guidelines (EPA, 2022).
Step 7: Develop the Plan for Obtaining Data	Samples to be collected from boreholes advanced to a depth of up to 2m BGL across the Site in a judgemental sampling pattern at 6 locations. The additional samples in conjunction with the PSI met the minimum number of sampling locations in the SDGs for a 1.38 ha site. Groundwater to be assessed by installation of one monitoring wells and subsequent sampling. Sampling strategy for soil, as well as appropriate Site-specific Quality Assurance/ Quality Control procedures are detailed within Section 4 (Sampling and Analysis Plan) and Section 6.1 (Data Quality Indicators). Samples submitted for analysis based on the analytical schedule in Section 4.

4. SAMPLING AND ANALYSIS PLAN

The sampling and analysis plan was developed with reference to the *NSW EPA (2020) Consultants Reporting on Contaminated Land Guidelines*, relevant sections in Schedule B2 of the National Environment Protection Council (NEPC) 2013 National Environment Protection (Assessment of Site Contamination) Measure 1999 (April 2013) (ASC NEPM 2013), site observations, information from the PSI including the preliminary CSM.

NSW EPA Contaminated Land Guidelines: Sampling design part 1 - Application (2022) recommend 25 sampling locations to characterise a 1.38 ha site using a systematic sampling layout. For the PSI a reduced sampling density of 20 borehole locations was undertaken. The sample locations were spread across the investigation area in an approximately systematic grid (noting buildings occupying portions of the site).

The soil boring investigation depth was targeted to reach natural material underlying fill which extends up to 2mBGL, based on the anticipated top-down contamination exposure route. A limited groundwater investigation was undertaken by installation of one monitoring well to confirm anticipated low risk to groundwater. Sample locations are provided in Figure 3 of Appendix A.

The sampling and laboratory analysis plan of works executed as part of this DSI together with the sampling rationale, is presented in Table 4-1.

Table 4-1: Sampling and Analysis Plan

Task	Method
Service Location	Before-You-Dig-Australia (BYDA) service plans for the Site and nearby surrounds (<500m) and a service locator's report provided by the Client were reviewed prior to commencement of intrusive investigation works. Investigation locations were cleared by a licensed and experienced underground service clearance sub-contractor using an electromagnetic detector.
SOIL	
Soil Sampling Rationale	The Site comprised mostly a grassed lawn and car parking lot, with structures including an old incinerator/ workshop and an above-ground storage tank. The mechanism of contamination for any on-site sources is anticipated to be top down and potential impacts to surface soils on-site (<1.0 m depth) may be present from imported fill, surface water runoff and anthropogenic materials (e.g. asbestos) if present. <i>NSW EPA Contaminated Land Guidelines: Sampling design part 1 - Application (2022)</i> recommend 25 sampling locations to characterise a 1.38 ha site using a systematic sampling layout. The PSI including soil sampling from 20 borehole locations. This DSI investigated a further 6 targeted locations to address data gaps and meet sampling density within the sampling design guidelines. The soil boring investigation depth was targeted to the depth of natural material underlying the fill (<2.0 mBGL), to assess the anticipated top-down contamination. Sample locations are presented on Figure 3 of Appendix A.
Soil Sampling Method	Six boreholes (BH01A – BH06A) were advanced at the targeted locations using a 200mm auger on a track mounted Geoprobe rig. The auger was advanced in 500mm increments to allow for collection of soil samples at target depths within the soil profile. Soil cuttings were removed from the auger between borehole locations.
Soil Sampling	Soil samples were collected in accordance with Tetra Tech's Standard Operating Procedures (SOP), which are based on industry standard practice. Soil samples were collected directly from the auger into laboratory-supplied Teflon-lined lid glass jars with zero headspace and Ziplock bags (500 g for asbestos). Soil samples were immediately placed in an ice-chilled storage container during field work and subsequent transport to the selected laboratory (Eurofins Environment Testing Australia Pty Ltd (Eurofins)).

Task	Method
	Samples were collected to assess the potential presence of contamination from fill and natural material. Soil samples were collected at specific intervals within the soil profile, including: • One from fill (0.0-0.2 mBGL). • One from half a metre depth (0.5-0.7 mBGL). • One from 1 metre depth (0.9-1.0 mBGL). • One in the natural material. • On the basis of field observations, evidence of staining, chemical odours wastes or black slag material etc. (if encountered). • At changes in the strata targeting fill and natural material.
Asbestos Screening of Soil	Sample collection, screening and analysis for asbestos was completed in accordance with Section 11.3.2 of Schedule B2 of the ASC NEPM and included the following: • Samples were collected using hand tools by removing grass and rootlets in a approximately 50cm by 50cm square area immediately next to the location of the borehole. • Samples were collected from the fill material at 0.0 – 0.25m BGL. • A 10L sample was collected, weighed and screened through a 7mm x 7mm sieve. • Any material retained on the sieve was examined for the presence of cement, sheeting fragments or other material with the potential to contain asbestos. • Suspect asbestos material retained on the sieve was placed in double Ziplock bags for analysis. • A 500mL sub-sample was collected at the same depth ranges for analysis be placed in double zip lock bags and with samples of suspect material retained on the sieve was forwarded to the laboratory for analysis.
Soil Logging	Boreholes were logged by suitably qualified and experienced Tetra Tech environmental scientist in accordance with Tetra Tech's SOPs, which are consistent with AS1726:2017. The presence or absence of anthropogenic material and indicators of contamination (i.e. odours or staining) were included in the bore logs, which are presented in Appendix B.
Soil PID Screening	Soil samples were screened in the field for the presence of ionisable VOCs using a PID fitted with a 10.6eV lamp. The PID was bump tested at the start of each day of fieldworks using a 100-ppm isobutylene canister and in fresh air. PID measurements were taken by placing the sample of soil into a dedicated zip-lock bag, sealing it and after about one minute, perforating the bag with the PID with the highest measurement recorded after 60 seconds. Headspace screening results were recorded on bore log sheets, which are presented in Appendix B.
Laboratory Analysis – Soil	Soil samples were scheduled for analysis as follows: • 6 samples from the shallow surface/near surface, for: ▪ Total recoverable hydrocarbons (TRH). ▪ Benzene, toluene, ethylbenzene and xylenes (BTEX). ▪ Polycyclic aromatic hydrocarbons (PAHs). ▪ Metals (arsenic, cadmium, chromium, copper, lead, nickel and zinc). ▪ Polychlorinated biphenyls (PCBs). ▪ Organochlorine pesticides (OCPs) and organophosphate pesticides (OPPs). ▪ Asbestos (500 g). • 6 deeper fill/natural samples for: ▪ metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc). ▪ PAHs. ▪ TRH.

Task	Method
	▪ BTEX. • Up to five samples for suspected asbestos fibre cement fragments, if found on or in soil, will to be analysed for asbestos. • TCLP leachability analysis for as required for waste classification for PAHs and selected metals.
GROUNDWATER	
Groundwater Sampling Rationale	A groundwater monitoring well was installed in a location downgradient from the yard maintenance shed in the general direction of anticipated groundwater flow. This was installed to assess whether there is potential groundwater contamination on site arising from the onsite soil contamination.
Groundwater Sampling	Tetra Tech developed the newly installed monitoring well on 3 September 2024 to remove any residual sediment from the installation process by use of a bailer. The recharge was observed to be slow, therefore the well was bailed dry. On 11 September 2024 (8 days after installation and development), Tetra Tech gauged and sampled the newly installed monitoring well by Hydrasleeve. A summary of the sampling methodology is summarised follows: • Monitoring wells were gauged using an Interface Probe (IP) to determine the depth to water, total well depth and the presence/ absence of non- aqueous phase liquids (NAPLs). • Using bailer chord, Hydrasleeves® was gently lowered so that the Hydrasleeve weight was positioned above the bottom of each well within the well screen. • Tension was maintained on the tether and the Hydrasleeve was then retrieved in one smooth motion, pulling the tether up at a rate of approximately 0.5m per second to allow the top check valve to open and fill with groundwater. • A small volume of water trapped in the Hydrasleeve above the check valve was then discarded immediately after its extraction, this was to ensure water from the top of the water column is removed and not included as part of the sampling process. • Collected groundwater was transferred from the Hydrasleeve into appropriately preserved laboratory prepared containers specific to the targeted COCs. • Once sampling had been completed, water quality parameters such as temperature, pH, dissolved oxygen (DO), redox potential and electrical conductivity (EC) were measured from the remaining groundwater within the Hydrasleeve. • Water quality parameters were measured with the use of a calibrated Water Quality Meter. Calibration certificates are presented in Appendix G. • Field observations from groundwater from groundwater sampling were recorded onto field sheets (presented in Appendix H), and included: ▪ Well diameter. ▪ Depth of well. ▪ Depth to groundwater. ▪ Water quality parameters. • Visual and odorous observations (presence of LNAPL, surface sheen, discolouration, odours).
Quality Assurance/Quality Control	
Sample Storage and Handling	Sample storage, handling and transport was in accordance with Tetra Tech's SOPs. The samples were placed into ice-chilled coolers and dispatched to NATA accredited laboratories for analysis under Chain of Custody (CoC) documentation.
Decontamination of Sampling Equipment	It was not considered practical to wash the Geoprobe auger between each sampling locations. The auger was brushed off between each borehole location by wire brush to remove soil that may have adhered to the probe. Care was taken to not collect soil directly in contact with the auger, to avoid cross-contamination.

Task	Method
	The interface probe (IP) used for groundwater sampling was decontaminated by rinsing with water, immersing in a Decon90 solution and then a final rinse with laboratory supplied DI water.
Cross-contamination Management	Dedicated nitrile gloves were used for each sample collected. The auger was brushed off between each borehole location by wire brush to remove adhering soil. Care was taken to not collect soil directly in contact with the auger, to avoid cross-contamination.
QA/QC Samples	To measure the accuracy and precision of the data generated by the procedures for this assessment, Tetra Tech collected the following quality assurance/quality control (QA/QC) samples: • Intra-laboratory duplicate – One duplicate QA/QC sample was collected per twenty primary samples (soil) collected. • Inter-laboratory triplicate – One triplicate QA/QC sample was collected per twenty primary samples (soil) collected. • Trip blank – Two trip blank samples were included for within each batch of samples submitted to the laboratory for analysis. • Trip spike – Two trip spike samples were included within each batch of samples submitted to the laboratory for analysis.

TRH – Total Recoverable Hydrocarbons, BTEX – Benzene, Toluene, Ethylbenzene, Xylenes, PAH-Polycyclic Aromatic Hydrocarbons
Metals - aluminium, arsenic, barium, cadmium, chromium, cobalt, copper, lead, manganese, mercury, nickel, selenium, zinc

5. ASSESSMENT CRITERIA

Schedule B1 of the ASC NEPM (2013) provides health and environmental values appropriate for the assessment of land contamination, based on selected land use settings. Health-based criteria has been developed for generic exposure settings, including residential, recreational, and commercial/industrial. Ecological criteria have been devised for three generic exposure settings, including national parks and areas with high ecological value, urban residential and public open space and commercial/industrial.

For a Tier 1 assessment, as is the case for this DSI, the results should meet the following criteria:

- The standard deviation of the results should be less than 50% of the relevant investigation or screening level.
- No single value should exceed 250% of the relevant health investigation or screening level.

Ecological criteria for benzo(a)pyrene have been adopted from *The Canadian Council of Ministers of the Environment Canadian Soil Quality Guidelines for the Protection of Environmental and Human Health – Polycyclic Aromatic Hydrocarbons* (CCME, 2010).

Tetra Tech understands that the Site will be redeveloped as an extension of the current Cessnock Hospital, as such, the applicable land use for assessing land contamination conditions is commercial/ industrial. The assessment criteria adopted the Site is presented in the following sections.

5.1 HUMAN HEALTH CRITERIA

Health Investigation Levels (HILs) are applicable for assessing human health risk via relevant exposure pathways. HILs have been developed for a broad range of metals and organic substances. These are generic to all soil types and apply generally to a depth of up to 3 metres below the soil surface.

Health screening levels (HSLs) have been developed for selected petroleum compounds and fractions and are applicable to assessing human health risk via inhalation after vapour intrusion into indoor air and direct contact with soil and groundwater. HSLs depend on general soil type (sand, silt and clay), building configurations and land use scenarios, with sand being the most conservative of the criteria followed by silt then clay.

HSLs for direct contact and Intrusive Maintenance Worker (Shallow Trench) were adopted from CRC CARE 2011 *Technical Report 10, Health Screening Levels for Petroleum Hydrocarbons in Soil and Groundwater Part 1: Technical Development Document* (CRC CARE, 2011).

As the Site is proposed to be used for continued commercial/ industrial land use, HIL/HSL D (commercial/industrial) criteria has been adopted to assess the soil analytical results against.

The adopted HILs and HSLs for COPCs are summarised in Table 5-1 and Table 5-2. As a conservative measure, a coarse-grained sandy soil type has been assumed to be present at the Site.

Table 5-1:ASC NEPM (2013) Health Investigation Levels (HIL D - commercial/industrial)

Chemical	HIL – D Commercial/ Industrial (mg/kg) ¹
Aluminium	-
Arsenic	3,000
Barium	-
Cadmium	900
Chromium (VI)	3,600
Copper	240,000

Chemical	HIL – D Commercial/ Industrial (mg/kg) ¹
Lead	1,500
Manganese	60,000
Mercury (inorganic)	730
Nickel	6,000
Selenium	10,000
Zinc	400,000
Carcinogenic PAHs, as Benzo(a)pyrene TEQ ²	40
Total PAHs	4,000
Phenol	240,000
Pentachlorophenol	660
Cresols	25,000

1. Table 1A(1) – Health investigation levels for soil contaminants - commercial/industrial land use (ASC NEPM (2013)).

2. TEQ = Toxicity Equivalence

Table 5-2: ASC NEPM (2013) Health Screening Levels (HSL D - commercial/industrial)

Chemical	HSL D – Commercial/ Industrial (Sand) (mg/kg) ¹	HSL-D Direct Contact ² (mg/kg)	HSL – Intrusive Maintenance Worker (Shallow Trench) (Sand) ³ (mg/kg)
	0m to <1m		0m to <2m
Benzene	3	430	77
Toluene	NL	99,000	NL
Ethylbenzene	NL	27,000	NL
Xylenes	230	81,000	NL
Naphthalene	NL	11,000	NL
F1 (TRH C ₆ -C ₁₀ – BTEX)	260	-	NL
TRH C ₆ -C ₁₀	-	26,000	-
F2 (TRH >C ₁₀ -C ₁₆ – Naphthalene)	NL	-	NL
TRH C ₁₀ -C ₁₆	-	20,000	-
TRH C ₁₆ -C ₃₄	-	27,000	-
TRH C ₃₄ -C ₄₀	-	38,000	-

NL: non-limiting (i.e. contaminant is not considered to pose a risk to human health through vapour inhalation regardless of concentration).
Soil type is assumed to be sandy as the most conservative option.

1. Table 1A(3) – Soil Health Screening Levels for Vapour Intrusion (ASC NEPM(2013)).

2. Table A4 - Soil Health Screening levels for Direct Contact for commercial/ industrial (CRC CARE, 2011).

3. Table A3 – Soil Health Screening Levels for Vapour Intrusion (Intrusive Maintenance Worker) (CRC CARE, 2011).

5.1.1 Asbestos

In accordance with Section 4.8 of Schedule B1 of the ASC NEPM (2013), HSLs for asbestos have been included. HSLs for asbestos in soils have been established for three forms of asbestos, which include:

- Asbestos Containing Material (ACM) – material that is ‘bound in a matrix such as cement or resin (e.g. asbestos fencing and vinyl tiles). This term is restricted to material that cannot pass a 7 mm x 7 mm sieve. This sieve size is selected because it approximates the thickness of common asbestos cement sheeting and for fragments to be smaller than this would imply a high degree of damage and hence potential for fibre release’.

- Fibrous Asbestos (FA) – material that ‘comprises friable asbestos material and includes severely weathered cement sheet, insulation products and woven asbestos material. This type of friable asbestos is defined here as asbestos material that is in a degraded condition such that it can be broken or crumbled by hand pressure. This material is typically unbonded or was previously bonded and is now significantly degraded (crumbling)’.
- Asbestos Fines (AF) – material that ‘includes free fibres, small fibre bundles and also small fragments of bonded ACM that pass through a 7 mm x 7 mm sieve. (Note that for bonded ACM fragments to pass through a 7 mm x 7 mm sieve implies a substantial degree of damage which increases the potential for fibre release.)’.

No visible forms of asbestos relating to ‘All forms of asbestos’ relates to the top 0.1 m of soil.

Table 5-3 presents the criteria for HSLs for asbestos in soils.

Table 5-3: Asbestos in soils HSLs (commercial/industrial)

Form of Asbestos	Health Screening Levels (w/w)
	Commercial/Industrial D (HSL - D)
Bonded ACM*	0.05%
FA and AF*	0.001%
All forms of asbestos	No visible forms of asbestos

ACM: Asbestos Containing Material, FA: Friable Asbestos, AF: Asbestos Fines; *Not applicable to the CA as the sampling and analysis would not correlate to the HSLs; No visible forms of asbestos related to the top 0.1m of soil.

5.2 MANAGEMENT LIMITS

In accordance with Section 2.9 of Schedule B1 of the NEPM (2013), consideration of Management Limits for petroleum hydrocarbons has been included to assess the potential for accumulation of explosive vapours, the potential risk to buried infrastructure, or the formation of light non-aqueous phase liquid (LNAPL).

A summary of the adopted management limits for this Site is provided in Table 5-4.

Table 5-4: Management Limits for Commercial/ Industrial Land Use

Chemical	Soil Type	Commercial/ Industrial (mg/kg) ¹
F1: TRH C ₆ -C ₁₀	Coarse	700
F2: TRH C ₁₀ -C ₁₆	Coarse	1,000
F3: TRH C ₁₆ -C ₃₄	Coarse	3,500
F4: TRH C ₃₄ -C ₄₀	Coarse	10,000

1. Table 1 B(7) Management Limits for TPH fractions F1-F4 in soil (ASC NEPM (2013)).

5.3 ECOLOGICAL CRITERIA

Ecological Investigation Levels (EILs) have been developed for selected metals and organic compounds, for assessing risk to terrestrial ecosystems under residential, open space and commercial/industrial land use scenarios. They apply to the top 2 m of accessible soil, which corresponds to the root zone and habitation zone of many species.

Site-specific EILs for heavy metals were derived through analysis of soil pH, CEC, iron content, clay content and organic carbon content.

Ecological screening levels (ESLs) have been developed for selected petroleum compounds and fractions and are applicable for assessing risk to terrestrial ecosystems. The ESLs broadly apply to coarse and fine-grained soils under various land use scenarios and are applicable to the top 2 m of accessible soil.

The adopted EILs and ESLs for a commercial/ industrial land use are based on a continued commercial/ industrial land use and are summarised in Table 5-5 and Table 5-6, respectively. The site-specific EILs for fill and natural soil horizons were calculated as part of Tetra Techs PSI.

Table 5-5: Ecological Investigation Levels (Commercial/ Industrial)

Chemical	EIL – Commercial/ Industrial (mg/kg) ¹
Arsenic	160
Chromium	430 ³
Copper	150 ³
Lead	1,800 ²
Nickel	80 ³
Zinc	480 ³
Naphthalene	370

1. Table 1B(5) Generic EILs for aged As, fresh DDT and fresh naphthalene in soils irrespective of their physicochemical properties (ASC NEPM (2013)).
2. Table 1B(4) Generic added contaminant limits for lead in soils irrespective of their physicochemical properties (NEPM (2013)).
3. Site-specific EILs (ASC NEPM (2013)).

Table 5-6: Ecological Screening Levels (Commercial/ Industrial)

Chemical	ESL – Commercial/ Industrial (mg/kg) ¹
TRH F1 C ₆ – C ₁₀	215
TRH F2 >C ₁₀ – C ₁₆	170
TRH F3 >C ₁₆ – C ₃₄	1,700
TRH F4 > >C ₃₄ – C ₄₀	3,300
Benzene	75
Toluene	135
Ethylbenzene	165
Xylene	180
Benzo(a)pyrene	72 ²

1. ESLs for TPH fractions F1 – F4, BTEX and benzo(a)pyrene in soil (ASC NEPM (2013)).
2. Canadian Soil Quality Guidelines for the Protection of Environmental and Human Health – Polycyclic Aromatic Hydrocarbons (CCME, 2010)

5.4 IN-SITU WASTE CLASSIFICATION CRITERIA

Soil analytical results will be assessed against the criteria presented in the NSW EPA Waste Classification Guidelines, by answering the following 6 questions:

1. Is the Waste Special Waste?
2. Is the Waste Liquid Waste?
3. Is the Waste Pre-Classified?
4. Does the Waste Possess Hazardous Characteristics?
5. What is the Chemical Characterisation of the Soil Material
6. Is the Waste Putrescible or Non-Putrescible?

The chemical characterisation of the soil material is assessed against the criteria summarised in Table 5-7.

Table 5-7 Waste Classification CT1 criteria

Chemical	Maximum values of specific contaminant concentration (SCC) for classification without TCLP	
	General Solid Waste CT1 (mg/kg)	Restricted solid waste CT2 (mg/kg)
Arsenic	100	400
Benzene	10	40
Benzo(a)pyrene	0.8	3.2
Cadmium	20	80
Chlorpyrifos	4	16
Chromium (VI)	100	400
Endosulfan	60	240
Ethylbenzene	600	2,400
Lead	100	400
Mercury	4	16
Moderately harmful pesticides ⁶ (total)	250	1,000
Nickel	40	160
C6–C9 petroleum hydrocarbons	650	2,600
C10–C36 petroleum hydrocarbons	10,000	40,000
Phenol (non-halogenated)	288	1,152
Polychlorinated biphenyls ⁹	<50	<50
Polycyclic aromatic hydrocarbons (total)	200	800
Toluene	288	1,152
Xylenes (total)	1,000	4,000

CT = Contaminant threshold

5.5 GROUNDWATER CRITERIA

Groundwater investigation levels presented in Schedule B1 of the ASC NEPM, supplemented with values from ANZG (2018) Australian and New Zealand Guidelines for Fresh and Marine Water Quality where required, are considered applicable for the protection of fresh and marine species of the receiving waters. It is important to note that these are not threshold values at which an environmental impact is likely to occur if exceeded. Rather, if the Default guidelines values (DGVs) are exceeded, then further action is required which may include either further site-specific investigations to assess whether or not there is a potentially adverse effect, or the implementation of management/ remedial actions.

With consideration to the proximity to the closest surface water body (Black Creek and associated tributaries) and potential receptors, it is considered that the freshwater DGV's are applicable for investigating contaminant concentrations in groundwater.

The NSW EPA policy is that 95% protection is the default condition, regardless of the actual condition of the habitat. Guidelines indicate use of 99% protection where bio-accumulation is possible.

There were no registered groundwater bores identified onsite and no registered groundwater bores within 500m of the Site. There were no registered groundwater bores downgradient within 2 km of the Site identified for domestic use. Therefore, drinking water guidelines provided within the ASC NEPM have not been considered as part of the additional contamination assessment criteria.

Based on the above, the adopted Groundwater Investigation Levels (GILs) are listed in Table 5-8.

Table 5-8: Groundwater Investigation Levels

Contaminant	Guideline		
	ANZG Freshwater Water 95% (µg/L)	NEPM HSL D Commercial/ Industrial (2m to <4m) (mg/L)	NEPM HSL D Commercial/ Industrial (4m to <8m) (mg/L)
Arsenic	-	-	-
Cadmium	0.2	-	-
Chromium (III)	3.3	-	-
Copper	1.4	-	-
Lead	3.4	-	-
Mercury	0.6	-	-
Nickel	11	-	-
Zinc	8	-	-
Benzene	950	30	35
Toluene	180	NL	NL
Ethylbenzene	80	NL	NL
m-Xylene	75	-	-
o-Xylene	350	-	-
p-Xylene	200	-	-
Xylenes	-	NL	NL
Naphthalene	80	NL	NL
TRH F1	-	NL	NL
TRH F2	-	NL	NL
Anthracene	0.4	-	-
Benzo(a)pyrene	0.2	-	-
Fluoranthene	1.4	-	-
Naphthalene (PAH)	16	-	-
Phenanthrene	2.0	-	-
Pentachlorophenol	10	-	-
Phenol	320	-	-

NL: non-limiting (i.e. contaminant is not considered to pose a risk to human health through vapour inhalation regardless of concentration).
Soil type for HSLs is clay.

6. QA/QC ASSESSMENT

The outcome of the field and laboratory quality control were assessed according to the established Data Quality Indicators (DQIs). DQIs are used to assess whether the DQOs have been met. DQIs for the project are based on the field and laboratory considerations in Section 19.6 of ASC NEPM Schedule B2 Appendix B. The quality assurance review checked performance against the DQIs adopted for this investigation. The DQI review is presented in the Data Validation Report provided in Appendix E and summarised below.

6.1 FIELD QUALITY CONTROL MEASURES

Field quality control measures included:

- Sampling performed by qualified Tetra Tech environmental professionals in accordance with Tetra Tech's SOPs which are based on industry accepted protocols for environmental sampling and are consistent with Schedule B2 of the ASC NEPM.
- Field quality control samples collected in accordance with Section 4.

A summary of the field quality control samples collected is presented in Table 6-1. Results tables for RPDs, trip blank and trip spike are presented in Appendix E.

Table 6-1: Summary of Field Quality Control Samples

Sample ID	Media	Description	Date	Corresponding Primary Sample
QC1	Soil	Duplicate	12.06.24	BH11_0.0-0.2
QC2	Soil	Duplicate	12.06.24	BH11_0.0-0.2
QC3	Soil	Duplicate	13.06.24	BH17_0.5-0.7
QC4	Soil	Duplicate	13.06.24	BH17_0.5-0.7
QC1A	Soil	Duplicate	03.09.24	BH4A_0.1-0.2
QC2A	Soil	Interlab duplicate	03.09.24	BH4A_0.1-0.2
QC1	Water	Duplicate	11.09.24	MW01
QC2	water	Interlab duplicate	11.09.24	MW01
Trip Blank	Soil	Laboratory Trip Blank	12.06.24	N/A
Trip Spike	Soil	Laboratory Trip Spike	12.06.24	N/A
Trip Blank	Soil	Laboratory Trip Blank	13.06.24	N/A
Trip Spike	Soil	Laboratory Trip Spike	13.06.24	N/A
QC1	Groundwater	Duplicate	03.09.24	MW01
QC2	Groundwater	Interlab duplicate	03.09.24	MW01
Trip Blank	Groundwater	Laboratory Trip Blank	03.09.24	N/A
Trip Spike	Groundwater	Laboratory Trip Spike	03.09.24	N/A
Rinsate	Groundwater	Rinsate from interface probe	03.09.24	N/A

All trip blanks reported analytes below the LOR and trip spikes reported recoveries within an acceptable range (70-130%), therefore the transport and handling of samples in not considered to have affected the accuracy of the reported results.

Exceedances of field RPD criteria were reported in soil for TRH fractions, PAHs (related to primary sample BH4A_0.1-0.2) and for some metals. These were considered to be related to heterogeneity of fill. In groundwater RPD criteria exceedance were reported for arsenic, cadmium, chromium and copper, where

concentration reported were close to laboratory detection limits. Where an RPD exceedance was reported the higher concentration within the QC pair was utilised.

6.2 LABORATORY QUALITY ASSURANCE/ QUALITY CONTROL

The selected laboratories performed internal QA/QC procedures which included laboratory duplicates, method blanks, laboratory control samples and surrogate spikes. The laboratory certificates are included in Appendix F.

Laboratory QC analytical results are summarised below:

- Analysis of samples was undertaken by NATA accredited laboratories.
- All primary samples were extracted and analysed within recommended holding times, except for conductivity in 5 samples and benzo(a)pyrene (3 TCLP samples only).
- No target analytes were detected in any of the method blanks.
- RPDs for the internal laboratory duplicate samples were mostly within the acceptable range, except for several PAHs and metals.
- Percentage recovery results for laboratory control samples were within the acceptable range.
- Percentage recovery results for surrogates were within the acceptable range. Some surrogates for phenols, BTEX and OCP/OPPs were outside criteria, however only minor concentrations of phenols and BTEX were reported above LOR, and no OCPs/OPPs were reported above LOR.

6.3 DATA QUALITY ASSESSMENT

Tetra Tech considers that the data presented is acceptable and meets the DQOs and that the DQI's were complied with during the assessment. Tetra Tech consider that the field and laboratory data assessed is reliable in consideration of the following:

- All identified sampling locations were sampled, and all planned samples collected in accordance with the Sampling and Analysis Plan (Section 4).
- Field works, and sampling was completed by an experienced and suitably qualified Environmental Scientist. SOPs were appropriate and generally complied with. Sampling procedures were appropriate, implemented consistently during the assessment works.
- Sample documentation was completed.
- The laboratory analysed samples as per the COC, which was in accordance with the analytical schedule (Section 4).
- The primary (Eurofins) and secondary (ALS) laboratories were NATA accredited for the analysis undertaken. The LORs were appropriate for the assessment (below assessment criteria).
- Field and laboratory QAQC were undertaken and considered satisfactory with consideration given the non-conformances identified for the reasons outlined in the data validation report in Appendix E.

Based on the QA/QC assessment completed, the field and laboratory QA/QC data are considered to be usable and representative of the sampling locations at the time of sampling and are suitable for the purpose of the assessment.

7. RESULTS

7.1 FIELDWORK OBSERVATIONS

Observations made during drilling and sampling of boreholes related to the nature of the soil and indicators of contamination are presented in the logs in Appendix B. A photolog of observations is presented in Appendix C.

A fill mound was present in the grassed area behind the workshops, which sloped downward to the north, and the depth of the fill mound was observed to decrease to the west. A fill mound was also observed behind the pathology building and also sloped downward to the north.

The nature of the fill including observations of anthropogenic materials was consistent with the PSI. Fragments of asbestos were observed in BH01A (near the pathology building) and in BH5A behind the workshops. Waste items including plastic, tile and nails were reported in fill in BH2A. No stains or odours were observed.

The yard maintenance shed had only moderate localised staining on the concrete slab and deterioration of the surface (cracks etc) was not evident.

7.2 SOIL RESULTS

7.2.1 Subsurface lithology

A generalisation of the subsurface lithology encountered during the intrusive investigation works is presented in Table 7-1. Sample locations are presented in Figure 3 of Appendix A. Borehole logs are presented in Appendix B. Indicative fill depths across the Site based on investigation boreholes are presented as cross sections in Figures 4a – 4c of Appendix A.

Table 7-1: Observed Subsurface Lithology

Depth	Description
0 – 0.1	Topsoil (in grassed areas) Silty CLAY, Asphalt (in sealed areas)
0.1 – 1.6	Fill (Silty Sand to Silty CLAY, with gravels)
0.5 – 2.0	Residual Soil (CLAY, high plasticity)
1.9 – 8.0	Sandstone and siltstone

7.2.2 Soil Analytical Results

All soil chemical results compared with the adopted assessment criteria are presented in Table 1a and asbestos in soil results in Table 1b of Appendix D. Results from the PSI are also included for inclusion in calculation of statistical parameters. A waste classification results table is presented in Table 1c of Appendix D including the PSI data for provision of an updated in situ waste classification. Certified laboratory reports are provided in Appendix F.

A summary of the soil chemical results and assessment criteria exceedances is presented in Table 7-2. A statistical appraisal is presented of contaminants reported above the adopted site criteria in Table 7-3. No COPCs with individual exceedances of criteria reported 95% UCL_{AVERAGE} above criteria. One sample for Zinc was >250% of the EIL criteria (BH2A_1.0-1.1). Additional analyses of samples from the borehole (BH2A_0.5-0.6, BH2A_1.9-2.0) were below criteria. Benzo(a)pyrene (TEQ) in QC1A (BH4A_0.1-0.2) was >250% of the

HIL criteria. The concentration reported in the sample from lower in the borehole (1.0-1.1m) was below criteria.

A summary of asbestos in soil results is presented in Table 7-4. Gravimetric sampling (including sieving of 10L soil samples <7mm sieve) was completed on samples BH1A, BH2A, BH3A, BH5A. Other samples had testing only on a 500ml soil sample as they were collected below asphalt. Additionally, as part of the PSI only 500ml soil samples were analysed for asbestos identification only. Asbestos fragments were reported retained on the sieve in BH1A and BH5A. Asbestos fragments were reported from the PSI in two boreholes (BH06_0.5-0.7, BH09_0.5-0.7).

Table 7-2: Soil Chemical Results Summary

Analyte	Minimum	Max	Average*	Standard Deviation	Criteria Exceedances
Metals					
Arsenic	2.3	26	8.3	4.4	None
Cadmium	<0.4	1	0.23	0.13	None
Chromium	7.4	39	15	6.7	None
Copper	<5	150	21	27	None
Lead	<5	570	48	84	None
Mercury	0.1	3.4	0.2	0.51	None
Nickel	<5	65	18	14	None
Zinc	9.5	1,400	107	199	EIL BH2A_1.0-1.1, QC1A (BH4A_0.1-0.2)
TRH					
C ₆ -C ₁₀	<20	<20	10	0	None
F1 (C ₆ -C ₁₀ minus BTEX)	<20	<20	10	0	None
C ₁₀ -C ₁₆	<50	350	35	49	None
F2 C ₁₀ - C ₁₆ (minus Naphthalene)	<50	350	35	49	ESL: BH15_1.0-1.2
F3 (C ₁₆ - C ₃₄)	<100	3,000	181	432	ESL: BH13_0.0-0.2 & QC1A (BH4A_0.1-0.2)
F4 (C ₃₄ - C ₄₀)	<100	940	101	161	None
PAHs					
Benzo(a) pyrene	<0.5	56	2.5	8.3	None
Benzo(a)pyrene TEQ (0.5 LOR)	0.6	92	4.2	14	BH13_0.0-0.2 & QC1A (BH4A_0.1-0.2)
Naphthalene	<0.5	<0.5	0.25	-	None
PAHs (Sum of total)	<0.5	800	35	120	
Other					
BTEX	<LOR	<LOR	0.05 – 0.25	-	None

PCBs (Sum of total)	<0.1	<0.1	0.05	-	None
OPPs	<LOR	<LOR	0.025	-	None
OCPs	<LOR	<LOR	0.01	-	None
*An 0.5x LOR multiplier has been applied to non-detects for calculation of the Average Concentration					

Table 7-3: Summary of Soil Results for Chemical Contaminants

Analyte	95% UCL _{AVERAGE} ⁺	95% UCL _{AVERAGE} below criteria?	Standard Deviation <50% of criteria	Any results over 250% of criteria
Zinc*	108 [#]	Yes	Yes	Yes (BH2A_1.0-1.1) ^a
F2 C₁₀ - C₁₆ (minus Naphthalene)	46.36	Yes	Yes	No
F3 (C₁₆ - C₃₄)	281.4	Yes	Yes	No
Benzo(a)pyrene TEQ (0.5 LOR)	7.365	Yes	Yes	Yes (QC1A) (BH4A_0.1-0.2)
*Excluding hotspot (where concentration >250% of criteria)				
⁺ Students T unless otherwise indicated				
[#] 95% H-UCL (recommended by ProUCL calculation based on non-parametric distribution)				
^a Additional samples analysed (BH2A_0.5-0.6, BH2A_1.9-2.0) confirmed this exceedance to be isolated				

Table 7-4: Summary of Asbestos in Soil

Sample	Form of Asbestos Detected	Asbestos content (g)	ACM (%w/w) ⁺	FA & AF (%w/w) ⁺
BH1A	Chrysotile fibre cement	0.13	0.026	< 0.001%
BH1A-F	Chrysotile fibre cement	2.85	0.0252	< 0.001%
BH5A-F	Chrysotile asbestos		- *	-
BH06_0.5-0.7-F1	Chrysotile asbestos		- *	- *
BH09_0.5-0.7-F	Chrysotile and amosite asbestos		- *	- *
* Asbestos ID only				
+ Results in bold exceeds HSLs				

7.2.3 Groundwater Analytical Results

Groundwater samples were collected from the monitoring well installed for the DSI (MW01). Groundwater quality parameters are presented in Table 7-5. The groundwater conditions were slightly acidic, brackish and slightly oxidising. The water clarity was clear and no odours or sheens were observed.

Table 7-5: Groundwater Quality Parameters

	SWL (mbtoc)	Temperature	pH	EC μ S/cm	Redox mV	DO mg/L	Clarity	Comment
MW01	0.50	21.6	6.53	8393	13.3	1.9	clear	No odours or sheens

Results for groundwater analysis are presented against the adopted assessment criteria in Table 2 of Appendix D.

Concentrations of TRH, BTEX, PAHs and phenols were below LOR. Arsenic and Copper were detected at the LOR. Nickel and Zinc were reported at 15 and 60 µg/L respectively, above the freshwater ANZG Freshwater Water 95% protection level.

7.2.4 In Situ Waste Classification

The in-situ waste classification was updated from the PSI including results from the additional DSI samples and is presented in Table 7-6.

Table 7-6: In situ Waste Classification of site Fill

Waste Classification Step	Assessment
Is the Waste Special Waste?	No, except for fill material reported to contain asbestos
Is the Waste Liquid Waste?	No
Is the Waste Pre-Classified?	No
Does the Waste Possess Hazardous Characteristics?	No
Is the Waste Putrescible or Non-Putrescible?	Non-Putrescible
What is the Chemical Characterisation of the Soil Material?	Complete chemical characterisation results for waste classification are presented Table 1c of Appendix A. The concentrations were initially assessed against the Tier one CT1 General Solid Waste CT1 (No Leaching) and CT2 Restricted Solid Waste CT2 (No Leaching) criteria. Exceedances of NSW 2014 General Solid Waste CT1 (No Leaching) criteria was reported for: - Benzo(a) pyrene concentrations in BH5A_0.5-0.6, BH6A_0.1-0.2, BH02_0.0-0.2, BH03_0.0-0.2, BH09_0.0-0.2 - PAHs (Sum of total) in BH2A_1.0-1.1 - Lead in BH4A_0.1-0.2, BH09_0.0-0.2, BH13_0.0-0.2 and BH07_0.5-0.7 - Nickel in BH07_0.5-0.7, BH17_0.0-0.2, BH18_0.0-0.2 and BH19_0.0-0.2 Exceedances of NSW 2014 Restricted Solid Waste CT2 (No Leaching) criteria was reported for: - Benzo(a) pyrene concentrations in BH4A_0.1-0.2, BH4A_1.0-1.1, BH5A_0.1-0.2, BH13_0.0-0.2, BH13_1.0-1.2, BH15_0.0-0.2, BH15_1.0-1.2 - Lead in BH2A_1.0-1.1 The highest reported concentrations for benzo(a) pyrene, lead and nickel were then analysed for leachability (Toxicity Characteristic Leaching Procedure (TCLP) analysis) to assess the samples against the Tier 2 criteria (SCC1 and TCLP1 general solid waste criteria). - The concentrations of lead and nickel met both the TCLP1 and SCC1 general solid waste criteria. - Concentrations of benzo(a) pyrene met the TCLP1 criteria, however exceeded SCC1 in BH13_0.0-0.2 and SCC2 in BH4A_0.1-0.2 - These exceedances were restricted to samples taken immediately below the asphalt. - The calculated 95% UCL_{AVERAGE} for benzo(a) pyrene in fill was below SCC1 criteria. - Total PAHs also exceeded the SCC1 in BH4A_0.1-0.2 and BH13_0.0-0.2. The calculated 95% UCL_{AVERAGE} for Total PAHs in fill was below SCC1 criteria

Waste Classification Conclusion

Based on the in-situ investigation fill material has been assessed as General Solid Waste except for fill material in the grassed area where asbestos has been reported in BH01A, BH05A, BH06 and BH09, which is classified as Special Solid Waste – asbestos.

Final

8. UPDATED CONCEPTUAL SITE MODEL

8.1 SOURCE-PATHWAY-RECEPTOR ASSESSMENT

A summary of the potential contamination sources, receptors and exposure pathways is presented in Table 8-1.

Table 8-1: Potential Sources of Contamination and Associated Contaminants of Concern

Primary Sources	Media	COPCs	Pathway	Receptor	Likelihood of Source-Pathway-Receptor Linkage	Contamination Likelihood	Comments
Uncontrolled fill (general)	Soil	TRH BTEX PAHs Metals	Ingestion of, inhalation of and dermal contact with impacted soils.	Maintenance and construction workers and excavation workers on-site (shallow trench)	Potentially complete	Low to moderate	Evidence of fill was observed across the Site (see borelogs in Appendix B). The soil analytical results were below the adopted human health assessment criteria except for an isolated exceedance for benzo(a)pyrene (TEQ) in fill (BH13 and BH4A) in the vicinity of the incinerator. The risk of contaminant exposure to maintenance and excavation workers on-site is assessed as generally low (based on the limited extent of benzo(a)pyrene and expected short exposure time experienced by maintenance workers digging shallow trenches.
				Current and future Site users (commercial/industrial)	Potentially Incomplete	Low	Soil analytical results were below the adopted health assessment criteria for a commercial/ industrial land use except for an isolated exceedance for benzo(a)pyrene beneath asphalt. The risk of contaminant exposure to both current and future Site

Primary Sources	Media	COPCs	Pathway	Receptor	Likelihood of Source-Pathway-Receptor Linkage	Contamination Likelihood	Comments
							users in a commercial/ industrial setting is assessed as low.
				Environmental – on-site flora and fauna, including transitory wildlife and soil microbiota	Incomplete	Low	Only isolated exceedances of ecological criteria were reported for TRH F2 and F3 (from fill material below asphalt) and zinc from two fill samples. The soil analytical results in the vicinity of the line of trees along the northern Site boundary (BH10 and BH12) were below the adopted ecological assessment criteria. No obvious signs of vegetation stress or die off were recorded.
			Ingestion of and dermal contact with surface water impacted from runoff	Environmental – ecology of the ephemeral creek to the north of the Site & downgradient wetlands	Incomplete	Low	The soil analytical results in the vicinity of the line of trees along the northern Site boundary (BH10 and BH12) were below the adopted ecological assessment criteria. Surface water runoff towards the ephemeral creek to the north of the Site and downgradient wetlands are not anticipated to be impacted by contamination based on the soil analytical results reported in this DSI.
			Leaching of contaminants from fill into groundwater	Groundwater	Incomplete	Low	Groundwater was encountered > 6m bgl. The likelihood of top-down contamination of groundwater based on this DSI findings is low. Concentrations of COPCs in groundwater were low and likely reflected natural concentrations

Primary Sources	Media	COPCs	Pathway	Receptor	Likelihood of Source-Pathway-Receptor Linkage	Contamination Likelihood	Comments
							rather than any top-down contamination from site.
Fill mounds (potentially containing buried waste) in vicinity of the former incinerator/ workshop buildings / pathology Building	Soil	TRH BTEX PAHs Metals Asbestos	Ingestion of, inhalation of and dermal contact with impacted soils.	Maintenance and construction workers and excavation workers on-site (shallow trench)	Potentially Complete	Moderate to High	Anecdotal evidence was provided of the burial of incinerator waste in fill in the grassed area and asbestos waste beneath these buildings. Bonded ACM fragments were observed in fill in boreholes from samples in the vicinity. benzo(a)pyrene above human health criteria was reported beneath asphalt in the vicinity of the incinerator.
				Current and future Site users (commercial/industrial)	Potentially Complete	Low	Exposure of current site users to COPC in this area is expected to be relatively limited as these areas are not frequented by most site users. The impacted soils are below a layer of grass which would reduce potential dust generation and direct contact with soil. Future development of the area could increase potential for exposure.
				Environmental – on-site flora and fauna, including transitory wildlife and soil microbiota	Incomplete	Low	Only isolated exceedances of ecological criteria were reported for TRH F2 and F3 (from fill material below asphalt) and zinc from two fill samples. The soil analytical results in the vicinity of the line of trees along the northern Site boundary (BH10 and BH12) were below the adopted

Primary Sources	Media	COPCs	Pathway	Receptor	Likelihood of Source-Pathway-Receptor Linkage	Contamination Likelihood	Comments
							ecological assessment criteria. No obvious signs of vegetation stress or die off were recorded.
			Ingestion of and dermal contact with surface water impacted from runoff	Environmental – ecology of the ephemeral creek to the north of the Site & downgradient wetlands	Incomplete	Low	The soil analytical results in the vicinity of the line of trees along the northern Site boundary (BH10 and BH12) were below the adopted ecological assessment criteria. Surface water runoff towards the ephemeral creek to the north of the Site and downgradient wetlands are not anticipated to be impacted by contamination based on the soil analytical results reported in this DSI.
			Leaching of contaminants from fill into groundwater	Groundwater	Incomplete	Low	Groundwater was encountered > 6m bgl. Top-down contamination of groundwater based on this DSI was not indicated and likelihood of occurrence based on this DSI is considered low.
Yard maintenance shed and Above-ground storage tank (AST) (fuel storage)	Soil	TRH PAHs	Ingestion of, inhalation of and dermal contact with impacted soils.	Maintenance and construction workers and excavation workers on-site (shallow trench)	Potentially Incomplete	Low	There was no indication of staining or odour indicative of spills or oil leaks in soil. Only moderate, localised oil stains were observed on the slab within the maintenance shed and no cracks or deterioration of the slab was evident. The AST did not appear to be currently used for fuel storage and no stain were observed in the vicinity. The tank was banded. The concentrations of petroleum hydrocarbons (as TPH/TRH) that

Primary Sources	Media	COPCs	Pathway	Receptor	Likelihood of Source-Pathway-Receptor Linkage	Contamination Likelihood	Comments
							were reported in the analysed soil samples in the vicinity of the yard maintenance shed (BH2A, BH06 and BH07) and AST (BH14) were below human health criteria. BTEX concentrations were reported below LOR. Based on these considerations the risk is considered negligible (no complete exposure pathway identified).
				Current and future Site users (commercial/industrial)	Incomplete	Low	Based on the current conditions encountered during the site investigation and the reported soil analytical results, the risk to current and future Site users is considered negligible (no complete exposure pathway identified).
				Environmental – on-site flora and fauna, including transitory wildlife and soil microbiota	Potentially incomplete	Low	BH4A, BH13 and BH15 had individual concentrations above the ESLs for TRH. However, these areas were sealed and so no significant ecological receptors at this location are anticipated to be present.
		TRH, PAH	Ingestion of, inhalation of and dermal contact with impacted surface water runoff.	Environmental – ecology of the ephemeral creek to the north of the Site	Potentially incomplete	Low	Based on the reported concentrations for surface fill, particularly along the northern boundary of the Site, the risk to ecological receptors of the ephemeral creek to the north of the Site is negligible.
		TRH, BTEX	Inhalation of vapours that accumulate in excavations or	Maintenance and construction workers and excavation workers on-site (shallow trench)	Incomplete	Low	The concentrations of petroleum hydrocarbons (as TPH/TRH) that were reported in the analysed soil samples do not indicate a risk of

Primary Sources	Media	COPCs	Pathway	Receptor	Likelihood of Source-Pathway-Receptor Linkage	Contamination Likelihood	Comments
			service trenches.				vapour accumulation in excavations or shallow trenches. It is considered unlikely based on the current results for vapour accumulation to occur in trenches or excavations.
				Current and future Site users (commercial/industrial)		Low	The concentrations of petroleum hydrocarbons (as TPH/TRH) that were reported in the analysed soil samples in the vicinity of the above-ground fuel storage tank and yard maintenance shed do not indicate that the levels are sufficiently elevated to pose an unacceptable risk of vapour intrusion into on-site buildings (existing and/or proposed) and to site users in a commercial/ industrial and use setting.
	Groundwater		Ingestion of, and dermal contact with impacted groundwater (perched or regional)	Maintenance and construction workers and excavation workers on-site (shallow trench)	Incomplete	Low	Groundwater was encountered > 6m bgl. Therefore, a complete exposure pathway for maintenance and construction workers conducting sub surface trench works is not present.
				Site users (commercial/industrial)	Incomplete	Low	There were no registered groundwater abstraction bores identified onsite. As such there were no plausible linkage identified between Site users and groundwater at or beneath the Site.
Hazardous building materials in the former incinerator/	Soil	Asbestos, Lead, PCBs	Ingestion of, inhalation of and dermal contact	Maintenance and construction workers and excavation workers on-site (shallow trench)	Potentially complete	Low	Concentrations of Lead in soils were below criteria and PCB's below LORs. Asbestos was reported in fill in the vicinity of

Primary Sources	Media	COPCs	Pathway	Receptor	Likelihood of Source-Pathway-Receptor Linkage	Contamination Likelihood	Comments
workshop buildings / Pathology Building, old mortuary			with impacted soils.				these buildings but was not necessarily related to asbestos containing materials in these buildings.
				Site users (commercial/industrial)	Potentially Incomplete	Low	Site users are expected to have low potential to exposure to soil contaminated directly by the identified hazardous building materials unless the soil is deliberately disturbed.
				Environmental – on-site flora and fauna, including transitory wildlife and soil microbiota	Potentially Incomplete	Low	The risk to ecological receptors on site from the hazardous building materials is low based on this investigation. Potential impact to soil would only be expected in the immediate vicinity of the buildings.
			Ingestion of and dermal contact with surface water impacted from runoff	Environmental – ecology of the ephemeral creek to the north of the Site	Incomplete	Low	The potential risk to offsite ecological receptors from soil impacted by hazardous building materials is negligible based on the assessed concentrations in soil.
Groundwater	Water	Metals	Ingestion of, and dermal contact with impacted groundwater (perched or regional)	Maintenance and construction workers and excavation workers on-site (shallow trench)	Incomplete	Low	Groundwater was encountered > 6m bgl. Therefore, a complete exposure pathway for maintenance and construction workers conducting sub surface trench works is not present.
				Site users (commercial/industrial)	Incomplete	Low	There were no registered groundwater abstraction bores identified onsite. As such there were no plausible linkage identified between Site users and groundwater at or beneath the Site.
				Environmental – ecology of the on-site and the	Potentially incomplete	Low	Groundwater was present at >6m bgl therefore only aquatic

Primary Sources	Media	COPCs	Pathway	Receptor	Likelihood of Source-Pathway-Receptor Linkage	Contamination Likelihood	Comments
				connecting ephemeral creek to the north of the Site			organisms in groundwater (stygo fauna) would be exposed on site. Reported concentrations were not considered to be indicative of top-down contamination. Groundwater is anticipated to flow to the northwest and nearest potential discharge to surface water approximately 500m from the Site.

Notes: This is a semi-quantitative assessment of the probability of contamination being detected at the Site. Total petroleum hydrocarbons (TPH), Total recoverable hydrocarbons (TRH), benzene, toluene, ethylbenzene and xylene (BTEX), polycyclic aromatic hydrocarbons (PAH), heavy metals (arsenic, cadmium, chromium, copper, lead, mercury and zinc).

9. DISCUSSION

The DSI comprised of additional investigations at the Site to supplement the PSI and address data gaps and. Soil samples were collected from an additional six borehole locations and a groundwater monitoring well was installed and sampled.

Fill was observed across the site to depths from 0.5m up to 1.6m. The highest fill depths were reported associated with a fill mound at the top of the grassed area in the area of the yard maintenance shed and workshops. A fill mound was also observed to the rear of the pathology building. Fill was observed to be clayey with gravels, coal and contain some waste materials including brick, plastic, tile, nails, glass and asbestos.

There was no indication of significant contamination of soil from potential oils spills within the yard maintenance shed from concentrations in boreholes in the vicinity (BH2A BH07, BH06). Reported concentrations of TRHs were relatively low and BTEX was below LOR. Similarly, in the vicinity of the fuel AST, which appeared no longer to be in use. The groundwater monitoring well installed downgradient from the yard maintenance shed to screen for contamination of groundwater did not indicate top-down contamination.

Elevated Zinc exceeding site-specific EIL criteria in BH2A_1.0-1.1 (1,400 mg/kg) and BH4A_0.1-0.2 (620 mg/kg) were isolated (not reported in other depth samples from the borehole and other boreholes) and associated with fill containing waste materials. The calculated 95% UCL_{AVERAGE} for zinc across the site was below assessment criteria.

Concentrations of TRH exceeding the ESL assessment criteria for F3 (C₁₆ - C₃₄) and benzo(a)pyrene (TEQ) (carcinogenic PAHs) were reported in BH13_0.0-0.2 and BH4A_0.1-0.2 (QC1A) sample above criteria, with QC1A >250% of criteria. TRHs and benzo(a)pyrene were also reported in the deeper samples (around 1m bgl), though were at lower concentrations below assessment criteria. These were collected below the asphalt in the vicinity of the incinerator building and reported concentrations likely reflect the nature of the fill which was observed to be distinct and potential influence from traces of asphalt in the analysed sample. The calculated 95% UCL_{AVERAGE} for F3 (C₁₆ - C₃₄) and benzo(a)pyrene (TEQ) were below criteria.

TRH fraction F2 (C₁₀ - C₁₆, minus Naphthalene) was reported exceeding the ESL criteria in BH15_1.0-1.2. The criteria was not exceeded in the near surface sample (BH15_0.0-0.2) or in samples from the nearby borehole (BH6A). The calculated 95% UCL_{AVERAGE} for F2 (C₁₀ - C₁₆, minus Naphthalene) was below assessment criteria.

Groundwater was encountered at >6mbgl and reported only low concentrations of metals. Other COPCs were below LORs. Top-down contamination from fill and other potential identified sources (such as the yard maintenance shed) on site was not indicated.

Asbestos in the form of bonded ACM was reported in fill from the grassed area behind the workshops and yard maintenance shed and the pathology building. The potential also exists for asbestos debris to be present beneath the footprints of these buildings. Some of the asbestos was reported in the surface soils therefore would not meet the HSL requirement for no visible forms of asbestos (applicable to the top 10cm of soil).

10. CONCLUSIONS AND RECOMMENDATIONS

Additional investigations were carried out as to address data gaps identified within the PSI and collect an adequate number of samples for the DSI to inform assessment of contamination at the site and whether the site was suitable or could be made suitable from a contamination perspective for the proposed hospital redevelopment. An updated in-situ waste classification of fill was conducted.

Based on the in-situ investigation, fill material, should it be required to be managed offsite, was assessed as General Solid Waste, except for fill mounds in the grassed area where asbestos has been reported in BH01A, BH05A, BH06 and BH09, which was classified as Special Solid Waste –Asbestos. Please note that this in-situ classification is only indicative, and any material excavated during site remediation and/or redevelopment will require to be properly waste classified at the time in accordance with the Waste Classification Guidelines.

Exceedances of assessment criteria reported for the site were isolated and considered to be generally related to uncontrolled fill and buried waste materials. The risk of contamination to human health and ecological receptors for the current and proposed ongoing land uses arising from chemical contaminants of concern has been assessed as low based on the findings of the PSI and this DSI. However, asbestos in the form of ACM was identified in the fill which represents a risk to human health, particularly maintenance and construction workers conducting subsurface excavations. Groundwater was not indicated to be impacted by top-down contamination from the site.

On the basis of these findings, Tetra Tech concludes that the Site can be made suitable for the proposed redevelopment works of the hospital subject to management of bonded asbestos. A remediation action plan (RAP) that includes an unexpected finds protocol should be developed for this activity.

11. REFERENCES

Cessnock 1:100 000 Geological Map (Sheet Code 9132, 1976)

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acid sulfate soil risk mapping <https://www.environment.nsw.gov.au/eSpade2WebApp>; accessed 26 June 2024

Salinity <https://www.environment.nsw.gov.au/eSpade2WebApp>; accessed 26 June 2024

Topography – Google Earth

Ecology <https://www.lmbc.nsw.gov.au/Maps/index.html?viewer=BOSEMap> on 26 June 2024

NSW EPA List of NSW contaminated sites notified to EPA <https://www.epa.nsw.gov.au/your-environment/contaminated-land/notified-and-regulated-contaminated-land/list-of-notified-sites> accessed on 27 June 2024

NSW EPA Contaminated Land Record of notices <https://www.epa.nsw.gov.au/your-environment/contaminated-land/notified-and-regulated-contaminated-land/record-of-notices> accessed on 27 June 2024

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NSW EPA PFAS investigation program <https://www.epa.nsw.gov.au/your-environment/contaminated-land/pfas-investigation-program> accessed on 2 July 2024

NSW list of former gasworks sites <https://www.epa.nsw.gov.au/your-environment/contaminated-land/other-contamination-issues/former-gasworks-sites> accessed on 2 July 2024

Australian Government Geoscience Australia Waste Management Facilities database
https://www.arcgis.com/home/webmap/viewer.html?url=https%3A%2F%2Fservices.ga.gov.au%2Fgis%2Frest%2Fservices%2FWaste_Management_Facilities%2FMapServer&source=sd accessed on 2 July 2024

12. LIMITATIONS

Final

IMPORTANT INFORMATION ABOUT YOUR TETRA TECH COFFEY ENVIRONMENTAL REPORT

Introduction

This report has been prepared by Tetra Tech Coffey for you, as Tetra Tech Coffey's client, in accordance with our agreed purpose, scope, schedule and budget.

The report has been prepared using accepted procedures and practices of the consulting profession at the time it was prepared, and the opinions, recommendations and conclusions set out in the report are made in accordance with generally accepted principles and practices of that profession.

The report is based on information gained from environmental conditions (including assessment of some or all of soil, groundwater, vapour and surface water) and supplemented by reported data of the local area and professional experience. Assessment has been scoped with consideration to industry standards, regulations, guidelines and your specific requirements, including budget and timing. The characterisation of site conditions is an interpretation of information collected during assessment, in accordance with industry practice.

This interpretation is not a complete description of all material on or in the vicinity of the site, due to the inherent variation in spatial and temporal patterns of contaminant presence and impact in the natural environment. Tetra Tech Coffey may have also relied on data and other information provided by you and other qualified individuals in preparing this report. Tetra Tech Coffey has not verified the accuracy or completeness of such data or information except as otherwise stated in the report. For these reasons the report must be regarded as interpretative, in accordance with industry standards and practice, rather than being a definitive record.

Your report has been written for a specific purpose

Your report has been developed for a specific purpose as agreed by us and applies only to the site or area investigated. Unless otherwise stated in the report, this report cannot be applied to an adjacent site or area, nor can it be used when the nature of the specific purpose changes from that which we agreed.

For each purpose, a tailored approach to the assessment of potential soil and groundwater contamination is required. In most cases, a key objective is to identify, and if possible quantify, risks that both recognised and potential contamination pose in the context of the agreed purpose. Such risks may be financial (for example, clean up costs or constraints on site use) and/or physical (for example, potential health risks to users of the site or the general public).

Limitations of the Report

The work was conducted, and the report has been prepared, in response to an agreed purpose and scope, within time and budgetary constraints, and in reliance on certain data and information made available to Tetra Tech Coffey.

The analyses, evaluations, opinions and conclusions presented in this report are based on that purpose and scope, requirements, data or information, and they could change if such requirements or data are inaccurate or incomplete.

This report is valid as of the date of preparation. The condition of the site (including subsurface conditions) and extent or nature of contamination or other environmental hazards can change over time, as a result of either natural processes or human influence. Tetra Tech Coffey should be kept apprised of any such events and should be consulted for further investigations if any changes are noted, particularly during construction activities where excavations often reveal subsurface conditions.

In addition, advancements in professional practice regarding contaminated land and changes in applicable statutes and/or guidelines may affect the validity of this report. Consequently, the currency of conclusions and recommendations in this report should be verified if you propose to use this report more than 6 months after its date of issue.

The report does not include the evaluation or assessment of potential geotechnical engineering constraints of the site.

Interpretation of factual data

Environmental site assessments identify actual conditions only at those points where samples are taken and on the date collected. Data derived from indirect field measurements, and sometimes other reports on the site, are interpreted by geologists, engineers or scientists to provide an opinion about overall site conditions, their likely impact with respect to the report purpose and recommended actions.

Variations in soil and groundwater conditions may occur between test or sample locations and actual conditions may differ from those inferred to exist. No environmental assessment program, no matter how comprehensive, can reveal all subsurface details and anomalies. Similarly, no professional, no matter how well qualified, can reveal what is hidden by earth, rock or changed through time.

The actual interface between different materials may be far more gradual or abrupt than assumed based on the facts obtained. Nothing can be done to change the actual site conditions which exist, but steps can be taken to reduce the impact of unexpected conditions.

For this reason, parties involved with land acquisition, management and/or redevelopment should retain the services of a suitably qualified and experienced environmental consultant through the development and use of the site to identify variances, conduct additional tests if required, and recommend solutions to unexpected conditions or other unrecognised features encountered on site. Tetra Tech Coffey would be pleased to assist with any investigation or advice in such circumstances.

Recommendations in this report

This report assumes, in accordance with industry practice, that the site conditions recognised through discrete sampling are representative of actual conditions throughout the investigation area. Recommendations are based on the resulting interpretation.

Should further data be obtained that differs from the data on which the report recommendations are based (such as through excavation or other additional assessment), then the recommendations would need to be reviewed and may need to be revised.

Report for benefit of client

Unless otherwise agreed between us, the report has been prepared for your benefit and no other party. Other parties should not rely upon the report or the accuracy or completeness of any recommendation and should make their own enquiries and obtain independent advice in relation to such matters.

Tetra Tech Coffey assumes no responsibility and will not be liable to any other person or organisation for, or in relation to, any matter dealt with or conclusions expressed in the report, or for any loss or damage suffered by any other person or organisation arising from matters dealt with or conclusions expressed in the report.

To avoid misuse of the information presented in your report, we recommend that Tetra Tech Coffey be consulted before the report is provided to another party who may not be familiar with the background and the purpose of the report. In particular, an environmental disclosure report for a property vendor may not be suitable for satisfying the needs of that property's purchaser. This report should not be applied for any purpose other than that stated in the report.

Interpretation by other professionals

Costly problems can occur when other professionals develop their plans based on misinterpretations of a report. To help avoid misinterpretations, a suitably qualified and experienced environmental consultant should be retained to explain the implications of the report to other professionals referring to the report and then review plans and specifications produced to see how other professionals have incorporated the report findings.

Given Tetra Tech Coffey prepared the report and has familiarity with the site, Tetra Tech Coffey is well placed to provide such assistance. If another party is engaged to interpret the recommendations of the report, there is a risk that the contents of the report may be misinterpreted and Tetra Tech Coffey disowns any responsibility for such misinterpretation.

Data should not be separated from the report

The report as a whole presents the findings of the site assessment and the report should not be copied in part or altered in any way. Logs, figures, laboratory data, drawings, etc. are customarily included in our reports and are developed by scientists or engineers based on their interpretation of field logs, field testing and laboratory evaluation of samples. This information should not under any circumstances be redrawn for inclusion in other documents or separated from the report in any way.

This report should be reproduced in full. No responsibility is accepted for use of any part of this report in any other context or for any other purpose or by third parties.

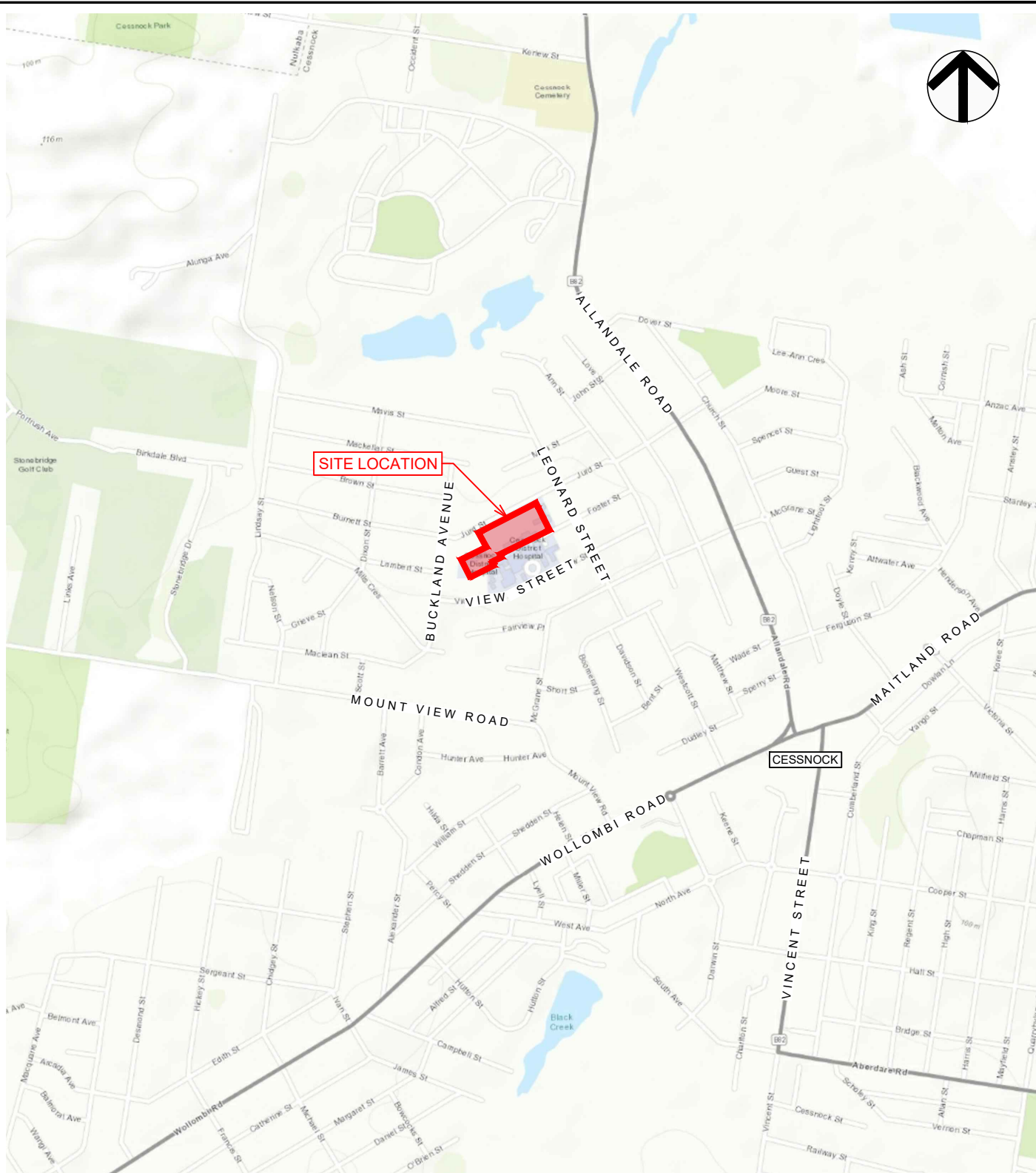
Responsibility

Environmental reporting relies on interpretation of factual information using professional judgement and opinion and has a level of uncertainty attached to it, which is much less exact than other design disciplines. This has often resulted in claims being lodged against consultants, which are unfounded. As noted earlier, the recommendations and findings set out in this report should only be regarded as interpretive and should not be taken as accurate and complete information about all environmental media at all depths and locations across the site.

APPENDIX A: FIGURES

Final

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MAP PROJECTION: GDA2020 MGA ZONE 56



Scale (metres) 1:15000

IMAGERY SOURCE: WORLD TOPOGRAPHIC MAP
SOURCES: ESRI, HERE, GARMIN, INTERMAP, INCREMENT P CORP., GEBCO, USGS, FAO, NPS, NRCAN, GEOBASE, IGN, KADASTER NL, ORDINANCE SURVEY, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), (C) OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY

DRAFT

drawn	PS / DR		client:	TURNER TOWNSEND		
approved	-		project:	CESSNOCK HOSPITAL 24 VIEW STREET, CESSNOCK, NSW		
date	13-09-2024		title:	SITE LOCATION PLAN		
scale	AS SHOWN		project no:	754-NTLEN347071-R02	figure no:	FIGURE 1
original size	A4				rev:	A



LEGEND

SITE BOUNDARY

DRAFT

revision	no.	description	drawn	approved	date
	A	ORIGINAL ISSUE	-	-	-

MAP PROJECTION: GDA2020 MGA ZONE 56

100 0 10 30 50

Scale (metres) 1:1000

AERIAL IMAGERY COPYRIGHT: ©Land and Property Information (2018)
SOURCED FROM WEBSITE: http://www.lpi.nsw.gov.au/mapping_and_imagery/lpi_web_services
LICENSED UNDER CC BY 3.0 AU (<https://creativecommons.org/licenses/by/3.0/au/legalcode>)

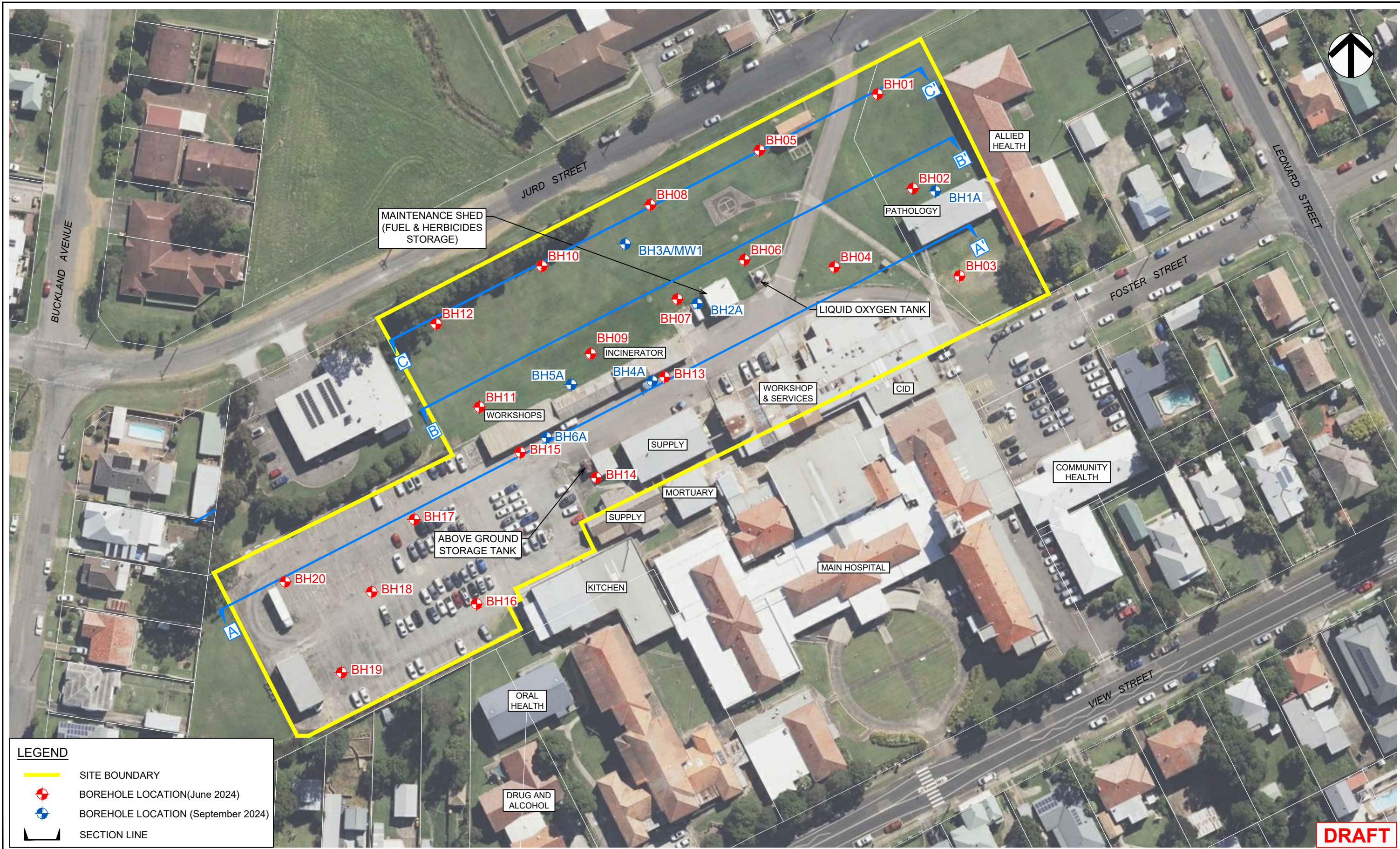
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approved	-
date	13-09-2024
scale	AS SHOWN
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Tt

TETRA TECH
COFFEY

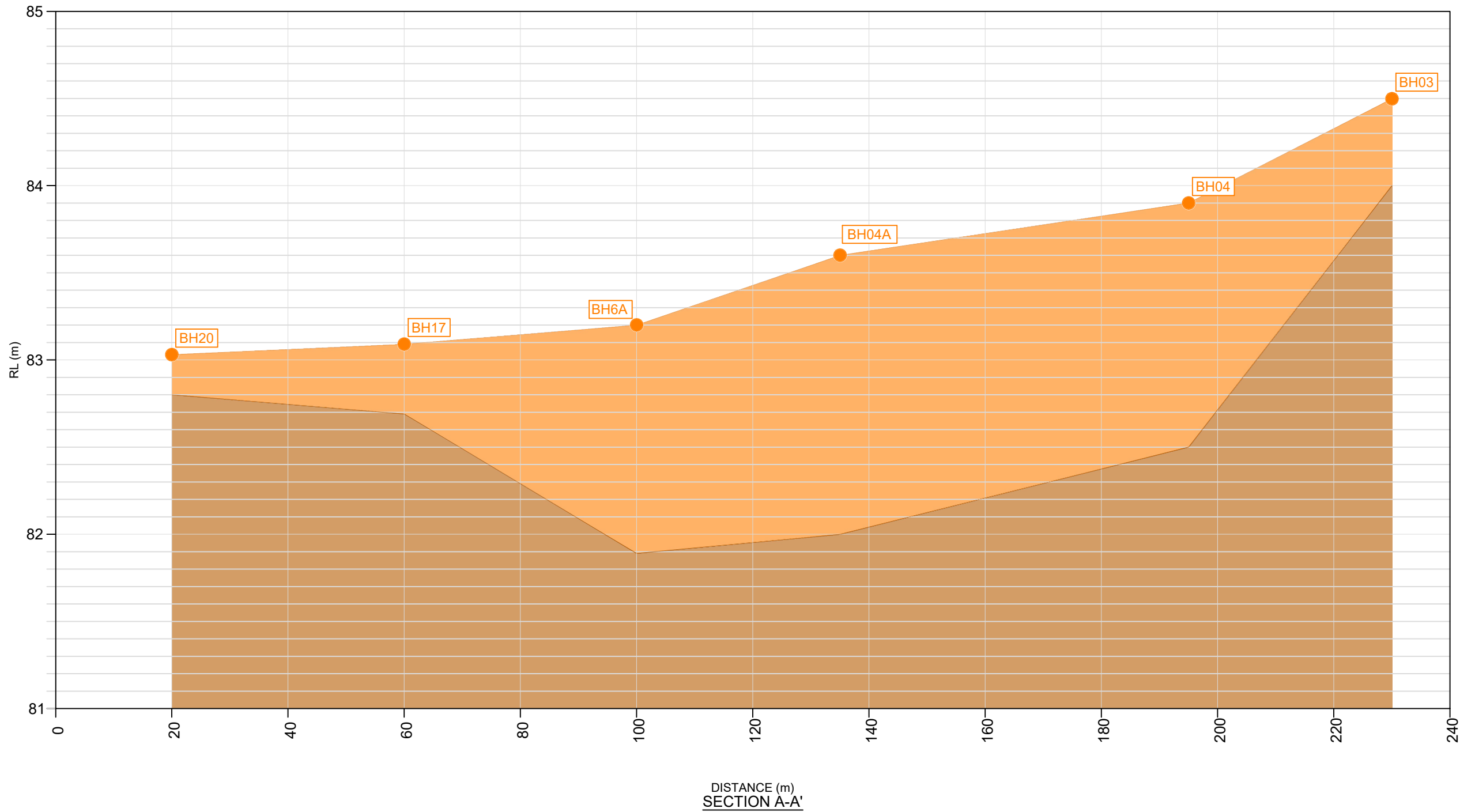
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title:	SITE LAYOUT		
project no:	754-NTLEN347071-R02	figure no:	FIGURE 2
		rev:	A

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revision	no.	description			drawn	approved	date	MAP PROJECTION: GDA2020 MGA ZONE 56 1000metres 1000metres Scale (metres) 1:1000 AERIAL IMAGERY COPYRIGHT: ©Land and Property Information (2018) SOURCED FROM WEBSITE: http://www.lpi.nsw.gov.au/mapping_and_imagery/lpi_web_services LICENSED UNDER CC BY 3.0 AU (https://creativecommons.org/licenses/by/3.0/au/legalcode)	drawn	PS / DR	Tt TETRA TECH COFFEY	client:	TURNER TOWNSEND		
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									date	13-09-2024		title:	SOIL SAMPLING PLAN		
									scale	AS SHOWN		project no:	754-NTLEN347071-R02	figure no:	FIGURE 3
									original size	A3		rev: A			

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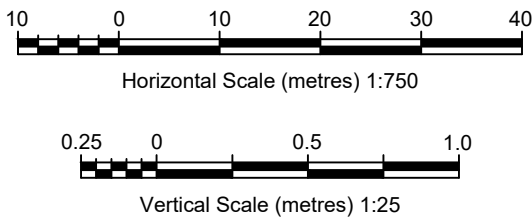


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FILL DEPTH AHD

DRAFT

revision	no.	description	drawn	approved	date
	A	ORIGINAL ISSUE	-	-	-

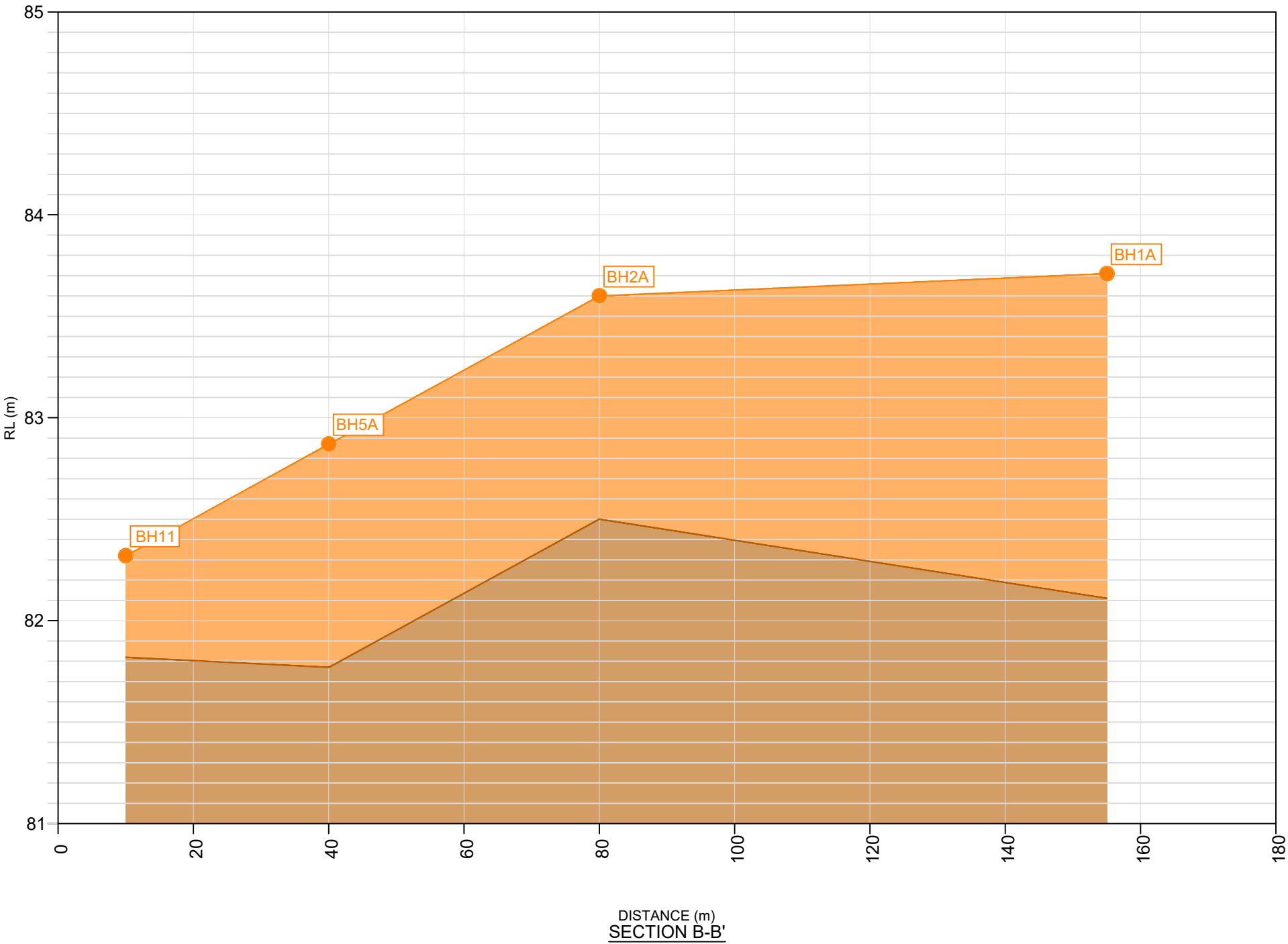


drawn	PS / DR
approved	-
date	13-09-2024
scale	AS SHOWN
original size	A3



client:	TURNER TOWNSEND		
project:	CESSNOCK HOSPITAL 24 VIEW STREET, CESSNOCK, NSW		
title:	INDICATIVE FILL DEPTH PLAN		
project no:	754-NTLEN347071-R02	figure no:	FIGURE 4A
		rev:	A

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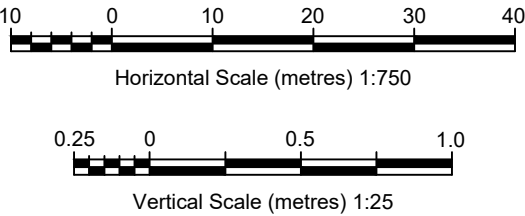


LEGEND

FILL DEPTH AHD

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revision	no.	description	drawn	approved	date
	A	ORIGINAL ISSUE	-	-	-



drawn	PS / DR
approved	-
date	13-09-2024
scale	AS SHOWN
original size	A3



client:	TURNER TOWNSEND		
project:	CESSNOCK HOSPITAL 24 VIEW STREET, CESSNOCK, NSW		
title:	INDICATIVE FILL DEPTH PLAN		
project no:	754-NTLEN347071-R02	figure no:	FIGURE 4B
		rev:	A

APPENDIX B: BORELOGS

Final



Environmental Log - Borehole

client: **Health Infrastructure c/o Turner & Townsend**

principal:

project: **Cessnock Hospital**

location: **23 View Street Cessnock**

Hole ID. **BH1A**

sheet: 1 of 1

project no. **754-NTLEN347071-2**

date started: **03 Sep 2024**

date completed:

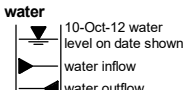
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checked by:

position: Not Specified surface elevation: Not Specified angle from horizontal: 90°

equipment type: Geoprobe, Track mounted drilling fluid: Auger hole diameter : 200 mm

drilling information					material substance							
method & support	water	samples & field tests	photoluminescence detector (ppmv)	RL (m)	depth (m)	graphic log	soil group symbol	material description SOIL NAME: plasticity or particle characteristics, colour, secondary and minor components	moisture condition	consistency / relative density	soil origin, structure and additional observations	
Not Encountered			1.1				SW-SM	SILTY SAND: fine - medium grained, brown to dark grey.	D		FILL - TOPSOIL	
	E: 0.1-0.2											
							0.5		CL-CL	Silty CLAY: low - medium plasticity, grey brown, with SR-SA gravels.	M	FILL slag, asbestos fragments
	E: 0.5-0.6											
							1.0					
	E: 1.0_1.1								CH	CLAY: high plasticity, pale brown mottled red.		RESIDUAL SOIL
							</					

method AD auger drilling* HA hand auger MR mud rotary W washbore PT push tube HS hollow stem SS solid stem SD sonic drilling * bit shown by suffix e.g. AD/T B blank bit T TC bit V V bit	support M mud C casing N nil water  10-Oct-12 water level on date shown water inflow water outflow	samples & field tests B bulk disturbed sample D disturbed sample E environmental sample SS split spoon sample U## undisturbed sample ##mm diameter WS water sample HB hammer bouncing N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone R refusal	soil group symbol & material description based on AS 1726:2017 moisture condition D dry M moist W wet Wp plastic limit Wl liquid limit	consistency / relative density VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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CDF_0_0_10_00.4_LIBRARY\GLB rev\CDF_0_10_00.4 2021-09-30 Log COF BOREHOLE: ENVIRONMENTAL 754-NTLEN317964-2.GPJ <<DrawingFiles>> 27/09/2024 16:36



Environmental Log - Borehole

client: **Health Infrastructure c/o Turner & Townsend**

principal:

project: **Cessnock Hospital**

location: **23 View Street Cessnock**

Hole ID. **BH2A**

sheet: 1 of 1

project no. **754-NTLEN347071-2**

date started: **03 Sep 2024**

date completed:

logged by: **PS**

checked by:

position: Not Specified surface elevation: Not Specified angle from horizontal: 90°

equipment type: Geoprobe, Track mounted drilling fluid: Auger hole diameter : 200 mm

drilling information					material substance				
method & support	water	samples & field tests	photoluminescence detector (ppmv)	RL (m)	depth (m)	graphic log	soil group symbol	material description SOIL NAME: plasticity or particle characteristics, colour, secondary and minor components	moisture condition consistency / relative density
	Not Encountered		1		0.5		CL-ML	Silty CLAY: low plasticity, dark brown, with SR-SA gravels.	D
		E: 0.5-0.6					SW-SM	SILTY SAND: medium - coarse grained, dark grey, trace gravels.	
					1.0		CL	Silty CLAY: low plasticity, dark grey, with SR-SA gravels.	M
		E: 1.0_1.1					CH	CLAY: high plasticity, brown mottled pale brown to yellow.	W
					1.5				
		E: 1.9_2.0			2.0			Borehole BH2A terminated at 2.00 m Target stratum	
					2.5				

method AD auger drilling* HA hand auger MR mud rotary W washbore PT push tube HS hollow stem SS solid stem SD sonic drilling * bit shown by suffix e.g. AD/T B blank bit T TC bit V V bit	support M mud C casing N nil water 10-Oct-12 water level on date shown water inflow water outflow	samples & field tests B bulk disturbed sample D disturbed sample E environmental sample SS split spoon sample U## undisturbed sample ##mm diameter WS water sample HB hammer bouncing N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone R refusal	soil group symbol & material description based on AS 1726:2017 moisture condition D dry M moist W wet Wp plastic limit Wl liquid limit	consistency / relative density VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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CDF_0_10_00.4_LIBRARY\GLB rev\CDF_0_10_00.4 2021-09-30 Log COF BOREHOLE: ENVIRONMENTAL 754-NTLEN317964-2.GPJ <<DrawingFile>> 27/09/2024 16:36

Environmental Log - Monitoring Well

client: **Health Infrastructure c/o Turner & Townsend**

principal:

project: **Cessnock Hospital**

location: **23 View Street Cessnock**

Hole ID: **BH3A / MW01**

sheet: 1 of 3

project no. **754-NTLEN347071-2**

date started: **03 Sep 2024**

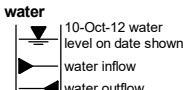
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checked by:

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equipment type: Geoprobe, Track mounted drilling fluid: Auger hole diameter : 125 mm

drilling information				well details		material substance						
method & support	water	samples & field tests	photoionization detector (ppmv)	MW01	depth (m)	graphic log	soil group symbol	material description SOIL NAME: plasticity or particle characteristics, colour, secondary and minor components	moisture condition	consistency / relative density	soil origin, structure and additional observations	
			1				CL	Silty CLAY: low plasticity, brown.			FILL - TOPSOIL	
				CH	CLAY: high plasticity, pale brown.	PID: 1 ppm						
					increasing red mottled	RESIDUAL SOIL						
		E: 0.5-0.6										
		E: 1.0_1.1										
		E: 1.4_1.5								EXTREMELY WEATHERED MATERIAL		
											ROCK	

method AD auger drilling* HA hand auger MR mud rotary W washbore PT push tube HS hollow stem SS solid stem SD sonic drilling * bit shown by suffix e.g. AD/T B blank bit T TC bit V V bit		support M mud C casing N nil water  10-Oct-12 water level on date shown water inflow water outflow		samples & field tests B bulk disturbed sample D disturbed sample E environmental sample SS split spoon sample U## undisturbed sample ##mm diameter WS water sample HB hammer bouncing N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone R refusal		soil group symbol & material description based on AS 1726:2017 moisture condition D dry M moist W wet Wp plastic limit Wl liquid limit		consistency / relative density VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense	
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Environmental Log - Monitoring Well

client: **Health Infrastructure c/o Turner & Townsend**
principal:
project: **Cessnock Hospital**
location: **23 View Street Cessnock**

Hole ID. **BH3A / MW01**
sheet: 2 of 3
project no. **754-NTLEN347071-2**
date started: **03 Sep 2024**
date completed:
logged by: **PS**
checked by:

position: Not Specified				surface elevation: Not Specified				angle from horizontal: 90°					
equipment type: Geoprobe, Track mounted				drilling fluid: Auger				hole diameter : 125 mm					
drilling information				well details		material substance							
method & support	water	samples & field tests	photionization detector (ppmv)		depth (m)	graphic log	soil group symbol	material description		moisture condition	consistency / relative density	soil origin, structure and additional observations	
								SANDSTONE: fine - medium grained, pale orange. (continued) pale brown to orange brown				ROCK	
					3.5								
					4.0								
					4.5								
					5.0								
					5.5								
method AD auger drilling* HA hand auger MR mud rotary W washbore PT push tube HS hollow stem SS solid stem SD sonic drilling * bit shown by suffix e.g. AD/T B blank bit T TC bit V V bit				support M mud C casing N nil water 10-Oct-12 water level on date shown water inflow water outflow		samples & field tests B bulk disturbed sample D disturbed sample E environmental sample SS split spoon sample U## undisturbed sample ##mm diameter WS water sample HB hammer bouncing N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone R refusal			soil group symbol & material description based on AS 1726:2017 moisture condition D dry M moist W wet Wp plastic limit Wl liquid limit		consistency / relative density VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense		



Environmental Log - Monitoring Well

client: **Health Infrastructure c/o Turner & Townsend**
principal:
project: **Cessnock Hospital**
location: **23 View Street Cessnock**

Hole ID. **BH3A / MW01**
sheet: 3 of 3
project no. **754-NTLEN347071-2**
date started: **03 Sep 2024**
date completed:
logged by: **PS**
checked by:

position: Not Specified surface elevation: Not Specified angle from horizontal: 90°
equipment type: Geoprobe, Track mounted drilling fluid: Auger hole diameter : 125 mm

drilling information				well details		material substance					
method & support	water	samples & field tests	photoionization detector (ppmv)		depth (m)	graphic log	soil group symbol	material description SOIL NAME: plasticity or particle characteristics, colour, secondary and minor components	moisture condition	consistency / relative density	soil origin, structure and additional observations
	03/09/24 11:30				6.5 7.0 7.5 8.0			SANDSTONE: fine - medium grained, pale orange. <i>(continued)</i> becoming softer SILTSTONE: fine - medium grained, grey to dark grey. Monitoring Well BH3A / MW01 terminated at 8.00 m Target depth			ROCK
					8.5						standpipe piezometer MW01 details: 5.0-8.0m: screen

method	support	samples & field tests	soil group symbol & material description based on AS 1726:2017	consistency / relative density
AD auger drilling* HA hand auger MR mud rotary W washbore PT push tube HS hollow stem SS solid stem SD sonic drilling * bit shown by suffix e.g. AD/T B blank bit T TC bit V V bit	M mud C casing N nill water 10-Oct-12 water level on date shown water inflow water outflow	B bulk disturbed sample D disturbed sample E environmental sample SS split spoon sample U## undisturbed sample ##mm diameter WS water sample HB hammer bouncing N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone R refusal	moisture condition D dry M moist W wet Wp plastic limit Wl liquid limit	VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense

Environmental Log - Borehole

client: **Health Infrastructure c/o Turner & Townsend**

principal:

project: **Cessnock Hospital**

location: **23 View Street Cessnock**

Hole ID: **BH4A**

sheet: 1 of 1

project no. **754-NTLEN347071-2**

date started: **03 Sep 2024**

date completed:

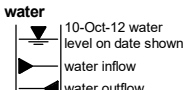
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checked by:

position: Not Specified surface elevation: Not Specified angle from horizontal: 90°

equipment type: Geoprobe, Track mounted drilling fluid: Auger hole diameter : 200 mm

drilling information					material substance				
method & support	water	samples & field tests	photolization detector (ppmv)	RL (m)	depth (m)	graphic log	soil group symbol	material description SOIL NAME: plasticity or particle characteristics, colour, secondary and minor components	moisture condition consistency / relative density
Not Encountered		E: 0.1-0.2	1.4					ASPHALT.	FILL
							SW	SAND: fine - medium grained, low plasticity, dark brown, with gravels SR - SA.	
		E: 0.5-0.6			0.5				
		E: 1.0_1.1			1.0		SW-SM	Gravelly SILTY SAND: sub-rounded to sub-angular, pale brown to dark brown.	
					1.5			becoming more clayey	
		E: 1.6_1.7					CH	CLAY: high plasticity, pale brown mottled red to yellow.	
					2.0			Borehole BH4A terminated at 2.00 m Target stratum	RESIDUAL SOIL
					2.5				

method AD auger drilling* HA hand auger MR mud rotary W washbore PT push tube HS hollow stem SS solid stem SD sonic drilling * bit shown by suffix e.g. AD/T B blank bit T TC bit V V bit	support M mud C casing N nil water 	samples & field tests B bulk disturbed sample D disturbed sample E environmental sample SS split spoon sample U## undisturbed sample ##mm diameter WS water sample HB hammer bouncing N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone R refusal	soil group symbol & material description based on AS 1726:2017 moisture condition D dry M moist W wet Wp plastic limit Wl liquid limit	consistency / relative density VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Environmental Log - Borehole

client: **Health Infrastructure c/o Turner & Townsend**

principal:

project: **Cessnock Hospital**

location: **23 View Street Cessnock**

Hole ID. **BH5A**

sheet: 1 of 1

project no. **754-NTLEN347071-2**

date started: **03 Sep 2024**

date completed:

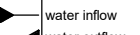
logged by: **PS**

checked by:

position: Not Specified surface elevation: Not Specified angle from horizontal: 90°

equipment type: Geoprobe, Track mounted drilling fluid: Auger hole diameter : 200 mm

drilling information					material substance						
method & support	water	samples & field tests	photoionization detector (ppmv)	RL (m)	depth (m)	graphic log	soil group symbol	material description SOIL NAME: plasticity or particle characteristics, colour, secondary and minor components	moisture condition	consistency / relative density	soil origin, structure and additional observations
	Not Encountered		1.4		0.5		SW-SM	SILTY SAND: fine - medium grained, brown. Silty CLAY: low - medium plasticity, brown, with sub angular gravels. CLAY: high plasticity, pale brown trace pale mottle. Borehole BH5A terminated at 1.50 m Target stratum	W		FILL - TOPSOIL
		CL-CL					FILL glass				
		E: 0.5-0.6									
		E: 1.0_1.1			1.0						
		E: 1.4_1.5			1.5				M		RESIDUAL SOIL
					2.0						
					2.5						
	</										

method AD auger drilling* HA hand auger MR mud rotary W washbore PT push tube HS hollow stem SS solid stem SD sonic drilling * bit shown by suffix e.g. AD/T B blank bit T TC bit V V bit	support M mud C casing N nil water  10-Oct-12 water level on date shown water inflow water outflow	samples & field tests B bulk disturbed sample D disturbed sample E environmental sample SS split spoon sample U## undisturbed sample ##mm diameter WS water sample HB hammer bouncing N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone R refusal	soil group symbol & material description based on AS 1726:2017 moisture condition D dry M moist W wet Wp plastic limit WL liquid limit	consistency / relative density VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
---	---	--	---	--

CDF_0_10_00.4_LIBRARY\GLB rev\CDF_0_10_00.4 2021-09-30 Log COF BOREHOLE: ENVIRONMENTAL 754-NTLEN317964-2.GPJ <<DrawingFiles>> 27/09/2024 16:36



Environmental Log - Borehole

client: **Health Infrastructure c/o Turner & Townsend**
principal:
project: **Cessnock Hospital**
location: **23 View Street Cessnock**

Hole ID: **BH6A**
sheet: 1 of 1
project no. **754-NTLEN347071-2**
date started: **03 Sep 2024**
date completed:
logged by: **PS**
checked by:

position: Not Specified surface elevation: Not Specified angle from horizontal: 90°
equipment type: Geoprobe, Track mounted drilling fluid: Auger hole diameter : 200 mm

drilling information					material substance				
method & support	water	samples & field tests	photoionization detector (ppmv)	RL (m)	depth (m)	graphic log	soil group symbol	material description	moisture condition
	Not Encountered		1.8		0.5		SW	ASPHALT.	M
		E: 0.5-0.6						Gravelly SAND: medium - coarse grained, sub-rounded to sub-angular, pale brown.	
								Silty CLAY: medium plasticity, dark brown mottled red and dark grey, trace gravels.	
		E: 1.0_1.1						becoming more mottled	
								CLAY: high plasticity, pale brown mottled red.	
		E: 1.4_1.5			1.5		CH	Borehole BH6A terminated at 1.50 m Target stratum	
					2.0				
					2.5				

method

AD auger drilling*
HA hand auger
MR mud rotary
W washbore
PT push tube
HS hollow stem
SS solid stem
SD sonic drilling
* bit shown by suffix
e.g. AD/T
B blank bit
T TC bit
V V bit

support

M mud
C casing
N nil

water

10-Oct-12 water level on date shown
water inflow
water outflow

samples & field tests

B bulk disturbed sample
D disturbed sample
E environmental sample
SS split spoon sample
U## undisturbed sample ##mm diameter
WS water sample
HB hammer bouncing
N standard penetration test (SPT)
N* SPT - sample recovered
Nc SPT with solid cone
R refusal

soil group symbol & material description
based on AS 1726:2017

moisture condition

D dry
M moist
W wet
Wp plastic limit
Wl liquid limit

consistency / relative density

VS very soft
S soft
F firm
St stiff
VSt very stiff
H hard
Fb friable
VL very loose
L loose
MD medium dense
D dense
VD very dense

CDF_0_0_10_00.4_LIBRARY\GLB rev\CDF_0_10_00.4 2021-09-30 Log COF BOREHOLE: ENVIRONMENTAL 754-NTLEN317964-2.GPJ <<DrawingFiles>> 27/09/2024 16:36

APPENDIX C: PHOTOLOG

Final



To the rear of the Pathology Building. A fill mound is evident



Looking Eastward from the northern grassed area. Areas of Fill are visible around and above Helicopter



Liquid Oxygen Storage Tank and Yard Maintenance Shed at the top of a fill mound



To the west of the Yard Maintenance Shed. The rear of the incinerator building is visible



Looking to the west at the rear of the old workshops. The Fill tapers to the west



Looking across the grassed area from the northwestern

drawn	PS		client:	Turner Townsend / Health Infrastructure
approved	PS		project:	Cessnock Hospital DSI
date	20.09.24		title:	Photo Log
scale	NTS		project no:	754-NTLEN347071-2
Original Size	A4			



Groundwater Monitoring Well installed downgradient of the Yard Maintenance Shed



Moderate oil staining on the concrete beneath the hoist of the Yard Maintenance Shed. No cracks or deterioration of the surface was noted



Additional borehole location (BH4a) at the western edge of the incinerator building near the PSI borehole BH13



Fill material from BH4a was consistent with that observed in PSI borehole BH13



Residual soil encountered beneath fill in BH4a

drawn	PS		client:	Turner Townsend / Health Infrastructure
approved	PS		project:	Cessnock Hospital DSI
date	20.09.24		title:	Photo Log
scale	NTS		project no:	754-NTLEN347071-2
Original Size	A4			



Sample location BH6a near the rear car park fence and to the east of PSI BH15



Fill material encountered in BH6a



Residual soil encountered in BH6a



Fill material encountered in BH2A next to the Yard Maintenance Shed



Fill material from BH5a at the rear of the former workshop buildings



Sandstone encountered in BH3a

drawn	PS		client:	Turner Townsend / Health Infrastructure
approved	PS		project:	Cessnock Hospital DSI
date	20.09.24		title:	Photo Log
scale	NTS		project no:	754-NTLEN347071-2
Original Size	A4			

APPENDIX D: DATA TABLES

Final

								DSI Samples (Septmeber 2024)							
								Field ID	BH1A_0.1-0.2	BH1A_0.5-0.6	BH2A_0.1-0.2	BH2A_0.5-0.6	BH2A_1.0-1.1	BH2A_1.9-2.0	BH3A_0.1-0.2
								Date	03 Sep 2024	03 Sep 2024	03 Sep 2024	03 Sep 2024	03 Sep 2024	03 Sep 2024	03 Sep 2024
								Lab Report Number	1135930	1135930	1135930	1140768	1135930	1140768	1135930
		Unit	EQL	NEPM 2013 Table 1A(1) HILs Comm/Ind D Soil	NEPM 2013 Table 1A(3) Comm/Ind D Soil HSL for Vapour Intrusion, Sand	NEPM 2013 Table 1B(5) Generic EIL - Comm/Ind	NEPM 2013 Table 1B(6) ESLs for Comm/Ind, Coarse Soil	NEPM 2013 Table 1B(7) Management Limits Comm / Ind, Coarse Soil							
Physical Parameters															
Cation Exchange Capacity (CEC)	meq/100g	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-
pH (lab)	pH Units	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-
Particle Size															
% Clay*	%	2.5	-	-	-	-	-	-	-	-	-	-	-	-	-
Inorganics															
Conductivity (1:5 aqueous extract)	uS/cm	10	-	-	-	-	-	-	-	-	-	-	-	-	-
TOC	mg/kg	1,000	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron (%)	%	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Recoverable Hydrocarbons															
C6 - C10	mg/kg	20	-	-	-	-	-	700	<20	<20	<20	-	<20	-	<20
F1 (C6 - C10) less BTEX	mg/kg	20	-	-	260 370 630	-	215	-	<20	<20	<20	-	<20	-	<20
C10 - C16	mg/kg	50	-	-	-	-	-	1,000	<50	<50	<50	-	<50	-	<50
F2 C10 - C16 (minus Naphthalene)	mg/kg	50	-	-	-	-	170	-	<50	<50	<50	-	<50	-	<50
F3 (C16 - C34)	mg/kg	100	-	-	-	-	1,700	3,500	<100	<100	<100	-	<100	-	<100
F4 (C34 - C40)	mg/kg	100	-	-	-	-	3,300	10,000	<100	<100	<100	-	<100	-	<100
C10 - C40 (Sum of total)	mg/kg	100	-	-	-	-	-	-	<100	<100	170	-	<100	-	<100
Total Petroleum Hydrocarbons															
C6 - C9	mg/kg	20	-	-	-	-	-	-	<20	<20	<20	-	<20	-	<20
C10 - C14	mg/kg	20	-	-	-	-	-	-	<20	<20	<20	-	<20	-	<20
C15 - C28	mg/kg	50	-	-	-	-	-	-	50	<50	63	-	<50	-	<50
C29 - C36	mg/kg	50	-	-	-	-	-	-	<50	<50	150	-	<50	-	<50
C10 - C36 (Sum of total)	mg/kg	50	-	-	-	-	-	-	50	<50	213	-	<50	-	<50
BTEXN															
Benzene	mg/kg	0.1	-	-	3 3 3 3	-	75	-	<0.1	<0.1	<0.1	-	<0.1	-	<0.1
Toluene	mg/kg	0.1	-	-	-	-	135	-	<0.1	<0.1	<0.1	-	<0.1	-	<0.1
Ethyl Benzene	mg/kg	0.1	-	-	-	-	165	-	<0.1	<0.1	<0.1	-	<0.1	-	<0.1
m,p-Xylene	mg/kg	0.2	-	-	-	-	-	-	<0.2	<0.2	<0.2	-	<0.2	-	<0.2
o-Xylene	mg/kg	0.1	-	-	-	-	-	-	<0.1	<0.1	<0.1	-	<0.1	-	<0.1
Total Xylenes	mg/kg	0.3	-	-	230	-	180	-	<0.3	<0.3	<0.3	-	<0.3	-	<0.3
Naphthalene (VOC)	mg/kg	0.5	-	-	-	-	-	-	<0.5	<0.5	<0.5	-	<0.5	-	<0.5
Metals															
Arsenic	mg/kg	2	3,000	-	-	160	-	-	13	12	2.8	-	8.9	-	6.0
Cadmium	mg/kg	0.4	900	-	-	-	-	-	<0.4	<0.4	<0.4	-	1.0	-	<0.4
Chromium (III+VI)	mg/kg	5	-	-	-	430	-	-	8.2	10.0	8.6	-	23	-	12
Copper	mg/kg	5	240,000	-	-	150	-	-	28	19	34	-	98	-	56
Iron	mg/kg	20	-	-	-	-	-	-	-	-	-	-	-	-	-
Lead	mg/kg	5	1,500	-	-	1800	-	-	43	47	51	-	570	-	31
Mercury	mg/kg	0.1	730	-	-	-	-	-	<0.1	<0.1	<0.1	-	0.2	-	0.2
Nickel	mg/kg	5	6,000	-	-	80	-	-	19	14	19	-	24	-	17
Zinc	mg/kg	5	400,000	-	-	480	-	-	93	84	210	49	1,400	140	86
Polycyclic Aromatic Hydrocarbons															
Benzo(b)fluoranthene	mg/kg	0.5	-	-	-	-	-	-	<0.5	<0.5	0.6	-	<0.5	-	<0.5
Acenaphthene	mg/kg	0.5	-	-	-	-	-	-	<0.5	<0.5	<0.5	-	<0.5	-	<0.5
Acenaphthylene	mg/kg	0.5	-	-	-	-	-	-	<0.5	<0.5	<0.5	-	<0.5	-	<0.5
Anthracene	mg/kg	0.5	-	-	-	-	-	-	<0.5	<0.5	<0.5	-	<0.5	-	<0.5
Benzo(a)anthracene	mg/kg	0.5	-	-	-	-	-	-	<0.5	<0.5	<0.5	-	<0.5	-	<0.5
Benzo(a) pyrene	mg/kg	0.5	-	-	-	-	72	-	<0.5	<0.5	<0.5	-	<0.5	-	<0.5
Benzo(a)pyrene TEQ calc (Zero)	mg/kg	0.5	40	-	-	-	-	-	<0.5	<0.5	<0.5	-	<0.5	-	<0.5
Benzo(a)pyrene TEQ calc (Half)	mg/kg	0.5	40	-	-	-	-	-	0.6	0.6	0.7	-	0.6	-	0.6
Benzo(a)pyrene TEQ (LOR)	mg/kg	0.5	40	-	-	-	-	-	1.2	1.2	1.2	-	1.2	-	1.2
Benzo(g,h,i)perylene	mg/kg	0.5	-	-	-	-	-	-	<0.5	<0.5	<0.5	-	<0.5	-	<0.5
Benzo(k)fluoranthene	mg/kg	0.5	-	-	-	-	-	-	<0.5	<0.5	0.5	-	<0.5	-	<0.5
Chrysene	mg/kg	0.5	-	-	-	-	-	-	<0.5	<0.5	0.6	-	<0.5	-	<0.5
Dibenz(a,h)anthracene	mg/kg	0.5	-	-	-	-	-	-	<0.5	<0.5	<0.5	-	<0.5	-	<0.5
Fluoranthene	mg/kg	0.5	-	-	-	-	-	-	0.9	1.3	1.5	-	<0.5	-	<0.5
Fluorene	mg/kg	0.5	-	-	-	-	-	-	<0.5	<0.5	<0.5	-	<0.5	-	<0.5
Indeno(1,2,3-c,d)pyrene	mg/kg	0.5	-	-	-	-	-	-	<0.5	<0.5	<0.5	-	<0.5	-	<0.5
Naphthalene	mg/kg	0.5	-	-	370	-	-	-	<0.5	<0.5	<0.5	-	<0.5	-	<0.5
Phenanthrene	mg/kg	0.5	-	-	-	-	-	-	<0.5	0.6	0.5	-	<0.5	-	<0.5
Pyrene	mg/kg	0.5	-	-	-	-	-	-	0.8	1.2	1.3	-	<0.5	-	<0.5
PAHs (Sum of total)	mg/kg	0.5	4,000	-	-	-	-	-	1.7	3.1	5.0	-	<0.5	-	<0.5
PCBs															
Arochlor 1016	mg/kg	0.1	-	-	-	-	-	-	<0.1	-	<1	-	-	-	-
Arochlor 1221	mg/kg	0.1	-	-	-	-	-	-	<0.1	-	<1	-	-	-	-
Arochlor 1232	mg/kg	0.1	-	-	-	-	-	-	<0.1	-	<1	-	-	-	-
Arochlor 1242	mg/kg	0.1	-	-	-	-	-	-	<0.1	-	<1	-	-	-	-
Arochlor 1248	mg/kg	0.1	-	-	-	-	-	-	<0.1	-	<1	-	-	-	-
Arochlor 1254	mg/kg	0.1	-	-	-	-	-	-	<0.1	-	<1	-	-	-	-
Arochlor 1260	mg/kg	0.1	-	-	-	-	-	-	<0.1	-	<1	-	-	-	-
PCBs (Sum of total)	mg/kg	0.1	7	-	-	-	-	-	<0.1	-	<1	-	-	-	-
Organochlorine Pesticides															
Organochlorine pesticides EPAVic	mg/kg	0.1	-	-	-	-	-	-	<0.1	-	<1	-	-	-	-
Other organochlorine pesticides															
EPAVic	mg/kg	0.1	-	-	-	-	-	-	<0.1	-	<1	-	-	-	-
4,4'-DDE	mg/kg	0.05	-	-	-	-	-	-	<0.05	-	<0.5	-	-	-	-
a-BHC	mg/kg	0.05	-	-	-	-	-	-	<0.05	-	<0.5	-	-	-	-
Aldrin	mg/kg	0.05	-	-	-	-	-	-	<0.05	-	<0.5	-	-	-	-
Aldrin + Dieldrin	mg/kg	0.05	45	-	-	-	-	-	<0.05	-	<0.5	-	-	-	-
b-BHC	mg/kg	0.05	-	-	-	-	-	-	<0.05	-	<0.5	-	-	-	-
chlordan	mg/kg	0.1	530	-	-	-	-	-	<0.1	-	<1	-	-	-	-
d-BHC	mg/kg	0.05	-	-	-	-	-	-	<0.05	-	<0.5	-	-	-	-
DDD	mg/kg	0.05	-	-	-	-	-	-	<0.05	-	<0.5	-	-	-	-
DDT	mg/kg	0.05	-	-	640	-	-	-	<0.05	-	<0.5	-	-	-	-
DDT+DDE+DDD	mg/kg	0.05	3												

Statistics
* A Non Detect Multiplier of 0.5 has been applied.

PSI Samples (June 2024)																									
								Field ID		BH01_0.0-0.2		BH01_0.5-0.7		BH02_0.0-0.2		BH02_0.5-0.7		BH03_0.0-0.2		BH03_1.0-1.2		BH04_0.5-0.7			
								Date		14 Jun 2024		14 Jun 2024		12 Jun 2024		12 Jun 2024		12 Jun 2024		12 Jun 2024		12 Jun 2024			
								Lab Report Number		1108144		1108144		1107687		1107687		1107687		1107687		1107687			
		Unit	EQL	NEPM 2013 Table 1A(1) HILs Comm/Ind D Soil	NEPM 2013 Table 1A(3) Comm/Ind D Soil HSL for Vapour Intrusion, Sand	NEPM 2013 Table 1B(5) Generic EIL - Comm/Ind	NEPM 2013 Table 1B(6) ESLs for Comm/Ind, Coarse Soil	NEPM 2013 Table 1B(7) Management Limits Comm / Ind, Coarse Soil																	
Physical Parameters																									
Cation Exchange Capacity (CEC)		meq/100g	0.5	-	-	-	-	-	-	-	-	-	-	11	-	-	-	-	-	-	-	-	-	-	
pH (lab)		pH Units	0.1	-	-	-	-	-	-	-	-	-	-	6.7	-	-	-	-	-	-	-	-	-		
Particle Size																									
% Clay*		%	2.5	-	-	-	-	-	-	-	-	-	-	5.6	-	-	-	-	-	-	-	-	-		
Inorganics																									
Conductivity (1:5 aqueous extract)		uS/cm	10	-	-	-	-	-	-	-	-	-	-	28	-	-	-	-	-	-	-	-	-		
TOC		mg/kg	1,000	-	-	-	-	-	-	-	-	-	-	23,000	-	-	-	-	-	-	-	-	-		
Iron (%)		%	0.01	-	-	-	-	-	-	-	-	-	-	0.86	-	-	-	-	-	-	-	-	-		
Total Recoverable Hydrocarbons																									
C6 - C10		mg/kg	20	-	-	-	-	700	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20		
F1 (C6 - C10) less BTEX		mg/kg	20	-	260 370 630	-	215	-	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20		
C10 - C16		mg/kg	50	-	-	-	-	1,000	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50		
F2 C10 - C16 (minus Naphthalene)		mg/kg	50	-	-	-	170	-	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50		
F3 (C16 - C34)		mg/kg	100	-	-	-	1,700	3,500	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100		
F4 (C34 - C40)		mg/kg	100	-	-	-	3,300	10,000	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100		
C10 - C40 (Sum of total)		mg/kg	100	-	-	-	-	-	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100		
Total Petroleum Hydrocarbons																									
C6 - C9		mg/kg	20	-	-	-	-	-	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20		
C10 - C14		mg/kg	20	-	-	-	-	-	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20		
C15 - C28		mg/kg	50	-	-	-	-	-	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50		
C29 - C36		mg/kg	50	-	-	-	-	-	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50		
C10 - C36 (Sum of total)		mg/kg	50	-	-	-	-	-	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50		
BTEXN																									
Benzene		mg/kg	0.1	-	3 3 3 3	-	75	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		
Toluene		mg/kg	0.1	-	-	-	135	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		
Ethyl Benzene		mg/kg	0.1	-	-	-	165	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		
m,p-Xylene		mg/kg	0.2	-	-	-	-	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2		
o-Xylene		mg/kg	0.1	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		
Total Xylenes		mg/kg	0.3	-	230	-	180	-	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3		
Naphthalene (VOC)		mg/kg	0.5	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Metals																									
Arsenic		mg/kg	2	3,000	-	160	-	-	6.0	11	6.7	-	13	8.6	11	-	-	-	-	-	-	-	6.4		
Cadmium		mg/kg	0.4	900	-	-	-	-	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4		
Chromium (III+VI)		mg/kg	5	-	430	-	-	-	10	28	11	-	23	16	17	-	-	-	-	-	-	-	11		
Copper		mg/kg	5	240,000	-	150	-	-	27	<5	17	-	<5	9.8	<5	-	-	-	-	-	-	-	26		
Iron		mg/kg	20	-	-	-	-	-	-	-	8,600	-	-	-	-	-	-	-	-	-	-	-	-		
Lead		mg/kg	5	1,500	-	1800	-	-	80	13	57	-	16	37	16	-	-	-	-	-	-	-	55		
Mercury		mg/kg	0.1	730	-	-	-	-	0.1	<0.1	0.1	-	<0.1	0.2	<0.1	-	-	-	-	-	-	-	<0.1		
Nickel		mg/kg	5	6,000	-	80	-	-	18	12	11	-	11	13	6.5	-	-	-	-	-	-	-	7.2		
Zinc		mg/kg	5	400,000	-	480	-	-	110	33	100	-	62	92	38	-	-	-	-	-	-	-	20		
Polycyclic Aromatic Hydrocarbons																									
Benzo(b)fluoranthene		mg/kg	0.5	-	-	-	-	-	<0.5	<0.5	0.7	-	<0.5	0.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Acenaphthene		mg/kg	0.5	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Acenaphthylene		mg/kg	0.5	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Anthracene		mg/kg	0.5	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Benzo(a)anthracene		mg/kg	0.5	-	-	-	-	-	<0.5	<0.5	0.8	<0.5	0.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Benzo(a) pyrene		mg/kg	0.5	-	-	-	72	-	<0.5	<0.5	0.9	<0.5	0.9	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Benzo(a)pyrene TEQ calc (Zero)		mg/kg	0.5	40	-	-	-	-	<0.5	<0.5	1.3	<0.5	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Benzo(a)pyrene TEQ calc (Half)		mg/kg	0.5	40	-	-	-	-	0.6	0.6	1.5	0.6	1.4	0.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Benzo(a)pyrene TEQ (LOR)		mg/kg	0.5	40	-	-	-	-	1.2	1.2	1.8	1.2	1.2	1.7	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Benzo(g,h,i)perylene		mg/kg	0.5	-	-	-	-	-	<0.5	<0.5	0.7	<0.5	0.7	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Benzo(k)fluoranthene		mg/kg	0.5	-	-																				

								Field ID	BH04_1.3-1.5	BH05_0.0-0.2	BH05_0.5-0.7	BH06_0.5-0.7	BH06_0.5-0.7-F1	BH06_1.0-1.2	BH07_0.0-0.2
								Date	12 Jun 2024	12 Jun 2024	12 Jun 2024	12 Jun 2024	12 Jun 2024	12 Jun 2024	12 Jun 2024
								Lab Report Number	1107687	1107687	1107687	1107687	1107687	1107687	1107687
	Unit	EQL	NEPM 2013 Table 1A(1) HILs Comm/Ind D Soil	NEPM 2013 Table 1A(3) Comm/Ind D Soil HSL for Vapour Intrusion, Sand	NEPM 2013 Table 1B(5) Generic EIL - Comm/Ind	NEPM 2013 Table 1B(6) ESLs for Comm/Ind, Coarse Soil	NEPM 2013 Table 1B(7) Management Limits Comm / Ind, Coarse Soil								
Physical Parameters															
Cation Exchange Capacity (CEC)	meq/100g	0.5	-	-	-	-	-	-	-	17	-	18	-	-	-
pH (lab)	pH Units	0.1	-	-	-	-	-	-	-	6.3	-	6.9	-	-	-
Particle Size															
% Clay*	%	2.5	-	-	-	-	-	-	-	4.4	-	<2.5	-	-	-
Inorganics															
Conductivity (1:5 aqueous extract)	uS/cm	10	-	-	-	-	-	-	-	56	-	150	-	-	-
TOC	mg/kg	1,000	-	-	-	-	-	-	-	61,000	-	250,000	-	-	-
Iron (%)	%	0.01	-	-	-	-	-	-	-	2.3	-	1.4	-	-	-
Total Recoverable Hydrocarbons															
C6 - C10	mg/kg	20	-	-	-	-	700	<20	<20	<20	<20	<20	-	<20	<20
F1 (C6 - C10) less BTEX	mg/kg	20	-	260 370 630	-	215	-	<20	<20	<20	<20	<20	-	<20	<20
C10 - C16	mg/kg	50	-	-	-	-	1,000	<50	<50	<50	<50	<50	-	<50	<50
F2 C10 - C16 (minus Naphthalene)	mg/kg	50	-	-	-	170	-	<50	<50	<50	<50	<50	-	<50	<50
F3 (C16 - C34)	mg/kg	100	-	-	-	1,700	3,500	<100	<100	<100	<100	<100	-	<100	<100
F4 (C34 - C40)	mg/kg	100	-	-	-	3,300	10,000	<100	<100	<100	<100	<100	-	<100	<100
C10 - C40 (Sum of total)	mg/kg	100	-	-	-	-	-	<100	<100	<100	<100	<100	-	<100	<100
Total Petroleum Hydrocarbons															
C6 - C9	mg/kg	20	-	-	-	-	-	<20	<20	<20	<20	<20	-	<20	<20
C10 - C14	mg/kg	20	-	-	-	-	-	<20	<20	<20	<20	<20	-	<20	<20
C15 - C28	mg/kg	50	-	-	-	-	-	50	<50	<50	<50	66	-	<50	<50
C29 - C36	mg/kg	50	-	-	-	-	-	<50	<50	<50	<50	110	-	<50	<50
C10 - C36 (Sum of total)	mg/kg	50	-	-	-	-	-	50	<50	<50	<50	176	-	<50	<50
BTEXN															
Benzene	mg/kg	0.1	-	3 3 3 3	-	75	-	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1
Toluene	mg/kg	0.1	-	-	-	135	-	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1
Ethyl Benzene	mg/kg	0.1	-	-	-	165	-	<0.1	<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	-	<0.2	<0.2
o-Xylene	mg/kg	0.1	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1
Total Xylenes	mg/kg	0.3	-	230	-	180	-	<0.3	<0.3	<0.3	<0.3	<0.3	-	<0.3	<0.3
Naphthalene (VOC)	mg/kg	0.5	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5
Metals															
Arsenic	mg/kg	2	3,000	-	160	-	-	12	11	15	6.0	-	-	7.9	6.3
Cadmium	mg/kg	0.4	900	-	-	-	-	<0.4	<0.4	<0.4	<0.4	-	-	<0.4	<0.4
Chromium (III+VI)	mg/kg	5	-	-	430	-	-	25	24	33	7.8	-	-	15	9.2
Copper	mg/kg	5	240,000	-	150	-	-	<5	24	<5	20	-	-	20	46
Iron	mg/kg	20	-	-	-	-	-	-	23,000	-	14,000	-	-	-	-
Lead	mg/kg	5	1,500	-	1800	-	-	11	54	12	41	-	-	77	66
Mercury	mg/kg	0.1	730	-	-	-	-	<0.1	0.1	<0.1	<0.1	-	-	0.1	0.8
Nickel	mg/kg	5	6,000	-	80	-	-	10	11	16	31	-	-	17	34
Zinc	mg/kg	5	400,000	-	480	-	-	46	170	44	110	-	-	98	140
Polycyclic Aromatic Hydrocarbons															
Benzo(b)fluoranthene	mg/kg	0.5	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5
Acenaphthene	mg/kg	0.5	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5
Acenaphthylene	mg/kg	0.5	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5
Anthracene	mg/kg	0.5	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5
Benzo(a)anthracene	mg/kg	0.5	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5
Benzo(a) pyrene	mg/kg	0.5	-	-	-	72	-	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5
Benzo(a)pyrene TEQ calc (Zero)	mg/kg	0.5	40	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5
Benzo(a)pyrene TEQ calc (Half)	mg/kg	0.5	40	-	-	-	-	0.6	0.6	0.6	0.6	-	-	0.6	0.6
Benzo(a)pyrene TEQ (LOR)	mg/kg	0.5	40	-	-	-	-	1.2	1.2	1.2	1.2	-	-	1.2	1.2
Benzo(g,h,i)perylene	mg/kg	0.5	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5
Benzo(k)fluoranthene	mg/kg	0.5	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5
Chrysene	mg/kg	0.5	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5
Dibenz(a,h)anthracene	mg/kg	0.5	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5
Fluoranthene	mg/kg	0.5	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	0.8
Fluorene	mg/kg	0.5	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5
Indeno(1,2,3-c,d)pyrene	mg/kg	0.5	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5
Naphthalene	mg/kg	0.5	-	-	370	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5
Phenanthrene	mg/kg	0.5	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	0.5
Pyrene	mg/kg	0.5	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	0.8
PAHs (Sum of total)	mg/kg	0.5	4,000	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	2.1
PCBs															
Arochlor 1016	mg/kg	0.1	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1
Arochlor 1221	mg/kg	0.1	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1
Arochlor 1232	mg/kg	0.1	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1
Arochlor 1242	mg/kg	0.1	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1
Arochlor 1248	mg/kg	0.1	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1
Arochlor 1254	mg/kg	0.1	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1
Arochlor 1260	mg/kg	0.1	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1
PCBs (Sum of total)	mg/kg	0.1	7	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1
Organochlorine Pesticides															
Organochlorine pesticides EPAVic	mg/kg	0.1	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1
Other organochlorine pesticides															
EPAVic	mg/kg	0.1	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1
4,4'-DDE	mg/kg	0.05	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05
a-BHC	mg/kg	0.05	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05
Aldrin	mg/kg	0.05	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05
Aldrin + Dieldrin	mg/kg	0.05	45	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05
b-BHC	mg/kg	0.05	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05
chlordan	mg/kg	0.1	530	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1
d-BHC	mg/kg	0.05	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05
DDD	mg/kg	0.05	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05
DDT	mg/kg	0.05	-	-	640	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05
DDT+DDE+DDD	mg/kg	0.05	3,600	-	-	-	-	<0.05							

								Field ID	BH07_0.5-0.7	BH08_0.0-0.2	BH08_1.3-1.5	BH09_0.0-0.2	BH09_0.5-0.7	BH09_0.5-0.7-F	BH09_1.0-1.2
								Date	12 Jun 2024	12 Jun 2024	12 Jun 2024	12 Jun 2024	12 Jun 2024	12 Jun 2024	12 Jun 2024
								Lab Report Number	1107687	1107687	1107687	1107687	1107687	1107687	1107687
	Unit	EQL	NEPM 2013 Table 1A(1) HILs Comm/Ind D Soil	NEPM 2013 Table 1A(3) Comm/Ind D Soil HSL for Vapour Intrusion, Sand	NEPM 2013 Table 1B(5) Generic EIL - Comm/Ind	NEPM 2013 Table 1B(6) ESIs for Comm/Ind, Coarse Soil	NEPM 2013 Table 1B(7) Management Limits Comm / Ind, Coarse Soil								
Physical Parameters															
Cation Exchange Capacity (CEC)	meq/100g	0.5	-	-	-	-	-	-	-	11	-	-	19	-	-
pH (lab)	pH Units	0.1	-	-	-	-	-	-	-	6.7	-	-	6.7	-	-
Particle Size															
% Clay*	%	2.5	-	-	-	-	-	-	-	<2.5	-	-	13	-	-
Inorganics															
Conductivity (1:5 aqueous extract)	uS/cm	10	-	-	-	-	-	-	-	100	-	-	42	-	-
TOC	mg/kg	1,000	-	-	-	-	-	-	-	48,000	-	-	43,000	-	-
Iron (%)	%	0.01	-	-	-	-	-	-	-	0.71	-	-	0.83	-	-
Total Recoverable Hydrocarbons															
C6 - C10	mg/kg	20	-	-	-	-	700	<20	<20	<20	<20	-	-	-	<20
F1 (C6 - C10) less BTEX	mg/kg	20	-	260 370 630	-	215	-	<20	<20	<20	<20	-	-	-	<20
C10 - C16	mg/kg	50	-	-	-	-	1,000	<50	<50	<50	<50	-	-	-	<50
F2 C10 - C16 (minus Naphthalene)	mg/kg	50	-	-	-	170	-	<50	<50	<50	<50	-	-	-	<50
F3 (C16 - C34)	mg/kg	100	-	-	-	1,700	3,500	<100	<100	<100	<100	-	-	-	<100
F4 (C34 - C40)	mg/kg	100	-	-	-	3,300	10,000	<100	<100	<100	<100	-	-	-	<100
C10 - C40 (Sum of total)	mg/kg	100	-	-	-	-	-	<100	<100	<100	<100	-	-	-	<100
Total Petroleum Hydrocarbons															
C6 - C9	mg/kg	20	-	-	-	-	-	<20	<20	<20	<20	-	-	-	<20
C10 - C14	mg/kg	20	-	-	-	-	-	<20	<20	<20	<20	-	-	-	<20
C15 - C28	mg/kg	50	-	-	-	-	-	<50	<50	<50	61	-	-	-	53
C29 - C36	mg/kg	50	-	-	-	-	-	<50	<50	<50	<50	-	-	-	<50
C10 - C36 (Sum of total)	mg/kg	50	-	-	-	-	-	<50	<50	<50	61	-	-	-	53
BTEXN															
Benzene	mg/kg	0.1	-	3 3 3 3	-	75	-	<0.1	<0.1	<0.1	<0.1	-	-	-	<0.1
Toluene	mg/kg	0.1	-	-	-	135	-	<0.1	<0.1	<0.1	<0.1	-	-	-	<0.1
Ethyl Benzene	mg/kg	0.1	-	-	-	165	-	<0.1	<0.1	<0.1	<0.1	-	-	-	<0.1
m,p-Xylene	mg/kg	0.2	-	-	-	-	-	<0.2	<0.2	<0.2	<0.2	-	-	-	<0.2
o-Xylene	mg/kg	0.1	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	-	-	-	<0.1
Total Xylenes	mg/kg	0.3	-	230	-	180	-	<0.3	<0.3	<0.3	<0.3	-	-	-	<0.3
Naphthalene (VOC)	mg/kg	0.5	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	-	-	-	<0.5
Metals															
Arsenic	mg/kg	2	3,000	-	160	-	-	2.3	2.4	7.0	5.1	-	-	-	6.3
Cadmium	mg/kg	0.4	900	-	-	-	-	<0.4	0.5	<0.4	<0.4	-	-	-	<0.4
Chromium (III+VI)	mg/kg	5	-	-	430	-	-	8.7	7.4	17	14	-	-	-	9.1
Copper	mg/kg	5	240,000	-	150	-	-	21	11	<5	29	-	-	-	6.7
Iron	mg/kg	20	-	-	-	-	-	-	7,100	-	-	8,300	-	-	-
Lead	mg/kg	5	1,500	-	1800	-	-	16	29	14	110	-	-	-	32
Mercury	mg/kg	0.1	730	-	-	-	-	<0.1	0.2	<0.1	0.2	-	-	-	<0.1
Nickel	mg/kg	5	6,000	-	80	-	-	43	9.9	5.8	20	-	-	-	9.1
Zinc	mg/kg	5	400,000	-	480	-	-	34	64	20	130	-	-	-	93
Polycyclic Aromatic Hydrocarbons															
Benzo(b)fluoranthene	mg/kg	0.5	-	-	-	-	-	<0.5	<0.5	<0.5	1.7	-	-	-	0.9
Acenaphthene	mg/kg	0.5	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	-	-	-	<0.5
Acenaphthylene	mg/kg	0.5	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	-	-	-	<0.5
Anthracene	mg/kg	0.5	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	-	-	-	<0.5
Benzo(a)anthracene	mg/kg	0.5	-	-	-	-	-	<0.5	<0.5	<0.5	0.8	-	-	-	0.6
Benzo(a) pyrene	mg/kg	0.5	-	-	-	72	-	<0.5	<0.5	<0.5	1.1	-	-	-	0.8
Benzo(a)pyrene TEQ calc (Zero)	mg/kg	0.5	40	-	-	-	-	<0.5	<0.5	<0.5	1.7	-	-	-	1.2
Benzo(a)pyrene TEQ calc (Half)	mg/kg	0.5	40	-	-	-	-	0.6	0.6	0.6	1.9	-	-	-	1.4
Benzo(a)pyrene TEQ (LOR)	mg/kg	0.5	40	-	-	-	-	1.2	1.2	1.2	2.2	-	-	-	1.7
Benzo(g,h,i)perylene	mg/kg	0.5	-	-	-	-	-	<0.5	<0.5	<0.5	1.5	-	-	-	1.0
Benzo(k)fluoranthene	mg/kg	0.5	-	-	-	-	-	<0.5	<0.5	<0.5	1.8	-	-	-	1.2
Chrysene	mg/kg	0.5	-	-	-	-	-	<0.5	<0.5	<0.5	1.7	-	-	-	1.1
Dibenz(a,h)anthracene	mg/kg	0.5	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	-	-	-	<0.5
Fluoranthene	mg/kg	0.5	-	-	-	-	-	<0.5	<0.5	<0.5	2.9	-	-	-	2.0
Fluorene	mg/kg	0.5	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	-	-	-	<0.5
Indeno(1,2,3-c,d)pyrene	mg/kg	0.5	-	-	-	-	-	<0.5	<0.5	<0.5	1.1	-	-	-	0.7
Naphthalene	mg/kg	0.5	-	370	-	-	-	<0.5	<0.5	<0.5	<0.5	-	-	-	<0.5
Phenanthrene	mg/kg	0.5	-	-	-	-	-	<0.5	<0.5	<0.5	0.8	-	-	-	<0.5
Pyrene	mg/kg	0.5	-	-	-	-	-	<0.5	<0.5	<0.5	2.7	-	-	-	1.8
PAHs (Sum of total)	mg/kg	0.5	4,000	-	-	-	-	<0.5	<0.5	<0.5	16	-	-	-	10
PCBs															
Arochlor 1016	mg/kg	0.1	-	-	-	-	-	<0.1	<0.1	<0.1	<1	-	-	-	<1
Arochlor 1221	mg/kg	0.1	-	-	-	-	-	<0.1	<0.1	<0.1	<1	-	-	-	<1
Arochlor 1232	mg/kg	0.1	-	-	-	-	-	<0.1	<0.1	<0.1	<1	-	-	-	<1
Arochlor 1242	mg/kg	0.1	-	-	-	-	-	<0.1	<0.1	<0.1	<1	-	-	-	<1
Arochlor 1248	mg/kg	0.1	-	-	-	-	-	<0.1	<0.1	<0.1	<1	-	-	-	<1
Arochlor 1254	mg/kg	0.1	-	-	-	-	-	<0.1	<0.1	<0.1	<1	-	-	-	<1
Arochlor 1260	mg/kg	0.1	-	-	-	-	-	<0.1	<0.1	<0.1	<1	-	-	-	<1
PCBs (Sum of total)	mg/kg	0.1	7	-	-	-	-	<0.1	<0.1	<0.1	<1	-	-	-	<1
Organochlorine Pesticides															
Organochlorine pesticides EPAVic	mg/kg	0.1	-	-	-	-	-	<0.1	<0.1	<0.1	<1	-	-	-	<1
Other organochlorine pesticides															
EPAVic	mg/kg	0.1	-	-	-	-	-	<0.1	<0.1	<0.1	<1	-	-	-	<1
4,4'-DDE	mg/kg	0.05	-	-	-	-	-	<0.05	<0.05	<0.05	<0.5	-	-	-	<0.5
a-BHC	mg/kg	0.05	-	-	-	-	-	<0.05	<0.05	<0.05	<0.5	-	-	-	<0.5
Aldrin	mg/kg	0.05	-	-	-	-	-	<0.05	<0.05	<0.05	<0.5	-	-	-	<0.5
Aldrin + Dieldrin	mg/kg	0.05	45	-	-	-	-	<0.05	<0.05	<0.05	<0.5	-	-	-	<0.5
b-BHC	mg/kg	0.05	-	-	-	-	-	<0.05	<0.05	<0.05	<0.5	-	-	-	<0.5
chlordan	mg/kg	0.1	530	-	-	-	-	<0.1	<0.1	<0.1	<1	-	-	-	<1
d-BHC	mg/kg	0.05	-	-	-	-	-	<0.05	<0.05	<0.05	<0.5	-	-	-	<0.5
DDD	mg/kg	0.05	-	-	-	-	-	<0.05	<0.05	<0.05	<0.5	-	-	-	<0.5
DDT	mg/kg	0.05	-	-	640	-	-	<0.05	<0.05	<0.05	<0.5	-	-	-	<0.5
DDT+DDE+DDD	mg/kg	0.05	3,600	-	-	-	-	<0.05	<0.05	<0.05	<0.5	-	-	-	<0.5
Dieldrin	mg/kg	0.05	-	-	-	-	-	<0.05	<0.05	<0.05	<0.5	-	-	-	<0.5
Endrin aldehyde	mg/kg	0.05	-	-	-	-	-	<0.05	<0.05	<0.05	<0.5	-	-	-	<0.5
Endrin ketone	mg/kg	0.05	-	-	-	-	-	<0.05	<0.05	<0.05	<0.5	-	-	-	<0.5
Endosulfan I	µg/kg	50	-	-	-	-	-	<50	<50	<50	<500	-	-	-	<500
Endosulfan II	mg/kg	0.05	-	-	-	-	-	<0.05	<0.05	<0.05	<0.5	-	-	-	<0.5
Endosulfan sulphate	mg/kg	0.05	-	-	-	-	-	<0.05	<0.05	<0.05	<0.5	-	-	-	<0.5
Endrin	mg/kg	0.05	100	-											

								Field ID	BH10_0.0-0.2	BH10_0.5-0.7	BH11_0.0-0.2	BH11_1.0-1.2	BH12_0.0-0.2	BH12_0.5-0.7	BH13_0.0-0.2
								Date	12 Jun 2024	12 Jun 2024	12 Jun 2024	12 Jun 2024	12 Jun 2024	12 Jun 2024	13 Jun 2024
								Lab Report Number	1107687	1107687	1107687	1107687	1107687	1107687	1107687
	Unit	EQL	NEPM 2013 Table 1A(1) HILs Comm/Ind D Soil	NEPM 2013 Table 1A(3) Comm/Ind D Soil HSL for Vapour Intrusion, Sand	NEPM 2013 Table 1B(5) Generic EIL - Comm/Ind	NEPM 2013 Table 1B(6) ESLs for Comm/Ind, Coarse Soil	NEPM 2013 Table 1B(7) Management Limits Comm / Ind, Coarse Soil								
Physical Parameters															
Cation Exchange Capacity (CEC)	meq/100g	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-
pH (lab)	pH Units	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-
Particle Size															
% Clay*	%	2.5	-	-	-	-	-	-	-	-	-	-	-	-	-
Inorganics															
Conductivity (1:5 aqueous extract)	uS/cm	10	-	-	-	-	-	-	-	-	-	-	-	-	-
TOC	mg/kg	1,000	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron (%)	%	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Recoverable Hydrocarbons															
C6 - C10	mg/kg	20	-	-	-	-	700	<20	<20	<20	<20	<20	<20	<20	<20
F1 (C6 - C10) less BTEX	mg/kg	20	-	260 370 630	-	215	-	<20	<20	<20	<20	<20	<20	<20	<20
C10 - C16	mg/kg	50	-	-	-	-	1,000	<50	<50	<50	<50	<50	<50	<50	<100
F2 C10 - C16 (minus Naphthalene)	mg/kg	50	-	-	-	170	-	<50	<50	<50	<50	<50	<50	<50	<100
F3 (C16 - C34)	mg/kg	100	-	-	-	1,700	3,500	<100	<100	<100	<100	<100	<100	130	3,000
F4 (C34 - C40)	mg/kg	100	-	-	-	3,300	10,000	<100	<100	<100	<100	<100	<100	110	750
C10 - C40 (Sum of total)	mg/kg	100	-	-	-	-	-	<100	<100	<100	<100	<100	<100	240	3,750
Total Petroleum Hydrocarbons															
C6 - C9	mg/kg	20	-	-	-	-	-	<20	<20	<20	<20	<20	<20	<20	<20
C10 - C14	mg/kg	20	-	-	-	-	-	<20	<20	<20	<20	<20	<20	<20	<40
C15 - C28	mg/kg	50	-	-	-	-	-	<50	<50	<50	<50	64	92	2,600	
C29 - C36	mg/kg	50	-	-	-	-	-	<50	<50	<50	<50	52	110	920	
C10 - C36 (Sum of total)	mg/kg	50	-	-	-	-	-	<50	<50	<50	<50	116	202	3,520	
BTEXN															
Benzene	mg/kg	0.1	-	3 3 3 3	-	75	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	0.1	-	-	-	135	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Ethyl Benzene	mg/kg	0.1	-	-	-	165	-	<0.1	<0.1	<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	<0.2	<0.2	<0.2
o-Xylene	mg/kg	0.1	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Xylenes	mg/kg	0.3	-	230	-	180	-	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Naphthalene (VOC)	mg/kg	0.5	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Metals															
Arsenic	mg/kg	2	3,000	-	160	-	-	4.8	8.1	4.9	7.8	3.7	6.0	5.6	
Cadmium	mg/kg	0.4	900	-	-	-	-	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium (III+VI)	mg/kg	5	-	-	430	-	-	11	18	10	19	9.1	15	12	
Copper	mg/kg	5	240,000	-	150	-	-	5.8	<5	20	<5	<5	<5	<5	44
Iron	mg/kg	20	-	-	-	-	-	-	-	-	-	-	-	-	-
Lead	mg/kg	5	1,500	-	1800	-	-	22	11	46	9.1	15	9.1	170	
Mercury	mg/kg	0.1	730	-	-	-	-	0.6	<0.1	0.4	<0.1	0.3	0.2	<0.1	<0.1
Nickel	mg/kg	5	6,000	-	80	-	-	17	6.6	15	<5	5.7	<5	29	
Zinc	mg/kg	5	400,000	-	480	-	-	38	17	97	18	27	14	230	
Polycyclic Aromatic Hydrocarbons															
Benzo(b)fluoranthene	mg/kg	0.5	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	58
Acenaphthene	mg/kg	0.5	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	4.7
Acenaphthylene	mg/kg	0.5	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	mg/kg	0.5	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	16
Benzo(a)anthracene	mg/kg	0.5	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	58
Benzo(a) pyrene	mg/kg	0.5	-	-	-	72	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	56
Benzo(a)pyrene TEQ calc (Zero)	mg/kg	0.5	40	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	92
Benzo(a)pyrene TEQ calc (Half)	mg/kg	0.5	40	-	-	-	-	0.6	0.6	0.6	0.6	0.6	0.6	0.6	92
Benzo(a)pyrene TEQ (LOR)	mg/kg	0.5	40	-	-	-	-	1.2	1.2	1.2	1.2	1.2	1.2	1.2	92
Benzo(g,h,i)perylene	mg/kg	0.5	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	45
Benzo(k)fluoranthene	mg/kg	0.5	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	50
Chrysene	mg/kg	0.5	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	60
Dibenz(a,h)anthracene	mg/kg	0.5	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	14
Fluoranthene	mg/kg	0.5	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	160
Fluorene	mg/kg	0.5	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	3.2
Indeno(1,2,3-c,d)pyrene	mg/kg	0.5	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	45
Naphthalene	mg/kg	0.5	-	370	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	mg/kg	0.5	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	99
Pyrene	mg/kg	0.5	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	130
PAHs (Sum of total)	mg/kg	0.5	4,000	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	800
PCBs															
Arochlor 1016	mg/kg	0.1	-	-	-	-	-	<0.1	<0.1	<1	<0.1	<0.1	<0.1	<0.1	<1
Arochlor 1221	mg/kg	0.1	-	-	-	-	-	<0.1	<0.1	<1	<0.1	<0.1	<0.1	<0.1	<1
Arochlor 1232	mg/kg	0.1	-	-	-	-	-	<0.1	<0.1	<1	<0.1	<0.1	<0.1	<0.1	<1
Arochlor 1242	mg/kg	0.1	-	-	-	-	-	<0.1	<0.1	<1	<0.1	<0.1	<0.1	<0.1	<1
Arochlor 1248	mg/kg	0.1	-	-	-	-	-	<0.1	<0.1	<1	<0.1	<0.1	<0.1	<0.1	<1
Arochlor 1254	mg/kg	0.1	-	-	-	-	-	<0.1	<0.1	<1	<0.1	<0.1	<0.1	<0.1	<1
Arochlor 1260	mg/kg	0.1	-	-	-	-	-	<0.1	<0.1	<1	<0.1	<0.1	<0.1	<0.1	<1
PCBs (Sum of total)	mg/kg	0.1	7	-	-	-	-	<0.1	<0.1	<1	<0.1	<0.1	<0.1	<0.1	<1
Organochlorine Pesticides															
Organochlorine pesticides EPAVic	mg/kg	0.1	-	-	-	-	-	<0.1	<0.1	<1	<0.1	<0.1	<0.1	<0.1	<1
Other organochlorine pesticides															
EPAVic	mg/kg	0.1	-	-	-	-	-	<0.1	<0.1	<1	<0.1	<0.1	<0.1	<0.1	<1
4,4'-DDE	mg/kg	0.05	-	-	-	-	-	<0.05	<0.05	<0.5	<0.05	<0.05	<0.05	<0.05	<0.5
a-BHC	mg/kg	0.05	-	-	-	-	-	<0.05	<0.05	<0.5	<0.05	<0.05	<0.05	<0.05	<0.5
Aldrin	mg/kg	0.05	-	-	-	-	-	<0.05	<0.05	<0.5	<0.05	<0.05	<0.05	<0.05	<0.5
Aldrin + Dieldrin	mg/kg	0.05	45	-	-	-	-	<0.05	<0.05	<0.5	<0.05	<0.05	<0.05	<0.05	<0.5
b-BHC	mg/kg	0.05	-	-	-	-	-	<0.05	<0.05	<0.5	<0.05	<0.05	<0.05	<0.05	<0.5
chlordan	mg/kg	0.1	530	-	-	-	-	<0.1	<0.1	<1	<0.1	<0.1	<0.1	<0.1	<1
d-BHC	mg/kg	0.05	-	-	-	-	-	<0.05	<0.05	<0.5	<0.05	<0.05	<0.05	<0.05	<0.5
DDD	mg/kg	0.05	-	-	-	-	-	<0.05	<0.05	<0.5	<0.05	<0.05	<0.05	<0.05	<0.5
DDT	mg/kg	0.05	-	-	640	-	-	<0.05	<0.05	<0.5	<0.05	<0.05	<0.05	<0.05	<0.5
DDT+DDE+DDD	mg/kg	0.05	3,600	-	-	-									

								Field ID	BH13_1.0-1.2	BH14_0.0-0.2	BH14_0.5-0.7	BH15_0.0-0.2	BH15_1.0-1.2	BH16_0.0-0.2	BH16_0.5-0.7
								Date	13 Jun 2024	13 Jun 2024	13 Jun 2024	13 Jun 2024	13 Jun 2024	13 Jun 2024	13 Jun 2024
								Lab Report Number	1107687	1107687	1107687	1107687	1107687	1107687	1107687
	Unit	EQL	NEPM 2013 Table 1A(1) HILs Comm/Ind D Soil	NEPM 2013 Table 1A(3) Comm/Ind D Soil HSL for Vapour Intrusion, Sand	NEPM 2013 Table 1B(5) Generic EIL - Comm/Ind	NEPM 2013 Table 1B(6) ESLs for Comm/Ind, Coarse Soil	NEPM 2013 Table 1B(7) Management Limits Comm / Ind, Coarse Soil								
Physical Parameters															
Cation Exchange Capacity (CEC)	meq/100g	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-
pH (lab)	pH Units	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-
Particle Size															
% Clay*	%	2.5	-	-	-	-	-	-	-	-	-	-	-	-	-
Inorganics															
Conductivity (1:5 aqueous extract)	uS/cm	10	-	-	-	-	-	-	-	-	-	-	-	-	-
TOC	mg/kg	1,000	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron (%)	%	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Recoverable Hydrocarbons															
C6 - C10	mg/kg	20	-	-	-	-	700	<20	<20	<20	<20	<20	<20	<20	<20
F1 (C6 - C10) less BTEX	mg/kg	20	-	260 370 630	-	215	-	<20	<20	<20	<20	<20	<20	<20	<20
C10 - C16	mg/kg	50	-	-	-	-	1,000	<50	160	<50	<50	350	<50	<50	<50
F2 C10 - C16 (minus Naphthalene)	mg/kg	50	-	-	-	170	-	<50	160	<50	<50	350	<50	<50	<50
F3 (C16 - C34)	mg/kg	100	-	-	-	1,700	3,500	480	820	<100	320	570	300	<100	<100
F4 (C34 - C40)	mg/kg	100	-	-	-	3,300	10,000	170	940	<100	110	<100	360	<100	<100
C10 - C40 (Sum of total)	mg/kg	100	-	-	-	-	-	650	1,920	<100	430	920	660	<100	<100
Total Petroleum Hydrocarbons															
C6 - C9	mg/kg	20	-	-	-	-	-	<20	<20	<20	<20	<20	<20	<20	<20
C10 - C14	mg/kg	20	-	-	-	-	-	<20	78	<20	<20	200	<20	<20	<20
C15 - C28	mg/kg	50	-	-	-	-	-	390	470	<50	250	620	140	<50	<50
C29 - C36	mg/kg	50	-	-	-	-	-	180	670	<50	130	110	260	<50	<50
C10 - C36 (Sum of total)	mg/kg	50	-	-	-	-	-	570	1,218	<50	380	930	400	<50	<50
BTEXN															
Benzene	mg/kg	0.1	-	3 3 3 3	-	75	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	0.1	-	-	-	135	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Ethyl Benzene	mg/kg	0.1	-	-	-	165	-	<0.1	<0.1	<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	<0.2	<0.2	<0.2
o-Xylene	mg/kg	0.1	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Xylenes (VOC)	mg/kg	0.3	-	230	-	180	-	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Naphthalene (VOC)	mg/kg	0.5	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Metals															
Arsenic	mg/kg	2	3,000	-	160	-	-	7.9	4.0	8.4	11	14	8.0	9.8	9.8
Cadmium	mg/kg	0.4	900	-	-	-	-	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium (III+VI)	mg/kg	5	-	-	430	-	-	12	11	20	17	25	12	14	14
Copper	mg/kg	5	240,000	-	150	-	-	54	150	<5	<5	<5	10	<5	<5
Iron	mg/kg	20	-	-	-	-	-	-	-	-	-	-	-	-	-
Lead	mg/kg	5	1,500	-	1800	-	-	46	26	9.2	12	17	15	9.1	9.1
Mercury	mg/kg	0.1	730	-	-	-	-	<0.1	0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	5	6,000	-	80	-	-	35	15	5.6	8.2	6.8	17	<5	<5
Zinc	mg/kg	5	400,000	-	480	-	-	140	65	20	24	23	36	9.5	9.5
Polycyclic Aromatic Hydrocarbons															
Benzo(b)fluoranthene	mg/kg	0.5	-	-	-	-	-	7.6	<0.5	<0.5	4.1	6.9	<0.5	<0.5	<0.5
Acenaphthene	mg/kg	0.5	-	-	-	-	-	0.7	<0.5	<0.5	2.0	6.6	<0.5	<0.5	<0.5
Acenaphthylene	mg/kg	0.5	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	mg/kg	0.5	-	-	-	-	-	3.9	<0.5	<0.5	3.2	8.9	<0.5	<0.5	<0.5
Benzo(a)anthracene	mg/kg	0.5	-	-	-	-	-	8.4	<0.5	<0.5	5.0	8.1	<0.5	<0.5	<0.5
Benzo(a) pyrene	mg/kg	0.5	-	-	-	72	-	7.7	<0.5	<0.5	4.5	7.1	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc (Zero)	mg/kg	0.5	40	-	-	-	-	13	<0.5	<0.5	6.1	11	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc (Half)	mg/kg	0.5	40	-	-	-	-	13	0.6	0.6	6.3	11	0.6	0.6	0.6
Benzo(a)pyrene TEQ (LOR)	mg/kg	0.5	40	-	-	-	-	13	1.2	1.2	6.6	11	1.2	1.2	1.2
Benzo(g,h,i)perylene	mg/kg	0.5	-	-	-	-	-	5.5	<0.5	<0.5	3.2	4.1	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	mg/kg	0.5	-	-	-	-	-	7.9	<0.5	<0.5	3.0	6.7	0.5	<0.5	<0.5
Chrysene	mg/kg	0.5	-	-	-	-	-	9.6	<0.5	<0.5	5.9	9.6	<0.5	<0.5	<0.5
Dibenz(a,h)anthracene	mg/kg	0.5	-	-	-	-	-	1.9	<0.5	<0.5	<0.5	1.6	<0.5	<0.5	<0.5
Fluoranthene	mg/kg	0.5	-	-	-	-	-	27	1.2	<0.5	17	32	0.9	<0.5	<0.5
Fluorene	mg/kg	0.5	-	-	-	-	-	<0.5	<0.5	<0.5	0.9	3.6	<0.5	<0.5	<0.5
Indeno(1,2,3-c,d)pyrene	mg/kg	0.5	-	-	-	-	-	5.3	<0.5	<0.5	2.9	4.0	<0.5	<0.5	<0.5
Naphthalene	mg/kg	0.5	-	370	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	mg/kg	0.5	-	-	-	-	-	16	1.0	<0.5	11	29	<0.5	<0.5	<0.5
Pyrene	mg/kg	0.5	-	-	-	-	-	22	1.1	<0.5	14	26	0.8	<0.5	<0.5
PAHs (Sum of total)	mg/kg	0.5	4,000	-	-	-	-	120	3.3	<0.5	77	150	2.2	<0.5	<0.5
PCBs															
Arochlor 1016	mg/kg	0.1	-	-	-	-	-	<1	<1	<0.1	<1	<1	<1	<1	<0.1
Arochlor 1221	mg/kg	0.1	-	-	-	-	-	<1	<1	<0.1	<1	<1	<1	<1	<0.1
Arochlor 1232	mg/kg	0.1	-	-	-	-	-	<1	<1	<0.1	<1	<1	<1	<1	<0.1
Arochlor 1242	mg/kg	0.1	-	-	-	-	-	<1	<1	<0.1	<1	<1	<1	<1	<0.1
Arochlor 1248	mg/kg	0.1	-	-	-	-	-	<1	<1	<0.1	<1	<1	<1	<1	<0.1
Arochlor 1254	mg/kg	0.1	-	-	-	-	-	<1	<1	<0.1	<1	<1	<1	<1	<0.1
Arochlor 1260	mg/kg	0.1	-	-	-	-	-	<1	<1	<0.1	<1	<1	<1	<1	<0.1
PCBs (Sum of total)	mg/kg	0.1	7	-	-	-	-	<1	<1	<0.1	<1	<1	<1	<1	<0.1
Organochlorine Pesticides															
Organochlorine pesticides EPAVic	mg/kg	0.1	-	-	-	-	-	<1	<1	<0.1	<1	<1	<1	<1	<0.1
Other organochlorine pesticides															
EPAVic	mg/kg	0.1	-	-	-	-	-	<1	<1	<0.1	<1	<1	<1	<1	<0.1
4,4'-DDE	mg/kg	0.05	-	-	-	-	-	<0.5	<0.5	<0.05	<0.5	<0.5	<0.5	<0.5	<0.05
a-BHC	mg/kg	0.05	-	-	-	-	-	<0.5	<0.5	<0.05	<0.5	<0.5	<0.5	<0.5	<0.05
Aldrin	mg/kg	0.05	-	-	-	-	-	<0.5	<0.5	<0.05	<0.5	<0.5	<0.5	<0.5	<0.05
Aldrin + Dieldrin	mg/kg	0.05	45	-	-	-	-	<0.5	<0.5	<0.05	<0.5	<0.5	<0.5	<0.5	<0.05
b-BHC	mg/kg	0.05	-	-	-	-	-	<0.5	<0.5	<0.05	<0.5	<0.5	<0.5	<0.5	<0.05
chlordan	mg/kg	0.1	530	-	-	-	-	<1	<1	<0.1	<1	<1	<1	<1	<0.1
d-BHC	mg/kg	0.05	-	-	-	-	-	<0.5	<0.5	<0.05	<0.5	<0.5	<0.5	<0.5	<0.05
DDD	mg/kg	0.05	-	-	-	-	-	<0.5	<0.5	<0.05	<0.5	<0.5	<0.5	<0.5	<0.05
DDT	mg/kg	0.05	-	-	640	-	-	<0.5	<0.5	<0.05	<0.5	<0.5	<0.5	<0.5	<0.05
DDT+DDE+DDD	mg/kg	0.05	3,600	-	-	-	-	<0.5	<0.5	<0.05	<0.5	<0.5	<0.5	<0.5	<0.05
Dieldrin	mg/kg	0.05	-	-	-	-	-	<0.5	<0.5	<0.05	<0.5	<0.5	<0.5	<	

								Field ID	BH17_0.0-0.2	BH17_0.5-0.7	BH18_0.0-0.2	BH18_1.0-1.2	BH19_0.0-0.2	BH19_1.0-1.2	BH20_0.0-0.2
								Date	13 Jun 2024	13 Jun 2024	13 Jun 2024	13 Jun 2024	13 Jun 2024	13 Jun 2024	13 Jun 2024
								Lab Report Number	1107687	1107687	1107687	1107687	1107687	1107687	1107687
	Unit	EQL	NEPM 2013 Table 1A(1) HILs Comm/Ind D Soil	NEPM 2013 Table 1A(3) Comm/Ind D Soil HSL for Vapour Intrusion, Sand	NEPM 2013 Table 1B(5) Generic EIL - Comm/Ind	NEPM 2013 Table 1B(6) ESLs for Comm/Ind, Coarse Soil	NEPM 2013 Table 1B(7) Management Limits Comm / Ind, Coarse Soil								
Physical Parameters															
Cation Exchange Capacity (CEC)	meq/100g	0.5	-	-	-	-	-	-	-	-	5.7	-	-	-	-
pH (lab)	pH Units	0.1	-	-	-	-	-	-	-	-	8.8	-	-	-	-
Particle Size															
% Clay*	%	2.5	-	-	-	-	-	-	-	-	<2.5	-	-	-	-
Inorganics															
Conductivity (1:5 aqueous extract)	uS/cm	10	-	-	-	-	-	-	-	-	150	-	-	-	-
TOC	mg/kg	1,000	-	-	-	-	-	-	-	-	4,000	-	-	-	-
Iron (%)	%	0.01	-	-	-	-	-	-	-	-	1.2	-	-	-	-
Total Recoverable Hydrocarbons															
C6 - C10	mg/kg	20	-	-	-	-	700	<20	<20	<20	<20	<20	<20	<20	<20
F1 (C6 - C10) less BTEX	mg/kg	20	-	260 370 630	-	215	-	<20	<20	<20	<20	<20	<20	<20	<20
C10 - C16	mg/kg	50	-	-	-	-	1,000	<50	<50	<50	<50	<50	<50	<50	<50
F2 C10 - C16 (minus Naphthalene)	mg/kg	50	-	-	-	170	-	<50	<50	<50	<50	<50	<50	<50	<50
F3 (C16 - C34)	mg/kg	100	-	-	-	1,700	3,500	<100	<100	110	<100	<100	<100	<100	<100
F4 (C34 - C40)	mg/kg	100	-	-	-	3,300	10,000	170	<100	190	<100	<100	<100	<100	<100
C10 - C40 (Sum of total)	mg/kg	100	-	-	-	-	-	170	<100	300	<100	<100	<100	<100	<100
Total Petroleum Hydrocarbons															
C6 - C9	mg/kg	20	-	-	-	-	-	<20	<20	<20	<20	<20	<20	<20	<20
C10 - C14	mg/kg	20	-	-	-	-	-	<20	<20	<20	<20	<20	<20	<20	<20
C15 - C28	mg/kg	50	-	-	-	-	-	<50	<50	<50	<50	<50	<50	<50	<50
C29 - C36	mg/kg	50	-	-	-	-	-	85	110	130	<50	53	<50	58	58
C10 - C36 (Sum of total)	mg/kg	50	-	-	-	-	-	85	<50	130	<50	53	<50	58	58
BTEXN															
Benzene	mg/kg	0.1	-	3 3 3 3	-	75	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	0.1	-	-	-	135	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Ethyl Benzene	mg/kg	0.1	-	-	-	165	-	<0.1	<0.1	<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	<0.2	<0.2	<0.2
o-Xylene	mg/kg	0.1	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Xylenes	mg/kg	0.3	-	230	-	180	-	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Naphthalene (VOC)	mg/kg	0.5	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Metals															
Arsenic	mg/kg	2	3,000	-	160	-	-	5.2	19	4.4	6.5	4.4	13	5.5	5.5
Cadmium	mg/kg	0.4	900	-	-	-	-	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium (III+VI)	mg/kg	5	-	-	430	-	-	13	19	12	13	12	24	12	12
Copper	mg/kg	5	240,000	-	150	-	-	17	17	15	<5	18	<5	12	12
Iron	mg/kg	20	-	-	-	-	-	-	-	12,000	-	-	-	-	-
Lead	mg/kg	5	1,500	-	1800	-	-	<5	27	<5	7.1	7.5	11	<5	<5
Mercury	mg/kg	0.1	730	-	-	-	-	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	5	6,000	-	80	-	-	50	26	56	5.8	65	9.8	35	35
Zinc	mg/kg	5	400,000	-	480	-	-	42	62	46	20	43	52	30	30
Polycyclic Aromatic Hydrocarbons															
Benzo(b)fluoranthene	mg/kg	0.5	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	mg/kg	0.5	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	mg/kg	0.5	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	mg/kg	0.5	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)anthracene	mg/kg	0.5	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a) pyrene	mg/kg	0.5	-	-	-	72	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc (Zero)	mg/kg	0.5	40	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc (Half)	mg/kg	0.5	40	-	-	-	-	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (LOR)	mg/kg	0.5	40	-	-	-	-	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Benzo(g,h,i)perylene	mg/kg	0.5	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	mg/kg	0.5	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	mg/kg	0.5	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a,h)anthracene	mg/kg	0.5	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	mg/kg	0.5	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	mg/kg	0.5	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1,2,3-c,d)pyrene	mg/kg	0.5	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	mg/kg	0.5	-	370	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	mg/kg	0.5	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	mg/kg	0.5	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
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
PCBs															
Arochlor 1016	mg/kg	0.1	-	-	-	-	-	<1	<1	-	<0.1	<1	<1	<1	<1
Arochlor 1221	mg/kg	0.1	-	-	-	-	-	<1	<1	-	<0.1	<1	<1	<1	<1
Arochlor 1232	mg/kg	0.1	-	-	-	-	-	<1	<1	-	<0.1	<1	<1	<1	<1
Arochlor 1242	mg/kg	0.1	-	-	-	-	-	<1	<1	-	<0.1	<1	<1	<1	<1
Arochlor 1248	mg/kg	0.1	-	-	-	-	-	<1	<1	-	<0.1	<1	<1	<1	<1
Arochlor 1254	mg/kg	0.1	-	-	-	-	-	<1	<1	-	<0.1	<1	<1	<1	<1
Arochlor 1260	mg/kg	0.1	-	-	-	-	-	<1	<1	-	<0.1	<1	<1	<1	<1
PCBs (Sum of total)	mg/kg	0.1	7	-	-	-	-	<1	<1	-	<0.1	<1	<1	<1	<1
Organochlorine Pesticides															
Organochlorine pesticides EPAVic	mg/kg	0.1	-	-	-	-	-	<1	<1	-	<0.1	<1	<1	<1	<1
Other organochlorine pesticides															
EPAVic	mg/kg	0.1	-	-	-	-	-	<1	<1	-	<0.1	<1	<1	<1	<1
4,4'-DDE	mg/kg	0.05	-	-	-	-	-	<0.5	<0.5	-	<0.05	<0.5	<0.5	<0.5	<0.5
a-BHC	mg/kg	0.05	-	-	-	-	-	<0.5	<0.5	-	<0.05	<0.5	<0.5	<0.5	<0.5
Aldrin	mg/kg	0.05	-	-	-	-	-	<0.5	<0.5	-	<0.05	<0.5	<0.5	<0.5	<0.5
Aldrin + Dieldrin	mg/kg	0.05	45	-	-	-	-	<0.5	<0.5	-	<0.05	<0.5	<0.5	<0.5	<0.5
b-BHC	mg/kg	0.05	-	-	-	-	-	<0.5	<0.5	-	<0.05	<0.5	<0.5	<0.5	<0.5
chlordan	mg/kg	0.1	530	-	-	-	-	<1	<1	-	<0.1	<1	<1	<1	<1
d-BHC	mg/kg	0.05	-	-	-	-	-	<0.5	<0.5	-	<0.05	<0.5	<0.5	<0.5	<0.5
DDD	mg/kg	0.05	-	-	-	-	-	<0.5	<0.5	-	<0.05	<0.5	<0.5	<0.5	<0.5
DDT	mg/kg	0.05	-	-	640	-	-	<0.5	<0.5	-	<0.05	<0.5	<0.5	<0.5	<0.5
DDT+DDE+DDD	mg/kg	0.05	3,600	-	-	-	-	<0.5	<0.5	-	<0.05	<0.5	<0.5	<0.5	<0.5
Dieldrin	mg/kg	0.05	-	-	-	-	-	<0.5	<0.5	-	<0.05	<0.5	<0.5	<0.5	<0.5
Endrin aldehyde	mg/kg	0.05	-	-	-	-	-	<0.5	<0.5	-	<0.05	<0.5	<0.5	<0.5	&

								Field ID Date Lab Report Number	BH20_0.5-0.7 13 Jun 2024 1107687
	Unit	EQL	NEPM 2013 Table 1A(1) HILs Comm/Ind D Soil	NEPM 2013 Table 1A(3) Comm/Ind D Soil HSL for Vapour Intrusion, Sand	NEPM 2013 Table 1B(5) Generic EIL - Comm/Ind	NEPM 2013 Table 1B(6) ESLs for Comm/Ind, Coarse Soil	NEPM 2013 Table 1B(7) Management Limits Comm / Ind, Coarse Soil		
Physical Parameters									
Cation Exchange Capacity (CEC)	meq/100g	0.5	-	-	-	-	-	-	-
pH (lab)	pH Units	0.1	-	-	-	-	-	-	-
Particle Size									
% Clay*	%	2.5	-	-	-	-	-	-	-
Inorganics									
Conductivity (1:5 aqueous extract)	uS/cm	10	-	-	-	-	-	-	-
TOC	mg/kg	1,000	-	-	-	-	-	-	-
Iron (%)	%	0.01	-	-	-	-	-	-	-
Total Recoverable Hydrocarbons									
C6 - C10	mg/kg	20	-	-	-	-	700	-	<20
F1 (C6 - C10) less BTEX	mg/kg	20	-	260 370 630	-	215	-	-	<20
C10 - C16	mg/kg	50	-	-	-	-	1,000	-	<50
F2 C10 - C16 (minus Naphthalene)	mg/kg	50	-	-	-	170	-	-	<50
F3 (C16 - C34)	mg/kg	100	-	-	-	1,700	3,500	-	<100
F4 (C34 - C40)	mg/kg	100	-	-	-	3,300	10,000	-	<100
C10 - C40 (Sum of total)	mg/kg	100	-	-	-	-	-	-	<100
Total Petroleum Hydrocarbons									
C6 - C9	mg/kg	20	-	-	-	-	-	-	<20
C10 - C14	mg/kg	20	-	-	-	-	-	-	<20
C15 - C28	mg/kg	50	-	-	-	-	-	-	<50
C29 - C36	mg/kg	50	-	-	-	-	-	-	55
C10 - C36 (Sum of total)	mg/kg	50	-	-	-	-	-	-	55
BTEXN									
Benzene	mg/kg	0.1	-	3 3 3 3	-	75	-	-	<0.1
Toluene	mg/kg	0.1	-	-	-	135	-	-	<0.1
Ethyl Benzene	mg/kg	0.1	-	-	-	165	-	-	<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	-	230	-	180	-	-	<0.3
Naphthalene (VOC)	mg/kg	0.5	-	-	-	-	-	-	<0.5
Metals									
Arsenic	mg/kg	2	3,000	-	160	-	-	-	8.8
Cadmium	mg/kg	0.4	900	-	-	-	-	-	<0.4
Chromium (III+VI)	mg/kg	5	-	-	430	-	-	-	14
Copper	mg/kg	5	240,000	-	150	-	-	-	45
Iron	mg/kg	20	-	-	-	-	-	-	-
Lead	mg/kg	5	1,500	-	1800	-	-	-	7.6
Mercury	mg/kg	0.1	730	-	-	-	-	-	<0.1
Nickel	mg/kg	5	6,000	-	80	-	-	-	5.7
Zinc	mg/kg	5	400,000	-	480	-	-	-	23
Polycyclic Aromatic Hydrocarbons									
Benzo[<i>b</i>]fluoranthene	mg/kg	0.5	-	-	-	-	-	-	<0.5
Acenaphthene	mg/kg	0.5	-	-	-	-	-	-	<0.5
Acenaphthylene	mg/kg	0.5	-	-	-	-	-	-	<0.5
Anthracene	mg/kg	0.5	-	-	-	-	-	-	<0.5
Benzo[<i>a</i>]anthracene	mg/kg	0.5	-	-	-	-	-	-	<0.5
Benzo[<i>a</i>] pyrene	mg/kg	0.5	-	-	-	72	-	-	<0.5
Benzo[<i>a</i>]pyrene TEQ calc (Zero)	mg/kg	0.5	40	-	-	-	-	-	<0.5
Benzo[<i>a</i>]pyrene TEQ calc (Half)	mg/kg	0.5	40	-	-	-	-	-	0.6
Benzo[<i>a</i>]pyrene TEQ (LOR)	mg/kg	0.5	40	-	-	-	-	-	1.2
Benzo[<i>g,h,i</i>]perylene	mg/kg	0.5	-	-	-	-	-	-	<0.5
Benzo[<i>k</i>]fluoranthene	mg/kg	0.5	-	-	-	-	-	-	<0.5
Chrysene	mg/kg	0.5	-	-	-	-	-	-	<0.5
Dibenz[<i>a,h</i>]anthracene	mg/kg	0.5	-	-	-	-	-	-	<0.5
Fluoranthene	mg/kg	0.5	-	-	-	-	-	-	<0.5
Fluorene	mg/kg	0.5	-	-	-	-	-	-	<0.5
Indeno[1,2,3- <i>c,d</i>]pyrene	mg/kg	0.5	-	-	-	-	-	-	<0.5
Naphthalene	mg/kg	0.5	-	-	370	-	-	-	<0.5
Phenanthrene	mg/kg	0.5	-	-	-	-	-	-	<0.5
Pyrene	mg/kg	0.5	-	-	-	-	-	-	<0.5
PAHs (Sum of total)	mg/kg	0.5	4,000	-	-	-	-	-	<0.5
PCBs									
Arochlor 1016	mg/kg	0.1	-	-	-	-	-	-	<0.1
Arochlor 1221	mg/kg	0.1	-	-	-	-	-	-	<0.1
Arochlor 1232	mg/kg	0.1	-	-	-	-	-	-	<0.1
Arochlor 1242	mg/kg	0.1	-	-	-	-	-	-	<0.1
Arochlor 1248	mg/kg	0.1	-	-	-	-	-	-	<0.1
Arochlor 1254	mg/kg	0.1	-	-	-	-	-	-	<0.1
Arochlor 1260	mg/kg	0.1	-	-	-	-	-	-	<0.1
PCBs (Sum of total)	mg/kg	0.1	7	-	-	-	-	-	<0.1
Organochlorine Pesticides									
Organochlorine pesticides EPAVic	mg/kg	0.1	-	-	-	-	-	-	<0.1
Other organochlorine pesticides									
EPAVic	mg/kg	0.1	-	-	-	-	-	-	<0.1
4,4'-DDE	mg/kg	0.05	-	-	-	-	-	-	<0.05
α-BHC	mg/kg	0.05	-	-	-	-	-	-	<0.05
Aldrin	mg/kg	0.05	-	-	-	-	-	-	<0.05
Aldrin + Dieldrin	mg/kg	0.05	45	-	-	-	-	-	<0.05
β-BHC	mg/kg	0.05	-	-	-	-	-	-	<0.05
chlordan	mg/kg	0.1	530	-	-	-	-	-	<0.1
δ-BHC	mg/kg	0.05	-	-	-	-	-	-	<0.05
DDD	mg/kg	0.05	-	-	-	-	-	-	<0.05
DDT	mg/kg	0.05	-	-	640	-	-	-	<0.05
DDT+DDE+DDD	mg/kg	0.05	3,600	-	-	-	-	-	<0.05
Dieldrin	mg/kg	0.05	-	-	-	-	-	-	<0.05
Endrin aldehyde	mg/kg	0.05	-	-	-	-	-	-	<0.05
Endrin ketone	mg/kg	0.05	-	-	-	-	-	-	<0.05
Endosulfan I	µg/kg	50	-	-	-	-	-	-	<50
Endosulfan II	mg/kg	0.05	-	-	-	-	-	-	<0.05
Endosulfan sulphate	mg/kg	0.05	-	-	-	-	-	-	<0.05
Endrin	mg/kg	0.05	100	-	-	-	-	-	<0.05
γ-BHC (Lindane)	mg/kg	0.05	-	-	-	-	-	-	<0.05
Heptachlor	mg/kg	0.05	50	-	-	-	-	-	<0.05
Heptachlor epoxide	mg/kg	0.05	-	-	-	-	-	-	<0.05
Methoxychlor	µg/kg	50	2,500,000	-	-	-	-	-	<50
Toxaphene	mg/kg	0.5	160	-	-	-	-	-	<0.5
Organophosphorus Pesticides									
Tokuthion	mg/kg	0.2	-	-	-	-	-	-	<0.2
Azinophos methyl	mg/kg	0.2	-	-	-	-	-	-	<0.2
Bolstar (Sulprofos)	mg/kg	0.2	-	-	-	-	-	-	<0.2
Chlorfenvinphos	mg/kg	0.2	-	-	-	-	-	-	<0.2
Chlorpyrifos	mg/kg	0.2	2,000	-	-	-	-	-	<0.2
Chlorpyrifos-methyl	mg/kg	0.2	-	-	-	-	-	-	<0.2
Coumaphos	mg/kg	2	-	-	-	-	-	-	<2
Demeton-O	mg/kg	0.2	-	-	-	-	-	-	<0.2
Demeton-S	mg/kg	0.2	-	-	-	-	-	-	<0.2
Diazinon	mg/kg	0.2	-	-	-	-	-	-	<0.2
Dichlorvos	mg/kg	0.2	-	-	-	-	-	-	<0.2
Disulfoton	mg/kg	0.2	-	-	-	-	-	-	<0.2
Dimethoate	mg/kg	0.2	-	-	-	-	-	-	<0.2
Ethoprop	mg/kg	0.2	-	-	-	-	-	-	<0.2
Ethion	mg/kg	0.2	-	-	-	-	-	-	<0.2
Fenitrothion	mg/kg	0.2	-	-	-	-	-	-	<0.2
Fensulfothion	mg/kg	0.2	-	-	-	-	-	-	<0.2
Fenthion	mg/kg	0.2	-	-	-	-	-	-	<0.2
EPN	mg/kg	0.2	-	-	-	-	-	-	<0.2
Merphos	mg/kg	0.2	-	-	-	-	-	-	<0.2
Malathion	mg/kg	0.2	-	-	-	-	-	-	<0.2
Methyl parathion	mg/kg	0.2	-	-	-	-	-	-	<0.2
Mevinphos (Phosdrin)	mg/kg	0.2	-	-	-	-	-	-	<0.2
Monocrotophos	mg/kg	2	-	-	-	-	-	-	<2
Naled (Dibrom)	mg/kg	0.2	-	-	-	-	-	-	<0.2
Omethoate	mg/kg	2	-	-	-	-	-	-	<2
Phorate	mg/kg	0.2	-	-	-	-	-	-	<0.2
Pyrazophos	mg/kg	0.2	-	-	-	-	-	-	<0.2
Ronnel	mg/kg	0.2	-	-	-	-	-	-	<0.2
Terbufos	mg/kg	0.2	-	-	-	-	-	-	<0.2
Trichloronate	mg/kg	0.2	-	-	-	-	-	-	<0.2
Tetrachlorvinphos	mg/kg	0.2	-	-	-	-	-	-	<0.2
Pesticides									
Parathion	mg/kg	0.2	-	-	-	-	-	-	<0.2
Pirimiphos-methyl	mg/kg	0.2	-	-	-	-	-	-	<0.2
Halogenated Benzenes									
Hexachlorobenzene	mg/kg	0.05	80	-	-	-	-	-	<0.05

Red text indicates the higher value of the QC sample (duplicate/triplicate) has been used

Environmental Standards
NEPM, NEPM 2013 Table 1B(7) Management Limits Comm / Ind, Coarse Soil

Statistics
* A Non Detect Multiplier of 0.5 has been applied.

								Statistics						
								Field ID Date Lab Report Number						
	Unit	EQL	NEPM 2013 Table 1A(1) HILs Comm/Ind D Soil	NEPM 2013 Table 1A(3) Comm/Ind D Soil HSL for Vapour Intrusion, Sand	NEPM 2013 Table 1B(5) Generic EIL - Comm/Ind	NEPM 2013 Table 1B(6) ESLS for Comm/Ind, Coarse Soil	NEPM 2013 Table 1B(7) Management Limits Comm / Ind, Coarse Soil	Number of Results	Number of Detects	Minimum Concentration	Minimum Detect	Maximum Concentration	Maximum Detect	Average Concentration *
Physical Parameters														
Cation Exchange Capacity (CEC)	meq/100g	0.5	-	-	-	-	-	6	6	5.7	5.7	19	19	14
pH (lab)	pH Units	0.1	-	-	-	-	-	6	6	6.3	6.3	8.8	8.8	7
Particle Size														
% Clay*	%	2.5	-	-	-	-	-	6	3	<2.5	4.4	13	13	4.5
Inorganics														
Conductivity (1:5 aqueous extract)	uS/cm	10	-	-	-	-	-	6	6	28	28	150	150	88
TOC	mg/kg	1,000	-	-	-	-	-	6	6	4,000	4,000	250,000	250,000	71,500
Iron (%)	%	0.01	-	-	-	-	-	6	6	0.71	0.71	2.3	2.3	1.2
Total Recoverable Hydrocarbons														
C6 - C10	mg/kg	20	-	-	-	-	700	52	0	<20	ND	<20	ND	10
F1 (C6 - C10) less BTEX	mg/kg	20	-	260 370 630	-	215	-	52	0	<20	ND	<20	ND	10
C10 - C16	mg/kg	50	-	-	-	-	1,000	52	3	<50	63	350	350	35
F2 C10 - C16 (minus Naphthalene)	mg/kg	50	-	-	-	170	-	52	3	<50	63	350	350	35
F3 (C16 - C34)	mg/kg	100	-	-	-	1,700	3,500	52	14	<100	110	3,000	3,000	181
F4 (C34 - C40)	mg/kg	100	-	-	-	3,300	10,000	52	11	<100	110	940	940	101
C10 - C40 (Sum of total)	mg/kg	100	-	-	-	-	-	52	15	<100	170	3,750	3,750	253
Total Petroleum Hydrocarbons														
C6 - C9	mg/kg	20	-	-	-	-	-	52	0	<20	ND	<20	ND	10
C10 - C14	mg/kg	20	-	-	-	-	-	52	3	<20	34	200	200	16
C15 - C28	mg/kg	50	-	-	-	-	-	52	19	50	50	2,600	2,600	133
C29 - C36	mg/kg	50	-	-	-	-	-	52	20	<50	52	920	920	88
C10 - C36 (Sum of total)	mg/kg	50	-	-	-	-	-	52	24	50	50	3,520	3,520	209
BTEXN														
Benzene	mg/kg	0.1	-	3 3 3 3	-	75	-	52	0	<0.1	ND	<0.1	ND	0.05
Toluene	mg/kg	0.1	-	-	-	135	-	52	0	<0.1	ND	<0.1	ND	0.05
Ethyl Benzene	mg/kg	0.1	-	-	-	165	-	52	0	<0.1	ND	<0.1	ND	0.05
m,p-Xylene	mg/kg	0.2	-	-	-	-	-	52	0	<0.2	ND	<0.2	ND	0.1
o-Xylene	mg/kg	0.1	-	-	-	-	-	52	0	<0.1	ND	<0.1	ND	0.05
Total Xylenes	mg/kg	0.3	-	230	-	180	-	52	0	<0.3	ND	<0.3	ND	0.15
Naphthalene (VOC)	mg/kg	0.5	-	-	-	-	-	52	0	<0.5	ND	<0.5	ND	0.25
Metals														
Arsenic	mg/kg	2	3,000	-	160	-	-	52	52	2.3	2.3	26	26	8.3
Cadmium	mg/kg	0.4	900	-	-	-	-	52	4	<0.4	0.5	1	1	0.23
Chromium (III+VI)	mg/kg	5	-	-	430	-	-	52	52	7.4	7.4	39	39	15
Copper	mg/kg	5	240,000	-	150	-	-	52	35	<5	5.2	150	150	21
Iron	mg/kg	20	-	-	-	-	-	6	6	7,100	7,100	23,000	23,000	12,167
Lead	mg/kg	5	1,500	-	1800	-	-	52	49	<5	7.1	570	570	48
Mercury	mg/kg	0.1	730	-	-	-	-	52	18	0.1	0.1	3.4	3.4	0.2
Nickel	mg/kg	5	6,000	-	80	-	-	52	49	<5	5.6	65	65	18
Zinc	mg/kg	5	400,000	-	480	-	-	52	52	9.5	9.5	1,400	1,400	107
Polycyclic Aromatic Hydrocarbons														
Benzo[<i>b</i>]fluoranthene	mg/kg	0.5	-	-	-	-	-	52	15	<0.5	0.6	58	58	2.6
Acenaphthene	mg/kg	0.5	-	-	-	-	-	52	6	<0.5	0.7	6.6	6.6	0.53
Acenaphthylene	mg/kg	0.5	-	-	-	-	-	52	0	<0.5	ND	<0.5	ND	0.25
Anthracene	mg/kg	0.5	-	-	-	-	-	52	7	<0.5	0.6	16	16	1.1
Benzo[<i>a</i>]anthracene	mg/kg	0.5	-	-	-	-	-	52	14	<0.5	0.6	58	58	2.6
Benzo[<i>a</i>]pyrene	mg/kg	0.5	-	-	-	72	-	52	13	<0.5	0.8	56	56	2.5
Benzo[<i>a</i>]pyrene TEQ calc (Zero)	mg/kg	0.5	40	-	-	-	-	52	13	<0.5	1.2	92	92	3.9
Benzo[<i>a</i>]pyrene TEQ calc (Half)	mg/kg	0.5	40	-	-	-	-	52	52	0.6	0.6	92	92	4.2
Benzo[<i>a</i>]pyrene TEQ (LOR)	mg/kg	0.5	40	-	-	-	-	52	52	1.2	1.2	92	92	4.7
Benzo[<i>g,h,i</i>]perylene	mg/kg	0.5	-	-	-	-	-	52	12	<0.5	0.6	49	49	1.8
Benzo[<i>k</i>]fluoranthene	mg/kg	0.5	-	-	-	-	-	52	16	0.5	0.5	50	50	2.3
Chrysene	mg/kg	0.5	-	-	-	-	-	52	15	<0.5	0.6	60	60	2.9
Dibenz[<i>a,h</i>]anthracene	mg/kg	0.5	-	-	-	-	-	52	7	<0.5	1.1	14	14	0.77
Fluoranthene	mg/kg	0.5	-	-	-	-	-	52	21	<0.5	0.8	160	160	7.6
Fluorene	mg/kg	0.5	-	-	-	-	-	52	4	<0.5	0.8	3.6	3.6	0.39
Indeno[1,2,3- <i>c,d</i>]pyrene	mg/kg	0.5	-	-	-	-	-	52	11	<0.5	0.6	45	45	1.9
Naphthalene	mg/kg	0.5	-	370	-	-	-	52	0	<0.5	ND	<0.5	ND	0.25
Phenanthrene	mg/kg	0.5	-	-	-	-	-	52	17	0.5	0.5	99	99	4.1
Pyrene	mg/kg	0.5	-	-	-	-	-	52	21	<0.5	0.8	130	130	6.3
PAHs (Sum of total)	mg/kg	0.5	4,000	-	-	-	-	52	21	<0.5	1.6	800	800	35
PCBs														
Arochlor 1016	mg/kg	0.1	-	-	-	-	-	42	0	<0.1	ND	<1	ND	0.25
Arochlor 1221	mg/kg	0.1	-	-	-	-	-	42	0	<0.1	ND	<1	ND	0.25
Arochlor 1232	mg/kg	0.1	-	-	-	-	-	42	0	<0.1	ND	<1	ND	0.25
Arochlor 1242	mg/kg	0.1	-	-	-	-	-	42	0	<0.1	ND	<1	ND	0.25
Arochlor 1248	mg/kg	0.1	-	-	-	-	-	42	0	<0.1	ND	<1	ND	0.25
Arochlor 1254	mg/kg	0.1	-	-	-	-	-	42	0	<0.1	ND	<1	ND	0.25
Arochlor 1260	mg/kg	0.1	-	-	-	-	-	42	0	<0.1	ND	<1	ND	0.25
PCBs (Sum of total)	mg/kg	0.1	7	-	-	-	-	42	0	<0.1	ND	<1	ND	0.25
Organochlorine Pesticides														
Organochlorine pesticides EPAVic	mg/kg	0.1	-	-	-	-	-	42	0	<0.1	ND	<1	ND	0.25
Other organochlorine pesticides														
EPAVic	mg/kg	0.1	-	-	-	-	-	42	0	<0.1	ND	<1	ND	0.25
4,4'-DDE	mg/kg	0.05	-	-	-	-	-	42	0	<0.05	ND	<0.5	ND	0.13
α-BHC	mg/kg	0.05	-	-	-	-	-	42	0	<0.05	ND	<0.5	ND	0.13
Aldrin	mg/kg	0.05	-	-	-	-	-	42	0	<0.05	ND	<0.5	ND	0.13
Aldrin + Dieldrin	mg/kg	0.05	45	-	-	-	-	42	0	<0.05	ND	<0.5	ND	0.13
β-BHC	mg/kg	0.05	-	-	-	-	-	42	0	<0.05	ND	<0.5	ND	0.13
chlordan	mg/kg	0.1	530	-	-	-	-	42	0	<0.1	ND	<1	ND	0.25
δ-BHC	mg/kg	0.05	-	-	-	-	-	42	0	<0.05	ND	<0.5	ND	0.13
DDD	mg/kg	0.05	-	-	-	-	-	42	0	<0.05	ND	<0.5	ND	0.13
DDT	mg/kg	0.05	-	640	-	-	-	42	0	<0.05	ND	<0.5	ND	0.13
DDT+DDE+DDD	mg/kg	0.05	3,600	-	-	-	-	42	0	<0.05	ND	<0.5	ND	0.13
Dieldrin	mg/kg	0.05	-	-	-	-	-	42	0	<0.05	ND	<0.5	ND	0.13
Endrin aldehyde	mg/kg	0.05	-	-	-	-	-	42	0	<0.05	ND	<0.5	ND	0.13
Endrin ketone	mg/kg	0.05	-	-	-	-	-	42	0	<0.05	ND	<0.5	ND	0.13
Endosulfan I	µg/kg	50	-	-	-	-	-	42	0	<50	ND	<500	ND	127
Endosulfan II	mg/kg	0.05	-	-	-	-	-	42	0	<0.05	ND	<0.5	ND	0.13
Endosulfan sulphate	mg/kg	0.05	-	-	-	-	-	42	0	<0.05	ND	<0.5	ND	0.13
Endrin	mg/kg	0.05	100	-	-	-	-	42	0	<0.05	ND	<0.5	ND	0.13
γ-BHC (Lindane)	mg/kg	0.05	-	-	-	-	-	42	0	<0.05	ND	<0.5	ND	0.13
Heptachlor	mg/kg	0.05	50	-	-	-	-	42	0	<0.05	ND	<0.5	ND	0.13
Heptachlor epoxide	mg/kg	0.05	-	-	-	-	-	42	0	<0.05	ND	<0.5	ND	0.13
Methoxychlor	µg/kg	50	2,500,000	-	-	-	-	42	0	<50	ND	<500	ND	127
Toxaphene	mg/kg	0.5	160	-	-	-	-	42	0	<0.5	ND	<10	ND	2.4
Organophosphorous Pesticides														
Tokuthion	mg/kg	0.2	-	-	-	-	-	42	0	<0.2	ND	<0.5	ND	0.17
Azinophos methyl	mg/kg	0.2	-	-	-	-	-	42	0	<0.2	ND	<0.5	ND	0.17
Bolstar (Sulprofos)	mg/kg	0.2	-	-	-	-	-	42	0	<0.2				

Field ID Date Lab Report Number										
	Unit	EQL	NEPM 2013 Table 1A(1) HILs Comm/Ind D Soil	NEPM 2013 Table 1A(3) Comm/Ind D Soil HSL for Vapour Intrusion, Sand	NEPM 2013 Table 1B(5) Generic EIL - Comm/Ind	NEPM 2013 Table 1B(6) ESLs for Comm/Ind, Coarse Soil	NEPM 2013 Table 1B(7) Management Limits Comm / Ind, Coarse Soil	Median Concentration *	Standard Deviation *	95% UCL (Student's-t) *
Physical Parameters										
Cation Exchange Capacity (CEC)	meq/100g	0.5	-	-	-	-	-	14	5.2	17.91
pH (lab)	pH Units	0.1	-	-	-	-	-	6.7	0.9	7.753
Particle Size										
% Clay*	%	2.5	-	-	-	-	-	2.825	4.6	8.231
Inorganics										
Conductivity (1:5 aqueous extract)	uS/cm	10	-	-	-	-	-	78	54	132.1
TOC	mg/kg	1,000	-	-	-	-	-	45,500	89,717	145,305
Iron (%)	%	0.01	-	-	-	-	-	1.03	0.59	1.702
Total Recoverable Hydrocarbons										
C6 - C10	mg/kg	20	-	-	-	-	700	10	0	10
F1 (C6 - C10) less BTEX	mg/kg	20	-	260 370 630	-	215	-	10	0	10
C10 - C16	mg/kg	50	-	-	-	-	1,000	25	49	46.36
F2 C10 - C16 (minus Naphthalene)	mg/kg	50	-	-	-	170	-	25	49	46.36
F3 (C16 - C34)	mg/kg	100	-	-	-	1,700	3,500	50	432	281.4
F4 (C34 - C40)	mg/kg	100	-	-	-	3,300	10,000	50	161	138.6
C10 - C40 (Sum of total)	mg/kg	100	-	-	-	-	-	50	589	389.7
Total Petroleum Hydrocarbons										
C6 - C9	mg/kg	20	-	-	-	-	-	10	0	10
C10 - C14	mg/kg	20	-	-	-	-	-	10	28	22.1
C15 - C28	mg/kg	50	-	-	-	-	-	25	372	219
C29 - C36	mg/kg	50	-	-	-	-	-	25	156	124.4
C10 - C36 (Sum of total)	mg/kg	50	-	-	-	-	-	25	526	331.3
BTEXN										
Benzene	mg/kg	0.1	-	3 3 3 3	-	75	-	0.05	0	0.05
Toluene	mg/kg	0.1	-	-	-	135	-	0.05	0	0.05
Ethyl Benzene	mg/kg	0.1	-	-	-	165	-	0.05	0	0.05
m,p-Xylene	mg/kg	0.2	-	-	-	-	-	0.1	0	0.1
o-Xylene	mg/kg	0.1	-	-	-	-	-	0.05	0	0.05
Total Xylenes	mg/kg	0.3	-	230	-	180	-	0.15	0	0.15
Naphthalene (VOC)	mg/kg	0.5	-	-	-	-	-	0.25	0	0.25
Metals										
Arsenic	mg/kg	2	3,000	-	160	-	-	7.4	4.4	9.364
Cadmium	mg/kg	0.4	900	-	-	-	-	0.2	0.13	0.263
Chromium (III+VI)	mg/kg	5	-	-	430	-	-	13	6.7	16.76
Copper	mg/kg	5	240,000	-	150	-	-	13	27	27.09
Iron	mg/kg	20	-	-	-	-	-	10,300	5,901	17,021
Lead	mg/kg	5	1,500	-	1800	-	-	19.5	84	67.51
Mercury	mg/kg	0.1	730	-	-	-	-	0.05	0.51	0.321
Nickel	mg/kg	5	6,000	-	80	-	-	14.5	14	21.09
Zinc	mg/kg	5	400,000	-	480	-	-	49	199	152.9
Polycyclic Aromatic Hydrocarbons										
Benzo[<i>b</i>]fluoranthene	mg/kg	0.5	-	-	-	-	-	0.25	8.6	4.586
Acenaphthene	mg/kg	0.5	-	-	-	-	-	0.25	1.1	0.784
Acenaphthylene	mg/kg	0.5	-	-	-	-	-	0.25	0	0.25
Anthracene	mg/kg	0.5	-	-	-	-	-	0.25	2.8	1.742
Benzo[<i>a</i>]anthracene	mg/kg	0.5	-	-	-	-	-	0.25	8.6	4.551
Benzo[<i>a</i>]pyrene	mg/kg	0.5	-	-	-	72	-	0.25	8.3	4.386
Benzo[<i>a</i>]pyrene TEQ calc. (Zero)	mg/kg	0.5	40	-	-	-	-	0.25	14	7.087
Benzo[<i>a</i>]pyrene TEQ calc. (Half)	mg/kg	0.5	40	-	-	-	-	0.6	14	7.365
Benzo[<i>a</i>]pyrene TEQ (LOR)	mg/kg	0.5	40	-	-	-	-	1.2	14	7.817
Benzo[<i>g,h,i</i>]perylene	mg/kg	0.5	-	-	-	-	-	0.25	6.9	3.349
Benzo[<i>k</i>]fluoranthene	mg/kg	0.5	-	-	-	-	-	0.25	7.3	4.024
Chrysene	mg/kg	0.5	-	-	-	-	-	0.25	9	4.991
Dibenz[<i>a,h</i>]anthracene	mg/kg	0.5	-	-	-	-	-	0.25	2.1	1.25
Fluoranthene	mg/kg	0.5	-	-	-	-	-	0.25	25	13.34
Fluorene	mg/kg	0.5	-	-	-	-	-	0.25	0.62	0.538
Indeno[1,2,3- <i>c,d</i>]pyrene	mg/kg	0.5	-	-	-	-	-	0.25	6.6	3.438
Naphthalene	mg/kg	0.5	-	-	370	-	-	0.25	0	0.25
Phenanthrene	mg/kg	0.5	-	-	-	-	-	0.25	15	7.514
Pyrene	mg/kg	0.5	-	-	-	-	-	0.25	20	10.92
PAHs (Sum of total)	mg/kg	0.5	4,000	-	-	-	-	0.25	120	62.39
PCBs										
Arochlor 1016	mg/kg	0.1	-	-	-	-	-	0.05	0.23	0.312
Arochlor 1221	mg/kg	0.1	-	-	-	-	-	0.05	0.23	0.312
Arochlor 1232	mg/kg	0.1	-	-	-	-	-	0.05	0.23	0.312
Arochlor 1242	mg/kg	0.1	-	-	-	-	-	0.05	0.23	0.312
Arochlor 1248	mg/kg	0.1	-	-	-	-	-	0.05	0.23	0.312
Arochlor 1254	mg/kg	0.1	-	-	-	-	-	0.05	0.23	0.312
Arochlor 1260	mg/kg	0.1	-	-	-	-	-	0.05	0.23	0.312
PCBs (Sum of total)	mg/kg	0.1	7	-	-	-	-	0.05	0.23	0.312
Organochlorine Pesticides										
Organochlorine pesticides EPAVic	mg/kg	0.1	-	-	-	-	-	0.05	0.23	0.312
Other organochlorine pesticides										
EPAVic	mg/kg	0.1	-	-	-	-	-	0.05	0.23	0.312
4,4'-DDE	mg/kg	0.05	-	-	-	-	-	0.025	0.11	0.156
α-BHC	mg/kg	0.05	-	-	-	-	-	0.025	0.11	0.156
Aldrin	mg/kg	0.05	-	-	-	-	-	0.025	0.11	0.156
Aldrin + Dieldrin	mg/kg	0.05	45	-	-	-	-	0.025	0.11	0.156
β-BHC	mg/kg	0.05	-	-	-	-	-	0.025	0.11	0.156
chlordan	mg/kg	0.1	530	-	-	-	-	0.05	0.23	0.312
δ-BHC	mg/kg	0.05	-	-	-	-	-	0.025	0.11	0.156
DDD	mg/kg	0.05	-	-	-	-	-	0.025	0.11	0.156
DDT	mg/kg	0.05	-	-	640	-	-	0.025	0.11	0.156
DDT+DDE+DDD	mg/kg	0.05	3,600	-	-	-	-	0.025	0.11	0.156
Dieldrin	mg/kg	0.05	-	-	-	-	-	0.025	0.11	0.156
Endrin aldehyde	mg/kg	0.05	-	-	-	-	-	0.025	0.11	0.156
Endrin ketone	mg/kg	0.05	-	-	-	-	-	0.025	0.11	0.156
Endosulfan I	µg/kg	50	-	-	-	-	-	25	113	156.2
Endosulfan II	mg/kg	0.05	-	-	-	-	-	0.025	0.11	0.156
Endosulfan sulphate	mg/kg	0.05	-	-	-	-	-	0.025	0.11	0.156
Endrin	mg/kg	0.05	100	-	-	-	-	0.025	0.11	0.156
γ-BHC (Lindane)	mg/kg	0.05	-	-	-	-	-	0.025	0.11	0.156
Heptachlor	mg/kg	0.05	50	-	-	-	-	0.025	0.11	0.156
Heptachlor epoxide	mg/kg	0.05	-	-	-	-	-	0.025	0.11	0.156
Methoxychlor	µg/kg	50	2,500,000	-	-	-	-	25	113	156.2
Toxaphene	mg/kg	0.5	160	-	-	-	-	0.25	2.4	3.02
Organophosphorous Pesticides										
Tokuthion	mg/kg	0.2	-	-	-	-	-	0.1	0.076	0.187
Azinophos methyl	mg/kg	0.2	-	-	-	-	-	0.1	0.076	0.187
Bolstar (Sulprofos)	mg/kg	0.2	-	-	-	-	-	0.1	0.076	0.187
Chlorfenvinphos	mg/kg	0.2	-	-	-	-	-	0.1	0.076	0.187
Chlorpyrifos	mg/kg	0.2	2,000	-	-	-	-	0.1	0.076	0.187
Chlorpyrifos-methyl	mg/kg	0.2	-	-	-	-	-	0.1	0.076	0.187
Coumaphos	mg/kg	2	-	-	-	-	-	1	0.76	1.875
Demeton-O	mg/kg	0.2	-	-	-	-	-	0.1	0.076	0.187
Demeton-S	mg/kg	0.2	-	-	-	-	-	0.1	0.076	0.187
Diazinon	mg/kg	0.2	-	-	-	-	-	0.1	0.076	0.187
Dichlorvos	mg/kg	0.2	-	-	-	-	-	0.1	0.076	0.187
Disulfoton	mg/kg	0.2	-	-	-	-	-	0.1	0.076	0.187
Dimethoate	mg/kg	0.2	-	-	-	-	-	0.1	0.076	0.187
Ethoprop	mg/kg	0.2	-	-	-	-	-	0.1	0.076	0.187
Ethion	mg/kg	0.2	-	-	-	-	-	0.1	0.076	0.187
Fenitrothion	mg/kg	0.2	-	-	-	-	-	0.1	0.076	0.187
Fensulfothion	mg/kg	0.2	-	-	-	-	-	0.1	0.076	0.187
Fenthion	mg/kg	0.2	-	-	-	-	-	0.1	0.076	0.187
EPN	mg/kg	0.2	-	-	-	-	-	0.1	0.076	0.187
Merphos	mg/kg	0.2	-	-	-	-	-	0.1	0.076	0.187
Malathion	mg/kg	0.2	-	-	-	-	-	0.1	0.076	0.187
Methyl parathion	mg/kg	0.2	-	-	-	-	-	0.1	0.076	0.187
Mevinphos (Phosdrin)	mg/kg	0.2	-	-	-	-	-	0.1	0.076	0.187
Monocrotophos	mg/kg	2	-	-	-	-	-	1	0.76	1.875
Naled (Dibrom)	mg/kg	0.2	-	-	-	-	-	0.1	0.076	0.187
Omethoate	mg/kg	2	-	-	-	-	-	1	0.76	1.875
Phorate	mg/kg	0.2	-	-	-	-	-	0.1	0.076	0.187
Pyrazophos	mg/kg	0.2	-	-	-	-	-	0.1	0.076	0.187
Ronnel	mg/kg	0.2	-	-	-	-	-	0.1	0.076	0.187
Terbufos	mg/kg	0.2	-	-	-	-	-	0.1	0.076	0.187
Trichloronate	mg/kg	0.2	-	-	-	-	-	0.1	0.076	0.187
Tetrachlorvinphos	mg/kg	0.2	-	-	-	-	-	0.1	0.076	0.187
Pesticides										
Parathion	mg/kg	0.2	-	-	-	-	-	0.1	0.076	0.187
Pirimiphos-methyl	mg/kg	0.2	-	-	-	-	-	0.1	0.076	0.187
Halogenated Benzenes										
Hexachlorobenzene	mg/kg	0.05	80	-	-	-	-	0.025	0.11	0.156

Red text indicates the higher value of the QC sample (duplicate/triplicate) has been used

Environmental Standards
NEPM, NEPM 2013 Table 1B(7) Management Limits Comm / Ind, Coarse Soil

Statistics
* A Non Detect Multiplier of 0.5 has been applied.

			Field ID Date Lab Report Number	DSI (September 2024)										
				BH1A	BH1A-F	BH2A	BH3A	BH4A	BH5A	BH5A-F ^a	BH6A	BH01_0.0-0.2	BH01_0.5-0.7	BH02_0.0-0.2
				03 Sep 2024	03 Sep 2024	03 Sep 2024	03 Sep 2024	03 Sep 2024	03 Sep 2024	03 Sep 2024	03 Sep 2024	14 Jun 2024	14 Jun 2024	12 Jun 2024
			1135930	1135930	1135930	1135930	1135930	1135930	1135930	1135930	1108144	1108144	1107687	
	Unit	EQL	NEPM 2013 Table 7 HSLs Comm/Ind D Soil											
Asbestos														
Soil Sample Mass (~500ml)	g			523	-	346	388	467	349	-	426	354	397	393
Soil Sample Mass (10L)	kg			11.3	-	11.6	12.0	-	12.2	-	-	-	-	-
Asbestos Detected				Chrysotile fibre cement	Chrysotile fibre cement					Chrysotile asbestos				
Mass ACM	g			2.7	19	0.000	0.000	0.000	0.000	<1	0.000	0.000	0.000	0.000
Mass AF	g			0.0000	0.0000	0.000	0.000	0.000	0.000	0.0000	0.000	0.000	0.000	0.000
Mass Asbestos in ACM	g			0.13	2.85*	0.000	0.000	0.000	0.000	0.15*	0.000	0.000	0.000	0.000
Mass asbestos in AF	g			0.0000	0.0000	0.000	0.000	0.000	0.000	0.0000	0.000	0.000	0.000	0.000
Mass Asbestos in FA	g			0.0000	0.0000	0.000	0.000	0.000	0.000	0.0000	0.000	0.000	0.000	0.000
Mass Asbestos in FA & AF	g			0.0000	0.0000	0.000	0.000	0.000	0.000	0.0000	0.000	0.000	0.000	0.000
Mass FA	g			0.0000	0.0000	0.000	0.000	0.000	0.000	0.0000	0.000	0.000	0.000	0.000
Asbestos	% w/w	0.001% w/w	0.05	0.026	0.0252	0.000	0.000	0.000	0.000	0.0000	0.000	0.000	0.000	0.000
Asbestos (FA & AF)	% w/w	0.001% w/w	0.00001	0.0000	0.0000	0.000	0.000	0.000	0.000	0.0000	0.000	0.000	0.000	0.000

* assuming 15% asbestos content in ACM
^a Sample incorrectly labelled in field as BH4A-F

PSI (July 2024)													
		BH03_0.0-0.2	BH04_0.5-0.7	BH05_0.0-0.2	BH06_0.5-0.7	BH06_0.5-0.7-F1	BH07_0.0-0.2	BH08_0.0-0.2	BH09_0.5-0.7	BH09_0.5-0.7-F	BH10_0.0-0.2	BH11_0.0-0.2	
		12 Jun 2024	12 Jun 2024	12 Jun 2024	12 Jun 2024	12 Jun 2024	12 Jun 2024	12 Jun 2024	12 Jun 2024	12 Jun 2024	12 Jun 2024	12 Jun 2024	
		1107687	1107687	1107687	1107687	1107687	1107687	1107687	1107687	1107687	1107687	1107687	
	Unit	EQL											
Asbestos													
Soil Sample Mass (~500ml)	g		381	340	263	327	-	342	371	392	-	476	338
Soil Sample Mass (10L)	kg		-	-	-	-	-	-	-	-	-	-	-
Asbestos Detected							Chrysotile asbestos				Chrysotile and amosite asbestos		
Mass ACM	g		0.000	0.000	0.000	0.000	10	0.000	0.000	0.000	18	0.000	0.000
Mass AF	g		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Mass Asbestos in ACM	g		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Mass asbestos in AF	g		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Mass Asbestos in FA	g		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Mass Asbestos in FA & AF	g		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Mass FA	g		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0000	0.000	0.000
Asbestos	% w/w	0.001% w/w	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Asbestos (FA & AF)	% w/w	0.001% w/w	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

* assuming 15% asbestos content in ACM
a Sample incorrectly labelled in field as BH4A-F

Table 1b: Soil Asbestos Results

			BH12_0.0-0.2	BH13_0.0-0.2	BH14_0.0-0.2	BH14_0.5-0.7	BH15_0.0-0.2	BH16_0.0-0.2	BH17_0.0-0.2	BH18_0.0-0.2	BH19_0.0-0.2	BH20_0.0-0.2
			12 Jun 2024	13 Jun 2024	13 Jun 2024	13 Jun 2024	13 Jun 2024	13 Jun 2024	13 Jun 2024	13 Jun 2024	13 Jun 2024	13 Jun 2024
			1107687	1107687	1107687	1107687	1107687	1107687	1107687	1107687	1107687	1107687
	Unit	EQL										
Asbestos												
Soil Sample Mass (~500ml)	g		387	328	389	391	381	311	484	257	452	363
Soil Sample Mass (10L)	kg		-	-	-	-	-	-	-	-	-	-
Asbestos Detected												
Mass ACM	g		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Mass AF	g		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Mass Asbestos in ACM	g		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Mass asbestos in AF	g		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Mass Asbestos in FA	g		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Mass Asbestos in FA & AF	g		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Mass FA	g		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Asbestos	% w/w	0.001% w/w	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Asbestos (FA & AF)	% w/w	0.001% w/w	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

* assuming 15% asbestos content in ACM
a Sample incorrectly labelled in field as BH4A-F

Table 1c: Waste Classification Results

			ISI (September 2024)										PSI (July 2024)																	
Field ID	Date	Lab Report Number	BH1A_0.1-0.2	BH1A_0.5-0.6	BH2A_0.1-0.2	BH2A_1.0-1.1	BH3A_0.1-0.2	BH3A_0.5-0.6	BH4A_0.1-0.2	BH4A_1.0-1.1	BH5A_0.1-0.2	BH5A_0.5-0.6	BH6A_0.1-0.2	BH6A_1.0-1.1	BH01_0.0-0.2	BH01_0.5-0.7	BH02_0.0-0.2	BH02_0.5-0.7	BH03_0.0-0.2	BH03_1.0-1.2	BH04_0.5-0.7	BH04_1.3-1.5								
			03 Sep 2024	03 Sep 2024	03 Sep 2024	03 Sep 2024	03 Sep 2024	03 Sep 2024	03 Sep 2024	03 Sep 2024	03 Sep 2024	03 Sep 2024	03 Sep 2024	03 Sep 2024	03 Sep 2024	03 Sep 2024	14 Jun 2024	14 Jun 2024	12 Jun 2024	12 Jun 2024	12 Jun 2024	12 Jun 2024	12 Jun 2024	12 Jun 2024						
			1135930	1135930	1135930	1135930	1135930	1135930	1135930	1135930	1135930	1135930	1135930	1135930	1108144	1108144	1107687	1107687	1107687	1107687	1107687	1107687								
Unit	EQL		NSW 2014 General Solid Waste CT1 (No Leaching)	NSW 2014 Restricted Solid Waste CT2 (No Leaching)	NSW 2014 General Solid Waste SCC1 (with leached)	NSW 2014 General Solid Waste TCLP1 (leached)	NSW 2014 Restricted Solid Waste SCC2 (with leached)	NSW 2014 Restricted Solid Waste TCLP2 (leached)																						
Asbestos	ACM - Comment		-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	-	1	-	1	-								
Total Recoverable Hydrocarbons																														
C5 - C10	mg/kg	20	-	-	-	-	-	-	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20								
F1 (C6 - C10) less BTEX	mg/kg	20	-	-	-	-	-	-	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20								
C10 - C16	mg/kg	50	-	-	-	-	-	-	<50	<50	<50	<50	<50	<50	63	<50	<50	<50	<50	<50	<50	<50								
F2 C10 - C16 (minus Naphthalene)	mg/kg	50	-	-	-	-	-	-	<50	<50	<50	<50	<50	<50	63	<50	<50	<50	<50	<50	<50	<50								
F3 (C16 - C34)	mg/kg	100	-	-	-	-	-	-	<100	<100	170	<100	<100	<100	210	<100	<100	<100	<100	<100	<100	<100								
F4 (C34 - C40)	mg/kg	100	-	-	-	-	-	-	<100	<100	190	<100	<100	<100	210	<100	<100	<100	<100	<100	<100	<100								
C10 - C36 (Sum of total)	mg/kg	100	-	-	-	-	-	-	<100	<100	170	<100	<100	<100	730	410	503	210	<100	<100	<100	<100								
Total Petroleum Hydrocarbons																														
C5 - C9	mg/kg	20	650	2,600	6,500	-	2,600	-	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20								
C10 - C14	mg/kg	20	-	-	-	-	-	-	<20	<20	<20	<20	<20	<20	34	<20	<20	<20	<20	<20	<20	<20								
C15 - C28	mg/kg	50	-	-	-	-	-	-	50	<50	63	<50	<50	<50	400	210	300	140	52	<50	<50	<50								
C29 - C36	mg/kg	50	-	-	-	-	-	-	<50	<50	150	<50	<50	<50	220	140	170	110	72	<50	<50	<50								
C10 - C36 (Sum of total)	mg/kg	50	10,000	40,000	10,000	-	40,000	-	50	<50	213	<50	<50	<50	620	350	504	250	124	<50	<50	<50								
BTXN																														
Benzene	mg/kg	0.1	10	40	18	-	72	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1								
Toluene	mg/kg	0.1	288	1,152	518	-	2,073	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1								
Ethyl Benzene	mg/kg	0.1	600	2,400	1,080	-	4,320	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1								
m,p-Xylene	mg/kg	0.2	-	-	-	-	-	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2								
o-Xylene	mg/kg	0.1	-	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1								
Total Xylenes	mg/kg	0.3	1,000	4,000	1,800	-	7,200	-	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3								
Naphthalene (VOC)	mg/kg	0.5	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5								
Metals																														
Arsenic	mg/kg	2	100	400	500	-	2,000	-	13	12	2.8	8.9	6.0	10	5.2	3.6	9.9	26	6.6	15	6.0	11								
Cadmium	mg/kg	0.4	20	80	100	-	400	-	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	0.5	<0.4	<0.4	<0.4	<0.4	<0.4								
Chromium (III+VI)	mg/kg	5	-	-	-	-	-	-	8.2	10.0	8.6	23	12	23	12	9.5	16	13	11	39	10	28								
Copper	mg/kg	5	-	-	-	-	-	-	28	19	34	98	56	5.2	31	39	41	62	5.5	7.7	27	17								
Iron	mg/kg	20	-	-	-	-	-	-	20	19	34	98	56	5.2	31	39	41	62	5.5	7.7	27	17								
Lead	mg/kg	5	100	400	1,500	-	6,000	-	43	47	51	570	31	11	200	100	100	88	16	15	80	13								
	mg/L	0	-	-	5	-	20,000	-	-	-	-	0.01	-	-	-	-	-	-	-	-	-	-								
Mercury	mg/kg	0.1	4	16	50	-	200	-	<0.1	<0.1	<0.1	0.2	0.2	<0.1	<0.1	3.4	1.4	<0.1	<0.1	0.1	<0.1	0.1								
Nickel	mg/kg	5	40	160	1,050	-	4,300	-	19	14	9	24	17	7.0	31	25	17	33	7.3	7.8	18	12								
	mg/L	0	-	-	2	-	8,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-								
Zinc	mg/kg	5	-	-	-	-	-	-	93	84	210	1,400	86	21	370	250	230	280	19	26	110	33								
Polycyclic Aromatic Hydrocarbons																														
Benzo(b)fluoranthene	mg/kg	0.5	-	-	-	-	-	-	<0.5	<0.5	0.6	<0.5	<0.5	<0.5	22	9.8	5.1	4.4	1.9	1.0	<0.5	<0.5								
Acenaphthene	mg/kg	0.5	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.3	0.8	0.5	<0.5	<0.5	<0.5	<0.5	<0.5								
Acenaphthylene	mg/kg	0.5	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5								
Anthracene	mg/kg	0.5	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	8.5	4.6	<0.5	<0.5	0.6	<0.5	<0.5	<0.5								
Ben(a)anthracene	mg/kg	0.5	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	2.9	0.5	2.9	0.5	0.6	<0.5	<0.5	<0.5								
Benzo(a)pyrene	mg/kg	0.5	0.8	3.2	10	-	23	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	21	10	3.5													

[illegible]

Environmental Standards

NSW EPA, November 2014, NSW 2014 General Solid Waste CT1 (No Leaching)

NSW EPA, November 2014, NSW 2014 General Solid Waste SCC1 (with leached)

NSW EPA, November 2014, NSW 2014 General Solid Waste TCLP1 (leached)

NSW EPA, November 2014, NSW 2014 Restricted Solid Waste CT2 (No Leaching)

NSW EPA, November 2014, NSW 2014 Restricted Solid Waste SCC2 (with leached)

NSW EPA, November 2014, NSW 2014 Restricted Solid Waste TCLP2 (leached)

Table 1c: Waste Classification Results

								Field ID	BH14_0.5-0.7	BH15_0.0-0.2	BH15_1.0-1.2	BH16_0.0-0.2	BH16_0.5-0.7	BH17_0.0-0.2	BH17_0.5-0.7	BH18_0.0-0.2	BH18_1.0-1.2	BH19_0.0-0.2	BH19_1.0-1.2	BH20_0.0-0.2	BH20_0.5-0.7		
								Date	13 Jun 2024	13 Jun 2024	13 Jun 2024	13 Jun 2024	13 Jun 2024	13 Jun 2024	13 Jun 2024	13 Jun 2024	13 Jun 2024	13 Jun 2024	13 Jun 2024	13 Jun 2024	13 Jun 2024		
								Lab Report Number	1107687	1107687	1107687	1107687	1107687	1107687	1107687	1107687	1107687	1107687	1107687	1107687	1107687		
								Unit	EQL	NSW 2014 General Solid Waste CT1 (No Leaching)	NSW 2014 Restricted Solid Waste CT2 (No Leaching)	NSW 2014 General Solid Waste SC1 (with leached)	NSW 2014 General Solid Waste TCLP1 (leached)	NSW 2014 Restricted Solid Waste SC2 (with leached)	NSW 2014 Restricted Solid Waste TCLP2 (leached)								
Asbestos																							
ACM - Comment	Comment		-	-	-	-	-	-	1	1	-	1	-	1	-	1	-	1	-	1	-		
Total Recoverable Hydrocarbons																							
C5 - C10	mg/kg	20	-	-	-	-	-	-	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20		
F1 (C6 - C10) less BTEX	mg/kg	20	-	-	-	-	-	-	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20		
C10 - C16	mg/kg	50	-	-	-	-	-	-	<50	<50	350	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50		
F2 C10 - C16 (minus Naphthalene)	mg/kg	50	-	-	-	-	-	-	<50	<50	350	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50		
F3 (C16 - C34)	mg/kg	100	-	-	-	-	-	-	<100	<100	570	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100		
F4 (C34 - C40)	mg/kg	100	-	-	-	-	-	-	<100	<100	110	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100		
C10 - C40 (Sum of total)	mg/kg	100	-	-	-	-	-	-	<100	<100	430	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100		
Total Petroleum Hydrocarbons																							
C8 - C9	mg/kg	20	650	2,600	6,500	-	2,600	-	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20		
C10 - C14	mg/kg	20	-	-	-	-	-	-	<20	<20	200	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20		
C15 - C28	mg/kg	50	-	-	-	-	-	-	<50	<50	250	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50		
C29 - C36	mg/kg	50	-	-	-	-	-	-	<50	<50	130	<50	<50	85	<50	130	<50	53	<50	58	55		
C10 - C36 (Sum of total)	mg/kg	50	10,000	40,000	10,000	-	40,000	-	<50	<50	380	<50	<50	85	<50	130	<50	53	<50	58	55		
BTXN																							
Benzene	mg/kg	0.1	10	40	18	-	72	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		
Toluene	mg/kg	0.1	288	1,152	518	-	2,073	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		
Ethyl Benzene	mg/kg	0.1	600	2,400	1,080	-	4,320	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		
m,p-Xylene	mg/kg	0.2	-	-	-	-	-	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2		
o-Xylene	mg/kg	0.1	-	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		
Total Xylenes	mg/kg	0.3	1,000	4,000	1,800	-	7,200	-	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3		
Naphthalene (VOC)	mg/kg	0.5	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Metals																							
Arsenic	mg/kg	2	100	400	500	-	2,000	-	8.4	11	14	8.0	9.8	5.2	19	4.4	6.5	4.4	13	5.5	8.8		
Cadmium	mg/kg	0.4	20	80	100	-	400	-	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4		
Chromium (III+VI)	mg/kg	5	-	-	-	-	-	-	20	17	25	12	14	13	14	12	13	24	12	14	14		
Copper	mg/kg	5	-	-	-	-	-	-	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5		
Iron	mg/kg	20	-	-	-	-	-	-	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20		
Lead	mg/kg	5	100	400	500	-	6,000	-	9.2	12	17	15	9.1	<5	27	<5	7.1	7.5	11	<5	7.6		
Mercury	mg/L	0	-	-	-	5	-	20,000	-	-	-	-	-	-	-	-	-	-	-	-	-		
Nickel	mg/kg	0.1	40	160	50	-	200	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		
Zinc	mg/L	0	-	-	-	2	-	-	5.6	8.2	6.8	17	<5	50	26	56	5.8	65	9.8	35	5.7		
	mg/kg	5	-	-	-	-	-	-	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5		
Polycyclic Aromatic Hydrocarbons																							
Benzo(a)fluoranthene	mg/kg	0.5	-	-	-	-	-	-	<0.5	<0.5	4.1	6.9	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Acenaphthene	mg/kg	0.5	-	-	-	-	-	-	<0.5	<0.5	2.0	6.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Acenaphthylene	mg/kg	0.5	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Anthracene	mg/kg	0.5	-	-	-	-	-	-	<0.5	<0.5	3.2	8.9	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Ben(a)anthracene	mg/kg	0.5	-	-	-	-	-	-	<0.5	<0.5	5.0	8.1	<0.5	<0.5	<0.5	5.0	<0.5	<0.5	<0.5	<0.5	<0.5		
Benzo(a) pyrene	mg/kg	0.5	0.8	3.2	10	-	23	-	<0.5	<0.5	4.5	7.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Benzo(g,h,i)perylene	mg/L	0	-	-	-	0.04	-	160	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Benzo(k)fluoranthene	mg/kg	0.5	-	-	-	-	-	-	<0.5	<0.5	3.0	6.7	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Chrysene	mg/kg	0.5	-	-	-	-	-	-	<0.5	<0.5	5.9	9.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Dibenz(a,h)anthracene	mg/kg	0.5	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Fluoranthene	mg/kg	0.5	-	-	-	-	-	-	<0.5	<0.5	17	32	0.9	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Fluorene	mg/kg	0.5	-	-	-	-	-	-	<0.5	<0.5	0.9	3.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Indeno(1,2,3-c,d)pyrene	mg/kg	0.5	-	-	-	-	-	-	<0.5	<0.5	2.9	4.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Naphthalene	mg/kg	0.5	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Phenanthrene	mg/kg	0																					

Table 1c: Waste Classification Results

									Field ID	Date			
									Lab Report Number				
	Unit	EQL	NSW 2014 General Solid Waste CT1 (No Leaching)	NSW 2014 Restricted Solid Waste CT2 (No Leaching)	NSW 2014 General Solid Waste SCC1 (with leached)	NSW 2014 General Solid Waste TCLP1 (leached)	NSW 2014 Restricted Solid Waste SCC2 (with leached)	NSW 2014 Restricted Solid Waste TCLP2 (leached)	Median Concentration *	Standard Deviation *	95% UCL (Student's-t) *		
Asbestos													
ACM - Comment	Comment		-	-	-	-	-	-	1	0	1		
Total Recoverable Hydrocarbons													
C5 - C10	mg/kg	20	-	-	-	-	-	-	10	0	10		
F1 (C6 - C10) less BTEX	mg/kg	20	-	-	-	-	-	-	10	0	10		
C10 - C16	mg/kg	50	-	-	-	-	-	-	25	49	46.36		
F2 C10 - C16 (minus Naphthalene)	mg/kg	50	-	-	-	-	-	-	25	49	46.36		
F3 (C16 - C34)	mg/kg	100	-	-	-	-	-	-	50	432	261.4		
F4 (C34 - C40)	mg/kg	100	-	-	-	-	-	-	50	161	138.6		
C10 - C40 (Sum of total)	mg/kg	100	-	-	-	-	-	-	50	589	389.7		
Total Petroleum Hydrocarbons													
C6 - C9	mg/kg	20	650	2,600	6,500	-	2,600	-	10	0	10		
C10 - C14	mg/kg	20	-	-	-	-	-	-	10	28	22.1		
C15 - C28	mg/kg	50	-	-	-	-	-	-	25	372	219		
C29 - C36	mg/kg	50	-	-	-	-	-	-	25	156	124.4		
C10 - C36 (Sum of total)	mg/kg	50	10,000	40,000	10,000	-	40,000	-	25	526	331.3		
BTEX													
Benzene	mg/kg	0.1	10	40	18	-	72	-	0.05	0	0.05		
Toluene	mg/kg	0.1	288	1,152	518	-	2,073	-	0.05	0	0.05		
Ethyl Benzene	mg/kg	0.1	600	2,400	1,080	-	4,320	-	0.05	0	0.05		
m,p-Xylene	mg/kg	0.2	-	-	-	-	-	-	0.1	0	0.1		
o-Xylene	mg/kg	0.1	-	-	-	-	-	-	0.05	0	0.05		
Total Xylenes	mg/kg	0.3	1,000	4,000	1,800	-	7,200	-	0.15	0	0.15		
Naphthalene (VOC)	mg/kg	0.5	-	-	-	-	-	-	0.25	0	0.25		
Metals													
Arsenic	mg/kg	2	100	400	500	-	2,000	-	7.4	4.4	9.364		
Cadmium	mg/kg	0.4	20	80	100	-	400	-	0.2	0.13	0.263		
Chromium (III+VI)	mg/kg	5	-	-	-	-	-	-	13	6.7	16.76		
Copper	mg/kg	5	-	-	-	-	-	-	13	27	27.09		
Iron	mg/kg	20	-	-	-	-	-	-	10,300	5,901	17,021		
Lead	mg/kg	5	100	400	1,500	-	6,000	-	19.5	84	67.51		
	mg/L	0	-	-	-	5	-	20,000	20	0	0		
Mercury	mg/kg	0.1	4	16	50	-	200	-	0.05	0.51	0.321		
Nickel	mg/kg	5	40	160	1,050	-	4,200	-	14.5	14	21.09		
	mg/L	0	-	-	-	2	-	8,000	70	0	0		
Zinc	mg/kg	5	-	-	-	-	-	-	49	199	152.9		
Polycyclic Aromatic Hydrocarbons													
Benzo(b)fluoranthene	mg/kg	0.5	-	-	-	-	-	-	0.25	8.6	4.586		
Acenaphthene	mg/kg	0.5	-	-	-	-	-	-	0.25	0.11	0.784		
Acenaphthylene	mg/kg	0.5	-	-	-	-	-	-	0.25	0	0.25		
Anthracene	mg/kg	0.5	-	-	-	-	-	-	0.25	2.8	1.742		
Ben(a)anthracene	mg/kg	0.5	-	-	-	-	-	-	0.25	8.6	4.551		
Benzo(a) pyrene	mg/kg	0.5	0.8	3.2	10	-	23	-	0.25	8.3	4.386		
	mg/L	0	-	-	-	0.04	-	160	2.5	0.71	5.657		
Benzo(g,h,i)perylene	mg/kg	0.5	-	-	-	-	-	-	0.25	6.9	3.349		
Benzo(k)fluoranthene	mg/kg	0.5	-	-	-	-	-	-	0.25	7.3	4.024		
Chrysene	mg/kg	0.5	-	-	-	-	-	-	0.25	9	4.991		
Dibenz(a,h)anthracene	mg/kg	0.5	-	-	-	-	-	-	0.25	2.1	1.25		
Fluoranthene	mg/kg	0.5	-	-	-	-	-	-	0.25	25	13.34		
Fluorene	mg/kg	0.5	-	-	-	-	-	-	0.25	0.62	0.538		
Indeno(1,2,3-c,d)pyrene	mg/kg	0.5	-	-	-	-	-	-	0.25	6.6	3.438		
Naphthalene	mg/kg	0.5	-	-	-	-	-	-	0.25	0	0.25		
Phenanthrene	mg/kg	0.5	-	-	-	-	-	-	0.25	15	7.514		
Pyrene	mg/kg	0.5	-	-	-	-	-	-	0.25	20	10.92		
PAHs (Sum of total)	mg/kg	0.5	200	800	200	-	800	-	0.25	120	62.39		
PCBs													
Arochlor 1016	mg/kg	0.1	-	-	-	-	-	-	0.05	0.23	0.312		
Arochlor 1221	mg/kg	0.1	-	-	-	-	-	-	0.05	0.23	0.312		
Arochlor 1232	mg/kg	0.1	-	-	-	-	-	-	0.05	0.23	0.312		
Arochlor 1242	mg/kg	0.1	-	-	-	-	-	-	0.05	0.23	0.312		
Arochlor 1248	mg/kg	0.1	-	-	-	-	-	-	0.05	0.23	0.312		
Arochlor 1254	mg/kg	0.1	-	-	-	-	-	-	0.05	0.23	0.312		
Arochlor 1260	mg/kg	0.1	-	-	-	-	-	-	0.05	0.23	0.312		
PCBs (Sum of total)	mg/kg	0.1	50	50	50	-	50	-	0.05	0.23	0.312		
Organochlorine Pesticides													
Organochlorine pesticides EPAVic	mg/kg	0.1	-	-	-	-	-	-	0.05	0.23	0.312		
Other organochlorine pesticides													
EPAVic	mg/kg	0.1	-	-	-	-	-	-	0.05	0.23	0.312		
4,4-DDD	mg/kg	0.05	-	-	-	-	-	-	0.025	0.11	0.156		
4-BHC	mg/kg	0.05	-	-	-	-	-	-	0.025	0.11	0.156		
Aldrin	mg/kg	0.05	-	-	-	-	-	-	0.025	0.11	0.156		
Aldrin + Dieldrin	mg/kg	0.05	-	-	-	-	-	-	0.025	0.11	0.156		
4-BHC	mg/kg	0.05	-	-	-	-	-	-	0.025	0.11	0.156		
Chlordane	mg/kg	0.1	-	-	-	-	-	-	0.05	0.23	0.312		
4-BHC	mg/kg	0.05	-	-	-	-	-	-	0.025	0.11	0.156		
DDD	mg/kg	0.05	-	-	-	-	-	-	0.025	0.11	0.156		
DDT	mg/kg	0.05	-	-	-	-	-	-	0.025	0.11	0.156		
DDT+DDD+DDD	mg/kg	0.05	-	-	-	-	-	-	0.025	0.11	0.156		
Dieldrin	mg/kg	0.05	-	-	-	-	-	-	0.025	0.11	0.156		
Endrin aldehyde	mg/kg	0.05	-	-	-	-	-	-	0.025	0.11	0.156		
Endrin ketone	mg/kg	0.05	-	-	-	-	-	-	0.025	0.11	0.156		
Endosulfan I	µg/kg	50	-	-	-	-	-	-	25	113	156.2		
Endosulfan II	mg/kg	0.05	-	-	-	-	-	-	0.025	0.11	0.156		
Endosulfan sulphate	mg/kg	0.05	-	-	-	-	-	-	0.025	0.11	0.156		
Endrin	mg/kg	0.05	-	-	-	-	-	-	0.025	0.11	0.156		
4-BHC (Lindane)	mg/kg	0.05	-	-	-	-	-	-	0.025	0.11	0.156		
Heptachlor	mg/kg	0.05	-	-	-	-	-	-	0.025	0.11	0.156		
Heptachlor epoxide	mg/kg	0.05	-	-	-	-	-	-	0.025	0.11	0.156		
Methoxychlor	µg/kg	50	-	-	-	-	-	-	25	113	156.2		
Toxaphene	mg/kg	0.5	-	-	-	-	-	-	0.25	2.4	3.02		
Organophosphorus Pesticides													
Toluthion	mg/kg	0.2	-	-	-	-	-	-	0.1	0.076	0.187		
Azinophos methyl	mg/kg	0.2	-	-	-	-	-	-	0.1	0.076	0.187		
Bolstar (Sulprofos)	mg/kg	0.2	-	-	-	-	-	-	0.1	0.076	0.187		
Chlorfenvinphos	mg/kg	0.2	-	-	-	-	-	-	0.1	0.076	0.187		
Chlorpyrifos	mg/kg	0.2	4	16	7.5	-	30	-	0.1	0.076	0.187		
Chlorpyrifos-methyl	mg/kg	0.2	-	-	-	-	-	-	0.1	0.076	0.187		
Coumaphos	mg/kg	2	-	-	-	-	-	-	1	0.76	1.875		
Demeton-O	mg/kg	0.2	-	-	-	-	-	-	0.1	0.076	0.187		
Demeton-S	mg/kg	0.2	-	-	-	-	-	-	0.1	0.076	0.187		
Diazinon	mg/kg	0.2	-	-	-	-	-	-	0.1	0.076	0.187		
Dichlorvos	mg/kg	0.2	-	-	-	-	-	-	0.1	0.076	0.187		
Disulfoton	mg/kg	0.2	-	-	-	-	-	-	0.1	0.076	0.187		
Dimethoate	mg/kg	0.2	-	-	-	-	-	-	0.1	0.076	0.187		
Ethoprop	mg/kg	0.2	-	-	-	-	-	-	0.1	0.076	0.187		
Ethion	mg/kg	0.2	-	-	-	-	-	-	0.1	0.076	0.187		
Fenitrothion	mg/kg	0.2	-	-	-	-	-	-	0.1	0.076	0.187		
Fensulfthion	mg/kg	0.2	-	-	-	-	-	-	0.1	0.076	0.187		
Fenithion	mg/kg	0.2	-	-	-	-	-	-	0.1	0.076	0.187		
EPN	mg/kg	0.2	-	-	-	-	-	-	0.1	0.076	0.187		
Merphos	mg/kg	0.2	-	-	-	-	-	-	0.1	0.076	0.187		
Malathion	mg/kg	0.2	-	-	-	-	-	-	0.1	0.076	0.187		
Methyl parathion	mg/kg	0.2	-	-	-	-	-	-	0.1	0.076	0.187		
Mevinphos (Phosdrin)	mg/kg	0.2	-	-	-	-	-	-	0.1	0.076	0.187		
Monocrotophos	mg/kg	2	-	-	-	-	-	-	1	0.76	1.875		
Naled (Dibrom)	mg/kg	0.2	-	-	-	-	-	-	0.1	0.076	0.187		
Omethoate	mg/kg	2	-	-	-	-	-	-	1	0.76	1.875		
Phorate	mg/kg	0.2	-	-	-	-	-	-	0.1	0.076	0.187		
Pyrazophos	mg/kg	0.2	-	-	-	-	-	-	0.1	0.076	0.187		
Ronnel	mg/kg	0.2	-	-	-	-	-	-	0.1	0.076	0.187		
Terbufos	mg/kg	0.2	-	-	-	-	-	-	0.1	0.076	0.187		
Trichloronate	mg/kg	0.2	-	-	-	-	-	-	0.1	0.076	0.187		
Tetrachlorvinphos	mg/kg	0.2	-	-	-	-	-	-	0.1	0.076	0.187		
Pesticides													
Parathion	mg/kg	0.2	-	-	-	-	-	-	0.1	0.076	0.187		
Primiphos-methyl	mg/kg	0.2	-	-	-	-	-	-	0.1	0.076	0.187		
Halogenated Benzenes													
Hexachlorobenzene	mg/kg	0.05	-	-	-	-	-	-	0.025	0.11	0.156		

Environmental Standards
 NSW EPA, November 2014, NSW 2014 General Solid Waste CT1 (No Leaching)
 NSW EPA, November 2014, NSW 2014 General Solid Waste SCC1 (with leached)
 NSW EPA, November 2014, NSW 2014 General Solid Waste TCLP1 (leached)
 NSW EPA, November 2014, NSW 2014 Restricted Solid Waste CT2 (No Leaching)
 NSW EPA, November 2014, NSW 2014 Restricted Solid Waste SCC2 (with leached)
 NSW EPA, November 2014, NSW 2014 Restricted Solid Waste TCLP2 (leached)

Table 2: Groundwater Results

			Field ID Date Lab Report Number			MW01 11 Sep 2024 1138492	
	Unit	EQL	NEPM 2013 Table 1A(4) Comm/Ind HSL D GW for Vapour Intrusion, Clay			ANZG Freshwater Water 95%	
			>=2m, <4m	>=4m, <8m	>=8m		
Total Recoverable Hydrocarbons							
C6 - C10	ug/L	20	-	-	-	-	<20
F1 (C6 - C10) less BTEX	ug/L	20	-	-	-	-	<20
C10 - C16	ug/L	50	-	-	-	-	<50
F2 C10 - C16 (minus Naphthalene)	ug/L	50	-	-	-	-	<50
F3 (C16 - C34)	ug/L	100	-	-	-	-	<100
F4 (C34 - C40)	ug/L	100	-	-	-	-	<100
C10 - C40 (Sum of total)	ug/L	100	-	-	-	-	<100
Total Petroleum Hydrocarbons							
C6 - C9	ug/L	20	-	-	-	-	<20
C10 - C14	ug/L	50	-	-	-	-	<50
C15 - C28	ug/L	100	-	-	-	-	<100
C29 - C36	ug/L	100	-	-	-	-	<100
C10 - C36 (Sum of total)	ug/L	100	-	-	-	-	<100
BTEXN							
Benzene	ug/L	1	30,000	30,000	35,000	950	<1
Toluene	ug/L	1	-	-	-	-	<1
Ethyl Benzene	ug/L	1	-	-	-	-	<1
m,p-Xylene	ug/L	2	-	-	-	-	<2
o-Xylene	ug/L	1	-	-	-	350	<1
Total Xylenes	ug/L	3	-	-	-	550	<3
Naphthalene (VOC)	ug/L	10	-	-	-	-	<10
Metals							
Arsenic	ug/L	1	-	-	-	-	3
Cadmium	ug/L	0.2	-	-	-	0.2	0.3
Chromium (III+VI)	ug/L	1	-	-	-	-	<1
Copper	ug/L	1	-	-	-	1.4	2
Lead	ug/L	1	-	-	-	3.4	<1
Mercury	ug/L	0.1	-	-	-	0.06	<0.1
Nickel	ug/L	1	-	-	-	11	15
Zinc	ug/L	5	-	-	-	8	60
Polycyclic Aromatic Hydrocarbons							
Benzo(b+)fluoranthene	ug/L	1	-	-	-	-	<1
Acenaphthene	ug/L	1	-	-	-	-	<1
Acenaphthylene	ug/L	1	-	-	-	-	<1
Anthracene	ug/L	1	-	-	-	-	<1
Benzo(a)anthracene	ug/L	1	-	-	-	-	<1
Benzo(a) pyrene	ug/L	1	-	-	-	-	<1
Benzo(g,h,i)perylene	ug/L	1	-	-	-	-	<1
Benzo(k)fluoranthene	ug/L	1	-	-	-	-	<1
Chrysene	ug/L	1	-	-	-	-	<1
Dibenz(a,h)anthracene	ug/L	1	-	-	-	-	<1
Fluoranthene	ug/L	1	-	-	-	-	<1
Fluorene	ug/L	1	-	-	-	-	<1
Indeno(1,2,3-c,d)pyrene	ug/L	1	-	-	-	-	<1
Naphthalene	ug/L	1	-	-	-	16	<1
Phenanthrene	ug/L	1	-	-	-	-	<1
Pyrene	ug/L	1	-	-	-	-	<1
PAHs (Sum of total)	ug/L	1	-	-	-	-	<1
Phenols							
2,4-Dinitrophenol	mg/L	0.03	-	-	-	0.045	<0.03
2,4,5-Trichlorophenol	mg/L	0.01	-	-	-	-	<0.01
2,4,6-Trichlorophenol	mg/L	0.01	-	-	-	0.003	<0.01
2,4-Dichlorophenol	mg/L	0.003	-	-	-	0.12	<0.003
2,4-Dimethylphenol	mg/L	0.003	-	-	-	-	<0.003
2,6-Dichlorophenol	µg/L	3	-	-	-	-	<3
2-Chlorophenol	mg/L	0.003	-	-	-	0.34	<0.003
2-Methylphenol	mg/L	0.003	-	-	-	-	<0.003
2-Nitrophenol	mg/L	0.01	-	-	-	-	<0.01
4,6-Dinitro-2-methylphenol	µg/L	30	-	-	-	-	<30
4,6-Dinitro-o-cyclohexyl phenol	mg/L	0.1	-	-	-	-	<0.1
4-Nitrophenol	mg/L	0.03	-	-	-	-	<0.03
4-chloro-3-methylphenol	mg/L	0.01	-	-	-	-	<0.01
Cresol Total	µg/L	10	-	-	-	-	<10
Pentachlorophenol	mg/L	0.01	-	-	-	0.0036	<0.01
Phenol	µg/L	3	-	-	-	320	<3
Tetrachlorophenols	mg/L	0.03	-	-	-	-	<0.03
Phenols (Total Halogenated)	mg/L	0.01	-	-	-	-	<0.01
Phenols (Total Non Halogenated)	mg/L	0.1	-	-	-	-	<0.1
Herbicides							
Dinoseb	mg/L	0.1	-	-	-	-	<0.1

APPENDIX E: DATA VALIDATION

Final

APPENDIX E: DATA VALIDATION REPORT

E.1 INTRODUCTION

The sampling and analysis process (collection, transport and analysis) during validation works was conducted in accordance with the sampling and analysis quality plan (SAQP) included in Section 8 of the main report body. The sampling and analysis were conducted according to Tetra Tech Coffey's standard operating procedures (SOPs) in the field and in the laboratory. The application of the quality assurance processes included within the SAQP, and completion of the investigation according to the SOPs served to minimise the effect of natural and inherent variability and extraneous factors on data quality.

To measure the accuracy and precision of the data generated by the field and laboratory procedures for this assessment, the quality assurance / quality control (QA/QC) samples were collected and analysed in accordance with the SAQP.

The QA/QC were developed based on guidelines presented in:

- *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013)* (ASC NEPM)
- *AS4482.1 Guide to the sampling and investigation of potentially contaminated soil, Part 1: Non-Volatile and Semi-volatile Substances.*

The outcome of the Field and Laboratory QA/QC are presented in this report, which are assessed according to the established Data Quality Indicators (DQIs). DQIs are used to show that the DQOs have been met. DQIs for the project are based on the field and laboratory considerations in Section 19.6 of ASC NEPM Schedule B2 Appendix B, which include:

- Completeness – a measure of the amount of useable data (expressed as %) from a data collection activity.
- Comparability – the confidence (expressed qualitatively) that data may be considered to be equivalent for each sampling and analytical event.
- Representativeness – the confidence (expressed qualitatively) that data are representative of each media present on the site.
- Precision – a quantitative measure of the variability (or reproducibility) of data; and
- Accuracy – a quantitative measure of the closeness of reported data to the true value.

E.2 QUALITY CONTROL CRITERIA

Acceptable limits adopted for data quality indicators for this assessment are outlined in Table 1.

Table 1. Quality Control Criteria

Item	Acceptable limits
Analysis of intra-laboratory duplicates and inter-laboratory duplicates.	Rate of 1:20 (5%) duplicate soil samples for the same analysis of primary samples. Calculation of RPDs between primary and duplicate samples. RPD results for soil samples: • 50% (where the average concentration is 5-10 x laboratory PQL/LOR). • 30% (where the average concentration is >10 x laboratory PQL/LOR)
Analysis of rinsate blanks	Rate of one (1) per equipment item per day of use; and Results less than the laboratory PQL/LOR.

Analysis of laboratory prepared trip blanks	Rate of one (1) sample per batch for soil samples where volatiles are analysed; and Results <LOR
Analysis of laboratory prepared trip spikes	Rate of one (1) sample per batch for soil samples where volatiles are analysed; and Results with 70 – 130% recovery.
Analysis of laboratory method blanks, surrogates, spikes and control samples	The laboratories conduct their own internal quality program for assessment of the repeatability of the analytical procedures and instrument accuracy under their NATA accreditation. This includes analysis of laboratory method blank samples, duplicate samples, spike samples, control samples and surrogate spikes. The laboratory QA/QC procedures and results are described within the laboratory reports. The frequency of QC samples within each process batch is: • 5% (1 in 20) for method blanks, laboratory control samples and matrix spikes • 10% (1 in 10) for laboratory duplicates • Surrogates are included for all target organic analytes The laboratory internal QA/QC sample results will be reviewed for comparison with the laboratory's NATA guidelines and Schedule B3 of ASC NEPM 2013.
Laboratories and methods used	National Association of Testing Authorities accredited for the method. Methods should be consistent with those listed in Schedule 3 of the ASC NEPM.
Holding times	Samples are analysed within recommended holding times.
Sample PQL/LORs	Results less than the adopted assessment criteria.

E.3 DATA QUALITY INDICATORS

Data Quality Indicators (DQIs) are based on the requirements detailed in Appendix C of Schedule B2 of the ASC NEPM. A summary of the field and laboratory DQIs for this assessment are provided in Table 2. Field and laboratory QC sample conformance is assessed in below in Sections E.4 E.5 and E.6. Non-conformances are identified and the effect on investigation outcome considered.

Table 2. Data Quality Indicator Performance

	Field DQIs	Laboratory DQIs
Completeness	Critical locations and depths sampled. All critical sample locations were assessed.	Critical samples and COPCs analysed in accordance with the SAQP. All samples within the scope were collected and submitted for analysis of identified COPCs in accordance with the analytical schedule
	SOPs appropriate and complied with. Tetra Techs SOPs were consistently followed with no deviations.	Appropriate methods and LORs. Samples were analysed by appropriate methods (LORs above criteria) and laboratories were NATA accredited for the analyses completed.
	Experienced sampler Sampling was completed by an experienced Tetra Tech Scientist.	Sample documentation complete Chain of custody's (COCs) were returned, signed and dated by laboratory. Sample receipt notifications (SRNs) were reviewed and indicated samples were received in good condition by the laboratory. NATA endorsed laboratory certificates were completed in accordance with Schedule B3 of the ASC NEPM.

Comparability	Documentation correct Records of samples, logs and fieldsheets completed. Samples were handled and transported under chain of custody (COCs) documentation.	Sample holding times complied with Holding time exceedances were reported for two analytes (conductivity and benzo(a)pyrene) as detailed in Section E.5
	Number of sampling events A soil sampling event was undertaken as part of the PSI, with an additional soil sampling event undertaken for the DSI. A single GME was undertaken of the newly installed monitoring well MW01.	Sample analytical methods used The samples were analysed by equivalent and comparable methods by the laboratories
	Climatic conditions (temperature, rainfall, wind) There were no climatic factors at the time of fieldworks, such as large rainfall events which would be expected to influence data interpretation.	Laboratory limits of reporting (LOR) Were generally consistent between the primary and secondary laboratories and between PSI and DSI investigations.
	Same types of samples collected Samples were collected and analysed consistent with the previous investigations and sampling events (i.e., soil and groundwater samples for the same COPCs).	
	Consistent methodologies and experienced sampler Comparable methods for soil sampling were used for the PSI and additional sampling in the DSI. Tetra Techs SOPs were consistently followed by an experienced Tetra Tech Scientist for each sampling event.	
Representativeness	Appropriate media identified and sampled according to the field program. Soil and groundwater were sampled in general accordance with the sampling and analysis plan.	Appropriate collection, handling, storage and preservation. Samples were appropriately collected, handled, stored and preserved as noted in Section E.5. Samples were received at the laboratory in good condition and within holding times (except as noted in in Section E.5.). Collected samples were analysed by NATA accredited laboratories.
	Samples properly and adequately preserved and kept in proper custody Samples collected into laboratory supplied containers (jars, bottles and ziplock bags) appropriate for the analysis and placed on ice in an esky for storage and transport to the laboratory under chain of custody documentation.	Analysis of field duplicates Field duplicates were analysed by the laboratory for the COPCs.

	Samples must be collected to reflect characteristics of each medium. Samples were collected at regular intervals within the subsurface profile and considered to be sufficiently representative of the fill material. Field duplicates were collected to assess the representativeness of samples. Trip Blanks and Trip Spikes were included in the field program where analysis of volatiles was to be undertaken and analysed by the laboratory. These are assessed in Section E.4. No non-conformances were identified.	Analysis of laboratory duplicates Laboratory duplicates were analysed in general accordance with Schedule B2 in ASC NEPM (2013).
Precision	Field program appropriate and complied with. The field program was developed to meet the investigation objectives with reference to legislation (ASC NEPM) and guidance (NSW EPA 2022 <i>Sampling design part 1 -application, Contaminated Land Guidelines</i>).	Assessment of Laboratory Duplicates Laboratory duplicates were analysed as part of the QAQC program of the laboratories. RPDs for laboratory duplicates are presented in the laboratory reports and assessed below in Section E.6.
	Assessment of Field Duplicates Analysis was performed on field duplicates in excess of the requirement for 1:20. Relative Percent Difference (RPD) was calculated for field duplicates. RPD criteria for field duplicates are provided in Section E.2. RPDs are assessed below in Section E.4 with exceedances of criteria presented.	Analysis of Laboratory QC samples The laboratory analysed method blanks, laboratory control samples, matrix spikes, and surrogates. Assessment of laboratory QC samples is presented in Section E.6. Analysis of Laboratory Control Samples (LCS) LCS recoveries within acceptable limits. Analysis of Matrix Spikes Some matrix spike recoveries were outside of acceptance criteria or unable to be determined. These are presented in Section E.6
Accuracy	Are SOPs appropriate and complied with? Tetra Techs SOPs were followed in completion of this investigation.	Analysis of Laboratory QC samples The laboratory analysed method blanks, laboratory control samples, matrix spikes, and surrogates. Assessment of laboratory QC samples is presented in Section E.6. Analysis of Method Blanks No detections of COPCs were reported in Method Blanks.
	Was sampling equipment calibrated? Calibration certificates are presented in Appendix G.	Analysis of Laboratory Control Samples LCS recoveries within acceptable limits.
	Detection of artefacts or external factors, e.g. contamination blanks Laboratory prepared Trip Spikes and Blanks were taken into the field and submitted for analysis. Assessment of Trip Spike recoveries and Trip Blank concentrations is presented in Section E.4. Acceptable recoveries were obtained for Trip Spikes. Concentrations in Trip Blanks were below LOR.	Analysis of Laboratory surrogates Some surrogate recoveries were reported outside acceptance limits. These are presented and discussed in Section E.6.

E.4 FIELD PROGRAM AND QUALITY CONTROL

Primary and Field QC sample summary

Counts of samples analysed during the field program are summarised in the Table below.

Number of Primary Samples	67
Sampling Events	3
Intra-laboratory Field Duplicates (at least 1 in 20 samples)	5
Inter-laboratory Field Duplicates (at least 1 in 20 samples)	1
Trip Blanks (at least 1 per sampling event)	3
Trip Spike (where loss of organics in transport is considered a risk)	3
Equipment Rinsate (at least 1/day/matrix/ reused equipment)	1

Comments

66 primary samples were collected (including 66 soil, and 1 groundwater) and sent to the primary laboratory Eurofins for the field program over three sampling events (PSI soil investigation, DSI soil investigation and GME). Four samples were submitted for TCLP analysis.

Two inter-laboratory duplicate sample were collected and submitted for laboratory analysis to the secondary laboratory Australian Laboratory Services (ALS). In some cases, the triplicate sample was also submitted to the primary lab, therefore there are less interlab duplicates. Results of field quality control samples are presented as attachments at this QAQC report. Eight additional samples were submitted for asbestos analysis only.

Samples were collected and analysed in accordance with the Sampling and Analysis plan including collection of the specified samples, analysis for identified COPCs, following documented protocols.

Inter-Laboratory and Intra-Laboratory Duplicates

QUESTION	YES	NO (Comment below)
Were an <u>Adequate Number</u> of inter-laboratory and inter-laboratory duplicates analysed for each chemical?	☒	☐
Were RPDs within Control Limits?	☐	☒

Comments

Field duplicates were collected at a rate of at least 1:20 as required for each sample batch.

Primary and duplicate RPDs exceedances reported were generally attributable to heterogeneity between the primary and duplicate/triplicate sample, due to the presence of fill and in particular for the PAHs due to the potential influence of asphalt fragments for sample BH4A_0.1-0.2 which was collected immediately below the asphalt layer. Where an RPD exceedance was reported, the higher concentration was used for assessment against the adopted site criteria.

The RPD exceedances are summarised in the Table below. The full RPD results tables are presented as an attachment to this Appendix.

Primary Sample	QC sample	Analyte	RPD (%)
BH17_0.5-0.7	QC4	Lead	57
	QC3	Arsenic	53
		Lead	98
		Zinc	46
BH4A_0.1-0.2	QC1A	TRH F3 (C ₁₆ - C ₃₄)	118
		TRH F4 (C ₃₄ - C ₄₀)	112
		TPH C ₁₅ - C ₂₈	111
		TPH C ₂₉ - C ₃₆	128
		Lead	58
		Benzo(b+j)fluoranthene	116
		Acenaphthene	94
		Anthracene	81
		Benz(a)anthracene	111
		Benzo(a) pyrene	109
		Benzo(g,h,i)perylene	196
		Benzo(k)fluoranthene	122
		Chrysene	106
		Dibenz(a,h)anthracene	101
		Fluoranthene	110
		Fluorene	127
		Indeno(1,2,3-c,d)pyrene	104
		Phenanthrene	119
		Pyrene	113
	QC2A	TPH C ₂₉ - C ₃₆	51
		Arsenic	63
		Zinc	51
		Anthracene	36
		Benzo(g,h,i)perylene	185
		Benzo(k)fluoranthene	50
		Dibenz(a,h)anthracene	59
		Indeno(1,2,3-c,d)pyrene	35
MW01	QC2	Arsenic	100
		Cadmium	40
		Copper	67

Trip Blanks

QUESTION	YES	NO (Comment below)
Was a trip blank included for each sample batch?	☒	☐
Were the Trip Blanks free of contaminants? (If no, comment whether the contaminants present are also detected in the samples and whether they are common laboratory chemicals.)	☒	☐

Comments

Trip Blank results are presented in a Table attached to this Appendix.

Trip Spikes

QUESTION	YES	NO (Comment below)
Was a trip spike included for each sample batch?	☒	☐
Was analyte recovery suitable (70 – 130%)? (If no, comment whether the low recovery and apparent concentrations may present a risk of a false negative.)	☒	☐

Comments

Trip Spike results are presented in a Table attached to this Appendix.

Rinsate Blanks

QUESTION	YES	NO (Comment below)
Were Rinsates from reusable equipment collected and analysed for each day?	☒	☐
Were the Equipment Rinsates free of contaminants? (If no, comment whether the contaminants present are also detected in the samples and whether they are common laboratory chemicals.)	☐	☐

Comments

Rinsates were generally not required for the soil assessment due to collection of soil samples by hand using new nitrile gloves for each sample. Groundwater was collected using separate Hydrasleeves installed in each well. No rinsate was collected from the interface probe which was used to gauge the wells. The IP was decontaminated between each groundwater well in accordance with the SAQP, therefore this non-conformance is not considered to affect the assessment outcome

Field QA/QC was:	☐	Satisfactory
	☒	Partially Satisfactory
	☐	Unsatisfactory

The Field QA/QC was considered to be partially satisfactory with consideration of the non-conformances identified. Non-conformances were not considered to affect the assessment outcome.

E.5 SAMPLE HANDLING

QUESTION	YES	NO (Comment below)
Were the sample holding times met?	☐	☒
Were the samples in proper custody between the field and reaching the laboratory?	☒	☐
Were the samples properly and adequately preserved? <i>This includes keeping the samples chilled, where applicable.</i>	☒	☐
Were the samples received by the laboratory in good condition?	☒	☐

Comments

Sample handling was conducted under chain of custody and in general accordance with Tetra Tech field quality assurance procedures. Conformance to QA/QC procedures are summarised in the following subsections.

Holding Times

Holding time exceedances reported are presented in the Table below.

Laboratory report	Analysis	Holding Time Exceedance (days)	Comment
1107687	Conductivity (1:5 aqueous extract)	1 Extraction ; 5 Analysis	5 samples
1114316	Benzo(a)pyrene	6 Extraction ; 7 Analysis	3 TCLP samples

Comments:

The holding times exceedances are considered minor, only applicable for conductivity analysis and TCLP analysis conducted on benzo(a)pyrene. Given the minor nature of these exceedances, the usability of the data is not considered to be influenced by these exceedances.

Proper Custody

Comments: Samples were kept on ice in an esky upon collection and provided to the laboratory chain of custody documentation.

Preservation

Comments: Samples were properly and adequately preserved.

Sample Receipt

Comments: Sample receipt was reviewed for each batch and confirmed the samples were received in good condition.

Sample Handling was:	☒	Satisfactory
	☐	Partially Satisfactory
	☐	Unsatisfactory

Sample handling was considered 'satisfactory' with consideration to the non-conformances identified. These were not considered to affect the usability of the data.

E.6 LABORATORY QUALITY ASSURANCE QUALITY CONTROL

Laboratories

QUESTION	YES	NO (Comment below)
Were NATA registered laboratories used?	☒	☐
Did the laboratories perform the requested tests?	☒	☐
Were the laboratory methods adopted NATA endorsed?	☒	☐
Were the appropriate test procedures followed?	☒	☐
Were the reporting limits satisfactory?	☒	☐
Was the NATA Seal on the reports?	☒	☐
Were the reports signed by an authorised person?	☒	☐

Comments

Eurofins – were engaged as the primary laboratories for analysis of all matrices. The laboratories are NATA accredited for soil and water for all the analytes requiring analysis.

ALS – were engaged as the secondary laboratory for analysis of soil and water samples. The laboratories are NATA accredited for soil and water for all the analytes requiring analysis.

Precision / Accuracy of the Laboratory Report	☒	Satisfactory
	☐	Partially Satisfactory
	☐	Unsatisfactory

Internal Laboratory Quality Control

QUESTION	YES	NO (Comment below)
Were the laboratory blanks/reagents blanks free of contamination?	☒	☐
Were the spike recoveries within control limits?	☐	☒
Were the RPDs of the laboratory duplicates within control limits?	☐	☒
Were the surrogate recoveries within control limits?	☐	☒

Laboratory Blanks

All laboratory method blank results reported concentrations of contaminants below the laboratory reporting limits.

Laboratory Duplicates

Internal laboratory duplicates reported exceedances of laboratory criteria. The exceedances are presented in the Table below with laboratory explanatory notes in the table footnotes.

Lab Report	Analyte	RPD (%)
1138492	Zinc	77 ^a
1108144	Arsenic	46 ^a
	Chromium	34 ^a
1107687	Benzo(b&j)fluoranthene	37 ^a
	Phenanthrene	33 ^a
	Benz(a)anthracene	100 ^a
	Benzo(a)pyrene	130 ^a
	Benzo(b&j)fluoranthene	110 ^a
	Benzo(g,h,i)perylene	110 ^a
	Benzo(k)fluoranthene	80 ^a
	Chrysene	98 ^a
	Fluoranthene	110 ^a
	Indeno(1.2.3-cd)pyrene	110 ^a
	Phenanthrene	100 ^a
	Pyrene	110 ^a
	Arsenic	46 ^a
	Chromium	34 ^a
	Total Organic Carbon	61 ^a
	Lead	36 ^a
	Copper	42 ^a
	Arsenic	34 ^a
	Chromium	47 ^a
ES2429051	Lead	43.4 ^e

^a - 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.

^b - RPD failed acceptance criteria due to sample heterogeneity.

^c - Reanalysis of sample in duplicate confirmed sample heterogeneity and inconsistency of results.

^d - The duplicate %RPD is outside the recommended acceptance criteria. Further analysis indicates sample heterogeneity as the cause

^e - Poor precision was obtained. Confirmed by redigestion and reanalysis.

Comments:

Exceedances were reported for Eurofins laboratory duplicates of the general RPD criteria of 30%. However, these samples were noted to be within acceptable limits as noted:

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%

Laboratory Control Samples

Batch	Analyte	Recovery	Lower Limit	Upper Limit
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Comments: No exceedances were reported

Matrix spikes

Matrix Spikes which reported recoveries outside laboratory criteria or where not able to be determined are presented in the Table below with laboratory explanatory notes in the table footnotes.

Batch	Analyte	Recovery	Lower Limit	Upper Limit
1138492	Benzo(k)fluoranthene	141 ^d	70	130
	2,4,5-Trichlorophenol	132 ^d	30	130
	Tetrachlorophenols - Total	137 ^d	30	130

^a - Recovery failed acceptance criteria / unable to be determined due to the presence of significant concentration of analyte

^b – Recovery not able to be reported due to inhomogeneous nature of element in sample. An acceptable recovery was obtained for the LCS

^c - Recovery failed acceptance criteria due to sample heterogeneity.

^d - The matrix spike recovery is outside of the recommended acceptance criteria. An acceptable recovery was obtained for the laboratory control sample indicating a sample matrix interference.

Comments:

Exceedances of laboratory criteria for Matrix Spikes were identified for only a few samples and related to sample matrix interference.

Surrogates

Surrogate recoveries outside laboratory criteria are presented in the Table below with laboratory explanatory notes in the table footnotes.

Batch	Analyte	Primary samples	Recovery	Lower Limit	Upper Limit
1107687	Dibutylchlorendate (OCP and PCB)	7	INT ^b	70	130
	Dibutylchlorendate (OCP and PCB)	9	55 - 67	70	130
	Dibutylchlorendate (OCP and PCB)	4	131 - 142	70	130
	Triphenylphosphate (OPP)	4	INT ^b	70	130
	Triphenylphosphate (OPP)	11	51 - 68	70	130
	Triphenylphosphate (OPP)	1	138	70	130
	4-Bromofluorobenzene (BTEX and Volatile TRH)	2	INT ^b	50	150
	Tetrachlorometaxylene (OCP and PCB)	12	52 - 68	70	130
1135930	4-Terphenyl-d14	1	148	30	130

^a - Recovery not determined due to chromatographic interference

^b - The Surrogate recovery is outside of the recommended acceptance criteria due to matrix interference. Acceptance criteria were met for all other QC

Comments:

Surrogate recoveries for Dibutylchlorodate (OCP and PCB) , Triphenylphosphate (OPP) Tetrachlorometaxylene (OCP and PCB) were below and/or above the nominated criteria (70 -130) for several samples. Recovery of the surrogate 4-Terphenyl-d14 was above the upper limit. Other surrogates documented had recoveries unable to be reported due to matrix interference.

OCPs, OPPs, PCBs and Phenols were not reported above the LOR in any primary samples, therefore this is not considered to affect the investigation outcome.

Quality Control Frequency

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.

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.

Laboratory internal QA/QC was	☒	Satisfactory
	☐	Partially Satisfactory
	☐	Unsatisfactory

Comments:

The laboratory internal QA/QC was considered to be satisfactory with consideration of the non-conformances identified, which was primarily matrix interference. Sample heterogeneity was attributed to variation in the coarse fractions between sample duplicates.

Data Usability Summary

Data Directly Usable	☒
Data Usable with the following corrections/modifications (see comment below)	☐
Data Not Usable.	☐

In summary, non-conformances were identified in the QA/QC data. These non-conformances however, as discussed above in this data validation report, are not considered to preclude the use of the analytical data for interpretation of the contamination status of the Site.

Sample Type Field ID Date Lab Report Number			Normal	Field_D	RPD	Normal	Field_D	RPD	Normal	Field_D	RPD	Normal
			BH11_0.0-0.2	QC2		BH11_0.0-0.2	QC1		BH17_0.5-0.7	QC4		BH17_0.5-0.7
			12 Jun 2024	12 Jun 2024		12 Jun 2024	12 Jun 2024		13 Jun 2024	12 Jun 2024		13 Jun 2024
			1107687	1107687		1107687	1107687		1107687	1107687		1107687
	Unit	EQL										
Total Recoverable Hydrocarbons												
C6 - C10	mg/kg	10	<20	<20	0	<20	<20	0	<20	<20	0	<20
F1 (C6 - C10) less BTEX	mg/kg	10	<20	<20	0	<20	<20	0	<20	<20	0	<20
C10 - C16	mg/kg	50	<50	<50	0	<50	<50	0	<50	<50	0	<50
F2 C10 - C16 (minus Naphthalene)	mg/kg	50	<50	<50	0	<50	<50	0	<50	<50	0	<50
F3 (C16 - C34)	mg/kg	100	<100	<100	0	<100	100	0	<100	110	10	<100
F4 (C34 - C40)	mg/kg	100	<100	<100	0	<100	<100	0	<100	150	40	<100
Total Petroleum Hydrocarbons												
C6 - C9	mg/kg	10	<20	<20	0	<20	<20	0	<20	<20	0	<20
C10 - C14	mg/kg	20	<20	<20	0	<20	<20	0	<20	<20	0	<20
C15 - C28	mg/kg	50	<50	<50	0	<50	63	23	<50	<50	0	<50
C29 - C36	mg/kg	50	<50	<50	0	<50	76	41	<50	110	75	<50
BTEXN												
Benzene	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1
Toluene	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1
Ethyl Benzene	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1
m,p-Xylene	mg/kg	0.2	<0.2	<0.2	0	<0.2	<0.2	0	<0.2	<0.2	0	<0.2
o-Xylene	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1
Total Xylenes	mg/kg	0.3	<0.3	<0.3	0	<0.3	<0.3	0	<0.3	<0.3	0	<0.3
Naphthalene (VOC)	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5
Metals												
Arsenic	mg/kg	2	4.9	5.8	17	4.9	7.4	41	19	12	45	19
Cadmium	mg/kg	0.4	<0.4	<0.4	0	<0.4	<0.4	0	<0.4	<0.4	0	<0.4
Chromium (III+VI)	mg/kg	2	10	12	18	10	13	26	14	12	15	14
Copper	mg/kg	5	20	20	0	20	21	5	14	17	19	14
Lead	mg/kg	5	46	46	0	46	55	18	27	15	57	27
Mercury	mg/kg	0.1	0.4	0.3	29	0.4	0.3	29	0.1	<0.1	0	0.1
Nickel	mg/kg	2	15	18	18	15	25	50	26	32	21	26
Zinc	mg/kg	5	97	93	4	97	110	13	62	47	28	62
Polycyclic Aromatic Hydrocarbons												
Benzo(b+j)fluoranthene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5
Acenaphthene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5
Acenaphthylene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5
Anthracene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5
Benz(a)anthracene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5
Benzo(a) pyrene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5
Benzo(g,h,i)perylene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5
Benzo(k)fluoranthene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5
Chrysene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5
Dibenz(a,h)anthracene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5
Fluoranthene	mg/kg	0.5	<0.5	<0.5	0	<0.5	0.5	0	<0.5	<0.5	0	<0.5
Fluorene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5
Indeno(1,2,3-c,d)pyrene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5
Naphthalene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5
Phenanthrene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5
Pyrene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5
PCBs												
Arochlor 1016	mg/kg	0.1	<1	-	-	<1	-	-	<1	-	-	<1
Arochlor 1221	mg/kg	0.1	<1	-	-	<1	-	-	<1	-	-	<1
Arochlor 1232	mg/kg	0.1	<1	-	-	<1	-	-	<1	-	-	<1
Arochlor 1242	mg/kg	0.1	<1	-	-	<1	-	-	<1	-	-	<1
Arochlor 1248	mg/kg	0.1	<1	-	-	<1	-	-	<1	-	-	<1
Arochlor 1254	mg/kg	0.1	<1	-	-	<1	-	-	<1	-	-	<1
Arochlor 1260	mg/kg	0.1	<1	-	-	<1	-	-	<1	-	-	<1
PCBs (Sum of total)	mg/kg	0.1	<1	-	-	<1	-	-	<1	-	-	<1
Organochlorine Pesticides												
Organochlorine pesticides EPAVic	mg/kg	0.1	<1	-	-	<1	-	-	<1	-	-	<1
Other organochlorine pesticides EPAVic												
4,4-DDE	mg/kg	0.05	<0.5	-	-	<0.5	-	-	<0.5	-	-	<0.5
a-BHC	mg/kg	0.05	<0.5	-	-	<0.5	-	-	<0.5	-	-	<0.5
Aldrin	mg/kg	0.05	<0.5	-	-	<0.5	-	-	<0.5	-	-	<0.5
Aldrin + Dieldrin	mg/kg	0.05	<0.5	-	-	<0.5	-	-	<0.5	-	-	<0.5
b-BHC	mg/kg	0.05	<0.5	-	-	<0.5	-	-	<0.5	-	-	<0.5
chlordane	mg/kg	0.1	<1	-	-	<1	-	-	<1	-	-	<1
d-BHC	mg/kg	0.05	<0.5	-	-	<0.5	-	-	<0.5	-	-	<0.5
DDD	mg/kg	0.05	<0.5	-	-	<0.5	-	-	<0.5	-	-	<0.5
DDT	mg/kg	0.05	<0.5	-	-	<0.5	-	-	<0.5	-	-	<0.5
DDT+DDE+DDD	mg/kg	0.05	<0.5	-	-	<0.5	-	-	<0.5	-	-	<0.5
Dieldrin	mg/kg	0.05	<0.5	-	-	<0.5	-	-	<0.5	-	-	<0.5
Endrin aldehyde	mg/kg	0.05	<0.5	-	-	<0.5	-	-	<0.5	-	-	<0.5
Endrin ketone	mg/kg	0.05	<0.5	-	-	<0.5	-	-	<0.5	-	-	<0.5
Endosulfan I	µg/kg	50	<500	-	-	<500	-	-	<500	-	-	<500
Endosulfan II	mg/kg	0.05	<0.5	-	-	<0.5	-	-	<0.5	-	-	<0.5
Endosulfan sulphate	mg/kg	0.05	<0.5	-	-	<0.5	-	-	<0.5	-	-	<0.5
Endrin	mg/kg	0.05	<0.5	-	-	<0.5	-	-	<0.5	-	-	<0.5
g-BHC (Lindane)	mg/kg	0.05	<0.5	-	-	<0.5	-	-	<0.5	-	-	<0.5
Heptachlor	mg/kg	0.05	<0.5	-	-	<0.5	-	-	<0.5	-	-	<0.5
Heptachlor epoxide	mg/kg	0.05	<0.5	-	-	<0.5	-	-	<0.5	-	-	<0.5
Methoxychlor	µg/kg	50	<500	-	-	<500	-	-	<500	-	-	<500
Toxaphene	mg/kg	0.5	<10	-	-	<10	-	-	<10	-	-	<10
Organophosphorous Pesticides												
Tokuthion	mg/kg	0.2	<0.5	-	-	<0.5	-	-	<0.5	-	-	<0.5
Azinophos methyl	mg/kg	0.2	<0.5	-	-	<0.5	-	-	<0.5	-	-	<0.5
Bolstar (Sulprofos)	mg/kg	0.2	<0.5	-	-	<0.5	-	-	<0.5	-	-	<0.5
Chlorfenvinphos	mg/kg	0.2	<0.5	-	-	<0.5	-	-	<0.5	-	-	<0.5
Chlorpyrifos	mg/kg	0.2	<0.5	-	-	<0.5	-	-	<0.5	-	-	<0.5
Chlorpyrifos-methyl	mg/kg	0.2	<0.5	-	-	<0.5	-	-	<0.5	-	-	<0.5
Coumaphos	mg/kg	2	<5	-	-	<5	-	-	<5	-	-	<5
Demeton-O	mg/kg	0.2	<0.5	-	-	<0.5	-	-	<0.5	-	-	<0.5
Demeton-S	mg/kg	0.2	<0.5	-	-	<0.5	-	-	<0.5	-	-	<0.5
Diazinon	mg/kg	0.2	<0.5	-	-	<0.5	-	-	<0.5	-	-	<0.5
Dichlorvos	mg/kg	0.2	<0.5	-	-	<0.5	-	-	<0.5	-	-	<0.5
Disulfoton	mg/kg	0.2	<0.5	-	-	<0.5	-	-	<0.5	-	-	<0.5
Dimethoate	mg/kg	0.2	<0.5	-	-	<0.5	-	-	<0.5	-	-	<0.5
Ethoprop	mg/kg	0.2	<0.5	-	-	<0.5	-	-	<0.5	-	-	<0.5
Ethion	mg/kg	0.2	<0.5	-	-	<0.5	-	-	<0.5	-	-	<0.5
Fenitrothion	mg/kg	0.2	<0.5	-	-	<0.5	-	-	<0.5	-	-	<0.5
Fensulfothion	mg/kg	0.2	<0.5	-	-	<0.5	-	-	<0.5	-	-	<0.5
Fenthion	mg/kg	0.2	<0.5	-	-	<0.5	-	-	<0.5	-	-	<0.5
EPN	mg/kg	0.2	<0.5	-	-	<0.5	-	-	<0.5	-	-	<0.5
Merphos	mg/kg	0.2	<0.5	-	-	<0.5	-	-	<0.5	-	-	<0.5
Malathion	mg/kg	0.2	<0.5	-	-	<0.5	-	-	<0.5	-	-	<0.5
Methyl parathion	mg/kg	0.2	<0.5	-	-	<0.5	-	-	<0.5	-	-	<0.5
Mevinphos (Phosdrin)	mg/kg	0.2	<0.5	-	-	<0.5	-	-	<0.5	-	-	<0.5
Monocrotophos	mg/kg	2	<5	-	-	<5	-	-	<5	-	-	<5
Naled (Dibrom)	mg/kg	0.2	<0.5	-	-	<0.5	-	-	<0.5	-	-	<0.5
Omethoate	mg/kg	2	<5	-	-	<5	-	-	<5	-	-	<5
Phorate	mg/kg	0.2	<0.5	-	-	<0.5	-	-	<0.5	-	-	<0.5
Pyrazophos	mg/kg	0.2	<0.5	-	-	<0.5	-	-	<0.5	-	-	<0.5
Ronnel	mg/kg	0.2	<0.5	-	-	<0.5	-	-	<0.5	-	-	<0.5
Terbufos	mg/kg	0.2	<0.5	-	-	<0.5	-	-	<0.5	-	-	<0.5
Trichloronate	mg/kg	0.2	<0.5	-	-	<0.5	-	-	<0.5	-	-	<0.5
Tetrachlorvinphos	mg/kg	0.2	<0.5	-	-	<0.5	-	-	<0.5	-	-	<0.5
Pesticides												
Parathion	mg/kg	0.2	<0.5	-	-	<0.5	-	-	<0.5	-	-	<0.5
Pirimiphos-methyl	mg/kg	0.2	<0.5	-	-	<0.5	-	-	<0.5	-	-	<0.5
Halogenated Benzenes												
Hexachlorobenzene	mg/kg	0.05	<0.5	-	-	<0.5	-	-	<0.5	-	-	<0.5

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

**Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RPDs for each EQL multiplier range are: 50 (5 - 10 x EQL); 30 (> 10 x EQL))

***Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary laboratory

Sample Type Field ID Date Lab Report Number	Unit	EQL	RPD		RPD		RPD		RPD	
Total Recoverable Hydrocarbons										
C6 - C10	mg/kg	10	<20	0	<20	<20	0	<20	<10	0
F1 (C6 - C10) less BTEX	mg/kg	10	<20	0	<20	<20	0	<20	<10	0
C10 - C16	mg/kg	50	<50	0	<50	<50	0	<50	<50	0
F2 C10 - C16 (minus Naphthalene)	mg/kg	50	<50	0	<50	<50	0	<50	<50	0
F3 (C16 - C34)	mg/kg	100	<100	0	540	2,100	118	540	750	33
F4 (C34 - C40)	mg/kg	100	<100	0	190	670	112	190	300	45
Total Petroleum Hydrocarbons										
C6 - C9	mg/kg	10	<20	0	<20	<20	0	<20	<10	0
C10 - C14	mg/kg	20	<20	0	<20	<20	0	<20	<50	0
C15 - C28	mg/kg	50	<50	0	400	1,400	111	400	500	22
C29 - C36	mg/kg	50	50	0	220	1,000	128	220	370	51
BTEXN										
Benzene	mg/kg	0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.2	0
Toluene	mg/kg	0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.5	0
Ethyl Benzene	mg/kg	0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.5	0
m,p-Xylene	mg/kg	0.2	<0.2	0	<0.2	<0.2	0	<0.2	<0.5	0
o-Xylene	mg/kg	0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.5	0
Total Xylenes	mg/kg	0.3	<0.3	0	<0.3	<0.3	0	<0.3	<0.5	0
Naphthalene (VOC)	mg/kg	0.5	<0.5	0	<0.5	<0.5	0	<0.5	<1	0
Metals										
Arsenic	mg/kg	2	11	53	5.2	5.4	4	5.2	10	63
Cadmium	mg/kg	0.4	<0.4	0	<0.4	1.0	86	<0.4	<1	0
Chromium (III+VI)	mg/kg	2	19	30	12	11	9	12	17	34
Copper	mg/kg	5	<5	95	31	37	18	31	35	12
Lead	mg/kg	5	9.2	98	200	110	58	200	156	25
Mercury	mg/kg	0.1	<0.1	0	<0.1	0.1	0	<0.1	<0.1	0
Nickel	mg/kg	2	16	48	31	26	18	31	32	3
Zinc	mg/kg	5	39	46	370	390	5	370	620	51
Polycyclic Aromatic Hydrocarbons										
Benzo(b+j)fluoranthene	mg/kg	0.5	<0.5	0	22	83	116	22	25.5	15
Acenaphthene	mg/kg	0.5	<0.5	0	1.3	3.6	94	1.3	1.0	26
Acenaphthylene	mg/kg	0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
Anthracene	mg/kg	0.5	<0.5	0	8.5	20	81	8.5	5.9	36
Benzo(a)anthracene	mg/kg	0.5	<0.5	0	21	73	111	21	20.3	3
Benzo(a) pyrene	mg/kg	0.5	<0.5	0	21	71	109	21	18.6	12
Benzo(g,h,i)perylene	mg/kg	0.5	<0.5	0	0.6	61	196	0.6	15.6	185
Benzo(k)fluoranthene	mg/kg	0.5	<0.5	0	16	66	122	16	9.6	50
Chrysene	mg/kg	0.5	<0.5	0	23	75	106	23	18.8	20
Dibenz(a,h)anthracene	mg/kg	0.5	<0.5	0	5.9	18	101	5.9	3.2	59
Fluoranthene	mg/kg	0.5	<0.5	0	67	230	110	67	58.8	13
Fluorene	mg/kg	0.5	<0.5	0	0.8	3.6	127	0.8	0.9	12
Indeno(1,2,3-c,d)pyrene	mg/kg	0.5	<0.5	0	17	54	104	17	11.9	35
Naphthalene	mg/kg	0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
Phenanthrene	mg/kg	0.5	<0.5	0	23	90	119	23	24.0	4
Pyrene	mg/kg	0.5	<0.5	0	53	190	113	53	47.6	11
PCBs										
Arochlor 1016	mg/kg	0.1	-	-	-	-	-	-	-	-
Arochlor 1221	mg/kg	0.1	-	-	-	-	-	-	-	-
Arochlor 1232	mg/kg	0.1	-	-	-	-	-	-	-	-
Arochlor 1242	mg/kg	0.1	-	-	-	-	-	-	-	-
Arochlor 1248	mg/kg	0.1	-	-	-	-	-	-	-	-
Arochlor 1254	mg/kg	0.1	-	-	-	-	-	-	-	-
Arochlor 1260	mg/kg	0.1	-	-	-	-	-	-	-	-
PCBs (Sum of total)	mg/kg	0.1	-	-	-	-	-	-	-	-
Organochlorine Pesticides										
Organochlorine pesticides EPAVic	mg/kg	0.1	-	-	-	-	-	-	-	-
Other organochlorine pesticides										
EPAVic	mg/kg	0.1	-	-	-	-	-	-	-	-
4,4-DDE	mg/kg	0.05	-	-	-	-	-	-	-	-
a-BHC	mg/kg	0.05	-	-	-	-	-	-	-	-
Aldrin	mg/kg	0.05	-	-	-	-	-	-	-	-
Aldrin + Dieldrin	mg/kg	0.05	-	-	-	-	-	-	-	-
b-BHC	mg/kg	0.05	-	-	-	-	-	-	-	-
chlordane	mg/kg	0.1	-	-	-	-	-	-	-	-
d-BHC	mg/kg	0.05	-	-	-	-	-	-	-	-
DDD	mg/kg	0.05	-	-	-	-	-	-	-	-
DDT	mg/kg	0.05	-	-	-	-	-	-	-	-
DDT+DDE+DDD	mg/kg	0.05	-	-	-	-	-	-	-	-
Dieldrin	mg/kg	0.05	-	-	-	-	-	-	-	-
Endrin aldehyde	mg/kg	0.05	-	-	-	-	-	-	-	-
Endrin ketone	mg/kg	0.05	-	-	-	-	-	-	-	-
Endosulfan I	µg/kg	50	-	-	-	-	-	-	-	-
Endosulfan II	mg/kg	0.05	-	-	-	-	-	-	-	-
Endosulfan sulphate	mg/kg	0.05	-	-	-	-	-	-	-	-
Endrin	mg/kg	0.05	-	-	-	-	-	-	-	-
g-BHC (Lindane)	mg/kg	0.05	-	-	-	-	-	-	-	-
Heptachlor	mg/kg	0.05	-	-	-	-	-	-	-	-
Heptachlor epoxide	mg/kg	0.05	-	-	-	-	-	-	-	-
Methoxychlor	µg/kg	50	-	-	-	-	-	-	-	-
Toxaphene	mg/kg	0.5	-	-	-	-	-	-	-	-
Organophosphorous Pesticides										
Tokuthion	mg/kg	0.2	-	-	-	-	-	-	-	-
Azinophos methyl	mg/kg	0.2	-	-	-	-	-	-	-	-
Bolstar (Sulprofos)	mg/kg	0.2	-	-	-	-	-	-	-	-
Chlorfenvinphos	mg/kg	0.2	-	-	-	-	-	-	-	-
Chlorpyrifos	mg/kg	0.2	-	-	-	-	-	-	-	-
Chlorpyrifos-methyl	mg/kg	0.2	-	-	-	-	-	-	-	-
Coumaphos	mg/kg	2	-	-	-	-	-	-	-	-
Demeton-O	mg/kg	0.2	-	-	-	-	-	-	-	-
Demeton-S	mg/kg	0.2	-	-	-	-	-	-	-	-
Diazinon	mg/kg	0.2	-	-	-	-	-	-	-	-
Dichlorvos	mg/kg	0.2	-	-	-	-	-	-	-	-
Disulfoton	mg/kg	0.2	-	-	-	-	-	-	-	-
Dimethoate	mg/kg	0.2	-	-	-	-	-	-	-	-
Ethoprop	mg/kg	0.2	-	-	-	-	-	-	-	-
Ethion	mg/kg	0.2	-	-	-	-	-	-	-	-
Fenitrothion	mg/kg	0.2	-	-	-	-	-	-	-	-
Fensulfothion	mg/kg	0.2	-	-	-	-	-	-	-	-
Fenthion	mg/kg	0.2	-	-	-	-	-	-	-	-
EPN	mg/kg	0.2	-	-	-	-	-	-	-	-
Merphos	mg/kg	0.2	-	-	-	-	-	-	-	-
Malathion	mg/kg	0.2	-	-	-	-	-	-	-	-
Methyl parathion	mg/kg	0.2	-	-	-	-	-	-	-	-
Mevinphos (Phosdrin)	mg/kg	0.2	-	-	-	-	-	-	-	-
Monocrotophos	mg/kg	2	-	-	-	-	-	-	-	-
Naled (Dibrom)	mg/kg	0.2	-	-	-	-	-	-	-	-
Omethoate	mg/kg	2	-	-	-	-	-	-	-	-
Phorate	mg/kg	0.2	-	-	-	-	-	-	-	-
Pyrazophos	mg/kg	0.2	-	-	-	-	-	-	-	-
Ronnel	mg/kg	0.2	-	-	-	-	-	-	-	-
Terbufos	mg/kg	0.2	-	-	-	-	-	-	-	-
Trichloronate	mg/kg	0.2	-	-	-	-	-	-	-	-
Tetrachlorvinphos	mg/kg	0.2	-	-	-	-	-	-	-	-
Pesticides										
Parathion	mg/kg	0.2	-	-	-	-	-	-	-	-
Pirimiphos-methyl	mg/kg	0.2	-	-	-	-	-	-	-	-
Halogenated Benzenes										
Hexachlorobenzene	mg/kg	0.05	-	-	-	-	-	-	-	-

*RPDs have only been considered where a concentration is greater than 1 times the EQL.
**Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RPDs for each EQL multiplier r2
***Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. An

		Field ID	Rinsate
		Date	11 Sep 2024
Lab Report Number		1138039	
	Unit	EQL	
Total Recoverable Hydrocarbons			
C6 - C10	ug/L	20	<20
	%	1	-
F1 (C6 - C10) less BTEX	ug/L	20	<20
C10 - C16	ug/L	50	<50
F2 C10 - C16 (minus Naphthalene)	ug/L	50	<50
F3 (C16 - C34)	ug/L	100	<100
F4 (C34 - C40)	ug/L	100	<100
C10 - C40 (Sum of total)	ug/L	100	<100
Total Petroleum Hydrocarbons			
C6 - C9	ug/L	20	<20
	%	1	-
C10 - C14	ug/L	50	<50
C15 - C28	ug/L	100	<100
C29 - C36	ug/L	100	<100
C10 - C36 (Sum of total)	ug/L	100	<100
BTEXN			
Benzene	ug/L	1	<1
	%	1	-
Toluene	ug/L	1	<1
	%	1	-
Ethyl Benzene	ug/L	1	<1
	%	1	-
m,p-Xylene	ug/L	2	<2
	%	1	-
o-Xylene	ug/L	1	<1
	%	1	-
Total Xylenes	ug/L	3	<3
	%	1	-
Naphthalene (VOC)	ug/L	10	<10
Naphthalene (VOC)	%	1	-
Metals			
Arsenic	ug/L	1	<1
Cadmium	ug/L	0.2	<0.2
Chromium (III+VI)	ug/L	1	<1
Copper	ug/L	1	<1
Lead	ug/L	1	<1
Mercury	ug/L	0.1	<0.1
Nickel	ug/L	1	<1
Zinc	ug/L	5	<5
Polycyclic Aromatic Hydrocarbons			
Benzo(b+j)fluoranthene	ug/L	1	<1
Acenaphthene	ug/L	1	<1
Acenaphthylene	ug/L	1	<1
Anthracene	ug/L	1	<1
Benz(a)anthracene	ug/L	1	<1
Benzo(a) pyrene	ug/L	1	<1
Benzo(g,h,i)perylene	ug/L	1	<1
Benzo(k)fluoranthene	ug/L	1	<1
Chrysene	ug/L	1	<1
Dibenz(a,h)anthracene	ug/L	1	<1
Fluoranthene	ug/L	1	<1
Fluorene	ug/L	1	<1
Indeno(1,2,3-c,d)pyrene	ug/L	1	<1
Naphthalene	ug/L	1	<1
Phenanthrene	ug/L	1	<1
Pyrene	ug/L	1	<1
PAHs (Sum of total)	ug/L	1	<1
Biological			
E. Coli	cfu/100 ml	1	-
	cfu/100 mL	1	-
Thermotolerant Coliforms	mL	1	-
Phenols			
2,4-Dinitrophenol	mg/L	0.03	<0.03
2,4,5-Trichlorophenol	mg/L	0.01	<0.01
2,4,6-Trichlorophenol	mg/L	0.01	<0.01
2,4-Dichlorophenol	mg/L	0.003	<0.003
2,4-Dimethylphenol	mg/L	0.003	<0.003
2,6-Dichlorophenol	µg/L	3	<3
2-Chlorophenol	mg/L	0.003	<0.003
2-Methylphenol	mg/L	0.003	<0.003
2-Nitrophenol	mg/L	0.01	<0.01
4,6-Dinitro-2-methylphenol	µg/L	30	<30
4,6-Dinitro-o-cyclohexyl phenol	mg/L	0.1	<0.1
4-Nitrophenol	mg/L	0.03	<0.03
4-chloro-3-methylphenol	mg/L	0.01	<0.01
Cresol Total	µg/L	10	<10
Pentachlorophenol	mg/L	0.01	<0.01
Phenol	µg/L	3	<3
Tetrachlorophenols	mg/L	0.03	<0.03
Phenols (Total Halogenated)	mg/L	0.01	<0.01
Phenols (Total Non Halogenated)	mg/L	0.1	<0.1
Herbicides			
Dinoseb	mg/L	0.1	<0.1

			Field ID	Trip Blank	Trip Blank	Trip Blank
			Date	12 Jun 2024	12 Jun 2024	03 Sep 2024
			Lab Report Number	1107687	1107687	1135930
	Unit	EQL				
Total Recoverable Hydrocarbons						
C6 - C10	mg/kg	20	<20	<20	<20	
F1 (C6 - C10) less BTEX	mg/kg	20	<20	<20	<20	
Total Petroleum Hydrocarbons						
C6 - C9	mg/kg	20	<20	<20	<20	
BTEXN						
Benzene	mg/kg	0.1	<0.1	<0.1	<0.1	
Toluene	mg/kg	0.1	<0.1	<0.1	<0.1	
Ethyl Benzene	mg/kg	0.1	<0.1	<0.1	<0.1	
m,p-Xylene	mg/kg	0.2	<0.2	<0.2	<0.2	
o-Xylene	mg/kg	0.1	<0.1	<0.1	<0.1	
Total Xylenes	mg/kg	0.3	<0.3	<0.3	<0.3	
Naphthalene (VOC)	mg/kg	0.5	<0.5	<0.5	<0.5	

Trip Spikes

Lab Report Number	Matrix Type	Field ID	Sampled Date/Time	Chem Name	Spike Recovery %
1107687	Soil	Trip Spike	12/06/2024	Ethyl Benzene	85
1107687	Soil	Trip Spike	12/06/2024	m,p-Xylene	88
1107687	Soil	Trip Spike	12/06/2024	Toluene	87
1107687	Soil	Trip Spike	12/06/2024	Total Xylenes	91
1107687	Soil	Trip Spike	12/06/2024	Benzene	80
1107687	Soil	Trip Spike	12/06/2024	Naphthalene (VOC)	100
1107687	Soil	Trip Spike	12/06/2024	o-Xylene	93
1107687	Soil	Trip Spike	12/06/2024	C6 - C10	87
1107687	Soil	Trip Spike	12/06/2024	C6 - C9	87
1107687	Soil	Trip Spike	12/06/2024	Ethyl Benzene	95
1107687	Soil	Trip Spike	12/06/2024	m,p-Xylene	98
1107687	Soil	Trip Spike	12/06/2024	Toluene	97
1107687	Soil	Trip Spike	12/06/2024	Total Xylenes	99
1107687	Soil	Trip Spike	12/06/2024	Benzene	87
1107687	Soil	Trip Spike	12/06/2024	Naphthalene (VOC)	100
1107687	Soil	Trip Spike	12/06/2024	o-Xylene	100
1107687	Soil	Trip Spike	12/06/2024	C6 - C10	97
1107687	Soil	Trip Spike	12/06/2024	C6 - C9	96
1135930	Water	Trip Spike	3/09/2024	Ethyl Benzene	110
1135930	Water	Trip Spike	3/09/2024	m,p-Xylene	110
1135930	Water	Trip Spike	3/09/2024	Toluene	110
1135930	Water	Trip Spike	3/09/2024	Total Xylenes	110
1135930	Water	Trip Spike	3/09/2024	Benzene	110
1135930	Water	Trip Spike	3/09/2024	Naphthalene (VOC)	100
1135930	Water	Trip Spike	3/09/2024	o-Xylene	110
1135930	Water	Trip Spike	3/09/2024	C6 - C10	110
1135930	Water	Trip Spike	3/09/2024	C6 - C9	110

Trip Spike Recoveries. Where no lab LCL and UCL is available, user defined limits between 70% and 130% have been adopted for n

APPENDIX F: LABORATORY CERTIFICATES

Final



+61428418368

Peter.sanderson@tetrattech.com

Report Results to:

Mobile:

Email:

Invoices to: Nadine Caldwell

Phone: +61 428 861 328

Email: nadine.caldwell@tetrattech.com

Project No: 754-NTLEN347071-2

Task No:

Project Name:	Cessnock Hospital
---------------	-------------------

Laboratory:

Eurofins

Sampler's Name: Peter Sanderson

Project Manager:

Peter Sanderson

Quote Number:

QUOTE#181018COF

Special Instructions:

Analysis Request Section

NOTES

 $\frac{1}{2}$ [illegible]

RELINQUISHED BY

Name: Peter Sanderson Date: 4/09/2024

Tetra Tech Coffey Time:

Name: _____ Date: _____

Company: _____ Time: _____

Y

Name: Wendy

Date: 4/6

Company: electronics

Time: 2:55

Name: _____

Company: _____

Sample Receipt Advice: (Lab Use Only)

All Samples Recieved in Good Condition

All Documentation is in Proper Order

☐ Samples Received Properly Chilled

Lab. Ref/Batch No.

1135930

*Container Type & Preservation Codes: P - Plastic, G - Glass Bottle, J - Glass Jar, V - Vial, Z - Ziplock bag, N - Nitric Acid Preserved, C - Hydrochloric Acid Preserved, S - Sulphuric Acid Preserved, I - Ice, ST - Sodium Thiosulfate, NP - No Preservative

17-7



Peter.sanderson@tetrattech.com

Email:

Email: nadine.caldwell@tetrattech.com

Special Instructions:

NOTES

Please send QC2A to ALS

X

Name:	Date:
Company:	Time:

Lab. Ref/Batch No.

*Container Type & Preservation Codes: P - Plastic, G- Glass Bottle, J - Glass Jar, V- Vial, Z - Ziplock bag, N - Nitric Acid Preserved, C - Hydrochloric Acid Preserved, S - Sulphuric Acid Preserved, I - ice, ST - Sodium Thiosulfate, NP - No Preservative

Eurofins Environment Testing Australia Pty Ltd

ABN: 50 005 085 521

Melbourne	Geelong	Sydney	Canberra	Brisbane	Newcastle
6 Monterey Road Dandenong South VIC 3175 +61 3 8564 5000 NATA# 1261 Site# 1254	19/8 Lewalan Street Grovedale VIC 3216 +61 3 8564 5000 NATA# 1261 Site# 25403	179 Magowar Road Girraween NSW 2145 +61 2 9900 8400 NATA# 1261 Site# 18217	Unit 1,2 Dacre Street Mitchell ACT 2911 +61 2 6113 8091 NATA# 1261 Site# 25466	1/21 Smallwood Place Murarie QLD 4172 T: +61 7 3902 4600 NATA# 1261 Site# 20794 & 2780	1/2 Frost Drive Mayfield West NSW 2304 +61 2 4968 8448 NATA# 1261 Site# 25079

Eurofins ARL Pty Ltd

ABN: 91 05 0159 898

Perth
46-48 Banksia Road Welshpool WA 6106 +61 8 6253 4444 NATA# 2377 Site# 2370

Eurofins ProMicro Pty Ltd

ABN: 47 009 120 549

Perth ProMicro
46-48 Banksia Road Welshpool WA 6106 +61 8 6253 4444 NATA# 2561 Site# 2554

Eurofins Environment Testing NZ Ltd

NZBN: 9429046024954

Auckland	Auckland (Focus)	Christchurch	Tauranga
35 O'Rorke Road Penrose, Auckland 1061 +64 9 526 4551 IANZ# 1327	Unit C1/4 Pacific Rise, Mount Wellington, Auckland 1061 +64 9 525 0568 IANZ# 1308	43 Detroit Drive Rolleston, Christchurch 7675 +64 3 343 5201 IANZ# 1290	1277 Cameron Road, Gate Pa, Tauranga 3112 +64 9 525 0568 IANZ# 1402

Sample Receipt Advice

Company name: Tetra Tech Coffey P/L N castle
Contact name: Peter Sanderson
Project name: CESSNOCK HOSPITAL
Project ID: 754-NTLEN347071-2
Turnaround time: 5 Day
Date/Time received: Sep 4, 2024 2:55 PM
Eurofins reference: 1135930

Sample Information

- ✓ A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- ✓ Sample Temperature of chilled sample on the batch as recorded by Eurofins Sample Receipt : 17.7 degrees Celsius.
- ✓ 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

QCA2 sent to ALS

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Andrew Black on phone : (+61) 2 9900 8490 or by email: AndrewBlack@eurofins.com

Results will be delivered electronically via email to Peter Sanderson - Peter.sanderson@tetrattech.com.

Note: A copy of these results will also be delivered to the general Tetra Tech Coffey P/L N castle email address.



web: www.eurofins.com.au
email: EnviroSales@eurofins.com

ABN: 50 005 085 521

Melbourne	Geelong	Sydney	Canberra	Brisbane	Newcastle
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ABN: 91 05 0159 898

Perth
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ABN: 47 009 120 549

Perth ProMicro
46-48 Banksia Road Welshpool WA 6106 +61 8 6253 4444 NATA# 2561 Site# 2554

NZBN: 9429046024954

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Company Name: Tetra Tech Coffey P/L N castle
Address: Unit 4, 60 Griffith Road
Lambton
NSW 2299

Project Name: CESSNOCK HOSPITAL
Project ID: 754-NTLEN347071-2

Order No.:
Report #: 1135930
Phone: 02 4016 2300
Fax: 02 4016 2380

Received: Sep 4, 2024 2:55 PM
Due: Sep 11, 2024
Priority: 5 Day
Contact Name: Peter Sanderson

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines	Asbestos Absence / Presence*	HOLD*	Eurofins Suite B15	Moisture Set	Eurofins Suite B7	BTEXN and Volatile TRH	BTEXN and Volatile TRH
Sydney Laboratory - NATA # 1261 Site # 18217						X		X	X	X	X	X	X
Mayfield West Laboratory - NATA # 1261 Site # 25079							X						
External Laboratory													
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID								
1	BH1A 0.1-0.2	Sep 03, 2024		Soil	N24-Se0011300				X	X	X		
2	BH1A 0.5-0.6	Sep 03, 2024		Soil	N24-Se0011301					X	X		
3	BH2A 0.1-0.2	Sep 03, 2024		Soil	N24-Se0011302				X	X	X		
4	BH2A 1.0-1.1	Sep 03, 2024		Soil	N24-Se0011303					X	X		
5	BH3A 0.1-0.2	Sep 03, 2024		Soil	N24-Se0011304					X	X		
6	BH3A 0.5-0.6	Sep 03, 2024		Soil	N24-Se0011305					X	X		
7	BH4A 0.1-0.2	Sep 03, 2024		Soil	N24-Se0011306					X	X		
8	BH4A 1.0-1.1	Sep 03, 2024		Soil	N24-Se0011307					X	X		
9	BH5A 0.1-0.2	Sep 03, 2024		Soil	N24-Se0011308				X	X	X		
10	BH5A 0.5-0.6	Sep 03, 2024		Soil	N24-Se0011309					X	X		
11	BH6A 0.1-0.2	Sep 03, 2024		Soil	N24-Se0011310					X	X		
12	BH6A 1.0-1.1	Sep 03, 2024		Soil	N24-Se0011311					X	X		
13	BH1A	Sep 03, 2024		Soil	N24-Se0011312	X							



web: www.eurofins.com.au
email: EnviroSales@eurofins.com

ABN: 50 005 085 521

Melbourne	Geelong	Sydney	Canberra	Brisbane	Newcastle
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ABN: 91 05 0159 898

Perth
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ABN: 47 009 120 549

Perth ProMicro
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NZBN: 9429046024954

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Company Name: Tetra Tech Coffey P/L N castle
Address: Unit 4, 60 Griffith Road
Lambton
NSW 2299

Project Name: CESSNOCK HOSPITAL
Project ID: 754-NTLEN347071-2

Order No.:
Report #: 1135930
Phone: 02 4016 2300
Fax: 02 4016 2380

Received: Sep 4, 2024 2:55 PM
Due: Sep 11, 2024
Priority: 5 Day
Contact Name: Peter Sanderson

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines	Asbestos Absence / Presence*	HOLD*	Eurofins Suite B15	Moisture Set	Eurofins Suite B7	BTEXN and Volatile TRH	BTEXN and Volatile TRH
Sydney Laboratory - NATA # 1261 Site # 18217						X		X	X	X	X	X	X
Mayfield West Laboratory - NATA # 1261 Site # 25079							X						
14	BH2A	Sep 03, 2024		Soil	N24-Se0011313	X							
15	BH3A	Sep 03, 2024		Soil	N24-Se0011314	X							
16	BH4A	Sep 03, 2024		Soil	N24-Se0011315	X							
17	BH5A	Sep 03, 2024		Soil	N24-Se0011316	X							
18	BH6A	Sep 03, 2024		Soil	N24-Se0011317	X							
19	QC1A	Sep 03, 2024		Soil	N24-Se0011318					X	X		
20	BH1A_1.0-1.1	Sep 03, 2024		Soil	N24-Se0011319			X					
21	BH1A_1.4-1.5	Sep 03, 2024		Soil	N24-Se0011320			X					
22	BH2A_0.5-0.6	Sep 03, 2024		Soil	N24-Se0011321			X					
23	BH2A_1.9-2.0	Sep 03, 2024		Soil	N24-Se0011322			X					
24	BH3A_1.0-1.1	Sep 03, 2024		Soil	N24-Se0011323			X					
25	BH3A_1.4-1.5	Sep 03, 2024		Soil	N24-Se0011324			X					
26	BH4A_0.5-0.6	Sep 03, 2024		Soil	N24-Se0011325			X					
27	BH4A_1.6-1.7	Sep 03, 2024		Soil	N24-Se0011326			X					
28	BH5A_1.0-1.1	Sep 03, 2024		Soil	N24-Se0011327			X					
29	BH5A_1.9-2.0	Sep 03, 2024		Soil	N24-Se0011328			X					



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email: EnviroSales@eurofins.com

Eurofins Environment Testing Australia Pty Ltd

ABN: 50 005 085 521

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Eurofins ProMicro Pty Ltd

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46-48 Banksia Road Welshpool WA 6106 +61 8 6253 4444 NATA# 2561 Site# 2554

Eurofins Environment Testing NZ Ltd

NZBN: 9429046024954

Auckland	Auckland (Focus)	Christchurch	Tauranga
35 O'Rorke Road Penrose, Auckland 1061 +64 9 526 4551 IANZ# 1327	Unit C1/4 Pacific Rise, Mount Wellington, Auckland 1061 +64 9 525 0568 IANZ# 1308	43 Detroit Drive Rolleston, Christchurch 7675 +64 3 343 5201 IANZ# 1290	1277 Cameron Road, Gate Pa, Tauranga 3112 +64 9 525 0568 IANZ# 1402

Company Name: Tetra Tech Coffey P/L N castle
Address: Unit 4, 60 Griffith Road
Lambton
NSW 2299

Project Name: CESSNOCK HOSPITAL
Project ID: 754-NTLEN347071-2

Order No.:
Report #: 1135930
Phone: 02 4016 2300
Fax: 02 4016 2380

Received: Sep 4, 2024 2:55 PM
Due: Sep 11, 2024
Priority: 5 Day
Contact Name: Peter Sanderson

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines	Asbestos Absence / Presence*	HOLD*	Eurofins Suite B15	Moisture Set	Eurofins Suite B7	BTEXN and Volatile TRH	BTEXN and Volatile TRH
Sydney Laboratory - NATA # 1261 Site # 18217						X		X	X	X	X	X	X
Mayfield West Laboratory - NATA # 1261 Site # 25079							X						
30	BH6A_0.5-0.6	Sep 03, 2024		Soil	N24-Se0011329			X					
31	BH6A_1.3-1.4	Sep 03, 2024		Soil	N24-Se0011330			X					
32	BH1A-F	Sep 03, 2024		Building Materials	N24-Se0011331		X						
33	BH4A-F	Sep 03, 2024		Building Materials	N24-Se0011332		X						
34	Trip Blank	Sep 03, 2024		Trip Blank (solid)	N24-Se0011333							X	
35	Trip Spike	Sep 03, 2024		Trip Spike (solid)	N24-Se0011334								X
36	Trip Spike LAB	Sep 03, 2024		Trip Spike (solid)	N24-Se0011335								X
Test Counts						6	2	12	3	13	13	1	2

Tetra Tech Coffey Pty Ltd Newcastle
Unit 4, 60 Griffith Road
Lambton
NSW 2299



NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025—Testing
 NATA is a signatory to the ILAC Mutual Recognition
 Arrangement for the mutual recognition of the
 equivalence of testing, medical testing, calibration,
 inspection, proficiency testing scheme providers and
 reference materials producers reports and certificates.

Attention: Peter Sanderson
Report 1135930-AID
Project Name CESSNOCK HOSPITAL
Project ID 754-NTLEN347071-2
Received Date Sep 04, 2024
Date Reported Sep 16, 2024

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 CESSNOCK HOSPITAL
Project ID 754-NTLEN347071-2
Date Sampled Sep 03, 2024
Report 1135930-AID

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
BH1A	24-Se0011312	Sep 03, 2024	Approximate Sample 523g Sample consisted of: Brown fine-grained clayey soil and rocks	ACM: Chrysotile asbestos detected in fibre cement material. Approximate raw weight of ACM = 2.7g Total estimated asbestos content in ACM = 0.13g* Total estimated asbestos concentration in ACM = 0.026% w/w* Organic fibre detected. No trace asbestos detected.
BH2A	24-Se0011313	Sep 03, 2024	Approximate Sample 346g Sample consisted of: Brown coarse-grained soil, coal, debris and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH3A	24-Se0011314	Sep 03, 2024	Approximate Sample 388g Sample consisted of: Brown fine-grained clayey soil, coal and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH4A	24-Se0011315	Sep 03, 2024	Approximate Sample 467g Sample consisted of: Brown fine-grained clayey soil, brick, coal, cement, ceramic material and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH5A	24-Se0011316	Sep 03, 2024	Approximate Sample 349g Sample consisted of: Brown fine-grained clayey soil, coal, cement and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH6A	24-Se0011317	Sep 03, 2024	Approximate Sample 426g Sample consisted of: Brown fine-grained clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH1A-F	24-Se0011331	Sep 03, 2024	Approximate Sample 19g / 70 x 45 x 4mm Sample consisted of: Grey fibre cement material	Chrysotile asbestos detected.

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
BH4A-F	24-Se0011332	Sep 03, 2024	Approximate Sample <1g / 15 x 20 x 2mm Sample consisted of: Grey fibre cement material	Chrysotile asbestos detected.

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Asbestos - LTM-ASB-8020	Sydney	Sep 05, 2024	Indefinite
Asbestos - LTM-ASB-8020	Newcastle	Sep 05, 2024	Indefinite



web: www.eurofins.com.au
email: EnviroSales@eurofins.com

Eurofins Environment Testing Australia Pty Ltd

ABN: 50 005 085 521

Melbourne	Geelong	Sydney	Canberra	Brisbane	Newcastle
6 Monterey Road Dandenong South VIC 3175 +61 3 8564 5000 NATA# 1261 Site# 1254	19/8 Lewalan Street Grovedale VIC 3216 +61 3 8564 5000 NATA# 1261 Site# 25403	179 Magowar Road Girraween NSW 2145 +61 2 9900 8400 NATA# 1261 Site# 18217	Unit 1,2 Dacre Street Mitchell ACT 2911 +61 2 6113 8091 NATA# 1261 Site# 25466	1/21 Smallwood Place Murarie QLD 4172 T: +61 7 3902 4600 NATA# 1261 Site# 20794 & 2780	1/2 Frost Drive Mayfield West NSW 2304 +61 2 4968 8448 NATA# 1261 Site# 25079

Eurofins ARL Pty Ltd

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Perth
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Eurofins ProMicro Pty Ltd

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Perth ProMicro
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Eurofins Environment Testing NZ Ltd

NZBN: 9429046024954

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Company Name: Tetra Tech Coffey P/L N castle
Address: Unit 4, 60 Griffith Road
Lambton
NSW 2299

Project Name: CESSNOCK HOSPITAL
Project ID: 754-NTLEN347071-2

Order No.:
Report #: 1135930
Phone: 02 4016 2300
Fax: 02 4016 2380

Received: Sep 4, 2024 2:55 PM
Due: Sep 11, 2024
Priority: 5 Day
Contact Name: Peter Sanderson

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines	Asbestos Absence / Presence*	HOLD*	Eurofins Suite B15	Moisture Set	Eurofins Suite B7	BTEXN and Volatile TRH	BTEXN and Volatile TRH
Sydney Laboratory - NATA # 1261 Site # 18217						X		X	X	X	X	X	X
Mayfield West Laboratory - NATA # 1261 Site # 25079							X						
External Laboratory													
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID								
1	BH1A 0.1-0.2	Sep 03, 2024		Soil	N24-Se0011300				X	X	X		
2	BH1A 0.5-0.6	Sep 03, 2024		Soil	N24-Se0011301					X	X		
3	BH2A 0.1-0.2	Sep 03, 2024		Soil	N24-Se0011302				X	X	X		
4	BH2A 1.0-1.1	Sep 03, 2024		Soil	N24-Se0011303					X	X		
5	BH3A 0.1-0.2	Sep 03, 2024		Soil	N24-Se0011304					X	X		
6	BH3A 0.5-0.6	Sep 03, 2024		Soil	N24-Se0011305					X	X		
7	BH4A 0.1-0.2	Sep 03, 2024		Soil	N24-Se0011306					X	X		
8	BH4A 1.0-1.1	Sep 03, 2024		Soil	N24-Se0011307					X	X		
9	BH5A 0.1-0.2	Sep 03, 2024		Soil	N24-Se0011308				X	X	X		
10	BH5A 0.5-0.6	Sep 03, 2024		Soil	N24-Se0011309					X	X		
11	BH6A 0.1-0.2	Sep 03, 2024		Soil	N24-Se0011310					X	X		
12	BH6A 1.0-1.1	Sep 03, 2024		Soil	N24-Se0011311					X	X		
13	BH1A	Sep 03, 2024		Soil	N24-Se0011312	X							



web: www.eurofins.com.au
email: EnviroSales@eurofins.com

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Address: Unit 4, 60 Griffith Road
Lambton
NSW 2299

Project Name: CESSNOCK HOSPITAL
Project ID: 754-NTLEN347071-2

Order No.:
Report #: 1135930
Phone: 02 4016 2300
Fax: 02 4016 2380

Received: Sep 4, 2024 2:55 PM
Due: Sep 11, 2024
Priority: 5 Day
Contact Name: Peter Sanderson

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines	Asbestos Absence / Presence*	HOLD*	Eurofins Suite B15	Moisture Set	Eurofins Suite B7	BTEXN and Volatile TRH	BTEXN and Volatile TRH
Sydney Laboratory - NATA # 1261 Site # 18217						X		X	X	X	X	X	X
Mayfield West Laboratory - NATA # 1261 Site # 25079							X						
14	BH2A	Sep 03, 2024		Soil	N24-Se0011313	X							
15	BH3A	Sep 03, 2024		Soil	N24-Se0011314	X							
16	BH4A	Sep 03, 2024		Soil	N24-Se0011315	X							
17	BH5A	Sep 03, 2024		Soil	N24-Se0011316	X							
18	BH6A	Sep 03, 2024		Soil	N24-Se0011317	X							
19	QC1A	Sep 03, 2024		Soil	N24-Se0011318					X	X		
20	BH1A_1.0-1.1	Sep 03, 2024		Soil	N24-Se0011319			X					
21	BH1A_1.4-1.5	Sep 03, 2024		Soil	N24-Se0011320			X					
22	BH2A_0.5-0.6	Sep 03, 2024		Soil	N24-Se0011321			X					
23	BH2A_1.9-2.0	Sep 03, 2024		Soil	N24-Se0011322			X					
24	BH3A_1.0-1.1	Sep 03, 2024		Soil	N24-Se0011323			X					
25	BH3A_1.4-1.5	Sep 03, 2024		Soil	N24-Se0011324			X					
26	BH4A_0.5-0.6	Sep 03, 2024		Soil	N24-Se0011325			X					
27	BH4A_1.6-1.7	Sep 03, 2024		Soil	N24-Se0011326			X					
28	BH5A_1.0-1.1	Sep 03, 2024		Soil	N24-Se0011327			X					
29	BH5A_1.9-2.0	Sep 03, 2024		Soil	N24-Se0011328			X					



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Project ID: 754-NTLEN347071-2

Order No.:
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Phone: 02 4016 2300
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Contact Name: Peter Sanderson

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Sample Detail						Asbestos - WA guidelines	Asbestos Absence / Presence*	HOLD*	Eurofins Suite B15	Moisture Set	Eurofins Suite B7	BTEXN and Volatile TRH	BTEXN and Volatile TRH
Sydney Laboratory - NATA # 1261 Site # 18217						X		X	X	X	X	X	X
Mayfield West Laboratory - NATA # 1261 Site # 25079							X						
30	BH6A_0.5-0.6	Sep 03, 2024		Soil	N24-Se0011329			X					
31	BH6A_1.3-1.4	Sep 03, 2024		Soil	N24-Se0011330			X					
32	BH1A-F	Sep 03, 2024		Building Materials	N24-Se0011331		X						
33	BH4A-F	Sep 03, 2024		Building Materials	N24-Se0011332		X						
34	Trip Blank	Sep 03, 2024		Trip Blank (solid)	N24-Se0011333							X	
35	Trip Spike	Sep 03, 2024		Trip Spike (solid)	N24-Se0011334								X
Test Counts						6	2	12	3	13	13	1	1

Internal Quality Control Review and Glossary General

1. QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Samples were analysed on an 'as received' basis.
4. Information identified on this report with the colour **blue** 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 the most recent version of the 'Sample Preservation and Container Guide' for holding times (QS3001).

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:	Percentage weight-for-weight basis, e.g. of asbestos in asbestos-containing finds in soil samples (% w/w)
F/fld	Airborne fibre filter loading as Fibres (N) per Fields counted (n)
F/mL	Airborne fibre reported concentration as Fibres per millilitre of air drawn over the sampler membrane (C)
g, kg	Mass, e.g. of whole sample (M) or asbestos-containing find within the sample (m)
g/kg	Concentration in grams per kilogram
L, mL	Volume, e.g. of air as measured in AFM (V = r x t)
L/min	Airborne fibre sampling Flowrate as litres per minute of air drawn over the sampler membrane (r)
min	Time (t), e.g. of air sample collection period

Calculations

Airborne Fibre Concentration: $C = \left(\frac{A}{a}\right) \times \left(\frac{N}{n}\right) \times \left(\frac{1}{r}\right) \times \left(\frac{1}{t}\right) = K \times \left(\frac{N}{n}\right) \times \left(\frac{1}{r}\right)$

Asbestos Content (as asbestos): $\% w/w = \frac{(m \times P_A)}{M}$

Weighted Average (of asbestos): $\%_{WA} = \sum \frac{(m \times P_A) \times x}{x}$

Terms

%asbestos	Estimated percentage of asbestos in a given matrix may be derived from knowledge or experience of the material, informed by HSG264 <i>Appendix 2</i> , else assumed to be 15% in accordance with WA DOH <i>Appendix 2 (P_A)</i> . This estimate is not NATA-accredited.
ACM	Asbestos Containing Materials. Asbestos contained within a non-asbestos matrix, typically presented in bonded (non-friable) condition. For the purposes of the NEPM and WA DOH, ACM corresponds to material larger than 7 mm x 7 mm.
AF	Asbestos Fines. Asbestos contamination within a soil sample, as defined by WA DOH. Includes loose fibre bundles and small pieces of friable and non-friable material such as asbestos cement fragments mixed with soil. Considered under the NEPM as equivalent to "non-bonded / friable".
AFM	Airborne Fibre Monitoring, e.g., by the MFM.
Amosite	Amosite Asbestos Detected. Amosite may also refer to Fibrous Grunerite or Brown Asbestos. Identified in accordance with AS 4964-2004.
AS	Australian Standard.
Asbestos Content (as asbestos)	Total %w/w asbestos content in asbestos-containing finds in a soil sample (% w/w).
Chrysotile	Chrysotile Asbestos Detected. Chrysotile may also refer to Fibrous Serpentine or White Asbestos. Identified in accordance with AS 4964-2004.
COC	Chain of Custody.
Crocidolite	Crocidolite Asbestos Detected. Crocidolite may also refer to Fibrous Riebeckite or Blue Asbestos. Identified in accordance with AS 4964-2004.
Dry	Sample is dried by heating prior to analysis.
DS	Dispersion Staining. Technique required for Unequivocal Identification of asbestos fibres by PLM.
FA	Fibrous Asbestos. Asbestos containing material that is wholly or in part friable, including materials with higher asbestos content with a propensity to become friable with handling, and any material that was previously non-friable and in a severely degraded condition. For the purposes of the NEPM and WA DOH, FA generally corresponds to material larger than 7 mm x 7 mm, although FA may be more difficult to visibly distinguish and may be assessed as AF.
Fibre Count	Total of all fibres (whether asbestos or not) meeting the counting criteria set out in the NOHSC:3003
Fibre ID	Fibre Identification. Unequivocal identification of asbestos fibres according to AS 4964-2004. Includes Chrysotile, Amosite (Grunerite) or Crocidolite asbestos.
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.
HSG248	UK HSE HSG248, <i>Asbestos: The Analysts Guide</i> , 2nd Edition (2021).
HSG264	UK HSE HSG264, <i>Asbestos: The Survey Guide</i> (2012).
ISO (also ISO/IEC)	International Organization for Standardization / International Electrotechnical Commission.
K Factor	Microscope constant (K) as derived from the effective filter area of the given AFM membrane used for collecting the sample (A) and the projected eyepiece graticule area of the specific microscope used for the analysis (a).
LOR	Limit of Reporting.
MFM (also NOHSC:3003)	Membrane Filter Method. As described by the Australian Government National Occupational Health and Safety Commission, <i>Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres</i> , 2nd Edition [NOHSC:3003(2005)].
NEPM (also ASC NEPM)	National Environment Protection (Assessment of Site Contamination) Measure, (2013, as amended).
Organic	Organic Fibres Detected. Organic may refer to Natural or Man-Made Polymeric Fibres. Identified in accordance with AS 4964-2004.
PCM	Phase Contrast Microscopy. As used for Fibre Counting according to the MFM.
PLM	Polarised Light Microscopy. As used for Fibre Identification and Trace Analysis according to AS 4964-2004.
Sampling	Unless otherwise stated Eurofins are not responsible for sampling equipment or the sampling process.
SMF	Synthetic Mineral Fibre Detected. SMF may also refer to Man Made Vitreous Fibres. Identified in accordance with AS 4964-2004.
SRA	Sample Receipt Advice.
Trace Analysis	Analytical procedure used to detect the presence of respirable fibres (particularly asbestos) in a given sample matrix.
UK HSE HSG	United Kingdom, Health and Safety Executive, Health and Safety Guidance, publication.
UMF	Unidentified Mineral Fibre Detected. Fibrous minerals that are detected but have not been unequivocally identified by PLM with DS according to the AS 4964-2004. May include (but not limited to) Actinolite, Anthophyllite or Tremolite asbestos.
WA DOH	Reference document for the NEPM. Government of Western Australia, <i>Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia</i> (updated 2021), including Appendix Four: <i>Laboratory analysis</i>
Weighted Average	Combined average %w/w asbestos content of all asbestos-containing finds in the given aliquot or total soil sample (%_{WA}).

Comments

24-Se0011313 - 24-Se0011317: Samples received were less than the nominal 500mL as recommended in Section 4.10 of the NEPM Schedule B1 - Guideline on Investigation Levels for Soil and Groundwater.

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

Asbestos Counter/Identifier:

Laxman Dias	Senior Analyst-Asbestos
Anita Weinberg	Senior Analyst-Asbestos

Authorised by:

Chamath JHM Annakkage	Senior Analyst-Asbestos
Bryce Keegan	Senior Analyst-Asbestos



Glenn Jackson
Managing Director

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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Tetra Tech Coffey Pty Ltd Newcastle
Unit 4, 60 Griffith Road
Lambton
NSW 2299



NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
 NATA is a signatory to the ILAC Mutual Recognition
 Arrangement for the mutual recognition of the
 equivalence of testing, medical testing, calibration,
 inspection, proficiency testing scheme providers and
 reference materials producers reports and certificates.

Attention: **Peter Sanderson**

Report **1135930-S**
Project name **CESSNOCK HOSPITAL**
Project ID **754-NTLEN347071-2**
Received Date **Sep 04, 2024**

Client Sample ID			BH1A_0.1-0.2	BH1A_0.5-0.6	G01BH2A_0.1-0.2	BH2A_1.0-1.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			N24-Se0011300	N24-Se0011301	N24-Se0011302	N24-Se0011303
Date Sampled			Sep 03, 2024	Sep 03, 2024	Sep 03, 2024	Sep 03, 2024
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	63	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	150	< 50
TRH C10-C36 (Total)	50	mg/kg	50	< 50	213	< 50
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	56	86	89
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene ^{N02}	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH >C10-C16 less Naphthalene (F2)* ^{N01}	50	mg/kg	< 50	< 50	< 50	< 50
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1) ^{N04}	20	mg/kg	< 20	< 20	< 20	< 20
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	0.7	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	0.6	< 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	0.6	< 0.5
Dibenz(a,h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	0.9	1.3	1.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			BH1A_0.1-0.2	BH1A_0.5-0.6	G01BH2A_0.1-0.2	BH2A_1.0-1.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			N24-Se0011300	N24-Se0011301	N24-Se0011302	N24-Se0011303
Date Sampled			Sep 03, 2024	Sep 03, 2024	Sep 03, 2024	Sep 03, 2024
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
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	0.6	0.5	< 0.5
Pyrene	0.5	mg/kg	0.8	1.2	1.3	< 0.5
Total PAH*	0.5	mg/kg	1.7	3.1	5.0	< 0.5
2-Fluorobiphenyl (surr.)	1	%	100	74	96	97
p-Terphenyl-d14 (surr.)	1	%	96	74	89	100
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	-	< 1	-
4,4'-DDD	0.05	mg/kg	< 0.05	-	< 0.5	-
4,4'-DDE	0.05	mg/kg	< 0.05	-	< 0.5	-
4,4'-DDT	0.05	mg/kg	< 0.05	-	< 0.5	-
α-HCH	0.05	mg/kg	< 0.05	-	< 0.5	-
Aldrin	0.05	mg/kg	< 0.05	-	< 0.5	-
β-HCH	0.05	mg/kg	< 0.05	-	< 0.5	-
δ-HCH	0.05	mg/kg	< 0.05	-	< 0.5	-
Dieldrin	0.05	mg/kg	< 0.05	-	< 0.5	-
Endosulfan I	0.05	mg/kg	< 0.05	-	< 0.5	-
Endosulfan II	0.05	mg/kg	< 0.05	-	< 0.5	-
Endosulfan sulphate	0.05	mg/kg	< 0.05	-	< 0.5	-
Endrin	0.05	mg/kg	< 0.05	-	< 0.5	-
Endrin aldehyde	0.05	mg/kg	< 0.05	-	< 0.5	-
Endrin ketone	0.05	mg/kg	< 0.05	-	< 0.5	-
γ-HCH (Lindane)	0.05	mg/kg	< 0.05	-	< 0.5	-
Heptachlor	0.05	mg/kg	< 0.05	-	< 0.5	-
Heptachlor epoxide	0.05	mg/kg	< 0.05	-	< 0.5	-
Hexachlorobenzene	0.05	mg/kg	< 0.05	-	< 0.5	-
Methoxychlor	0.05	mg/kg	< 0.05	-	< 0.5	-
Toxaphene	0.5	mg/kg	< 0.5	-	< 10	-
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	-	< 0.5	-
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	-	< 0.5	-
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	-	< 1	-
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	-	< 1	-
Dibutylchlorodate (surr.)	1	%	91	-	85	-
Tetrachloro-m-xylene (surr.)	1	%	98	-	94	-
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	< 0.2	-	< 0.5	-
Bolstar	0.2	mg/kg	< 0.2	-	< 0.5	-
Chlorfenvinphos	0.2	mg/kg	< 0.2	-	< 0.5	-
Chlorpyrifos	0.2	mg/kg	< 0.2	-	< 0.5	-
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2	-	< 0.5	-
Coumaphos	2	mg/kg	< 2	-	< 5	-
Demeton-S	0.2	mg/kg	< 0.2	-	< 0.5	-
Demeton-O	0.2	mg/kg	< 0.2	-	< 0.5	-
Diazinon	0.2	mg/kg	< 0.2	-	< 0.5	-
Dichlorvos	0.2	mg/kg	< 0.2	-	< 0.5	-
Dimethoate	0.2	mg/kg	< 0.2	-	< 0.5	-
Disulfoton	0.2	mg/kg	< 0.2	-	< 0.5	-

Client Sample ID			BH1A_0.1-0.2	BH1A_0.5-0.6	G01BH2A_0.1-0.2	BH2A_1.0-1.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			N24-Se0011300	N24-Se0011301	N24-Se0011302	N24-Se0011303
Date Sampled			Sep 03, 2024	Sep 03, 2024	Sep 03, 2024	Sep 03, 2024
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
EPN	0.2	mg/kg	< 0.2	-	< 0.5	-
Ethion	0.2	mg/kg	< 0.2	-	< 0.5	-
Ethoprop	0.2	mg/kg	< 0.2	-	< 0.5	-
Ethyl parathion	0.2	mg/kg	< 0.2	-	< 0.5	-
Fenitrothion	0.2	mg/kg	< 0.2	-	< 0.5	-
Fensulfothion	0.2	mg/kg	< 0.2	-	< 0.5	-
Fenthion	0.2	mg/kg	< 0.2	-	< 0.5	-
Malathion	0.2	mg/kg	< 0.2	-	< 0.5	-
Merphos	0.2	mg/kg	< 0.2	-	< 0.5	-
Methyl parathion	0.2	mg/kg	< 0.2	-	< 0.5	-
Mevinphos	0.2	mg/kg	< 0.2	-	< 0.5	-
Monocrotophos	2	mg/kg	< 2	-	< 5	-
Naled	0.2	mg/kg	< 0.2	-	< 0.5	-
Omethoate	2	mg/kg	< 2	-	< 5	-
Phorate	0.2	mg/kg	< 0.2	-	< 0.5	-
Pirimiphos-methyl	0.2	mg/kg	< 0.2	-	< 0.5	-
Pyrazophos	0.2	mg/kg	< 0.2	-	< 0.5	-
Ronnel	0.2	mg/kg	< 0.2	-	< 0.5	-
Terbufos	0.2	mg/kg	< 0.2	-	< 0.5	-
Tetrachlorvinphos	0.2	mg/kg	< 0.2	-	< 0.5	-
Tokuthion	0.2	mg/kg	< 0.2	-	< 0.5	-
Trichloronate	0.2	mg/kg	< 0.2	-	< 0.5	-
Triphenylphosphate (surr.)	1	%	101	-	100	-
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	< 0.1	-	< 1	-
Aroclor-1221	0.1	mg/kg	< 0.1	-	< 1	-
Aroclor-1232	0.1	mg/kg	< 0.1	-	< 1	-
Aroclor-1242	0.1	mg/kg	< 0.1	-	< 1	-
Aroclor-1248	0.1	mg/kg	< 0.1	-	< 1	-
Aroclor-1254	0.1	mg/kg	< 0.1	-	< 1	-
Aroclor-1260	0.1	mg/kg	< 0.1	-	< 1	-
Total PCB*	0.1	mg/kg	< 0.1	-	< 1	-
Dibutylchlorendate (surr.)	1	%	91	-	85	-
Tetrachloro-m-xylene (surr.)	1	%	98	-	94	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	170	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	170	< 100
Heavy Metals						
Arsenic	2	mg/kg	13	12	2.8	8.9
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	1.0
Chromium	5	mg/kg	8.2	10.0	8.6	23
Copper	5	mg/kg	28	19	34	98
Lead	5	mg/kg	43	47	51	570
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	0.2
Nickel	5	mg/kg	19	14	19	24
Zinc	5	mg/kg	93	84	210	1400

Client Sample ID			BH1A_0.1-0.2	BH1A_0.5-0.6	G01BH2A_0.1-0.2	BH2A_1.0-1.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			N24-Se0011300	N24-Se0011301	N24-Se0011302	N24-Se0011303
Date Sampled			Sep 03, 2024	Sep 03, 2024	Sep 03, 2024	Sep 03, 2024
Test/Reference	LOR	Unit				
Sample Properties						
% Moisture	1	%	15	15	6.8	16

Client Sample ID			BH3A_0.1-0.2	BH3A_0.5-0.6	BH4A_0.1-0.2	BH4A_1.0-1.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			N24-Se0011304	N24-Se0011305	N24-Se0011306	N24-Se0011307
Date Sampled			Sep 03, 2024	Sep 03, 2024	Sep 03, 2024	Sep 03, 2024
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	400	210
TRH C29-C36	50	mg/kg	< 50	< 50	220	140
TRH C10-C36 (Total)	50	mg/kg	< 50	< 50	620	350
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	%	72	97	100	114
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene ^{N02}	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH >C10-C16 less Naphthalene (F2) ^{*N01}	50	mg/kg	< 50	< 50	< 50	< 50
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1) ^{N04}	20	mg/kg	< 20	< 20	< 20	< 20
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	35	17
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	35	17
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	35	17
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	1.3	0.8
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	8.5	4.6
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	21	11
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	21	10
Benzo(b&j)fluoranthene ^{N07}	0.5	mg/kg	< 0.5	< 0.5	22	9.8
Benzo(g,h,i)perylene	0.5	mg/kg	< 0.5	< 0.5	0.6	7.9
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	16	9.9
Chrysene	0.5	mg/kg	< 0.5	< 0.5	23	13
Dibenz(a,h)anthracene	0.5	mg/kg	< 0.5	< 0.5	5.9	3.0
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	67	38
Fluorene	0.5	mg/kg	< 0.5	< 0.5	0.8	< 0.5
Indeno(1,2,3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	17	7.6
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	23	14
Pyrene	0.5	mg/kg	< 0.5	< 0.5	53	32

Client Sample ID			BH3A_0.1-0.2	BH3A_0.5-0.6	BH4A_0.1-0.2	BH4A_1.0-1.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			N24-Se0011304	N24-Se0011305	N24-Se0011306	N24-Se0011307
Date Sampled			Sep 03, 2024	Sep 03, 2024	Sep 03, 2024	Sep 03, 2024
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	280	160
2-Fluorobiphenyl (surr.)	1	%	99	62	99	97
p-Terphenyl-d14 (surr.)	1	%	97	75	92	115
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	540	300
TRH >C34-C40	100	mg/kg	< 100	< 100	190	110
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	730	410
Heavy Metals						
Arsenic	2	mg/kg	6.0	10	5.2	3.6
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	0.5
Chromium	5	mg/kg	12	23	12	9.5
Copper	5	mg/kg	56	5.2	31	39
Lead	5	mg/kg	31	11	200	100
Mercury	0.1	mg/kg	0.2	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	17	7.0	31	25
Zinc	5	mg/kg	86	21	370	250
Sample Properties						
% Moisture	1	%	22	20	14	20

Client Sample ID			G01 BH5A_0.1-0.2	BH5A_0.5-0.6	BH6A_0.1-0.2	BH6A_1.0-1.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			N24-Se0011308	N24-Se0011309	N24-Se0011310	N24-Se0011311
Date Sampled			Sep 03, 2024	Sep 03, 2024	Sep 03, 2024	Sep 03, 2024
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	34	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	300	140	52	< 50
TRH C29-C36	50	mg/kg	170	110	72	< 50
TRH C10-C36 (Total)	50	mg/kg	504	250	124	< 50
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	%	96	92	87	83
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene ^{N02}	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH >C10-C16 less Naphthalene (F2)* ^{N01}	50	mg/kg	63	< 50	< 50	< 50
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1) ^{N04}	20	mg/kg	< 20	< 20	< 20	< 20

Client Sample ID			G01 BH5A_0.1-0.2	BH5A_0.5-0.6	BH6A_0.1-0.2	BH6A_1.0-1.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			N24-Se0011308	N24-Se0011309	N24-Se0011310	N24-Se0011311
Date Sampled			Sep 03, 2024	Sep 03, 2024	Sep 03, 2024	Sep 03, 2024
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	6.2	5.2	2.2	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	6.2	5.3	2.5	0.8
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	6.2	5.3	2.8	1.3
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	0.6	< 0.5
Benzo(a)anthracene	0.5	mg/kg	2.9	2.9	2.3	0.8
Benzo(a)pyrene	0.5	mg/kg	3.5	2.9	1.5	< 0.5
Benzo(b&j)fluoranthene ^{N07}	0.5	mg/kg	5.1	4.4	1.9	1.0
Benzo(g,h,i)perylene	0.5	mg/kg	3.6	3.6	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	4.4	4.3	2.5	0.7
Chrysene	0.5	mg/kg	4.0	5.2	3.7	1.5
Dibenz(a,h)anthracene	0.5	mg/kg	1.1	1.1	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	9.0	9.0	7.5	2.8
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1,2,3-cd)pyrene	0.5	mg/kg	3.3	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	2.4	1.6	1.8	0.5
Pyrene	0.5	mg/kg	8.3	7.9	5.0	2.4
Total PAH*	0.5	mg/kg	48	43	27	9.7
2-Fluorobiphenyl (surr.)	1	%	78	109	118	101
p-Terphenyl-d14 (surr.)	1	%	148	130	120	101
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 1	-	-	-
4,4'-DDD	0.05	mg/kg	< 0.5	-	-	-
4,4'-DDE	0.05	mg/kg	< 0.5	-	-	-
4,4'-DDT	0.05	mg/kg	< 0.5	-	-	-
α-HCH	0.05	mg/kg	< 0.5	-	-	-
Aldrin	0.05	mg/kg	< 0.5	-	-	-
β-HCH	0.05	mg/kg	< 0.5	-	-	-
δ-HCH	0.05	mg/kg	< 0.5	-	-	-
Dieldrin	0.05	mg/kg	< 0.5	-	-	-
Endosulfan I	0.05	mg/kg	< 0.5	-	-	-
Endosulfan II	0.05	mg/kg	< 0.5	-	-	-
Endosulfan sulphate	0.05	mg/kg	< 0.5	-	-	-
Endrin	0.05	mg/kg	< 0.5	-	-	-
Endrin aldehyde	0.05	mg/kg	< 0.5	-	-	-
Endrin ketone	0.05	mg/kg	< 0.5	-	-	-
γ-HCH (Lindane)	0.05	mg/kg	< 0.5	-	-	-
Heptachlor	0.05	mg/kg	< 0.5	-	-	-
Heptachlor epoxide	0.05	mg/kg	< 0.5	-	-	-
Hexachlorobenzene	0.05	mg/kg	< 0.5	-	-	-
Methoxychlor	0.05	mg/kg	< 0.5	-	-	-
Toxaphene	0.5	mg/kg	< 10	-	-	-
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.5	-	-	-
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.5	-	-	-
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 1	-	-	-
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 1	-	-	-

Client Sample ID			G01 BH5A_0.1-0.2	BH5A_0.5-0.6	BH6A_0.1-0.2	BH6A_1.0-1.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			N24-Se0011308	N24-Se0011309	N24-Se0011310	N24-Se0011311
Date Sampled			Sep 03, 2024	Sep 03, 2024	Sep 03, 2024	Sep 03, 2024
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Dibutylchlorendate (surr.)	1	%	131	-	-	-
Tetrachloro-m-xylene (surr.)	1	%	122	-	-	-
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	< 0.5	-	-	-
Bolstar	0.2	mg/kg	< 0.5	-	-	-
Chlorfenvinphos	0.2	mg/kg	< 0.5	-	-	-
Chlorpyrifos	0.2	mg/kg	< 0.5	-	-	-
Chlorpyrifos-methyl	0.2	mg/kg	< 0.5	-	-	-
Coumaphos	2	mg/kg	< 5	-	-	-
Demeton-S	0.2	mg/kg	< 0.5	-	-	-
Demeton-O	0.2	mg/kg	< 0.5	-	-	-
Diazinon	0.2	mg/kg	< 0.5	-	-	-
Dichlorvos	0.2	mg/kg	< 0.5	-	-	-
Dimethoate	0.2	mg/kg	< 0.5	-	-	-
Disulfoton	0.2	mg/kg	< 0.5	-	-	-
EPN	0.2	mg/kg	< 0.5	-	-	-
Ethion	0.2	mg/kg	< 0.5	-	-	-
Ethoprop	0.2	mg/kg	< 0.5	-	-	-
Ethyl parathion	0.2	mg/kg	< 0.5	-	-	-
Fenitrothion	0.2	mg/kg	< 0.5	-	-	-
Fensulfothion	0.2	mg/kg	< 0.5	-	-	-
Fenthion	0.2	mg/kg	< 0.5	-	-	-
Malathion	0.2	mg/kg	< 0.5	-	-	-
Merphos	0.2	mg/kg	< 0.5	-	-	-
Methyl parathion	0.2	mg/kg	< 0.5	-	-	-
Mevinphos	0.2	mg/kg	< 0.5	-	-	-
Monocrotophos	2	mg/kg	< 5	-	-	-
Naled	0.2	mg/kg	< 0.5	-	-	-
Omethoate	2	mg/kg	< 5	-	-	-
Phorate	0.2	mg/kg	< 0.5	-	-	-
Pirimiphos-methyl	0.2	mg/kg	< 0.5	-	-	-
Pyrazophos	0.2	mg/kg	< 0.5	-	-	-
Ronnel	0.2	mg/kg	< 0.5	-	-	-
Terbufos	0.2	mg/kg	< 0.5	-	-	-
Tetrachlorvinphos	0.2	mg/kg	< 0.5	-	-	-
Tokuthion	0.2	mg/kg	< 0.5	-	-	-
Trichloronate	0.2	mg/kg	< 0.5	-	-	-
Triphenylphosphate (surr.)	1	%	138	-	-	-
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	< 1	-	-	-
Aroclor-1221	0.1	mg/kg	< 1	-	-	-
Aroclor-1232	0.1	mg/kg	< 1	-	-	-
Aroclor-1242	0.1	mg/kg	< 1	-	-	-
Aroclor-1248	0.1	mg/kg	< 1	-	-	-
Aroclor-1254	0.1	mg/kg	< 1	-	-	-
Aroclor-1260	0.1	mg/kg	< 1	-	-	-
Total PCB*	0.1	mg/kg	< 1	-	-	-
Dibutylchlorendate (surr.)	1	%	131	-	-	-
Tetrachloro-m-xylene (surr.)	1	%	122	-	-	-

Client Sample ID			G01 BH5A_0.1-0.2	BH5A_0.5-0.6	BH6A_0.1-0.2	BH6A_1.0-1.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			N24-Se0011308	N24-Se0011309	N24-Se0011310	N24-Se0011311
Date Sampled			Sep 03, 2024	Sep 03, 2024	Sep 03, 2024	Sep 03, 2024
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	50	mg/kg	63	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	440	210	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	503	210	< 100	< 100
Heavy Metals						
Arsenic	2	mg/kg	9.9	26	6.6	15
Cadmium	0.4	mg/kg	< 0.4	0.5	< 0.4	< 0.4
Chromium	5	mg/kg	16	13	11	39
Copper	5	mg/kg	41	62	5.5	7.7
Lead	5	mg/kg	100	88	16	15
Mercury	0.1	mg/kg	3.4	1.4	< 0.1	< 0.1
Nickel	5	mg/kg	17	33	7.3	7.8
Zinc	5	mg/kg	230	280	19	26
Sample Properties						
% Moisture	1	%	11	26	16	21

Client Sample ID			QC1A	Trip Blank	Trip Spike
Sample Matrix			Soil	Trip Blank (solid)	Trip Spike (solid)
Eurofins Sample No.			N24-Se0011318	N24-Se0011333	N24-Se0011334
Date Sampled			Sep 03, 2024	Sep 03, 2024	Sep 03, 2024
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	-	-
TRH C15-C28	50	mg/kg	1400	-	-
TRH C29-C36	50	mg/kg	1000	-	-
TRH C10-C36 (Total)	50	mg/kg	2400	-	-
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	%	58	125	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions					
Naphthalene ^{N02}	0.5	mg/kg	< 0.5	-	-
TRH >C10-C16 less Naphthalene (F2) ^{*N01}	50	mg/kg	< 50	-	-
TRH C6-C10	20	mg/kg	< 20	-	-
TRH C6-C10 less BTEX (F1) ^{N04}	20	mg/kg	< 20	-	-
Polycyclic Aromatic Hydrocarbons					
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	120	-	-
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	120	-	-
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	120	-	-
Acenaphthene	0.5	mg/kg	3.6	-	-

Client Sample ID			QC1A	Trip Blank	Trip Spike
Sample Matrix			Soil	Trip Blank (solid)	Trip Spike (solid)
Eurofins Sample No.			N24-Se0011318	N24-Se0011333	N24-Se0011334
Date Sampled			Sep 03, 2024	Sep 03, 2024	Sep 03, 2024
Test/Reference	LOR	Unit			
Polycyclic Aromatic Hydrocarbons					
Acenaphthylene	0.5	mg/kg	< 0.5	-	-
Anthracene	0.5	mg/kg	20	-	-
Benz(a)anthracene	0.5	mg/kg	73	-	-
Benzo(a)pyrene	0.5	mg/kg	71	-	-
Benzo(b&j)fluoranthene ^{N07}	0.5	mg/kg	83	-	-
Benzo(g,h,i)perylene	0.5	mg/kg	61	-	-
Benzo(k)fluoranthene	0.5	mg/kg	66	-	-
Chrysene	0.5	mg/kg	75	-	-
Dibenz(a,h)anthracene	0.5	mg/kg	18	-	-
Fluoranthene	0.5	mg/kg	230	-	-
Fluorene	0.5	mg/kg	3.6	-	-
Indeno(1,2,3-cd)pyrene	0.5	mg/kg	54	-	-
Naphthalene	0.5	mg/kg	< 0.5	-	-
Phenanthrene	0.5	mg/kg	90	-	-
Pyrene	0.5	mg/kg	190	-	-
Total PAH*	0.5	mg/kg	1000	-	-
2-Fluorobiphenyl (surr.)	1	%	94	-	-
p-Terphenyl-d14 (surr.)	1	%	86	-	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions					
TRH >C10-C16	50	mg/kg	< 50	-	-
TRH >C16-C34	100	mg/kg	2100	-	-
TRH >C34-C40	100	mg/kg	670	-	-
TRH >C10-C40 (total)*	100	mg/kg	2770	-	-
Heavy Metals					
Arsenic	2	mg/kg	5.4	-	-
Cadmium	0.4	mg/kg	1.0	-	-
Chromium	5	mg/kg	11	-	-
Copper	5	mg/kg	37	-	-
Lead	5	mg/kg	110	-	-
Mercury	0.1	mg/kg	0.1	-	-
Nickel	5	mg/kg	26	-	-
Zinc	5	mg/kg	390	-	-
Sample Properties					
% Moisture	1	%	10	-	-
BTEX and Naphthalene					
Naphthalene ^{N02}	0.5	mg/kg	-	< 0.5	-
Total Recoverable Hydrocarbons					
TRH C6-C10	20	mg/kg	-	< 20	-
TRH C6-C10 less BTEX (F1) ^{N04}	20	mg/kg	-	< 20	-
Naphthalene	1	%	-	-	100
TRH C6-C9	1	%	-	-	110
TRH C6-C10	1	%	-	-	110
BTEX					
Benzene	1	%	-	-	110
Ethylbenzene	1	%	-	-	110
m&p-Xylenes	1	%	-	-	110
o-Xylene	1	%	-	-	110

Client Sample ID			QC1A	Trip Blank	Trip Spike
Sample Matrix			Soil	Trip Blank (solid)	Trip Spike (solid)
Eurofins Sample No.			N24-Se0011318	N24-Se0011333	N24-Se0011334
Date Sampled			Sep 03, 2024	Sep 03, 2024	Sep 03, 2024
Test/Reference	LOR	Unit			
BTEX					
Toluene	1	%	-	-	110
Xylenes - Total	1	%	-	-	110
4-Bromofluorobenzene (surr.)	1	%	-	-	111

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

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	Sep 09, 2024	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
BTEX	Sydney	Sep 09, 2024	14 Days
- Method: LTM-ORG-2010 BTEX and Volatile TRH			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Sep 06, 2024	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons	Sydney	Sep 09, 2024	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Polycyclic Aromatic Hydrocarbons	Sydney	Sep 06, 2024	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Sep 06, 2024	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Metals M8	Sydney	Sep 06, 2024	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Eurofins Suite B15			
Organochlorine Pesticides	Sydney	Sep 06, 2024	14 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Organophosphorus Pesticides	Sydney	Sep 06, 2024	14 Days
- Method: LTM-ORG-2200 Organophosphorus Pesticides by GC-MS			
Polychlorinated Biphenyls	Sydney	Sep 06, 2024	28 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
% Moisture	Sydney	Sep 05, 2024	14 Days
- Method: LTM-GEN-7080 Moisture			



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Company Name: Tetra Tech Coffey P/L N castle
Address: Unit 4, 60 Griffith Road
Lambton
NSW 2299

Project Name: CESSNOCK HOSPITAL
Project ID: 754-NTLEN347071-2

Order No.:
Report #: 1135930
Phone: 02 4016 2300
Fax: 02 4016 2380

Received: Sep 4, 2024 2:55 PM
Due: Sep 11, 2024
Priority: 5 Day
Contact Name: Peter Sanderson

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines	Asbestos Absence / Presence*	HOLD*	Eurofins Suite B15	Moisture Set	Eurofins Suite B7	BTEXN and Volatile TRH	BTEXN and Volatile TRH
Sydney Laboratory - NATA # 1261 Site # 18217						X		X	X	X	X	X	X
Mayfield West Laboratory - NATA # 1261 Site # 25079							X						
External Laboratory													
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID								
1	BH1A 0.1-0.2	Sep 03, 2024		Soil	N24-Se0011300				X	X	X		
2	BH1A 0.5-0.6	Sep 03, 2024		Soil	N24-Se0011301					X	X		
3	BH2A 0.1-0.2	Sep 03, 2024		Soil	N24-Se0011302				X	X	X		
4	BH2A 1.0-1.1	Sep 03, 2024		Soil	N24-Se0011303					X	X		
5	BH3A 0.1-0.2	Sep 03, 2024		Soil	N24-Se0011304					X	X		
6	BH3A 0.5-0.6	Sep 03, 2024		Soil	N24-Se0011305					X	X		
7	BH4A 0.1-0.2	Sep 03, 2024		Soil	N24-Se0011306					X	X		
8	BH4A 1.0-1.1	Sep 03, 2024		Soil	N24-Se0011307					X	X		
9	BH5A 0.1-0.2	Sep 03, 2024		Soil	N24-Se0011308				X	X	X		
10	BH5A 0.5-0.6	Sep 03, 2024		Soil	N24-Se0011309					X	X		
11	BH6A 0.1-0.2	Sep 03, 2024		Soil	N24-Se0011310					X	X		
12	BH6A 1.0-1.1	Sep 03, 2024		Soil	N24-Se0011311					X	X		
13	BH1A	Sep 03, 2024		Soil	N24-Se0011312	X							



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Address: Unit 4, 60 Griffith Road
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NSW 2299

Project Name: CESSNOCK HOSPITAL
Project ID: 754-NTLEN347071-2

Order No.:
Report #: 1135930
Phone: 02 4016 2300
Fax: 02 4016 2380

Received: Sep 4, 2024 2:55 PM
Due: Sep 11, 2024
Priority: 5 Day
Contact Name: Peter Sanderson

Eurofins Analytical Services Manager : Andrew Black

Sample Detail

Sydney Laboratory - NATA # 1261 Site # 18217

Mayfield West Laboratory - NATA # 1261 Site # 25079

						Asbestos - WA guidelines	Asbestos Absence / Presence*	HOLD*	Eurofins Suite B15	Moisture Set	Eurofins Suite B7	BTEXN and Volatile TRH	BTEXN and Volatile TRH
						X		X	X	X	X	X	X
							X						
14	BH2A	Sep 03, 2024		Soil	N24-Se0011313	X							
15	BH3A	Sep 03, 2024		Soil	N24-Se0011314	X							
16	BH4A	Sep 03, 2024		Soil	N24-Se0011315	X							
17	BH5A	Sep 03, 2024		Soil	N24-Se0011316	X							
18	BH6A	Sep 03, 2024		Soil	N24-Se0011317	X							
19	QC1A	Sep 03, 2024		Soil	N24-Se0011318					X	X		
20	BH1A_1.0-1.1	Sep 03, 2024		Soil	N24-Se0011319			X					
21	BH1A_1.4-1.5	Sep 03, 2024		Soil	N24-Se0011320			X					
22	BH2A_0.5-0.6	Sep 03, 2024		Soil	N24-Se0011321			X					
23	BH2A_1.9-2.0	Sep 03, 2024		Soil	N24-Se0011322			X					
24	BH3A_1.0-1.1	Sep 03, 2024		Soil	N24-Se0011323			X					
25	BH3A_1.4-1.5	Sep 03, 2024		Soil	N24-Se0011324			X					
26	BH4A_0.5-0.6	Sep 03, 2024		Soil	N24-Se0011325			X					
27	BH4A_1.6-1.7	Sep 03, 2024		Soil	N24-Se0011326			X					
28	BH5A_1.0-1.1	Sep 03, 2024		Soil	N24-Se0011327			X					
29	BH5A_1.9-2.0	Sep 03, 2024		Soil	N24-Se0011328			X					



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NSW 2299

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Project ID: 754-NTLEN347071-2

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Phone: 02 4016 2300
Fax: 02 4016 2380

Received: Sep 4, 2024 2:55 PM
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Priority: 5 Day
Contact Name: Peter Sanderson

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines	Asbestos Absence / Presence*	HOLD*	Eurofins Suite B15	Moisture Set	Eurofins Suite B7	BTEXN and Volatile TRH	BTEXN and Volatile TRH
Sydney Laboratory - NATA # 1261 Site # 18217						X		X	X	X	X	X	X
Mayfield West Laboratory - NATA # 1261 Site # 25079							X						
30	BH6A_0.5-0.6	Sep 03, 2024		Soil	N24-Se0011329			X					
31	BH6A_1.3-1.4	Sep 03, 2024		Soil	N24-Se0011330			X					
32	BH1A-F	Sep 03, 2024		Building Materials	N24-Se0011331		X						
33	BH4A-F	Sep 03, 2024		Building Materials	N24-Se0011332		X						
34	Trip Blank	Sep 03, 2024		Trip Blank (solid)	N24-Se0011333							X	
35	Trip Spike	Sep 03, 2024		Trip Spike (solid)	N24-Se0011334								X
36	Trip Spike LAB	Sep 03, 2024		Trip Spike (solid)	N24-Se0011335								X
Test Counts						6	2	12	3	13	13	1	2

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follow guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013. They are included in this QC report where applicable. Additional QC data may be available on request.
2. Unless otherwise stated, all soil/sediment/solid results are reported on a dry weight basis.
3. Unless otherwise stated, all biota/food results are reported on a wet weight basis on the edible portion.
4. For CEC results where the sample's origin is unknown or environmentally contaminated, the results should be used advisedly.
5. Actual LORs are matrix dependent. Quoted LORs may be raised where sample extracts are diluted due to interferences.
6. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds where annotated.
7. SVOC analysis on waters is performed on homogenised, unfiltered samples unless noted otherwise.
8. Samples were analysed on an 'as received' basis.
9. Information identified in this report with **blue** colour indicates data provided by customers that may have an impact on the results.
10. This report replaces any interim results previously issued.

Holding Times

Please refer to the '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 before sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and despite any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the sampling date; therefore, compliance with these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether, the holding time is seven days; however, for all other VOCs, such as BTEX or C6-10 TRH, the holding time is 14 days.

Units

mg/kg: milligrams per kilogram	mg/L: milligrams per litre	ppm: parts per million
µg/L: micrograms per litre	ppb: parts per billion	%: Percentage
org/100 mL: Organisms per 100 millilitres	NTU: Nephelometric Turbidity Units	MPN/100 mL: Most Probable Number of organisms per 100 millilitres
CFU: Colony Forming Unit	Colour: Pt-Co Units (CU)	

Terms

APHA	American Public Health Association
CEC	Cation Exchange Capacity
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where moisture has been determined on a solid sample, the result is expressed on a dry weight basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - 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.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC represents the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a similar compound to the analyte target is reported as percentage recovery. See below for acceptance criteria.
TBTO	Tributyltin oxide (<i>bis</i> -tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment; however, free tributyltin was measured, and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 6.0
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should only be used as a guide and may be different when site-specific Sampling Analysis and Quality Plan (SAQP) have been implemented.

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%

NOTE: pH duplicates are reported as a range, not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS. SVOCs recoveries 20 – 150%, VOC recoveries 50 – 150%

PFAS field samples containing surrogate recoveries above the QC limit designated in QSM 6.0, where no positive PFAS results have been reported or reviewed, and no data was affected.

QC Data General Comments

1. Where a result is reported as 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 are not data from your samples.
3. 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.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery, the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results, a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. 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 C10-C14	mg/kg	< 20			20	Pass	
TRH C15-C28	mg/kg	< 50			50	Pass	
TRH C29-C36	mg/kg	< 50			50	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
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							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/kg	< 20			20	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	
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-HCH	mg/kg	< 0.05			0.05	Pass	
Aldrin	mg/kg	< 0.05			0.05	Pass	
b-HCH	mg/kg	< 0.05			0.05	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
d-HCH	mg/kg	< 0.05			0.05	Pass	
Dieldrin	mg/kg	< 0.05			0.05	Pass	
Endosulfan I	mg/kg	< 0.05			0.05	Pass	
Endosulfan II	mg/kg	< 0.05			0.05	Pass	
Endosulfan sulphate	mg/kg	< 0.05			0.05	Pass	
Endrin	mg/kg	< 0.05			0.05	Pass	
Endrin aldehyde	mg/kg	< 0.05			0.05	Pass	
Endrin ketone	mg/kg	< 0.05			0.05	Pass	
g-HCH (Lindane)	mg/kg	< 0.05			0.05	Pass	
Heptachlor	mg/kg	< 0.05			0.05	Pass	
Heptachlor epoxide	mg/kg	< 0.05			0.05	Pass	
Hexachlorobenzene	mg/kg	< 0.05			0.05	Pass	
Methoxychlor	mg/kg	< 0.05			0.05	Pass	
Toxaphene	mg/kg	< 0.5			0.5	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							
Polychlorinated Biphenyls							
Aroclor-1016	mg/kg	< 0.1			0.1	Pass	
Aroclor-1221	mg/kg	< 0.1			0.1	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Aroclor-1232	mg/kg	< 0.1			0.1	Pass	
Aroclor-1242	mg/kg	< 0.1			0.1	Pass	
Aroclor-1248	mg/kg	< 0.1			0.1	Pass	
Aroclor-1254	mg/kg	< 0.1			0.1	Pass	
Aroclor-1260	mg/kg	< 0.1			0.1	Pass	
Total PCB*	mg/kg	< 0.1			0.1	Pass	
Method Blank							
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 C10-C14	%	73			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	%	74			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	89			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	102			70-130	Pass	
Toluene	%	118			70-130	Pass	
Ethylbenzene	%	102			70-130	Pass	
m&p-Xylenes	%	106			70-130	Pass	
o-Xylene	%	96			70-130	Pass	
Xylenes - Total*	%	102			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	120			70-130	Pass	
TRH C6-C10	%	88			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	87			70-130	Pass	
Acenaphthylene	%	84			70-130	Pass	
Anthracene	%	85			70-130	Pass	
Benz(a)anthracene	%	83			70-130	Pass	
Benzo(a)pyrene	%	88			70-130	Pass	
Benzo(b&j)fluoranthene	%	92			70-130	Pass	
Benzo(g,h,i)perylene	%	83			70-130	Pass	
Benzo(k)fluoranthene	%	91			70-130	Pass	
Chrysene	%	89			70-130	Pass	
Dibenz(a,h)anthracene	%	87			70-130	Pass	
Fluoranthene	%	87			70-130	Pass	
Fluorene	%	88			70-130	Pass	
Indeno(1,2,3-cd)pyrene	%	87			70-130	Pass	
Naphthalene	%	87			70-130	Pass	
Phenanthrene	%	89			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Pyrene	%	87			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
Chlordanes - Total	%	86			70-130	Pass	
4,4'-DDD	%	83			70-130	Pass	
4,4'-DDE	%	89			70-130	Pass	
4,4'-DDT	%	82			70-130	Pass	
a-HCH	%	85			70-130	Pass	
Aldrin	%	85			70-130	Pass	
b-HCH	%	90			70-130	Pass	
d-HCH	%	87			70-130	Pass	
Dieldrin	%	87			70-130	Pass	
Endosulfan I	%	85			70-130	Pass	
Endosulfan II	%	80			70-130	Pass	
Endosulfan sulphate	%	86			70-130	Pass	
Endrin	%	88			70-130	Pass	
Endrin aldehyde	%	79			70-130	Pass	
Endrin ketone	%	85			70-130	Pass	
g-HCH (Lindane)	%	91			70-130	Pass	
Heptachlor	%	88			70-130	Pass	
Heptachlor epoxide	%	86			70-130	Pass	
Hexachlorobenzene	%	90			70-130	Pass	
Methoxychlor	%	76			70-130	Pass	
LCS - % Recovery							
Organophosphorus Pesticides							
Diazinon	%	115			70-130	Pass	
Dimethoate	%	119			70-130	Pass	
Ethion	%	95			70-130	Pass	
Fenitrothion	%	110			70-130	Pass	
Methyl parathion	%	123			70-130	Pass	
Mevinphos	%	107			70-130	Pass	
LCS - % Recovery							
Polychlorinated Biphenyls							
Aroclor-1016	%	84			70-130	Pass	
Aroclor-1260	%	87			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	82			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	103			70-130	Pass	
Toluene	%	95			70-130	Pass	
Ethylbenzene	%	94			70-130	Pass	
m&p-Xylenes	%	86			70-130	Pass	
o-Xylene	%	83			70-130	Pass	
Xylenes - Total*	%	85			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	100			70-130	Pass	
TRH C6-C10	%	81			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	95			80-120	Pass	
Cadmium	%	101			80-120	Pass	

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Chromium			%	106			80-120	Pass	
Copper			%	108			80-120	Pass	
Lead			%	103			80-120	Pass	
Mercury			%	106			80-120	Pass	
Nickel			%	107			80-120	Pass	
Zinc			%	106			80-120	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	S24-Se0018833	NCP	%	76			70-130	Pass	
TRH C10-C14	S24-Se0010341	NCP	%	72			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	S24-Se0006516	NCP	%	84			70-130	Pass	
Toluene	S24-Se0021282	NCP	%	92			70-130	Pass	
Ethylbenzene	S24-Se0006516	NCP	%	82			70-130	Pass	
m&p-Xylenes	S24-Se0006516	NCP	%	79			70-130	Pass	
o-Xylene	S24-Se0006516	NCP	%	80			70-130	Pass	
Xylenes - Total*	S24-Se0006516	NCP	%	80			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	S24-Au0085028	NCP	%	72			70-130	Pass	
TRH C6-C10	S24-Se0018833	NCP	%	75			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	S24-Se0010341	NCP	%	71			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S24-Se0017953	NCP	%	92			75-125	Pass	
Cadmium	S24-Se0017953	NCP	%	92			75-125	Pass	
Chromium	S24-Se0017953	NCP	%	101			75-125	Pass	
Copper	S24-Se0017953	NCP	%	97			75-125	Pass	
Lead	S24-Se0017953	NCP	%	100			75-125	Pass	
Mercury	S24-Se0017953	NCP	%	97			75-125	Pass	
Nickel	S24-Se0017953	NCP	%	86			75-125	Pass	
Zinc	S24-Se0017953	NCP	%	96			75-125	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	S24-Se0004449	NCP	%	71			70-130	Pass	
Acenaphthylene	S24-Se0004449	NCP	%	74			70-130	Pass	
Anthracene	S24-Se0004449	NCP	%	75			70-130	Pass	
Benz(a)anthracene	S24-Se0005446	NCP	%	79			70-130	Pass	
Benzo(a)pyrene	S24-Se0005446	NCP	%	91			70-130	Pass	
Benzo(b&j)fluoranthene	S24-Se0005446	NCP	%	81			70-130	Pass	
Benzo(g,h,i)perylene	S24-Se0005446	NCP	%	82			70-130	Pass	
Benzo(k)fluoranthene	S24-Se0005446	NCP	%	70			70-130	Pass	
Chrysene	S24-Se0005446	NCP	%	93			70-130	Pass	
Dibenz(a,h)anthracene	S24-Se0005446	NCP	%	88			70-130	Pass	
Fluoranthene	S24-Se0004449	NCP	%	74			70-130	Pass	
Fluorene	S24-Se0004449	NCP	%	74			70-130	Pass	
Indeno(1,2,3-cd)pyrene	S24-Se0005446	NCP	%	81			70-130	Pass	
Naphthalene	S24-Se0004449	NCP	%	74			70-130	Pass	
Phenanthrene	S24-Se0004449	NCP	%	76			70-130	Pass	
Pyrene	S24-Se0004449	NCP	%	71			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 - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C10-C14	S24-Se0010351	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	S24-Se0010351	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	S24-Se0010351	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S24-Se0024387	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S24-Se0024387	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S24-Se0024387	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S24-Se0024387	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	S24-Se0024387	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	S24-Se0024387	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g,h,i)perylene	S24-Se0024387	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	S24-Se0024387	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	S24-Se0024387	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a,h)anthracene	S24-Se0024387	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S24-Se0024387	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	S24-Se0024387	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1,2,3-cd)pyrene	S24-Se0024387	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	S24-Se0024387	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	S24-Se0024387	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	S24-Se0024387	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	S24-Se0010351	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	S24-Se0010351	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	S24-Se0010351	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
Sample Properties				Result 1	Result 2	RPD			
% Moisture	S24-Se0011178	NCP	%	2.2	2.5	15	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	N24-Se0011304	CP	mg/kg	6.0	6.9	15	30%	Pass	
Cadmium	N24-Se0011304	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	N24-Se0011304	CP	mg/kg	12	13	13	30%	Pass	
Copper	N24-Se0011304	CP	mg/kg	56	58	2.0	30%	Pass	
Lead	N24-Se0011304	CP	mg/kg	31	38	20	30%	Pass	
Mercury	N24-Se0011304	CP	mg/kg	0.2	0.2	12	30%	Pass	
Nickel	N24-Se0011304	CP	mg/kg	17	16	3.0	30%	Pass	
Zinc	N24-Se0011304	CP	mg/kg	86	99	15	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	N24-Se0011309	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	N24-Se0011309	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	N24-Se0011309	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	N24-Se0011309	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	N24-Se0011309	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	N24-Se0011309	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total*	N24-Se0011309	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	

Duplicate								
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD		
Naphthalene	N24-Se0011309	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
TRH C6-C10	N24-Se0011309	CP	mg/kg	< 20	< 20	<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
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

Authorised by:

Nileshni Goundar	Analytical Services Manager
Chamath JHM Annakkage	Senior Analyst-Asbestos
Fang Yee Tan	Senior Analyst-Metal
Mickael Ros	Senior Analyst-Metal
Raymond Siu	Senior Analyst-Volatile
Roopesh Rangarajan	Senior Analyst-Organic
Roopesh Rangarajan	Senior Analyst-Sample Properties
Roopesh Rangarajan	Senior Analyst-Volatile



Glenn Jackson
Managing Director

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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Sample Receipt Advice

Company name: Tetra Tech Coffey P/L N castle
Contact name: Peter Sanderson
Project name: CESSNOCK HOSPITAL
Project ID: 754-NTLEN347071-2
Turnaround time: 3 Day
Date/Time received: Sep 11, 2024 4:55 PM
Eurofins reference: 1138492

Sample Information

- ✓ A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- ✓ Sample Temperature of chilled sample on the batch as recorded by Eurofins Sample Receipt : 17.3 degrees Celsius.
- ✓ 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

QC2 sent to ALS

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Andrew Black on phone : (+61) 2 9900 8490 or by email: AndrewBlack@eurofins.com

Results will be delivered electronically via email to Peter Sanderson - Peter.sanderson@tetrattech.com.

Note: A copy of these results will also be delivered to the general Tetra Tech Coffey P/L N castle email address.



Eurofins Environment Testing Australia Pty Ltd

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--

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Company Name: Tetra Tech Coffey P/L N castle

Address: Unit 4, 60 Griffith Road
Lambton
NSW 2299

Project Name: CESSNOCK HOSPITAL

Project ID: 754-NTLEN347071-2

Order No.:

Report #: 1138492

Phone: 02 4016 2300

Fax: 02 4016 2380

Received: Sep 11, 2024 4:55 PM

Due: Sep 16, 2024

Priority: 3 Day

Contact Name: Peter Sanderson

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Eurofins Suite B7A
Sydney Laboratory - NATA # 1261 Site # 18217						X
External Laboratory						
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID	
1	MW01	Sep 11, 2024		Water	N24-Se0030934	X
2	QC1	Sep 11, 2024		Water	N24-Se0030935	X
Test Counts						2

Tetra Tech Coffey Pty Ltd Newcastle
Unit 4, 60 Griffith Road
Lambton
NSW 2299



NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
 NATA is a signatory to the ILAC Mutual Recognition
 Arrangement for the mutual recognition of the
 equivalence of testing, medical testing, calibration,
 inspection, proficiency testing scheme providers and
 reference materials producers reports and certificates.

Attention: **Peter Sanderson**

Report **1138492-W**
Project name **CESSNOCK HOSPITAL**
Project ID **754-NTLEN347071-2**
Received Date **Sep 11, 2024**

Client Sample ID			MW01	QC1
Sample Matrix			Water	Water
Eurofins Sample No.			N24- Se0030934	N24- Se0030935
Date Sampled			Sep 11, 2024	Sep 11, 2024
Test/Reference	LOR	Unit		
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				
TRH C6-C9	0.02	mg/L	< 0.02	< 0.02
TRH C10-C14	0.05	mg/L	< 0.05	< 0.05
TRH C15-C28	0.1	mg/L	< 0.1	< 0.1
TRH C29-C36	0.1	mg/L	< 0.1	< 0.1
TRH C10-C36 (Total)	0.1	mg/L	< 0.1	< 0.1
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	%	66	66
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				
Naphthalene ^{N02}	0.01	mg/L	< 0.01	< 0.01
TRH >C10-C16 less Naphthalene (F2)* ^{N01}	0.05	mg/L	< 0.05	< 0.05
TRH C6-C10	0.02	mg/L	< 0.02	< 0.02
TRH C6-C10 less BTEX (F1) ^{N04}	0.02	mg/L	< 0.02	< 0.02
Polycyclic Aromatic Hydrocarbons				
Acenaphthene	0.001	mg/L	< 0.001	< 0.001
Acenaphthylene	0.001	mg/L	< 0.001	< 0.001
Anthracene	0.001	mg/L	< 0.001	< 0.001
Benz(a)anthracene	0.001	mg/L	< 0.001	< 0.001
Benzo(a)pyrene	0.001	mg/L	< 0.001	< 0.001
Benzo(b&j)fluoranthene ^{N07}	0.001	mg/L	< 0.001	< 0.001
Benzo(g,h,i)perylene	0.001	mg/L	< 0.001	< 0.001
Benzo(k)fluoranthene	0.001	mg/L	< 0.001	< 0.001
Chrysene	0.001	mg/L	< 0.001	< 0.001
Dibenz(a,h)anthracene	0.001	mg/L	< 0.001	< 0.001
Fluoranthene	0.001	mg/L	< 0.001	< 0.001
Fluorene	0.001	mg/L	< 0.001	< 0.001
Indeno(1,2,3-cd)pyrene	0.001	mg/L	< 0.001	< 0.001
Naphthalene	0.001	mg/L	< 0.001	< 0.001
Phenanthrene	0.001	mg/L	< 0.001	< 0.001
Pyrene	0.001	mg/L	< 0.001	< 0.001

Client Sample ID			MW01	QC1
Sample Matrix			Water	Water
Eurofins Sample No.			N24-Se0030934	N24-Se0030935
Date Sampled			Sep 11, 2024	Sep 11, 2024
Test/Reference	LOR	Unit		
Polycyclic Aromatic Hydrocarbons				
Total PAH*	0.001	mg/L	< 0.001	< 0.001
2-Fluorobiphenyl (surr.)	1	%	65	65
p-Terphenyl-d14 (surr.)	1	%	118	108
Phenols (Halogenated)				
2-Chlorophenol	0.003	mg/L	< 0.003	< 0.003
2,4-Dichlorophenol	0.003	mg/L	< 0.003	< 0.003
2,4,5-Trichlorophenol	0.01	mg/L	< 0.01	< 0.01
2,4,6-Trichlorophenol	0.01	mg/L	< 0.01	< 0.01
2,6-Dichlorophenol	0.003	mg/L	< 0.003	< 0.003
4-Chloro-3-methylphenol	0.01	mg/L	< 0.01	< 0.01
Pentachlorophenol	0.01	mg/L	< 0.01	< 0.01
Tetrachlorophenols - Total	0.03	mg/L	< 0.03	< 0.03
Total Halogenated Phenol*	0.01	mg/L	< 0.01	< 0.01
Phenols (non-Halogenated)				
2-Cyclohexyl-4,6-dinitrophenol	0.1	mg/L	< 0.1	< 0.1
2-Methyl-4,6-dinitrophenol	0.03	mg/L	< 0.03	< 0.03
2-Nitrophenol	0.01	mg/L	< 0.01	< 0.01
2,4-Dimethylphenol	0.003	mg/L	< 0.003	< 0.003
2,4-Dinitrophenol	0.03	mg/L	< 0.03	< 0.03
2-Methylphenol (o-Cresol)	0.003	mg/L	< 0.003	< 0.003
3&4-Methylphenol (m&p-Cresol)	0.006	mg/L	< 0.006	< 0.006
Total cresols*	0.01	mg/L	< 0.01	< 0.01
4-Nitrophenol	0.03	mg/L	< 0.03	< 0.03
Dinoseb	0.1	mg/L	< 0.1	< 0.1
Phenol	0.003	mg/L	< 0.003	< 0.003
Phenol-d6 (surr.)	1	%	32	33
Total Non-Halogenated Phenol*	0.1	mg/L	< 0.1	< 0.1
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				
TRH >C10-C16	0.05	mg/L	< 0.05	< 0.05
TRH >C16-C34	0.1	mg/L	< 0.1	< 0.1
TRH >C34-C40	0.1	mg/L	< 0.1	< 0.1
TRH >C10-C40 (total)*	0.1	mg/L	< 0.1	< 0.1
Heavy Metals				
Arsenic	0.001	mg/L	0.001	0.001
Cadmium	0.0002	mg/L	< 0.0002	< 0.0002
Chromium	0.001	mg/L	< 0.001	< 0.001
Copper	0.001	mg/L	0.001	0.001
Lead	0.001	mg/L	< 0.001	< 0.001
Mercury	0.0001	mg/L	< 0.0001	< 0.0001
Nickel	0.001	mg/L	0.015	0.015
Zinc	0.005	mg/L	0.060	0.059

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

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 - Method: LTM-ORG-2010 TRH C6-C40	Sydney	Sep 13, 2024	7 Days
BTEX - Method: LTM-ORG-2010 BTEX and Volatile TRH	Sydney	Sep 13, 2024	14 Days
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Sydney	Sep 13, 2024	7 Days
Polycyclic Aromatic Hydrocarbons - Method: LTM-ORG-2130 PAH and Phenols in Soil and Water	Sydney	Sep 13, 2024	7 Days
Phenols (Halogenated) - Method: LTM-ORG-2130 PAH and Phenols in Soil and Water	Sydney	Sep 13, 2024	7 Days
Phenols (non-Halogenated) - Method: LTM-ORG-2130 PAH and Phenols in Soil and Water	Sydney	Sep 13, 2024	7 Days
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Sydney	Sep 13, 2024	7 Days
Metals M8 - Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS	Sydney	Sep 13, 2024	28 Days



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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794 & 2780	Site# 25079

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Company Name: Tetra Tech Coffey P/L N castle
Address: Unit 4, 60 Griffith Road
Lambton
NSW 2299

Project Name: CESSNOCK HOSPITAL
Project ID: 754-NTLEN347071-2

Order No.:
Report #: 1138492
Phone: 02 4016 2300
Fax: 02 4016 2380

Received: Sep 11, 2024 4:55 PM
Due: Sep 16, 2024
Priority: 3 Day
Contact Name: Peter Sanderson

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Eurofins Suite B7A
Sydney Laboratory - NATA # 1261 Site # 18217						X
External Laboratory						
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID	
1	MW01	Sep 11, 2024		Water	N24-Se0030934	X
2	QC1	Sep 11, 2024		Water	N24-Se0030935	X
Test Counts						2

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follow guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013. They are included in this QC report where applicable. Additional QC data may be available on request.
2. Unless otherwise stated, all soil/sediment/solid results are reported on a dry weight basis.
3. Unless otherwise stated, all biota/food results are reported on a wet weight basis on the edible portion.
4. For CEC results where the sample's origin is unknown or environmentally contaminated, the results should be used advisedly.
5. Actual LORs are matrix dependent. Quoted LORs may be raised where sample extracts are diluted due to interferences.
6. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds where annotated.
7. SVOC analysis on waters is performed on homogenised, unfiltered samples unless noted otherwise.
8. Samples were analysed on an 'as received' basis.
9. Information identified in this report with **blue** colour indicates data provided by customers that may have an impact on the results.
10. This report replaces any interim results previously issued.

Holding Times

Please refer to the '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 before sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and despite any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the sampling date; therefore, compliance with these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether, the holding time is seven days; however, for all other VOCs, such as BTEX or C6-10 TRH, the holding time is 14 days.

Units

mg/kg: milligrams per kilogram	mg/L: milligrams per litre	ppm: parts per million
µg/L: micrograms per litre	ppb: parts per billion	%: Percentage
org/100 mL: Organisms per 100 millilitres	NTU: Nephelometric Turbidity Units	MPN/100 mL: Most Probable Number of organisms per 100 millilitres
CFU: Colony Forming Unit	Colour: Pt-Co Units (CU)	

Terms

APHA	American Public Health Association
CEC	Cation Exchange Capacity
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where moisture has been determined on a solid sample, the result is expressed on a dry weight basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - 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.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC represents the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a similar compound to the analyte target is reported as percentage recovery. See below for acceptance criteria.
TBTO	Tributyltin oxide (<i>bis</i> -tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment; however, free tributyltin was measured, and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 6.0
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should only be used as a guide and may be different when site-specific Sampling Analysis and Quality Plan (SAQP) have been implemented.

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%

NOTE: pH duplicates are reported as a range, not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS. SVOCs recoveries 20 – 150%, VOC recoveries 50 – 150%

PFAS field samples containing surrogate recoveries above the QC limit designated in QSM 6.0, where no positive PFAS results have been reported or reviewed, and no data was affected.

QC Data General Comments

1. Where a result is reported as 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 are not data from your samples.
3. 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.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery, the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results, a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data; thus, it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/L	< 0.02			0.02	Pass	
TRH C10-C14	mg/L	< 0.05			0.05	Pass	
TRH C15-C28	mg/L	< 0.1			0.1	Pass	
TRH C29-C36	mg/L	< 0.1			0.1	Pass	
Method Blank							
BTEX							
Benzene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
m&p-Xylenes	mg/L	< 0.002			0.002	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	
Xylenes - Total*	mg/L	< 0.003			0.003	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/L	< 0.01			0.01	Pass	
TRH C6-C10	mg/L	< 0.02			0.02	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/L	< 0.001			0.001	Pass	
Acenaphthylene	mg/L	< 0.001			0.001	Pass	
Anthracene	mg/L	< 0.001			0.001	Pass	
Benz(a)anthracene	mg/L	< 0.001			0.001	Pass	
Benzo(a)pyrene	mg/L	< 0.001			0.001	Pass	
Benzo(b&j)fluoranthene	mg/L	< 0.001			0.001	Pass	
Benzo(g,h,i)perylene	mg/L	< 0.001			0.001	Pass	
Benzo(k)fluoranthene	mg/L	< 0.001			0.001	Pass	
Chrysene	mg/L	< 0.001			0.001	Pass	
Dibenz(a,h)anthracene	mg/L	< 0.001			0.001	Pass	
Fluoranthene	mg/L	< 0.001			0.001	Pass	
Fluorene	mg/L	< 0.001			0.001	Pass	
Indeno(1,2,3-cd)pyrene	mg/L	< 0.001			0.001	Pass	
Naphthalene	mg/L	< 0.001			0.001	Pass	
Phenanthrene	mg/L	< 0.001			0.001	Pass	
Pyrene	mg/L	< 0.001			0.001	Pass	
Method Blank							
Phenols (Halogenated)							
2-Chlorophenol	mg/L	< 0.003			0.003	Pass	
2,4-Dichlorophenol	mg/L	< 0.003			0.003	Pass	
2,4,5-Trichlorophenol	mg/L	< 0.01			0.01	Pass	
2,4,6-Trichlorophenol	mg/L	< 0.01			0.01	Pass	
2,6-Dichlorophenol	mg/L	< 0.003			0.003	Pass	
4-Chloro-3-methylphenol	mg/L	< 0.01			0.01	Pass	
Pentachlorophenol	mg/L	< 0.01			0.01	Pass	
Tetrachlorophenols - Total	mg/L	< 0.03			0.03	Pass	
Method Blank							
Phenols (non-Halogenated)							
2-Cyclohexyl-4,6-dinitrophenol	mg/L	< 0.1			0.1	Pass	
2-Methyl-4,6-dinitrophenol	mg/L	< 0.03			0.03	Pass	
2-Nitrophenol	mg/L	< 0.01			0.01	Pass	
2,4-Dimethylphenol	mg/L	< 0.003			0.003	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
2,4-Dinitrophenol	mg/L	< 0.03			0.03	Pass	
2-Methylphenol (o-Cresol)	mg/L	< 0.003			0.003	Pass	
3&4-Methylphenol (m&p-Cresol)	mg/L	< 0.006			0.006	Pass	
4-Nitrophenol	mg/L	< 0.03			0.03	Pass	
Dinoseb	mg/L	< 0.1			0.1	Pass	
Phenol	mg/L	< 0.003			0.003	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	mg/L	< 0.05			0.05	Pass	
TRH >C16-C34	mg/L	< 0.1			0.1	Pass	
TRH >C34-C40	mg/L	< 0.1			0.1	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/L	< 0.001			0.001	Pass	
Cadmium	mg/L	< 0.0002			0.0002	Pass	
Chromium	mg/L	< 0.001			0.001	Pass	
Copper	mg/L	< 0.001			0.001	Pass	
Lead	mg/L	< 0.001			0.001	Pass	
Mercury	mg/L	< 0.0001			0.0001	Pass	
Nickel	mg/L	< 0.001			0.001	Pass	
Zinc	mg/L	< 0.005			0.005	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	75			70-130	Pass	
TRH C10-C14	%	71			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	93			70-130	Pass	
Toluene	%	89			70-130	Pass	
Ethylbenzene	%	87			70-130	Pass	
m&p-Xylenes	%	85			70-130	Pass	
o-Xylene	%	83			70-130	Pass	
Xylenes - Total*	%	84			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	83			70-130	Pass	
TRH C6-C10	%	74			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	120			70-130	Pass	
Acenaphthylene	%	118			70-130	Pass	
Anthracene	%	97			70-130	Pass	
Benz(a)anthracene	%	122			70-130	Pass	
Benzo(a)pyrene	%	129			70-130	Pass	
Benzo(b&j)fluoranthene	%	109			70-130	Pass	
Benzo(g,h,i)perylene	%	124			70-130	Pass	
Benzo(k)fluoranthene	%	96			70-130	Pass	
Chrysene	%	102			70-130	Pass	
Dibenz(a,h)anthracene	%	107			70-130	Pass	
Fluoranthene	%	105			70-130	Pass	
Fluorene	%	90			70-130	Pass	
Indeno(1,2,3-cd)pyrene	%	101			70-130	Pass	
Naphthalene	%	114			70-130	Pass	
Phenanthrene	%	123			70-130	Pass	

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Pyrene			%	100			70-130	Pass	
LCS - % Recovery									
Phenols (Halogenated)									
2-Chlorophenol		%	115				25-140	Pass	
2,4-Dichlorophenol		%	120				25-140	Pass	
2,4,5-Trichlorophenol		%	140				25-140	Pass	
2,4,6-Trichlorophenol		%	133				25-140	Pass	
2,6-Dichlorophenol		%	139				25-140	Pass	
4-Chloro-3-methylphenol		%	114				25-140	Pass	
Pentachlorophenol		%	119				25-140	Pass	
Tetrachlorophenols - Total		%	136				25-140	Pass	
LCS - % Recovery									
Phenols (non-Halogenated)									
2-Cyclohexyl-4,6-dinitrophenol		%	137				25-140	Pass	
2-Methyl-4,6-dinitrophenol		%	120				25-140	Pass	
2-Nitrophenol		%	136				25-140	Pass	
2,4-Dimethylphenol		%	109				25-140	Pass	
2,4-Dinitrophenol		%	127				25-140	Pass	
2-Methylphenol (o-Cresol)		%	100				25-140	Pass	
3&4-Methylphenol (m&p-Cresol)		%	93				25-140	Pass	
4-Nitrophenol		%	55				25-140	Pass	
Dinoseb		%	136				25-140	Pass	
Phenol		%	50				25-140	Pass	
LCS - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions									
TRH >C10-C16		%	70				70-130	Pass	
LCS - % Recovery									
Heavy Metals									
Arsenic		%	94				80-120	Pass	
Cadmium		%	94				80-120	Pass	
Chromium		%	96				80-120	Pass	
Copper		%	93				80-120	Pass	
Lead		%	102				80-120	Pass	
Mercury		%	102				80-120	Pass	
Nickel		%	93				80-120	Pass	
Zinc		%	97				80-120	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9		S24-Se0029440	NCP	%	74		70-130	Pass	
TRH C10-C14		N24-Se0024223	NCP	%	116		70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene		S24-Se0029440	NCP	%	86		70-130	Pass	
Toluene		S24-Se0029440	NCP	%	85		70-130	Pass	
Ethylbenzene		S24-Se0029440	NCP	%	83		70-130	Pass	
m&p-Xylenes		S24-Se0029440	NCP	%	82		70-130	Pass	
o-Xylene		S24-Se0029440	NCP	%	82		70-130	Pass	
Xylenes - Total*		S24-Se0029440	NCP	%	82		70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene		S24-Se0029440	NCP	%	75		70-130	Pass	
TRH C6-C10		S24-Se0029440	NCP	%	76		70-130	Pass	
Spike - % Recovery									

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	N24-Se0024223	NCP	%	116			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	N24-Se0030935	CP	%	96			70-130	Pass	
Acenaphthylene	N24-Se0030935	CP	%	113			70-130	Pass	
Anthracene	N24-Se0030935	CP	%	109			70-130	Pass	
Benz(a)anthracene	N24-Se0030935	CP	%	97			70-130	Pass	
Benzo(a)pyrene	N24-Se0030935	CP	%	109			70-130	Pass	
Benzo(b&j)fluoranthene	N24-Se0030935	CP	%	84			70-130	Pass	
Benzo(g,h,i)perylene	N24-Se0030935	CP	%	86			70-130	Pass	
Benzo(k)fluoranthene	N24-Se0030935	CP	%	141			70-130	Fail	Q08
Chrysene	N24-Se0030935	CP	%	127			70-130	Pass	
Dibenz(a,h)anthracene	N24-Se0030935	CP	%	103			70-130	Pass	
Fluoranthene	N24-Se0030935	CP	%	128			70-130	Pass	
Fluorene	N24-Se0030935	CP	%	107			70-130	Pass	
Indeno(1,2,3-cd)pyrene	N24-Se0030935	CP	%	100			70-130	Pass	
Naphthalene	N24-Se0030935	CP	%	82			70-130	Pass	
Phenanthrene	N24-Se0030935	CP	%	102			70-130	Pass	
Pyrene	N24-Se0030935	CP	%	116			70-130	Pass	
Spike - % Recovery									
Phenols (Halogenated)				Result 1					
2-Chlorophenol	N24-Se0030935	CP	%	93			30-130	Pass	
2,4-Dichlorophenol	N24-Se0030935	CP	%	97			30-130	Pass	
2,4,5-Trichlorophenol	N24-Se0030935	CP	%	132			30-130	Fail	Q08
2,4,6-Trichlorophenol	N24-Se0030935	CP	%	119			30-130	Pass	
2,6-Dichlorophenol	N24-Se0030935	CP	%	120			30-130	Pass	
4-Chloro-3-methylphenol	N24-Se0030935	CP	%	97			30-130	Pass	
Pentachlorophenol	N24-Se0030935	CP	%	130			30-130	Pass	
Tetrachlorophenols - Total	N24-Se0030935	CP	%	137			30-130	Fail	Q08
Spike - % Recovery									
Phenols (non-Halogenated)				Result 1					
2,4-Dimethylphenol	N24-Se0030935	CP	%	100			30-130	Pass	
2-Methylphenol (o-Cresol)	N24-Se0030935	CP	%	67			30-130	Pass	
3&4-Methylphenol (m&p-Cresol)	N24-Se0030935	CP	%	78			30-130	Pass	
4-Nitrophenol	N24-Se0030935	CP	%	56			30-130	Pass	
Phenol	N24-Se0030935	CP	%	41			30-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	N24-Se0030935	CP	%	101			75-125	Pass	
Cadmium	N24-Se0030935	CP	%	98			75-125	Pass	
Chromium	N24-Se0030935	CP	%	94			75-125	Pass	
Copper	N24-Se0030935	CP	%	89			75-125	Pass	
Lead	N24-Se0030935	CP	%	96			75-125	Pass	
Mercury	N24-Se0030935	CP	%	101			75-125	Pass	
Nickel	N24-Se0030935	CP	%	89			75-125	Pass	
Zinc	N24-Se0030935	CP	%	94			75-125	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S24-Se0024937	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
TRH C10-C14	N24-Se0030934	CP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH C15-C28	N24-Se0030934	CP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH C29-C36	N24-Se0030934	CP	mg/L	< 0.1	< 0.1	<1	30%	Pass	

Duplicate								
BTX				Result 1	Result 2	RPD		
Benzene	S24-Se0024937	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Toluene	S24-Se0024937	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Ethylbenzene	S24-Se0024937	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
m&p-Xylenes	S24-Se0024937	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass
o-Xylene	S24-Se0024937	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Xylenes - Total*	S24-Se0024937	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass
Duplicate								
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD		
Naphthalene	S24-Se0024937	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass
TRH C6-C10	S24-Se0024937	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass
Duplicate								
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD		
Acenaphthene	N24-Se0030934	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Acenaphthylene	N24-Se0030934	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Anthracene	N24-Se0030934	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Benz(a)anthracene	N24-Se0030934	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Benzo(a)pyrene	N24-Se0030934	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Benzo(b&j)fluoranthene	N24-Se0030934	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Benzo(g,h,i)perylene	N24-Se0030934	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Benzo(k)fluoranthene	N24-Se0030934	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Chrysene	N24-Se0030934	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Dibenz(a,h)anthracene	N24-Se0030934	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Fluoranthene	N24-Se0030934	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Fluorene	N24-Se0030934	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Indeno(1,2,3-cd)pyrene	N24-Se0030934	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Naphthalene	N24-Se0030934	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Phenanthrene	N24-Se0030934	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Pyrene	N24-Se0030934	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Duplicate								
Phenols (Halogenated)				Result 1	Result 2	RPD		
2-Chlorophenol	N24-Se0030934	CP	mg/L	< 0.003	< 0.003	<1	30%	Pass
2,4-Dichlorophenol	N24-Se0030934	CP	mg/L	< 0.003	< 0.003	<1	30%	Pass
2,4,5-Trichlorophenol	N24-Se0030934	CP	mg/L	< 0.01	< 0.01	<1	30%	Pass
2,4,6-Trichlorophenol	N24-Se0030934	CP	mg/L	< 0.01	< 0.01	<1	30%	Pass
2,6-Dichlorophenol	N24-Se0030934	CP	mg/L	< 0.003	< 0.003	<1	30%	Pass
4-Chloro-3-methylphenol	N24-Se0030934	CP	mg/L	< 0.01	< 0.01	<1	30%	Pass
Pentachlorophenol	N24-Se0030934	CP	mg/L	< 0.01	< 0.01	<1	30%	Pass
Tetrachlorophenols - Total	N24-Se0030934	CP	mg/L	< 0.03	< 0.03	<1	30%	Pass
Duplicate								
Phenols (non-Halogenated)				Result 1	Result 2	RPD		
2-Cyclohexyl-4,6-dinitrophenol	N24-Se0030934	CP	mg/L	< 0.1	< 0.1	<1	30%	Pass
2-Methyl-4,6-dinitrophenol	N24-Se0030934	CP	mg/L	< 0.03	< 0.03	<1	30%	Pass
2-Nitrophenol	N24-Se0030934	CP	mg/L	< 0.01	< 0.01	<1	30%	Pass
2,4-Dimethylphenol	N24-Se0030934	CP	mg/L	< 0.003	< 0.003	<1	30%	Pass
2,4-Dinitrophenol	N24-Se0030934	CP	mg/L	< 0.03	< 0.03	<1	30%	Pass
2-Methylphenol (o-Cresol)	N24-Se0030934	CP	mg/L	< 0.003	< 0.003	<1	30%	Pass
3&4-Methylphenol (m&p-Cresol)	N24-Se0030934	CP	mg/L	< 0.006	< 0.006	<1	30%	Pass
4-Nitrophenol	N24-Se0030934	CP	mg/L	< 0.03	< 0.03	<1	30%	Pass
Dinoseb	N24-Se0030934	CP	mg/L	< 0.1	< 0.1	<1	30%	Pass
Phenol	N24-Se0030934	CP	mg/L	< 0.003	< 0.003	<1	30%	Pass
Duplicate								
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD		
TRH >C10-C16	N24-Se0030934	CP	mg/L	< 0.05	< 0.05	<1	30%	Pass
TRH >C16-C34	N24-Se0030934	CP	mg/L	< 0.1	< 0.1	<1	30%	Pass
TRH >C34-C40	N24-Se0030934	CP	mg/L	< 0.1	< 0.1	<1	30%	Pass

Duplicate								
Heavy Metals				Result 1	Result 2	RPD		
Arsenic	N24-Se0030934	CP	mg/L	0.001	0.001	10	30%	Pass
Cadmium	N24-Se0030934	CP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass
Chromium	N24-Se0030934	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Copper	N24-Se0030934	CP	mg/L	0.001	0.001	3.0	30%	Pass
Lead	N24-Se0030934	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Mercury	N24-Se0030934	CP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass
Nickel	N24-Se0030934	CP	mg/L	0.015	0.015	3.0	30%	Pass
Zinc	S24-Se0028698	NCP	mg/L	< 0.005	0.006	77	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
Q08	The matrix spike recovery is outside of the recommended acceptance criteria. An acceptable recovery was obtained for the laboratory control sample indicating a sample matrix interference.
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:

Andrew Black	Analytical Services Manager
Mickael Ros	Senior Analyst-Metal
Roopesh Rangarajan	Senior Analyst-Organic
Roopesh Rangarajan	Senior Analyst-Volatile



Glenn Jackson
Managing Director

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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RE: Eurofins Test Results, Invoice - Report 1135930 : Site CESSNOCK HOSPITAL (754-NTLEN347071-2)

From Sanderson, Peter <Peter.sanderson@tetrattech.com>

Date Thu 2024-09-19 5:58 AM

To Nileshni Goundar <nileshni.goundar@eurofinsanz.com>

Cc Andrew Black <Andrew.Black@eurofinsanz.com>; Adam Bateup <Adam.Bateup@eurofinsanz.com>

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Could I get them on 3 day TAT.

Regards,

Peter Sanderson | Environmental Scientist

Mobile +61 428 418 368 | peter.sanderson@tetrattech.com

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From: Nileshni Goundar <Nileshni.Goundar@eurofinsanz.com>

Sent: Wednesday, September 18, 2024 6:03 PM

To: Sanderson, Peter <Peter.sanderson@tetrattech.com>

Cc: Andrew Black <Andrew.Black@eurofinsanz.com>; Adam Bateup <Adam.Bateup@eurofinsanz.com>

Subject: Re: Eurofins Test Results, Invoice - Report 1135930 : Site CESSNOCK HOSPITAL (754-NTLEN347071-2)

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Hi Peter,

Do you want these to be booked on standard TAT or Urgent?

Thanks,
Nileshni

From: Sanderson, Peter <Peter.sanderson@tetrattech.com>

Sent: Wednesday, September 18, 2024 4:32 PM

To: Andrew Black <Andrew.Black@eurofinsanz.com>

Cc: NileshniGoundar@eurofins.com <NileshniGoundar@eurofins.com>

Subject: RE: Eurofins Test Results, Invoice - Report 1135930 : Site CESSNOCK HOSPITAL (754-NTLEN347071-2)

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Hi Andrew,

Could I request some additional testing:

For total Zinc analysis:

22 BH2A_0.5-0.6 Sep 03, 2024 Soil N24-Se0011321

23 BH2A_1.9-2.0 Sep 03, 2024 Soil N24-Se0011322

For TCLP for Lead

BH2A_1.0-1.1 Sep 03, 2024 Soil N24-Se0011303

For Asbestos is the BH1A-F 24-Se0011331 sample able to be analysed for the %ACM content. Also I wanted to confirm the total ACM mass: does the 19g / 70 x 45 x 4mm reported correspond to all of the fragments in the sample bag?

Regards,

Peter Sanderson | Environmental Scientist

Mobile +61 428 418 368 | peter.sanderson@tetrattech.com

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From: NileshniGoundar@eurofins.com <NileshniGoundar@eurofins.com>

Sent: Monday, September 16, 2024 7:20 PM

To: Sanderson, Peter <Peter.sanderson@tetrattech.com>

Cc: Caldwell, Nadine <Nadine.Caldwell@tetrattech.com>

Subject: Eurofins Test Results, Invoice - Report 1135930 : Site CESSNOCK HOSPITAL (754-NTLEN347071-2)

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Please find the attached reports.

Kind Regards,

Nileshni (Neena) Goundar

Assistant Analytical Services Manager

*Please note my work hours are **2pm-10pm**, anything outside of that please contact your ASM for anything urgent.*

Eurofins Environment Testing Australia Pty Ltd

179 Magowar Road

Girraween, NSW, 2145

Email: Nileshni.Goundar@eurofinsanz.com

Website: www.eurofins.com.au/environmental-testing

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Sample Receipt Advice

Company name: Tetra Tech Coffey P/L N castle
Contact name: Peter Sanderson
Project name: ADDITIONAL: CESSNOCK HOSPITAL
Project ID: 754-NTLEN347071-2
Turnaround time: 3 Day
Date/Time received: Sep 19, 2024 5:58 AM
Eurofins reference: 1140768

Sample Information

- ✓ A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- ✓ Sample Temperature of chilled sample on the batch as recorded by Eurofins Sample Receipt : 17.7 degrees Celsius.
- ✓ 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

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Andrew Black on phone : (+61) 2 9900 8490 or by email: AndrewBlack@eurofins.com

Results will be delivered electronically via email to Peter Sanderson - Peter.sanderson@tetrattech.com.

Note: A copy of these results will also be delivered to the general Tetra Tech Coffey P/L N castle email address.



web: www.eurofins.com.au
email: EnviroSales@eurofins.com

Eurofins Environment Testing Australia Pty Ltd

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Eurofins ARL Pty Ltd

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Eurofins ProMicro Pty Ltd

ABN: 47 009 120 549

Perth ProMicro
46-48 Banksia Road Welshpool WA 6106 +61 8 6253 4444 NATA# 2561 Site# 2554

Eurofins Environment Testing NZ Ltd

NZBN: 9429046024954

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35 O'Rorke Road Penrose, Auckland 1061 +64 9 526 4551 IANZ# 1327	Unit C1/4 Pacific Rise, Mount Wellington, Auckland 1061 +64 9 525 0568 IANZ# 1308	43 Detroit Drive Rolleston, Christchurch 7675 +64 3 343 5201 IANZ# 1290	1277 Cameron Road, Gate Pa, Tauranga 3112 +64 9 525 0568 IANZ# 1402

Company Name: Tetra Tech Coffey P/L N castle
Address: Unit 4, 60 Griffith Road
Lambton
NSW 2299

Project Name: ADDITIONAL: CESSNOCK HOSPITAL
Project ID: 754-NTLEN347071-2

Order No.:
Report #: 1140768
Phone: 02 4016 2300
Fax: 02 4016 2380

Received: Sep 19, 2024 5:58 AM
Due: Sep 24, 2024
Priority: 3 Day
Contact Name: Peter Sanderson

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Lead	Zinc	USA Leaching Procedure	Moisture Set
Sydney Laboratory - NATA # 1261 Site # 18217						X	X	X	X
External Laboratory									
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID				
1	BH2A_0.5-0.6	Sep 03, 2024		Soil	S24-Se0048334		X		X
2	BH2A_1.9-2.0	Sep 03, 2024		Soil	S24-Se0048335		X		X
3	BH2A_1.0-1.1	Sep 03, 2024		US Leachate	S24-Se0048336	X		X	
Test Counts						1	2	1	2

Tetra Tech Coffey Pty Ltd Newcastle
Unit 4, 60 Griffith Road
Lambton
NSW 2299



NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
 NATA is a signatory to the ILAC Mutual Recognition
 Arrangement for the mutual recognition of the
 equivalence of testing, medical testing, calibration,
 inspection, proficiency testing scheme providers and
 reference materials producers reports and certificates.

Attention: **Peter Sanderson**

Report **1140768-L**
Project name **ADDITIONAL: CESSNOCK HOSPITAL**
Project ID **754-NTLEN347071-2**
Received Date **Sep 18, 2024**

Client Sample ID			BH2A_1.0-1.1
Sample Matrix			US Leachate
Eurofins Sample No.			S24-Se0048336
Date Sampled			Sep 03, 2024
Test/Reference	LOR	Unit	
Heavy Metals			
Lead	0.01	mg/L	0.01
USA Leaching Procedure			
Leachate Fluid*^{C01}		comment	1.0
pH (initial)	0.1	pH Units	9.2
pH (off)*	0.1	pH Units	5.7
pH (USA HCl addition)*	0.1	pH Units	1.3

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

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
Heavy Metals - Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS	Sydney	Sep 19, 2024	28 Days
USA Leaching Procedure - Method: LTM-GEN-7010 Leaching Procedure for Soils & Solid Wastes	Sydney	Sep 19, 2024	14 Days



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Eurofins Environment Testing NZ Ltd

NZBN: 9429046024954

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Company Name: Tetra Tech Coffey P/L N castle
Address: Unit 4, 60 Griffith Road
Lambton
NSW 2299

Project Name: ADDITIONAL: CESSNOCK HOSPITAL
Project ID: 754-NTLEN347071-2

Order No.:
Report #: 1140768
Phone: 02 4016 2300
Fax: 02 4016 2380

Received: Sep 19, 2024 5:58 AM
Due: Sep 24, 2024
Priority: 3 Day
Contact Name: Peter Sanderson

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Lead	Zinc	USA Leaching Procedure	Moisture Set
Sydney Laboratory - NATA # 1261 Site # 18217						X	X	X	X
External Laboratory									
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID				
1	BH2A_0.5-0.6	Sep 03, 2024		Soil	S24-Se0048334		X		X
2	BH2A_1.9-2.0	Sep 03, 2024		Soil	S24-Se0048335		X		X
3	BH2A_1.0-1.1	Sep 03, 2024		US Leachate	S24-Se0048336	X		X	
Test Counts						1	2	1	2

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follow guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013. They are included in this QC report where applicable. Additional QC data may be available on request.
2. Unless otherwise stated, all soil/sediment/solid results are reported on a dry weight basis.
3. Unless otherwise stated, all biota/food results are reported on a wet weight basis on the edible portion.
4. For CEC results where the sample's origin is unknown or environmentally contaminated, the results should be used advisedly.
5. Actual LORs are matrix dependent. Quoted LORs may be raised where sample extracts are diluted due to interferences.
6. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds where annotated.
7. SVOC analysis on waters is performed on homogenised, unfiltered samples unless noted otherwise.
8. Samples were analysed on an 'as received' basis.
9. Information identified in this report with **blue** colour indicates data provided by customers that may have an impact on the results.
10. This report replaces any interim results previously issued.

Holding Times

Please refer to the '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 before sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and despite any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the sampling date; therefore, compliance with these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether, the holding time is seven days; however, for all other VOCs, such as BTEX or C6-10 TRH, the holding time is 14 days.

Units

mg/kg: milligrams per kilogram	mg/L: milligrams per litre	ppm: parts per million
µg/L: micrograms per litre	ppb: parts per billion	%: Percentage
org/100 mL: Organisms per 100 millilitres	NTU: Nephelometric Turbidity Units	MPN/100 mL: Most Probable Number of organisms per 100 millilitres
CFU: Colony Forming Unit	Colour: Pt-Co Units (CU)	

Terms

APHA	American Public Health Association
CEC	Cation Exchange Capacity
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where moisture has been determined on a solid sample, the result is expressed on a dry weight basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - 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.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC represents the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a similar compound to the analyte target is reported as percentage recovery. See below for acceptance criteria.
TBTO	Tributyltin oxide (<i>bis</i> -tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment; however, free tributyltin was measured, and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 6.0
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should only be used as a guide and may be different when site-specific Sampling Analysis and Quality Plan (SAQP) have been implemented.

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%

NOTE: pH duplicates are reported as a range, not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS. SVOCs recoveries 20 – 150%, VOC recoveries 50 – 150%

PFAS field samples containing surrogate recoveries above the QC limit designated in QSM 6.0, where no positive PFAS results have been reported or reviewed, and no data was affected.

QC Data General Comments

1. Where a result is reported as 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 are not data from your samples.
3. 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.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery, the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results, a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data; thus, it is possible to have two sets of data.

Quality Control Results

Test				Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank										
Heavy Metals										
Lead				mg/L	< 0.01			0.01	Pass	
LCS - % Recovery										
Heavy Metals										
Lead				%	89			80-120	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1				Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery										
Heavy Metals										
Lead					Result 1					
Lead				%	105			75-125	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1				Acceptance Limits	Pass Limits	Qualifying Code
Duplicate										
Heavy Metals										
Lead					Result 1	Result 2	RPD			
Lead				mg/L	< 0.01	< 0.01	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
C01	Leachate Fluid Key: 1 - pH 5.0; 2 - pH 2.9; 3 - pH 9.2; 4 - Reagent (DI) water; 5 - Client sample, 6 - other

Authorised by:

Andrew Black	Analytical Services Manager
Mickael Ros	Senior Analyst-Metal
Roopesh Rangarajan	Senior Analyst-Sample Properties



Glenn Jackson
Managing Director

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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Tetra Tech Coffey Pty Ltd Newcastle
Unit 4, 60 Griffith Road
Lambton
NSW 2299



NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
 NATA is a signatory to the ILAC Mutual Recognition
 Arrangement for the mutual recognition of the
 equivalence of testing, medical testing, calibration,
 inspection, proficiency testing scheme providers and
 reference materials producers reports and certificates.

Attention: **Peter Sanderson**

Report **1140768-S**
 Project name **ADDITIONAL: CESSNOCK HOSPITAL**
 Project ID **754-NTLEN347071-2**
 Received Date **Sep 18, 2024**

Client Sample ID			BH2A_0.5-0.6	BH2A_1.9-2.0
Sample Matrix			Soil	Soil
Eurofins Sample No.			S24-Se0048334	S24-Se0048335
Date Sampled			Sep 03, 2024	Sep 03, 2024
Test/Reference	LOR	Unit		
Heavy Metals				
Zinc	5	mg/kg	49	140
Sample Properties				
% Moisture	1	%	13	23

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

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

Heavy Metals

- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS

% Moisture

- Method: LTM-GEN-7080 Moisture

Testing Site

Sydney

Sydney

Extracted

Sep 19, 2024

Sep 19, 2024

Holding Time

28 Days

14 Days



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email: EnviroSales@eurofins.com

Eurofins Environment Testing Australia Pty Ltd

ABN: 50 005 085 521

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Company Name: Tetra Tech Coffey P/L N castle
Address: Unit 4, 60 Griffith Road
Lambton
NSW 2299

Project Name: ADDITIONAL: CESSNOCK HOSPITAL
Project ID: 754-NTLEN347071-2

Order No.:
Report #: 1140768
Phone: 02 4016 2300
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Received: Sep 19, 2024 5:58 AM
Due: Sep 24, 2024
Priority: 3 Day
Contact Name: Peter Sanderson

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Lead	Zinc	USA Leaching Procedure	Moisture Set
Sydney Laboratory - NATA # 1261 Site # 18217						X	X	X	X
External Laboratory									
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID				
1	BH2A_0.5-0.6	Sep 03, 2024		Soil	S24-Se0048334		X		X
2	BH2A_1.9-2.0	Sep 03, 2024		Soil	S24-Se0048335		X		X
3	BH2A_1.0-1.1	Sep 03, 2024		US Leachate	S24-Se0048336	X		X	
Test Counts						1	2	1	2

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follow guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013. They are included in this QC report where applicable. Additional QC data may be available on request.
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3. Unless otherwise stated, all biota/food results are reported on a wet weight basis on the edible portion.
4. For CEC results where the sample's origin is unknown or environmentally contaminated, the results should be used advisedly.
5. Actual LORs are matrix dependent. Quoted LORs may be raised where sample extracts are diluted due to interferences.
6. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds where annotated.
7. SVOC analysis on waters is performed on homogenised, unfiltered samples unless noted otherwise.
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Holding Times

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For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether, the holding time is seven days; however, for all other VOCs, such as BTEX or C6-10 TRH, the holding time is 14 days.

Units

mg/kg: milligrams per kilogram	mg/L: milligrams per litre	ppm: parts per million
µg/L: micrograms per litre	ppb: parts per billion	%: Percentage
org/100 mL: Organisms per 100 millilitres	NTU: Nephelometric Turbidity Units	MPN/100 mL: Most Probable Number of organisms per 100 millilitres
CFU: Colony Forming Unit	Colour: Pt-Co Units (CU)	

Terms

APHA	American Public Health Association
CEC	Cation Exchange Capacity
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
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Dry	Where moisture has been determined on a solid sample, the result is expressed on a dry weight basis.
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LOR	Limit of Reporting.
LCS	Laboratory Control Sample - 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.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC represents the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a similar compound to the analyte target is reported as percentage recovery. See below for acceptance criteria.
TBTO	Tributyltin oxide (<i>bis</i> -tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment; however, free tributyltin was measured, and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 6.0
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should only be used as a guide and may be different when site-specific Sampling Analysis and Quality Plan (SAQP) have been implemented.

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NOTE: pH duplicates are reported as a range, not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS. SVOCs recoveries 20 – 150%, VOC recoveries 50 – 150%

PFAS field samples containing surrogate recoveries above the QC limit designated in QSM 6.0, where no positive PFAS results have been reported or reviewed, and no data was affected.

QC Data General Comments

1. Where a result is reported as 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 are not data from your samples.
3. 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.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery, the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results, a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. 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										
Zinc				mg/kg	< 5			5	Pass	
LCS - % Recovery										
Heavy Metals										
Zinc				%	86			80-120	Pass	
Test	Lab Sample ID	QA Source		Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery										
Heavy Metals										
Zinc					Result 1					
Zinc				N24-Se0037575	NCP	%		100		
Zinc								75-125	Pass	
Test	Lab Sample ID	QA Source		Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate										
Heavy Metals										
Zinc					Result 1	Result 2	RPD			
Zinc				S24-Se0047809	NCP	mg/kg		86	86	<1
Zinc								30%	Pass	
Duplicate										
Sample Properties										
% Moisture					Result 1	Result 2	RPD			
% Moisture				S24-Se0047866	NCP	%		17	17	1.0
% Moisture								30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Authorised by:

Andrew Black	Analytical Services Manager
Fang Yee Tan	Senior Analyst-Metal
Mickael Ros	Senior Analyst-Metal
Roopesh Rangarajan	Senior Analyst-Sample Properties



Glenn Jackson
Managing Director

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

Work Order : ES2429051
Client : TETRA TECH COFFEY PTY LTD
Contact : PETER SANDERSON
Address : Unit 4/60 Griffiths Road
Lambton NEWCASTLE 2299
Telephone : ----
Project : 754-NTLEN347071-2 Cessnock Hospital
Order number : ----
C-O-C number : ----
Sampler : PETER SANDERSON
Site :
Quote number : EN/000
No. of samples received : 1
No. of samples analysed : 1

Page : 1 of 6
Laboratory : Environmental Division Sydney
Contact : Jason Dighton
Address : 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone : +61-2-8784 8555
Date Samples Received : 05-Sep-2024 10:00
Date Analysis Commenced : 06-Sep-2024
Issue Date : 11-Sep-2024 15:18



This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW



General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

ø = ALS is not NATA accredited for these tests.

~ = Indicates an estimated value.

- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) per the NEPM (2013) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a,h)anthracene (1.0), Benzo(g,h,i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero, for 'TEQ 1/2LOR' are treated as half the reported LOR, and for 'TEQ LOR' are treated as being equal to the reported LOR. Note: TEQ 1/2LOR and TEQ LOR will calculate as 0.6mg/Kg and 1.2mg/Kg respectively for samples with non-detects for all of the eight TEQ PAHs.
- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- EP075(SIM): Where reported, Total Cresol is the sum of the reported concentrations of 2-Methylphenol and 3- & 4-Methylphenol at or above the LOR.
- EG005: Poor precision was obtained for Lead on sample ES2428754-#001. Confirmed by redigestion and reanalysis.
- EP071: Results of sample QC2A have been confirmed by re-extraction and re-analysis.



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	QC2A	----	----	----	----
Sampling date / time					03-Sep-2024 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2429051-001	-----	-----	-----	-----
					Result	----	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		14.4	----	----	----	----
EG005(ED093)T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		10	----	----	----	----
Cadmium	7440-43-9	1	mg/kg		<1	----	----	----	----
Chromium	7440-47-3	2	mg/kg		17	----	----	----	----
Copper	7440-50-8	5	mg/kg		35	----	----	----	----
Lead	7439-92-1	5	mg/kg		156	----	----	----	----
Nickel	7440-02-0	2	mg/kg		32	----	----	----	----
Zinc	7440-66-6	5	mg/kg		620	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		<0.5	----	----	----	----
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	----	----	----	----
Acenaphthene	83-32-9	0.5	mg/kg		1.0	----	----	----	----
Fluorene	86-73-7	0.5	mg/kg		0.9	----	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg		24.0	----	----	----	----
Anthracene	120-12-7	0.5	mg/kg		5.9	----	----	----	----
Fluoranthene	206-44-0	0.5	mg/kg		58.8	----	----	----	----
Pyrene	129-00-0	0.5	mg/kg		47.6	----	----	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg		20.3	----	----	----	----
Chrysene	218-01-9	0.5	mg/kg		18.8	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		25.5	----	----	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		9.6	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg		18.6	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		11.9	----	----	----	----
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg		3.2	----	----	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	QC2A	----	----	----	----
Sampling date / time					03-Sep-2024 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2429051-001	-----	-----	-----	-----
					Result	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg		15.6	----	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		262	----	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		28.9	----	----	----	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		28.9	----	----	----	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		28.9	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	----	----	----	----
C10 - C14 Fraction	----	50	mg/kg		<50	----	----	----	----
C15 - C28 Fraction	----	100	mg/kg		500	----	----	----	----
C29 - C36 Fraction	----	100	mg/kg		370	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg		870	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	----	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		<10	----	----	----	----
>C10 - C16 Fraction	----	50	mg/kg		<50	----	----	----	----
>C16 - C34 Fraction	----	100	mg/kg		750	----	----	----	----
>C34 - C40 Fraction	----	100	mg/kg		300	----	----	----	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		1050	----	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		<50	----	----	----	----
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	----	----	----	----
Toluene	108-88-3	0.5	mg/kg		<0.5	----	----	----	----
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	----	----	----	----
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	----	----	----	----
^ Sum of BTEX	----	0.2	mg/kg		<0.2	----	----	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	QC2A	----	----	----	----
Sampling date / time					03-Sep-2024 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2429051-001	-----	-----	-----	-----
					Result	----	----	----	----
EP080: BTEXN - Continued									
^ Total Xylenes				----	0.5	mg/kg	<0.5	----	----
Naphthalene				91-20-3	1	mg/kg	<1	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6				13127-88-3	0.5	%	87.1	----	----
2-Chlorophenol-D4				93951-73-6	0.5	%	81.1	----	----
2.4.6-Tribromophenol				118-79-6	0.5	%	61.3	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl				321-60-8	0.5	%	82.2	----	----
Anthracene-d10				1719-06-8	0.5	%	85.0	----	----
4-Terphenyl-d14				1718-51-0	0.5	%	87.0	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4				17060-07-0	0.2	%	80.8	----	----
Toluene-D8				2037-26-5	0.2	%	86.9	----	----
4-Bromofluorobenzene				460-00-4	0.2	%	98.6	----	----



Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	63	123
2-Chlorophenol-D4	93951-73-6	66	122
2,4,6-Tribromophenol	118-79-6	40	138
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	70	122
Anthracene-d10	1719-06-8	66	128
4-Terphenyl-d14	1718-51-0	65	129
EP080S: TPH(V)/BTEX Surrogates			
1,2-Dichloroethane-D4	17060-07-0	63	125
Toluene-D8	2037-26-5	67	124
4-Bromofluorobenzene	460-00-4	66	131



QUALITY CONTROL REPORT

Work Order	: ES2429051	Page	: 1 of 8
Client	: TETRA TECH COFFEY PTY LTD	Laboratory	: Environmental Division Sydney
Contact	: PETER SANDERSON	Contact	: Jason Dighton
Address	: Unit 4/60 Griffiths Road Lambton NEWCASTLE 2299	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61-2-8784 8555
Project	: 754-NTLEN347071-2 Cessnock Hospital	Date Samples Received	: 05-Sep-2024
Order number	: ----	Date Analysis Commenced	: 06-Sep-2024
C-O-C number	: ----	Issue Date	: 11-Sep-2024
Sampler	: PETER SANDERSON		
Site	:		
Quote number	: EN/000		
No. of samples received	: 1		
No. of samples analysed	: 1		



This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW



General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot

CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

RPD = Relative Percentage Difference

= Indicates failed QC

* = The final LOR has been raised due to dilution or other sample specific cause; adjusted LOR is shown in brackets. The duplicate ranges for Acceptable RPD% are applied to the final LOR where applicable.

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 6042159)									
ES2429232-001	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	8	6	22.6	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	2	2	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	24	23	4.9	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	34	34	0.0	No Limit
ES2428754-001	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	11	12	10.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	22	19	14.6	0% - 50%
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	38	34	11.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	118	# 76	43.4	0% - 20%
		EG005T: Zinc	7440-66-6	5	mg/kg	211	241	13.5	0% - 20%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 6042180)									
ES2429018-001	Anonymous	EA055: Moisture Content	----	0.1 (1.0)*	%	1.8	1.8	0.0	No Limit
ES2429192-001	Anonymous	EA055: Moisture Content	----	0.1 (1.0)*	%	6.0	6.0	0.0	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 6042160)									
ES2429348-001	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
ES2428754-001	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 6038486)									
ES2429160-001	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
			205-82-3						
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
ES2429137-001	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
			205-82-3						
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 6038486) - continued									
ES2429137-001	Anonymous	EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 6038487)									
ES2429160-001	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
ES2429137-001	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 6042091)									
ES2429018-001	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
ES2429234-021	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 6038487)									
ES2429160-001	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
ES2429137-001	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 6042091)									
ES2429018-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
ES2429234-021	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
EP080: BTEXN (QC Lot: 6042091)									
ES2429018-001	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
ES2429234-021	Anonymous	EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit
		EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
	106-42-3								
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit

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Work Order : ES2429051
Client : TETRA TECH COFFEY PTY LTD
Project : 754-NTLEN347071-2 Cessnock Hospital



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP080: BTEXN (QC Lot: 6042091) - continued									
ES2429234-021	Anonymous	EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit



Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 6042159)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	121.1 mg/kg	97.6	88.0	113
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	0.74 mg/kg	72.3	70.0	130
EG005T: Chromium	7440-47-3	2	mg/kg	<2	19.6 mg/kg	105	68.0	132
EG005T: Copper	7440-50-8	5	mg/kg	<5	52.9 mg/kg	94.4	89.0	111
EG005T: Lead	7439-92-1	5	mg/kg	<5	60.8 mg/kg	90.8	82.0	119
EG005T: Nickel	7440-02-0	2	mg/kg	<2	15.3 mg/kg	88.6	80.0	120
EG005T: Zinc	7440-66-6	5	mg/kg	<5	139.3 mg/kg	80.5	66.0	133
EG035T: Total Recoverable Mercury by FIMS (QCLot: 6042160)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	0.087 mg/kg	96.0	70.0	125
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 6038486)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	6 mg/kg	98.0	77.0	125
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	6 mg/kg	97.7	72.0	124
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	6 mg/kg	98.0	73.0	127
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	6 mg/kg	99.6	72.0	126
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	6 mg/kg	99.2	75.0	127
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	6 mg/kg	89.5	77.0	127
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	6 mg/kg	91.7	73.0	127
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	6 mg/kg	93.7	74.0	128
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	6 mg/kg	89.9	69.0	123
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	6 mg/kg	95.4	75.0	127
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	6 mg/kg	93.0	68.0	116
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	6 mg/kg	96.8	74.0	126
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	6 mg/kg	95.7	70.0	126
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	6 mg/kg	93.4	61.0	121
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	6 mg/kg	91.3	62.0	118
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	6 mg/kg	91.1	63.0	121
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6038487)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	300 mg/kg	104	75.0	129
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	450 mg/kg	89.3	77.0	131
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	300 mg/kg	90.2	71.0	129



Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6042091)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	84.4	72.2	131
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6038487)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	375 mg/kg	105	77.0	125
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	525 mg/kg	85.9	74.0	138
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	225 mg/kg	91.9	63.0	131
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6042091)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	80.7	72.4	133
EP080: BTEXN (QCLot: 6042091)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	79.0	76.0	124
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	80.8	78.5	121
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	77.8	77.4	121
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	82.4	78.2	121
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	82.1	81.3	121
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	106	78.8	122

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: SOIL				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 6042159)							
ES2428754-001	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	117	70.0	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	105	70.0	130
		EG005T: Chromium	7440-47-3	50 mg/kg	106	68.0	132
		EG005T: Copper	7440-50-8	250 mg/kg	105	70.0	130
		EG005T: Lead	7439-92-1	250 mg/kg	128	70.0	130
		EG005T: Nickel	7440-02-0	50 mg/kg	76.2	70.0	130
		EG005T: Zinc	7440-66-6	250 mg/kg	95.9	66.0	133
EG035T: Total Recoverable Mercury by FIMS (QCLot: 6042160)							
ES2428754-001	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	96.0	70.0	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 6038486)							
ES2429137-001	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	101	70.0	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	99.2	70.0	130

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 Work Order : ES2429051
 Client : TETRA TECH COFFEY PTY LTD
 Project : 754-NTLEN347071-2 Cessnock Hospital



Sub-Matrix: SOIL				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6038487)							
ES2429137-001	Anonymous	EP071: C10 - C14 Fraction	----	480 mg/kg	124	73.0	137
		EP071: C15 - C28 Fraction	----	3100 mg/kg	114	53.0	131
		EP071: C29 - C36 Fraction	----	2060 mg/kg	115	52.0	132
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6042091)							
ES2429018-001	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	78.5	60.4	142
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6038487)							
ES2429137-001	Anonymous	EP071: >C10 - C16 Fraction	----	860 mg/kg	109	73.0	137
		EP071: >C16 - C34 Fraction	----	4320 mg/kg	113	53.0	131
		EP071: >C34 - C40 Fraction	----	890 mg/kg	125	52.0	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6042091)							
ES2429018-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	83.9	61.1	142
EP080: BTEXN (QCLot: 6042091)							
ES2429018-001	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	89.9	62.1	122
		EP080: Toluene	108-88-3	2.5 mg/kg	91.9	66.6	119
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	85.9	67.4	123
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	92.3	66.4	121
			106-42-3				
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	93.9	70.7	121
	EP080: Naphthalene	91-20-3	2.5 mg/kg	113	61.1	115	



QA/QC Compliance Assessment to assist with Quality Review

Work Order	: ES2429051	Page	: 1 of 4
Client	: TETRA TECH COFFEY PTY LTD	Laboratory	: Environmental Division Sydney
Contact	: PETER SANDERSON	Telephone	: +61-2-8784 8555
Project	: 754-NTLEN347071-2 Cessnock Hospital	Date Samples Received	: 05-Sep-2024
Site	:	Issue Date	: 11-Sep-2024
Sampler	: PETER SANDERSON	No. of samples received	: 1
Order number	: ----	No. of samples analysed	: 1

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO** Method Blank value outliers occur.
- **NO** Laboratory Control outliers occur.
- **NO** Matrix Spike outliers occur.
- Duplicate outliers exist - please see following pages for full details.
- For all regular sample matrices, where applicable to the methodology, **NO** surrogate recovery outliers occur.

Outliers : Analysis Holding Time Compliance

- **NO** Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

- **NO** Quality Control Sample Frequency Outliers exist.



Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Duplicate (DUP) RPDs							
EG005(ED093)T: Total Metals by ICP-AES	ES2428754--001	Anonymous	Lead	7439-92-1	43.4 %	0% - 20%	RPD exceeds LOR based limits

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for **VOC in soils** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)							
Soil Glass Jar - Unpreserved (EA055) QC2A	03-Sep-2024	----	----	----	09-Sep-2024	17-Sep-2024	✓
EG005(ED093)T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved (EG005T) QC2A	03-Sep-2024	09-Sep-2024	02-Mar-2025	✓	09-Sep-2024	02-Mar-2025	✓
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved (EG035T) QC2A	03-Sep-2024	09-Sep-2024	01-Oct-2024	✓	10-Sep-2024	01-Oct-2024	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved (EP075(SIM)) QC2A	03-Sep-2024	06-Sep-2024	17-Sep-2024	✓	07-Sep-2024	16-Oct-2024	✓
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP071) QC2A	03-Sep-2024	06-Sep-2024	17-Sep-2024	✓	10-Sep-2024	16-Oct-2024	✓
Soil Glass Jar - Unpreserved (EP080) QC2A	03-Sep-2024	09-Sep-2024	17-Sep-2024	✓	10-Sep-2024	17-Sep-2024	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Soil Glass Jar - Unpreserved (EP071) QC2A	03-Sep-2024	06-Sep-2024	17-Sep-2024	✓	10-Sep-2024	16-Oct-2024	✓
Soil Glass Jar - Unpreserved (EP080) QC2A	03-Sep-2024	09-Sep-2024	17-Sep-2024	✓	10-Sep-2024	17-Sep-2024	✓
EP080: BTEXN							
Soil Glass Jar - Unpreserved (EP080) QC2A	03-Sep-2024	09-Sep-2024	17-Sep-2024	✓	10-Sep-2024	17-Sep-2024	✓



Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	2	8	25.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	19	10.53	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	19	10.53	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	8	25.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	19	10.53	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)	EP075(SIM)	1	8	12.50	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	8	12.50	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
PAH/Phenols (SIM)	EP075(SIM)	1	8	12.50	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	8	12.50	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	1	8	12.50	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	8	12.50	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard



Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	In house: Referenced to APHA 3112 Hg - B (Flow-injection (SnCl ₂) (Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl ₂ which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM Schedule B(3)
TRH - Semivolatile Fraction	EP071	SOIL	In house: Referenced to USEPA SW 846 - 8015 Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C40. Compliant with NEPM Schedule B(3).
PAH/Phenols (SIM)	EP075(SIM)	SOIL	In house: Referenced to USEPA SW 846 - 8270. Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM Schedule B(3)
TRH Volatiles/BTEX	EP080	SOIL	In house: Referenced to USEPA SW 846 - 8260. Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. Compliant with NEPM Schedule B(3) amended.
Preparation Methods	Method	Matrix	Method Descriptions
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	In house: Referenced to USEPA 200.2. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM Schedule B(3).
Methanolic Extraction of Soils for Purge and Trap	ORG16	SOIL	In house: Referenced to USEPA SW 846 - 5030A. 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids	ORG17	SOIL	In house: Mechanical agitation (tumbler). 10g of sample, Na ₂ SO ₄ and surrogate are extracted with 30mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.



SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **ES2429051**

Client : **TETRA TECH COFFEY PTY LTD**
Contact : **PETER SANDERSON**
Address : **Unit 4/60 Griffiths Road**
Lambton NEWCASTLE 2299

E-mail : **peter.sanderson@tetrattech.com**
Telephone : **----**
Facsimile : **----**

Project : **754-NTLEN347071-2 Cessnock**
Hospital

Order number : **----**
C-O-C number : **----**

Site : **----**
Sampler : **PETER SANDERSON**

Laboratory : **Environmental Division Sydney**
Contact : **Jason Dighton**
Address : **277-289 Woodpark Road Smithfield**
NSW Australia 2164

E-mail : **jason.dighton@alsglobal.com**
Telephone : **+61-2-8784 8555**
Facsimile : **+61-2-8784 8500**

Page : **1 of 2**

Quote number : **ES2023COFENV0016 (EN/000)**
QC Level : **NEPM 2013 B3 & ALS QC Standard**

Dates

Date Samples Received : **05-Sep-2024 10:00**
Client Requested Due : **12-Sep-2024**
Date : **----**

Issue Date : **05-Sep-2024**
Scheduled Reporting Date : **12-Sep-2024**

Delivery Details

Mode of Delivery : **Undefined**
No. of coolers/boxes : **1**
Receipt Detail : **----**

Security Seal : **Not Available**
Temperature : **----**
No. of samples received / analysed : **1 / 1**

General Comments

- This report contains the following information:
 - Sample Container(s)/Preservation Non-Compliances
 - Summary of Sample(s) and Requested Analysis
 - Proactive Holding Time Report
 - Requested Deliverables
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Unless otherwise stated, analytical work for this work order will be conducted at ALS Sydney, NATA accreditation no. 825, site no. 10911.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months $\pm$ 1 week) from receipt of samples.
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.



TETRA TECH
COFFEY

Consigning Office: **Newcastle**

+61428418368
Peter.sanderson@tetratech.com

Report Results to:
Invoices to:

Mobile:
Phone:

Nadine Caldwell

Report Results to:
Invoices to:

Task No:

Laboratory:

Project Name:

Project Manager:

Quote Number:

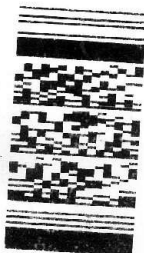
Special Instructions:

QUOTE#181018COF

Analysis Request Section				Notes			
Lab No.	Sample ID	Sample Date	Time	Matrix (Soil, etc)	Container Type & Preservative*	T-A-T (specify)	
BH6A_0.1-0.2		3/09/2024		Soil	Jar	Std	
BH6A_0.5-0.6		3/09/2024		Soil	Jar	Std	
BH6A_1.0-1.1		3/09/2024		Soil	Jar	Std	
BH6A_1.3-1.4		3/09/2024		Soil	Jar	Std	
BH1A		3/09/2024		Soil	Z	Std	
BH2A		3/09/2024		Soil	Z	Std	
BH3A		3/09/2024		Soil	Z	Std	
BH4A		3/09/2024		Soil	Z	Std	
BH5A		3/09/2024		Soil	Z	Std	
BH6A		3/09/2024		Soil	Z	Std	
BH1A-F		3/09/2024		Soil	Z	Std	
BH4A-F		3/09/2024		Soil	Z	Std	
QC1A		3/09/2024		Soil	Z	Std	
QC2A		3/09/2024		Soil	Jar	Std	
Trip Blank		3/09/2024		Soil	V	Std	
Trip Spike		3/09/2024		Soil	V	Std	

RELINQUISHED BY		Name: <u>Peter Sanderson</u> Date: <u>4/09/2024</u>	
		Company: <u>Tetra Tech Coffey</u>	
Name: <u>Alexandra</u> Date: <u>05.09.24</u>		Name: <u>Ying</u> Date: <u>4/9</u>	
Company: <u>ALS</u> Time: <u>17:00</u>		Company: <u>ALS</u> Time: <u>19:30</u>	
*Container Type & Preservation Codes: P - Plastic, G - Glass Bottle, J - Glass Jar, V - Vial, Z - Ziplock bag, N - Nitric Acid Preserved, C - Hydrochloric Acid Preserved, S - Sulphuric Acid Preserved, I - Ice, ST - Sodium Thiosulfate, NP - No Preservative			

Environmental Division
Sydney
Work Order Reference
ES2429051



Telephone : +61-2-8784 8555

EMAILED

**LAB OF ORIGIN:
NEWCASTLE**

Sample Receipt Advice: (Lab Use Only)
☐ All Samples Received in Good Condition
☐ All Documentation is in Proper Order
☐ Samples Received Properly Chilled
Lab. Ref/Batch No. 1135930



CERTIFICATE OF ANALYSIS

Work Order : **ES2429874**
Client : **TETRA TECH COFFEY PTY LTD**
Contact : **PETER SANDERSON**
Address : Unit 4/60 Griffiths Road
Lambton NEWCASTLE 2299
Telephone : ----
Project : 754-NTLEN347071-2 Cessnock Hospital
Order number : ----
C-O-C number : ----
Sampler : PETER SANDERSON
Site :
Quote number : EN/000
No. of samples received : 1
No. of samples analysed : 1

Page : 1 of 6
Laboratory : Environmental Division Sydney
Contact : Jason Dighton
Address : 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone : +61-2-8784 8555
Date Samples Received : 12-Sep-2024 14:37
Date Analysis Commenced : 13-Sep-2024
Issue Date : 17-Sep-2024 15:39



This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW



General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

ø = ALS is not NATA accredited for these tests.

~ = Indicates an estimated value.

- EP075 (SIM): Where reported, Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) per the NEPM (2013) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a,h)anthracene (1.0), Benzo(g,h,i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero.
- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- EP075(SIM): Where reported, Total Cresol is the sum of the reported concentrations of 2-Methylphenol and 3- & 4-Methylphenol at or above the LOR.



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	QC2				
Sampling date / time				11-Sep-2024 00:00					
Compound	CAS Number	LOR	Unit	ES2429874-001					
				Result					
EG020T: Total Metals by ICP-MS									
Arsenic	7440-38-2	0.001	mg/L	0.003					
Cadmium	7440-43-9	0.0001	mg/L	0.0003					
Chromium	7440-47-3	0.001	mg/L	0.001					
Copper	7440-50-8	0.001	mg/L	0.002					
Lead	7439-92-1	0.001	mg/L	0.001					
Nickel	7440-02-0	0.001	mg/L	0.015					
Zinc	7440-66-6	0.005	mg/L	0.053					
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L	<0.0001					
EP075(SIM)A: Phenolic Compounds									
Phenol	108-95-2	1.0	µg/L	<1.0					
2-Chlorophenol	95-57-8	1.0	µg/L	<1.0					
2-Methylphenol	95-48-7	1.0	µg/L	<1.0					
3- & 4-Methylphenol	1319-77-3	2.0	µg/L	<2.0					
2-Nitrophenol	88-75-5	1.0	µg/L	<1.0					
2,4-Dimethylphenol	105-67-9	1.0	µg/L	<1.0					
2,4-Dichlorophenol	120-83-2	1.0	µg/L	<1.0					
2,6-Dichlorophenol	87-65-0	1.0	µg/L	<1.0					
4-Chloro-3-methylphenol	59-50-7	1.0	µg/L	<1.0					
2,4,6-Trichlorophenol	88-06-2	1.0	µg/L	<1.0					
2,4,5-Trichlorophenol	95-95-4	1.0	µg/L	<1.0					
Pentachlorophenol	87-86-5	2.0	µg/L	<2.0					
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	1.0	µg/L	<1.0					
Acenaphthylene	208-96-8	1.0	µg/L	<1.0					
Acenaphthene	83-32-9	1.0	µg/L	<1.0					
Fluorene	86-73-7	1.0	µg/L	<1.0					



Analytical Results

Sub-Matrix: WATER
 (Matrix: WATER)

Sample ID

				QC2	----	----	----	----
Sampling date / time				11-Sep-2024 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	ES2429874-001	-----	-----	-----	-----
				Result	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
Phenanthrene	85-01-8	1.0	µg/L	<1.0	----	----	----	----
Anthracene	120-12-7	1.0	µg/L	<1.0	----	----	----	----
Fluoranthene	206-44-0	1.0	µg/L	<1.0	----	----	----	----
Pyrene	129-00-0	1.0	µg/L	<1.0	----	----	----	----
Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	----	----	----	----
Chrysene	218-01-9	1.0	µg/L	<1.0	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1.0	µg/L	<1.0	----	----	----	----
Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<1.0	----	----	----	----
Dibenz(a,h)anthracene	53-70-3	1.0	µg/L	<1.0	----	----	----	----
Benzo(g,h,i)perylene	191-24-2	1.0	µg/L	<1.0	----	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L	<0.5	----	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L	<0.5	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	----	----	----	----
C10 - C14 Fraction	----	50	µg/L	<50	----	----	----	----
C15 - C28 Fraction	----	100	µg/L	<100	----	----	----	----
C29 - C36 Fraction	----	50	µg/L	<50	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	----	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	----	----	----	----
>C10 - C16 Fraction	----	100	µg/L	<100	----	----	----	----
>C16 - C34 Fraction	----	100	µg/L	<100	----	----	----	----
>C34 - C40 Fraction	----	100	µg/L	<100	----	----	----	----



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	QC2	----	----	----	----
Sampling date / time					11-Sep-2024 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2429874-001	-----	-----	-----	-----
					Result	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued									
^ >C10 - C40 Fraction (sum)		----	100	µg/L	<100	----	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)		----	100	µg/L	<100	----	----	----	----
EP080: BTEXN									
Benzene	71-43-2	1	µg/L	<1	----	----	----	----	----
Toluene	108-88-3	2	µg/L	<2	----	----	----	----	----
Ethylbenzene	100-41-4	2	µg/L	<2	----	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	----	----	----	----	----
ortho-Xylene	95-47-6	2	µg/L	<2	----	----	----	----	----
^ Total Xylenes		----	2	µg/L	<2	----	----	----	----
^ Sum of BTEX		----	1	µg/L	<1	----	----	----	----
Naphthalene	91-20-3	5	µg/L	<5	----	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	1.0	%	20.8	----	----	----	----	----
2-Chlorophenol-D4	93951-73-6	1.0	%	40.3	----	----	----	----	----
2,4,6-Tribromophenol	118-79-6	1.0	%	35.5	----	----	----	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	1.0	%	51.0	----	----	----	----	----
Anthracene-d10	1719-06-8	1.0	%	50.6	----	----	----	----	----
4-Terphenyl-d14	1718-51-0	1.0	%	52.4	----	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	2	%	92.4	----	----	----	----	----
Toluene-D8	2037-26-5	2	%	90.6	----	----	----	----	----
4-Bromofluorobenzene	460-00-4	2	%	92.6	----	----	----	----	----



Surrogate Control Limits

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	10	44
2-Chlorophenol-D4	93951-73-6	14	94
2,4,6-Tribromophenol	118-79-6	17	125
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	20	104
Anthracene-d10	1719-06-8	27	113
4-Terphenyl-d14	1718-51-0	32	112
EP080S: TPH(V)/BTEX Surrogates			
1,2-Dichloroethane-D4	17060-07-0	72	143
Toluene-D8	2037-26-5	75	131
4-Bromofluorobenzene	460-00-4	73	137



QUALITY CONTROL REPORT

Work Order	: ES2429874	Page	: 1 of 6
Client	: TETRA TECH COFFEY PTY LTD	Laboratory	: Environmental Division Sydney
Contact	: PETER SANDERSON	Contact	: Jason Dighton
Address	: Unit 4/60 Griffiths Road Lambton NEWCASTLE 2299	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61-2-8784 8555
Project	: 754-NTLEN347071-2 Cessnock Hospital	Date Samples Received	: 12-Sep-2024
Order number	: ----	Date Analysis Commenced	: 13-Sep-2024
C-O-C number	: ----	Issue Date	: 17-Sep-2024
Sampler	: PETER SANDERSON		
Site	:		
Quote number	: EN/000		
No. of samples received	: 1		
No. of samples analysed	: 1		



This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW



General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key :
 Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
 CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
 LOR = Limit of reporting
 RPD = Relative Percentage Difference
 # = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EG020T: Total Metals by ICP-MS (QC Lot: 6053686)									
ES2429506-006	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.0	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 6053670)									
EN2410620-001	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
ES2429486-003	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 6053640)									
ES2429740-002	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
ES2429740-005	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 6053640)									
ES2429740-002	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
ES2429740-005	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
EP080: BTEXN (QC Lot: 6053640)									
ES2429740-002	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP080: BTEXN (QC Lot: 6053640) - continued									
ES2429740-002	Anonymous	EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit
ES2429740-005	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	<2	0.0	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit



Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EG020T: Total Metals by ICP-MS (QCLot: 6053686)								
EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	99.8	82.0	114
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	96.2	84.0	112
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	99.7	86.0	116
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	98.4	83.0	118
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	100	85.0	115
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	97.4	84.0	116
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	98.0	79.0	117
EG035T: Total Recoverable Mercury by FIMS (QCLot: 6053670)								
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	90.8	77.0	111
EP075(SIM)A: Phenolic Compounds (QCLot: 6053836)								
EP075(SIM): Phenol	108-95-2	1	µg/L	<1.0	5 µg/L	41.8	24.5	61.9
EP075(SIM): 2-Chlorophenol	95-57-8	1	µg/L	<1.0	5 µg/L	74.2	52.0	90.0
EP075(SIM): 2-Methylphenol	95-48-7	1	µg/L	<1.0	5 µg/L	65.2	51.0	91.0
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	2	µg/L	<2.0	10 µg/L	61.4	44.0	88.0
EP075(SIM): 2-Nitrophenol	88-75-5	1	µg/L	<1.0	5 µg/L	68.1	48.0	100
EP075(SIM): 2,4-Dimethylphenol	105-67-9	1	µg/L	<1.0	5 µg/L	80.8	49.0	99.0
EP075(SIM): 2,4-Dichlorophenol	120-83-2	1	µg/L	<1.0	5 µg/L	72.1	53.0	105
EP075(SIM): 2,6-Dichlorophenol	87-65-0	1	µg/L	<1.0	5 µg/L	70.5	57.0	105
EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	1	µg/L	<1.0	5 µg/L	69.8	53.0	99.0
EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	1	µg/L	<1.0	5 µg/L	85.5	50.0	106
EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	1	µg/L	<1.0	5 µg/L	78.0	51.0	105
EP075(SIM): Pentachlorophenol	87-86-5	2	µg/L	<2.0	10 µg/L	31.0	10.0	95.0
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 6053836)								
EP075(SIM): Naphthalene	91-20-3	1	µg/L	<1.0	5 µg/L	64.4	50.0	94.0
EP075(SIM): Acenaphthylene	208-96-8	1	µg/L	<1.0	5 µg/L	64.8	63.6	114
EP075(SIM): Acenaphthene	83-32-9	1	µg/L	<1.0	5 µg/L	66.8	62.2	113
EP075(SIM): Fluorene	86-73-7	1	µg/L	<1.0	5 µg/L	75.5	63.9	115
EP075(SIM): Phenanthrene	85-01-8	1	µg/L	<1.0	5 µg/L	84.1	62.6	116
EP075(SIM): Anthracene	120-12-7	1	µg/L	<1.0	5 µg/L	78.0	64.3	116
EP075(SIM): Fluoranthene	206-44-0	1	µg/L	<1.0	5 µg/L	83.5	63.6	118



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 6053836) - continued								
EP075(SIM): Pyrene	129-00-0	1	µg/L	<1.0	5 µg/L	86.4	63.1	118
EP075(SIM): Benz(a)anthracene	56-55-3	1	µg/L	<1.0	5 µg/L	69.8	64.1	117
EP075(SIM): Chrysene	218-01-9	1	µg/L	<1.0	5 µg/L	64.2	62.5	116
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2	1	µg/L	<1.0	5 µg/L	68.1	61.7	119
	205-82-3							
EP075(SIM): Benzo(k)fluoranthene	207-08-9	1	µg/L	<1.0	5 µg/L	82.0	63.0	115
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	5 µg/L	93.2	63.3	117
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L	<1.0	5 µg/L	76.8	59.9	118
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	1	µg/L	<1.0	5 µg/L	78.1	61.2	117
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	1	µg/L	<1.0	5 µg/L	78.2	59.1	118
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6053640)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	100	75.0	127
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6053837)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	400 µg/L	61.1	53.7	97.0
EP071: C15 - C28 Fraction	----	100	µg/L	<100	600 µg/L	83.2	63.3	107
EP071: C29 - C36 Fraction	----	50	µg/L	<50	400 µg/L	71.8	58.3	120
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6053640)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	310 µg/L	89.5	75.0	127
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6053837)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	500 µg/L	61.5	53.9	95.5
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	700 µg/L	104	57.8	110
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	300 µg/L	61.2	50.5	115
EP080: BTEXN (QCLot: 6053640)								
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	97.8	68.3	119
EP080: Toluene	108-88-3	2	µg/L	<2	10 µg/L	103	73.5	120
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	92.1	73.8	122
EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	10 µg/L	96.0	73.0	122
	106-42-3							
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	101	76.4	123
EP080: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	113	75.5	124

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG020T: Total Metals by ICP-MS (QCLot: 6053686)							
ES2429506-009	Anonymous	EG020A-T: Arsenic	7440-38-2	1 mg/L	87.1	70.0	130
		EG020A-T: Cadmium	7440-43-9	0.25 mg/L	85.8	70.0	130
		EG020A-T: Chromium	7440-47-3	1 mg/L	89.8	70.0	130
		EG020A-T: Copper	7440-50-8	1 mg/L	86.4	70.0	130
		EG020A-T: Lead	7439-92-1	1 mg/L	93.9	70.0	130
		EG020A-T: Nickel	7440-02-0	1 mg/L	86.3	70.0	130
		EG020A-T: Zinc	7440-66-6	1 mg/L	85.5	70.0	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 6053670)							
EM2415181-001	Anonymous	EG035T: Mercury	7439-97-6	0.01 mg/L	74.5	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6053640)							
ES2429740-002	Anonymous	EP080: C6 - C9 Fraction	----	325 µg/L	90.1	70.0	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6053640)							
ES2429740-002	Anonymous	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	82.6	70.0	130
EP080: BTEXN (QCLot: 6053640)							
ES2429740-002	Anonymous	EP080: Benzene	71-43-2	25 µg/L	98.8	70.0	130
		EP080: Toluene	108-88-3	25 µg/L	96.6	70.0	130
		EP080: Ethylbenzene	100-41-4	25 µg/L	88.9	70.0	130
		EP080: meta- & para-Xylene	108-38-3	25 µg/L	93.2	70.0	130
			106-42-3				
		EP080: ortho-Xylene	95-47-6	25 µg/L	93.0	70.0	130
		EP080: Naphthalene	91-20-3	25 µg/L	104	70.0	130



QA/QC Compliance Assessment to assist with Quality Review

Work Order	: ES2429874	Page	: 1 of 5
Client	: TETRA TECH COFFEY PTY LTD	Laboratory	: Environmental Division Sydney
Contact	: PETER SANDERSON	Telephone	: +61-2-8784 8555
Project	: 754-NTLEN347071-2 Cessnock Hospital	Date Samples Received	: 12-Sep-2024
Site	:	Issue Date	: 17-Sep-2024
Sampler	: PETER SANDERSON	No. of samples received	: 1
Order number	: ----	No. of samples analysed	: 1

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO** Method Blank value outliers occur.
- **NO** Duplicate outliers occur.
- **NO** Laboratory Control outliers occur.
- **NO** Matrix Spike outliers occur.
- For all regular sample matrices, where applicable to the methodology, **NO** surrogate recovery outliers occur.

Outliers : Analysis Holding Time Compliance

- **NO** Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

- Quality Control Sample Frequency Outliers exist - please see following pages for full details.



Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type		Count		Rate (%)		Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)						
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	0	4	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	5	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)						
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	0	4	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	5	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG020T: Total Metals by ICP-MS							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG020A-T) QC2	11-Sep-2024	13-Sep-2024	10-Mar-2025	✓	13-Sep-2024	10-Mar-2025	✓
EG035T: Total Recoverable Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG035T) QC2	11-Sep-2024	----	----	----	16-Sep-2024	09-Oct-2024	✓
EP075(SIM)A: Phenolic Compounds							
Amber Glass Bottle - Unpreserved (EP075(SIM)) QC2	11-Sep-2024	13-Sep-2024	18-Sep-2024	✓	13-Sep-2024	23-Oct-2024	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP075(SIM)) QC2	11-Sep-2024	13-Sep-2024	18-Sep-2024	✓	13-Sep-2024	23-Oct-2024	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP071) QC2	11-Sep-2024	13-Sep-2024	18-Sep-2024	✓	13-Sep-2024	23-Oct-2024	✓
Clear glass VOC vial - HCl (EP080) QC2	11-Sep-2024	13-Sep-2024	25-Sep-2024	✓	13-Sep-2024	25-Sep-2024	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Amber Glass Bottle - Unpreserved (EP071) QC2	11-Sep-2024	13-Sep-2024	18-Sep-2024	✓	13-Sep-2024	23-Oct-2024	✓
Clear glass VOC vial - HCl (EP080) QC2	11-Sep-2024	13-Sep-2024	25-Sep-2024	✓	13-Sep-2024	25-Sep-2024	✓



Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080: BTEXN							
Clear glass VOC vial - HCl (EP080) QC2	11-Sep-2024	13-Sep-2024	25-Sep-2024	✔	13-Sep-2024	25-Sep-2024	✔



Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	0	4	0.00	10.00	✖	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	16	12.50	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	6	16.67	10.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	5	0.00	10.00	✖	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	20	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	4	25.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	16	6.25	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	6	16.67	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	5	20.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	4	25.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	16	6.25	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	6	16.67	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	5	20.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	0	4	0.00	5.00	✖	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	16	6.25	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	6	16.67	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	5	0.00	5.00	✖	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard



Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Total Metals by ICP-MS - Suite A	EG020A-T	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Total Mercury by FIMS	EG035T	WATER	In house: Referenced to APHA 3112 Hg - B (Flow-injection (SnCl ₂)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the unfiltered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl ₂ which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM Schedule B(3).
TRH - Semivolatile Fraction	EP071	WATER	In house: Referenced to USEPA SW 846 - 8015 The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with the QC requirements of NEPM Schedule B(3)
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	WATER	In house: Referenced to USEPA SW 846 - 8270 Sample extracts are analysed by Capillary GC/MS in SIM Mode and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM Schedule B(3)
TRH Volatiles/BTEX	EP080	WATER	In house: Referenced to USEPA SW 846 - 8260 Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. This method is compliant with the QC requirements of NEPM Schedule B(3)

Preparation Methods	Method	Matrix	Method Descriptions
Digestion for Total Recoverable Metals	EN25	WATER	In house: Referenced to USEPA SW846-3005. Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM Schedule B(3)
Separatory Funnel Extraction of Liquids	ORG14	WATER	In house: Referenced to USEPA SW 846 - 3510 100 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM Schedule B(3) . ALS default excludes sediment which may be resident in the container.
Volatiles Water Preparation	ORG16-W	WATER	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for purging.



SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **ES2429874**

Client : **TETRA TECH COFFEY PTY LTD**
Contact : **PETER SANDERSON**
Address : **Unit 4/60 Griffiths Road**
Lambton NEWCASTLE 2299

E-mail : **peter.sanderson@tetrattech.com**
Telephone : **----**
Facsimile : **----**

Project : **754-NTLEN347071-2 Cessnock**
Hospital

Order number : **----**
C-O-C number : **----**

Site : **----**
Sampler : **PETER SANDERSON**

Laboratory : **Environmental Division Sydney**
Contact : **Jason Dighton**
Address : **277-289 Woodpark Road Smithfield**
NSW Australia 2164

E-mail : **jason.dighton@alsglobal.com**
Telephone : **+61-2-8784 8555**
Facsimile : **+61-2-8784 8500**

Page : **1 of 2**

Quote number : **ES2023COFENV0016 (EN/000)**
QC Level : **NEPM 2013 B3 & ALS QC Standard**

Dates

Date Samples Received : **12-Sep-2024 14:37**
Client Requested Due : **17-Sep-2024**
Date : **----**

Issue Date : **12-Sep-2024**
Scheduled Reporting Date : **17-Sep-2024**

Delivery Details

Mode of Delivery : **Undefined**
No. of coolers/boxes : **1**
Receipt Detail : **----**

Security Seal : **Not Available**
Temperature : **13.2 - Ice present**
No. of samples received / analysed : **1 / 1**

General Comments

- This report contains the following information:
 - Sample Container(s)/Preservation Non-Compliances
 - Summary of Sample(s) and Requested Analysis
 - Proactive Holding Time Report
 - Requested Deliverables
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Unless otherwise stated, analytical work for this work order will be conducted at ALS Sydney, NATA accreditation no. 825, site no. 10911.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months $\pm$ 1 week) from receipt of samples.
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.



+61428418368

Peter.sanderson@tetrattech.com

Report Results to:

Mobile:

Email:

Invoices to: **Nadine Caldwell**

Phone: +51 428 861 328

Email: nadine.caldwell@tetrattech.com

Project No: 754-NTLEN347071-2

Task No:

Project Name: Cessnock Hospital

Laboratory:

Eurofins

Sampler's Name: Peter Sanderson

Project Manager:

Peter Sanderson

Quote Number: QUOTE#181018COF

Special Instructions:

Analysis Request Section

NOTES

[illegible]

RELINQUISHED BY

✱

Name:	Peter Sanderson	Date:	11/09/2024
Tetra Tech Coffey		Time:	

Name: J Brandau Date: 11/9
Company: Time: 4:55

Name: JN Date: 13.10
Company: ALS Time: 17.4.14

Name: CUL Date: 12/1 17.30
Company: Time: 18:18

Sample Receipt Advice: (Lab Use Only)

☒ All Samples Recieved in Good Condition

All Documentation is in Proper Order ☐

☐ Samples Received Properly Chilled

Lab. Ref/Batch No.

1138492

*Container Type & Preservation Codes: P - Plastic, G - Glass Bottle, J - Glass Jar, V - Vial, Z - Ziplock bag, N - Nitric Acid Preserved, C - Hydrochloric Acid Preserved, S - Sulphuric Acid Preserved, I - Ice, ST - Sodium Thiosulfate, NP - No Preservative

LAB OF ORIGIN:
NEWCASTLE

E-MAILED

132

Environmental Division
Sydney

Work Order Reference

ES2429874



Telephone : - 61-2-8784 8556

APPENDIX G: CALIBRATION CERTIFICATES

Final

Multi Parameter Water Meter

Instrument **YSI Quatro Pro Plus**
 Serial No. **18G103111**



airmet

Air-Met Scientific Pty Ltd
 1300 137 067

Item	Test	Pass	Comments
Battery	Charge Condition	✓	
	Fuses	✓	
	Capacity	✓	
Switch/keypad	Operation	✓	
Display	Intensity	✓	
	Operation (segments)	✓	
Grill Filter	Condition	✓	
	Seal	✓	
PCB	Condition	✓	
Connectors	Condition	✓	
Sensor	1. pH	✓	
	2. mV	✓	
	3. EC	✓	
	4. D.O	✓	
	5. Temp	✓	
Alarms	Beeper	✓	
	Settings	✓	
Software	Version	✓	
Data logger	Operation	✓	
Download	Operation	✓	
Other tests:			

Certificate of Calibration

This is to certify that the above instrument has been calibrated to the following specifications:

Sensor	Serial no	Standard Solutions	Certified	Solution Bottle Number	Instrument Reading
2. pH 7.00		pH 7.00		419529	6.92
3. pH 4.00		pH 4.00		422643	3.96
4. ORP (mV)		237.813		A420151/B420152	238.8
5. EC (µS/cm)		2760 µS/cm		424499	2763
6. D.O (%)		0.0%		412773	0.1%
7. Temp (°C)		18.267		Testo 110	18.6

Calibrated by:

Miriam Poyitt

Calibration date:

05/09/2024

Next calibration due:

06/10/2024

Oil / Water Interface Meter

Instrument **Geotech Interface Meter (60m)**
 Serial No. **3954**



Air-Met Scientific Pty Ltd
 1300 137 067

Item	Test	Pass	Comments
Battery	Compartment	✓	
	Capacity	✓	
Probe	Cleaned/Decon.	✓	
	Operation	✓	
Connectors	Condition	✓	
Tape Check	Cleaned	✓	
Connectors	Checked for cuts	✓	
Instrument Test	At surface level	✓	

Certificate of Calibration

This is to certify that the above instrument has been cleaned and tested.

Calibrated by: _____ **Miriam Poyitt**

Calibration date: **30/07/2024**

Next calibration due: **28/09/2024**

PID Calibration Certificate

Instrument **PhoCheck Tiger**
 Serial No. **T-113990**



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	✓	10.6ev			
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		97 ppm Isobutylene	NATA	SY532		97.1 ppm

Calibrated by:

Christopher Nicdao

Calibration date: 28/08/2024

Next calibration due: 27/09/2024

APPENDIX H: FIELD SHEETS

Final

Groundwater Sampling Form (C) - Hydra Sleeve

Project Name: <u>Cessnock Hospital</u>		Project Number: <u>754-NILEN347071-2</u>		
Field Staff: <u>PS</u>		Date: <u>11/09/24</u>		
Project Manager: <u>PS</u>		Page: _____ of _____		

FIELD EQUIPMENT	Interface ID: <u>Geotech 3954</u>	WQ Meter ID: <u>18610311</u>	WQ Meter Type: <u>YSI Quattro Pro Plus</u>
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WELL ID: <u>MW01</u>	DIAMETER: <u>50</u> mm	WELL DEPTH: <u>8.0</u> mBTOC	SCREEN INTERVAL: _____ to _____ mBTOC	Stick Up: _____ mm
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SAMPLING DETAILS	Date/Time of Hydrasleeve Deployment	<u>2:40</u>	Date/Time of retrieval/sampling	<u>2:50</u>	
	DEPTH TO WATER	Before Deployment	<u>0.50</u> m below TOC	Hydrasleeve intake Depth	<u>~6.0</u> m below TOC
	Before Sampling	_____ m below TOC	WQ reading depth (in-situ)	_____ m below TOC	

Hydrasleeve, connection and cord type	Temperature (°C)	Dissolved Oxygen (mg/L)	Electrical Conductivity mS/cm or µS/cm	pH (pH units)	Redox Potential (mV)	Clarity					Observations (odour, colour, sediments, etc)
						Clear	Slightly Cloudy	Cloudy	Very Cloudy	Turbid	
	<u>19.5</u>	<u>21.6</u>	<u>8393</u>	<u>6.53</u>	<u>13.3</u>	☒	☐	☐	☐	☐	<u>none</u>

DUPLICATE COLLECTED? ☒	DUPLICATE ID: <u>Q01</u>	TRIPLICATE COLLECTED? ☒	TRIPLICATE ID: <u>Q02</u>
WERE METALS FIELD FILTERED? ☐	Installed by: _____	Retrieved by: _____	

Unfiltered samples must not be put into a preserved container (ie a 'metals' bottle)

Comment	
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WELL ID: _____	DIAMETER: _____ mm	WELL DEPTH: _____ mBTOC	SCREEN INTERVAL: _____ to _____ mBTOC	Stick Up: _____ mm
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SAMPLING DETAILS	Date/Time of Hydrasleeve Deployment	_____	Date/Time of retrieval/sampling	_____	
	DEPTH TO WATER	Before Deployment	_____ m below TOC	Hydrasleeve intake Depth	_____ m below TOC
	Before Sampling	_____ m below TOC	WQ reading depth (in-situ)	_____ m below TOC	

Hydrasleeve, connection and cord type	Temperature (°C)	Dissolved Oxygen (mg/L)	Electrical Conductivity mS/cm or µS/cm	pH (pH units)	Redox Potential (mV)	Clarity					Observations (odour, colour, sediments, etc)
						Clear	Slightly Cloudy	Cloudy	Very Cloudy	Turbid	
						☐	☐	☐	☐	☐	

DUPLICATE COLLECTED? ☐	DUPLICATE ID: _____	TRIPLICATE COLLECTED? ☐	TRIPLICATE ID: _____
WERE METALS FIELD FILTERED? ☐	Installed by: _____	Retrieved by: _____	

Unfiltered samples must not be put into a preserved container (ie a 'metals' bottle)