Two Wells Ambulance Station

Detailed Site Investigation

Grieve Gillett Architects

22 January 2025
Ref: 241697R001RevA

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Document History and Status

Rev	Description	Author	Reviewed	Approved	Date
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Contents

Project: Two Wells Ambulance Station | Detailed Site Investigation
Client: Grieve Gillett Architects
Ref: 241697R001RevA

Tables

Figures

Appendices

1 Introduction

Tonkin was commissioned by Grieve Gillett Architects (the client) to undertake a Detailed Site Investigation (DSI) for a portion of land encompassing two allotments, identified as Lot 51 Old Port Wakefield Road and the northern portion of the neighbouring Lot 53 Wells Road, Two Wells, herein referred to as 'the site'. Lot 51 is located within the northern portion of the site and fronts Old Port Wakefield Road. Lot 53 is situated to the south of Lot 51, the northern portion of which is to be included within the development area and is located adjacent the existing metropolitan fire service (MFS) shed on the adjacent Lot 52.

This DSI follows on from the preliminary site investigation (PSI) previously undertaken for the site by Tonkin. The works reported herein were necessitated to inform the suitability of the site for the proposed construction and ongoing land use as well as to advise on the soil classification, management and soil disposal requirements. The environmental soil sampling works were undertaken concurrently with the geotechnical investigation works which are reported separately to this DSI report.

The location of the site is included as Figure 1.1 following.

1.1 Preamble

The site is currently zoned as township main street and currently contains Council facilities including a Service Centre and administration facilities and the Two Wells Scout Group building which are located within Lot 51. Lot 53 contains an area of undeveloped land and a small recreational area (Two Wells Dog Park) which consists of fencing and a small shelter area. It is understood however that the dog park is not proposed as a part of the development at this stage and therefor has not been assessed as part of this DSI.

It is understood from the brief that the new ambulance station layout will be based on the recently constructed Birdwood Ambulance Station which includes:

- A three-bay garage
- Training room
- 10 external carparks
- Entry and existing crossovers
- Kitchen, offices, crew room, changeroom, storeroom, toilets and sleep rooms.

1.2 Objectives

The primary objective of the intrusive environmental assessment works were to:

- Determine any actual risk posed by source – receptor pathways identified as a part of the earlier PSI
- Determine the contamination status of fill materials and natural materials across the site, to ascertain the suitability of the materials for offsite disposal and or reuse onsite, and
- Determine any potential health risks posed to construction personnel, future site users and or the environment associated with the presence of contaminated soils or fill material within the proposed construction areas.

Figure 1.1 Site Location Plan

1.3 Site Characteristics and Surrounds

The land is currently zoned as Township Main Street within the suburb of Two Wells. The local government area (LGA) is described as Adelaide Plains Council. Site identification details are provided following in Table 1.1.

Table 1.1 Site Details

Site Address	Corners of Wells Road and Old Port Wakefield Road, Two Wells
Current Owner(s)	Adelaide Plains Council
Current Certificate of Title(s)	CR 6215/365 and CR 5984/729
Lot/ Plan Number	Allotment 51 and 53 Deposited Plan 73399 in the area named Two Wells, Hundred of Port Gawler
Local Government Authority	Adelaide Plains Council
Council Zoning	Township Main Street - TMS
Current Land Use	Commercial (Council services, car parking, scout shed, vacant land)
Proposed Land Use	Commercial
Land Area	Excluding dog park area: approximately 4,500 m^2

1.3.1 Site Layout

The site is an irregular shaped parcel of land that is bound by Old Port Wakefield Road to the north, commercial and residential properties to the east, commercial and open land to the south and Wells Road and the Two Wells Metropolitan Fire Service (MFS) facility to the west.

The site was observed as relatively level with a slight descending slope towards the west of the site from the eastern site portion. No surface water was observed during the inspection. Any surface water collected during high rainfall events is likely to flow towards the west of the site.

During the site inspection undertaken as a part of the PSI the following observations regarding the site were made:

- An "L shaped" building of brick and sandstone construction with a corrugated iron roof utilised as the Adelaide Plains Council Service Centre area is located within the northeast portion of the site.
- A corrugated iron building utilised as a scout building is situated within the central western portion of the site.
- A high voltage transformer is situated in the northwest site corner.
- The southern portion of the site is utilised as a recreational facility encompassing a fully enclosed dog park area with a small open shelter area in the southwestern site corner.
- There was evidence of a former septic soakage area along the western edge of the green lawn (and an old tank/slab) to the immediate south of the Adelaide Plains Council Service Centre area.
- A new high voltage (HV) transformer was observed within the north-western corner of site
- There was evidence of some construction and demolition waste within the eastern portion of the site that was marked by the presence of a concrete slab and some remnant bricks. This area was observed to be elevated in comparison to the western portion of the site indicating potential filling.

1.3.2 Surrounding Land Use

The surrounding land use is predominantly a mix of commercial and residential and is summarised in Table 1.2 below:

Table 1.2 Surrounding Land Use

Direction	Land Use
North	Immediately north of the site is Old Port Wakefield Road, beyond which lies a former medical centre, vacant land and a motel.
East	Immediately east of site are old brick and sandstone constructed commercial buildings and the Two Wells Resource Recovery Centre.
South	Immediately south of site is the Two Wells Resource Recovery Centre, including the main entrance.
West	Immediately west of site is Wells Road, beyond which lies recreational open space.

1.4 Environmental Setting

The local and site-specific geological and hydrogeological settings influence the fate and transport of potential contaminants, in the vicinity of and at the subject site.

The distributions of any contaminants across a site are influenced by the local geology and natural or humanmade/altered drainage features in the area or at the site. Their distribution within the sub-surface is influenced by natural preferential pathways including geological structures, variations in the permeability of soil and rock, geochemical, biological and mineralogical variations. Preferential pathways may additionally exist due to the presence of human-made structures and infrastructure such as underground services utilities, human-made lake lagoons and wetlands and the presence of subsurface basements.

Certain sites may be in areas that are naturally enriched with mineral resources and can appear to contain elevated levels of metals and metalloids in soil, surface water or groundwater.

Consequently, it is essential to understand the background quality of these media and to evaluate potential contamination of this type in terms of the beneficial uses of the site and its water resources.

Information regarding the regional geology, hydrology and hydrogeological conditions of the site are summarised in Table 1.3.

Table 1.3 Summary of Regional Conditions

Geology	The natural soils underlying the site are typified by the Pleistocene aged calcretes, associated with the Pooraka Formation. The soil mapping type for the site is described as Rudsol (A2) Coastal dunes and plains with some swamps: dunes of calcareous sands and also siliceous sands; plains of various saline soils (unclassified) and lesser areas of brown calcareous earths. Local geology and soil maps are presented within the Lotsearch report in Appendix C.
Acid Sulfate Soils	According to the Atlas of Australian Acid Sulfate Soil, the site is classified as Class C, indicating an extremely low 1-5% susceptibility to the development of Acid Sulfate Soils.

Hydrology	The closest natural surface water body to the site is Salt Creek located approximately 1 kilometre (km) south of the site and 1.2 km east of the site.
Hydrogeology	The aquifer on site is described as being a porous extensive aquifer of low to moderate productivity. According to Location SA Viewer (Location SA Viewer) The shallow groundwater salinity beneath the site is stated as ranging between 3,500 –4,500 mg/L and shallow standing water level is stated as ranging between 3 to 6 m bgl.
Topography	The site is located at an elevation of between 14 m and 15 m AHD. The site is marginally elevated on the eastern side and slopes gently towards Wells Road to the west.
Ecological Constraints	There are no native vegetation ecological constraints that exist for the site. Search results from CAPAD for protected marine environments showed that no results exist for the subject site. No groundwater dependant ecosystems exist for the site.

2 Scope of Work

The scope of work undertaken by Tonkin was generally consistent with that requested within the original proposal.

The scope of the environmental sampling works undertaken on January 8 in conjunction with the geotechnical works are summarised following. Locations of boreholes are presented following as Figure 2.1, whilst more information on the sampling method is provided in the following methodology sections.

- Underground services were firstly cleared at each location by a third-party service location company, prior to commencement of environmental/ geotechnical drilling works.
- Advancement of five boreholes across the site using a 4WD-mounted Rockmaster Drill rig employing push tube methodology. Three boreholes were drilled to a target depth of 4.0 meters below ground level (m bgl) and two boreholes were drilled to a target depth of 1.5 mBGL the site. The locations were adjusted based on the presence of existing underground services.
- The soil profile at each borehole location was logged by a Tonkin Geotechnical Engineer in accordance with AS 1726 Geotechnical site investigations.
- Soils were photographed and logged (refer Appendix A for photographs and bore logs) and samples were collected at regular intervals throughout the fill/ soil profile and at intervals where changes in lithology were noted. Additional samples were collected in areas where physical or olfactory indicators of potential contamination were observed.
- From the afore mentioned sampling event, a total of 24 primary soil samples and three duplicate (inter and intra laboratory) soil samples were collected. Upon collection, samples were placed in chilled conditions and submitted to the NATA accredited primary laboratory (ALS) and the NATA accredited secondary laboratory (Eurofins MGT) under industry standard chain of custody (CoC) documentation.
- Of the 24 primary soil samples collected a total of 11 primary samples were tested for the analytes identified in table 2.1.

Table 2.1 Summary of Soil Laboratory Analysis

Analytes	Primary Samples	Duplicate Samples
Heavy metals	10	1
TRH, BTEX	3	-
PAH	3	-
OC and OP	4	-
NEPM Screen	1	-
EIL Screen	1	-

Heavy metals: arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc
TRH: total recoverable hydrocarbons
BTEX: benzene, toluene, ethyl benzene and xylenes
PAH: polycyclic aromatic hydrocarbons
OC: organochlorine pesticides
OP: organophosphate pesticides

NEPM Screen: heavy metals plus barium, beryllium, boron, hexavalent chromium, cobalt, manganese, selenium, vanadium, TRH, BTEX, PAH, OC, OP, phenols, triazines, pyrethroids, cyanide and polychlorinated biphenyls

EIL screen: pH, cation exchange capacity, iron, total organic carbon

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Job Number: 241697.
Filename: 241697.qgz
Revision: RevA
Date: 2025-01-10 11:00
Drawn: Laki Abesekara.

Data Acknowledgement:
MetroMap, 2024

Grieve Gillett Architects

TWO WELLS SAAS AMBULANCE STATION
GEOTECHNICAL INVESTIGATION
BOREHOLE LOCATION PLAN

Figure 2.1

3 Methodology

The adopted methodology utilised for the investigation was based primarily on guidance provided in the following documents:

- Environment Protection Authority (2010) *Standard for the Production and Usage of Waste Derived Fill*
- Environment Protection Authority (2010) *Current Criteria for the Classification of Waste, Including Industrial and Commercial Waste* (Listed) and Waste Soil
- National Environment Protection (*Assessment of Site Contamination*) Measure 1999, (ASC NEPM)
- NSW EPA (2022) *Sampling Design Part 1 – Application*, Contaminated Land Guidelines

Field methodologies adopted during the intrusive soil assessment were consistent with Tonkin's standard field procedures and have been summarised following in Table 3.1

Table 3.1 Soil Investigation Methodology

Task	Comment
OHS/ JSA	Prior to the commencement of the field investigations, a site-specific Job Safety Analysis (JSA) document was prepared. All personnel working at the site were required to read, understand, sign and conform to the JSA.
Borehole clearance	Prior to the commencement of any intrusive sampling works, each borehole location was cleared of underground services which encompassed a surface scan for known and unidentified underground services.
Soil boring, logging and sampling	Combined geotechnical and environmental soil bores were advanced using push tubes to a depth of between 1.5 and 4 m bgl using 4-wd/ light truck mounted rig drilling methodologies. Soil cores were placed into soil core trays prior to logging and sampling. It should be noted that only push tube sampling methodologies were utilised for the collection of environmental samples to ensure samples were undisturbed and that cross contamination or dilution did not occur. All soil cores recovered were logged in accordance with the Australian Standard 1726-1993 *Geotechnical site Investigations* which is adopted by the ASC NEPM. Soil samples were recovered from the depth intervals deemed relevant by the Tonkin field representative, with all combined environmental and geotechnical boreholes sampled from the surface to the base of the borehole within the shallower holes and to 2m depth within the deeper boreholes. Care was taken to ensure representative samples of each individual fill and natural material layer were collected where possible, with additional samples collected from areas showing olfactory or visual signs of potential contamination. Soil borehole logs and photographs are included as Appendix A. Clean push tube liners (core sleeves) were used for each push tube core run, whilst fresh gloves were worn by the Engineer to recover each individual sample.

Task	Comment
Sample Nomenclature	Sample names utilised throughout the assessment correspond directly to the borehole number (BH01 etc) and the depth of the sample collection. For example sample number BH01_0.5-0.6 is a sample collected at between 0.5 and 0.6 m bgl from borehole BH01.
Equipment decontamination	Prior to, and between, sample locations, all re-usable sampling equipment (core trays, push tubes and soil hand auger) were scrubbed in a Decon-90 solution to remove particulate matter and were rinsed in mains water. Disposable equipment (push tube liners, gloves etc) were disposed of after a single use.
Sample preservation, transport and COC documentation	All samples recovered were immediately stored within a chilled insulted cooler, prior to and during transport to the NATA accredited analytical laboratory. Standard industry chain of custody (CoC) documentation was produced to accompany the samples to the analytical laboratory.
Soil bore abandonment	All soil bores were backfilled and compacted with excess soil cuttings and coarse sand. All surfaces were reinstated following.

3.1 Screening Criteria

In order to assess the relative concentration and significance of any potential contaminants detected through laboratory analysis, it is usual to reference established human health threshold levels or screening criteria. The contaminant screening criteria represent threshold concentrations of specific contaminants, which, if exceeded in a particular sample, may pose a health or environmental risk and therefore warrant further site-specific investigation or risk analysis.

The screening of the data against the established criteria is referred to as a Tier 1 Qualitative data review. Given the clearly stated objectives of the assessment, the following screening criteria have been utilised.

3.1.1 Soil Re-Use Onsite and Protection of Human Health

Soil health investigation levels (HILs), ecological investigation levels (EILs) and ecological screening levels (ESLs) adopted from Schedule B1 of NEPM 2013 have been utilised to assess the significance of human health and ecological risk associated with chemical contaminants in soil and the potential requirement for remediation and/or management:

- Soil HILs were used to assess human health risk via relevant exposure pathways of exposure for metals and organic substances. HILs are concentrations below which contaminants in soils are not considered to adversely affect human health and are based on differing land use scenarios. Schedule B1 of the ASC NEPM defines commercial/ industrial (HIL D) land uses as including premises such as shops, offices, factories and industrial sites.
- EILs for selected metals and organic substances were used for assessing risk to terrestrial ecosystems. EILs depend on specific soil physicochemical properties and land use scenarios and generally apply to the top 2.0 m of soil. Generic EILs for aged arsenic, fresh naphthalene and DDT were adopted. EILs were calculated for chromium (III), lead, copper, nickel, and zinc using the NEPM toolbox with the input of the pH and cation exchange capacity results included within the laboratory analytical results. EIL calculations can be found in Appendix B following the laboratory data summary tables and statistical analysis.
- ESLs for selected petroleum hydrocarbons will be used for assessing risk to terrestrial ecosystems. Concentrations of contaminants above which further appropriate investigation and evaluation is

generally required. ESLs, like EILs, depend on specific soil physicochemical properties and land use scenarios and generally apply to the top 2.0 m. ESLs for coarse- and fine-grained soils will be adopted for a commercial/industrial land use; and

- Where exceedances of benzo(a)pyrene criteria are identified in comparison to the primary NEPM 2013, CRC Care, risk-based management, and remediation guidance for benzo(a)pyrene (CRC Care 2017) will be adopted as a comparison guideline. CRC Care is a high reliability guideline which derives its screening levels from a larger database with more species and test results. As such, derived values of benzo(a)pyrene in CRC Care (2017) can be considered as high reliability.

3.1.2 Soil: Offsite Disposal

Where there is no potential for the retention or the reuse of soils onsite, soils have additionally been compared against the off-site waste disposal criteria as stipulated by the EPA[1]. There are three classifications of waste soil that are applicable to the investigation area if the soil is to leave the site, these are listed as follows:

- **Waste fill (WF):** A material consisting of clay, concrete, rock, sand, soil with chemical concentrations that meet the chemical criteria as defined within Part 1 the *Environment Protection Regulations* 2009. WF can be disposed offsite to a landfill or reused as a waste derived fill[2] dependant on the contamination risk posed by the source site, in accordance with the Waste Derived Fill guidelines.
- **Intermediate Waste Soil (IWS):** The material exceeds WF and is deemed to be a contaminated waste and must be disposed of in accordance with waste disposal guidelines to a facility licensed to accept this waste classification. Re-use on a third-party site can only be undertaken under the Site Contamination Auditor Protocol in accordance with the Waste Derived Fill guidelines.
- **Low Level Contaminated Waste (LLCW):** The material exceeds WF and IWS and must be disposed of in accordance with waste disposal guidelines to a facility licensed to accept this waste classification. This material cannot be re-used offsite as a waste derived fill.

3.1.3 Aesthetics

There are no quantifiable guidelines in determining if soils are appropriately aesthetic, however, the ASC NEPM 2013 does indicate that professional judgement concerning the quantity, type and distribution of foreign materials and/or odours in regard to the specific land use should be employed. The following scenarios (but not limited to) would trigger further aesthetic assessment:

- Hydrocarbon sheen on surface water.
- Anthropogenic soil staining; and
- Odorous soils i.e., petroleum hydrocarbon odours or hydrogen sulfidic odours in soil.

To assess the potential risk of contaminant concentrations in soil, reference was primarily made to the ASC NEPM for assessment criteria, where available. ASC NEPM Schedule B1 provides a framework for the use of investigation and screening levels based on human health and ecological risks.

[1] SA EPA (2010) Waste Disposal Information Sheet, Current Criteria for the Classification of Waste – including Industrial and Commercial Waste (Listed) and Waste Soil

[2] As defined within the SA EPA (2010) *Standard for the Production and use of Waste Derived Fill*

4 Results

4.1 Soil Profiles

The following fill materials were identified across the site area. Refer to Figure 2.1 for borehole locations:

- F1: Sandy GRAVEL, pale brown/ grey, brown, fine to coarse grained with a trace of silt.

This fill material was found within the existing carparking area and a recorded depth of approximately 0.3 m. The fill unit was overlain by asphalt at locations BH01 and BH02.

Natural materials were encountered at all locations underlying the fill materials where they were encountered, and natural materials were also observed from surface at location BH05. Natural materials were found to be consistent with calcareous clays and sandy clays and calcareous sandy gravels.

4.2 Soil Analytical Results

The results of the Tier 1 qualitative data review against the health and ecological investigation levels as well as the offsite disposal criteria are presented in the following section. Data summary tables showing highlighted exceedances of established screening criteria for the protection of human health and offsite soil disposal are presented in Appendix B, whilst NATA certificates of analysis presented by the laboratory are included as Appendix C. A summary of the Tier 1 Qualitative review is presented following where exceedances of the health, ecological and offsite disposal criteria are summarised and discussed. A summary of any statistical analysis undertaken on any package area is additionally presented following in section 4.2.2.

Table 4.1 Soil Analytical Summary – Excedances of Tier 1 Qualitative Review

				Samples Exceeding (mg/kg)			
				NEPM Re-use Onsite		SA EPA Offsite Disposal	
Analyte	Min Conc. (mg/kg)	Max Conc. (mg/kg)	HIL-D	EIL/ ESL	WF	IWS	LLWS
Copper	8	129	-	-	BH02-0.5-0.6	-	-

4.2.1 Onsite Retention/ Reuse of Soils

All concentrations of analytes including metals, hydrocarbons, pesticides/ herbicides, PFOS (perfluorooctane sulfonate) and PFOA (perfluorooctanoic acid) were at concentrations that were below the acceptable criteria for the protection of human health in an ongoing commercial/ industrial land use as well as below the criteria for the protection of ecological receptors on and offsite.

4.2.2 Offsite Disposal of Soils

The Tier 1 Qualitative Review of the data set against the offsite disposal criteria indicates that one sample of natural material at location BH02 contained elevated concentrations of copper that exceeded the waste fill criteria.

4.2.2.1 Statistical Analysis

Where exceedances of the WF criteria were identified, and where greater than ten samples were analysed, a statistical analysis including the calculation of the 95th per centile of the upper confidence limit (UCL) of the mean was undertaken.

The statistical analysis was undertaken in accordance with the ASC NEPM ensuring that:

- The standard deviation of the result was less than 50% of the stated maximum total dry weight concentration criteria).
- No single value was greater than 250% of the maximum total dry weight concentration criteria.
- The 95% UCL value was less than the desired criteria.

The results of the statistical assessment undertaken on the full data set are included within Appendix B and are summarised following:

Table 4.2 Statistical Analysis – Offsite Disposal

Analyte	Std. Deviation	Maximum Value	95% UCL (mg/kg)	WF Criteria (mg/kg)	STD dev < 50% of the WF criteria?	all values <2.5 x the adopted criteria?
Copper	49	179	**98**	**60**	**NO**	**NO**

On the basis of the statistical analysis, the one copper outlier fails the afore mentioned criteria and therefor statistical analysis is not applicable for this sample. It is therefore recommended that soil as this location is treated as an isolated hotspot if offsite disposal is required.

4.3 Nature and Location of Contamination

In accordance with the *Environment Protection Act 1993* (the Act), site contamination exists at a site if actual, or potential harm to the health or safety of human beings or the environment that is not trivial, taking into account current or proposed land uses is identified through intrusive investigation and sampling.

As previously stated, given that the existing and ongoing land use is deemed to be Commercial, as discussed previously in section 3.1 and also given that there were no exceedances of the health investigation or ecological investigation levels identified at the five sample location points, contamination is not thought to exist at the site based on the current information.

4.4 Quality Assurance/Quality Control (QA/QC)

Field methodologies were consistent with Tonkin's standard field procedures and those proposed.

Analytical results and RPD calculations for the inter-laboratory field duplicate soil samples are included in the analytical results summary tables in Appendix C. The precision of the results for each analyte between the primary sample and the field duplicate was determined by calculating the Relative Percentage Difference (RPD), as follows:

$$RPD = \frac{(Concentration\,1 - Concentration\,2)\ x\,100}{(Concentration\,1 + Concentration\,2)\ /\ 2}$$

Based on Australian Standard AS 4482.1-2005, a field duplicate RPD within the range of 30 to 50% is considered acceptable. Generally higher RPD values occur for organic compounds than for metals and where low concentrations of an analyte are recorded.

The results of internal laboratory QC procedures are provided within the laboratory analysis reports (Appendix C). The acceptance criterion for internal laboratory replicates is generally set at an RPD of 20 to 50%, depending on the concentration of an analyte present. Laboratory recoveries should be in the general range 70 to 130% although the laboratories set their own acceptance criteria which vary depending on the type of analyte.

Table 4.3 indicates conformance to specific QA/QC procedures for the soil and groundwater investigation programs.

Table 4.3 Data validation - Soil

QA/QC Requirement	Completed	Comments
Samples delivered to laboratory within sample holding times Correct chain of custody (CoC) procedures	Yes	Samples were delivered to the laboratories within the sample holding times and in laboratory-supplied containers. Samples were all analysed within analysis holding times bar one analysis for ASLP Leaching Procedure (overdue for extraction by 1 day only). All samples were transported under strict Tonkin CoC procedures.
All analyses National Association of Testing Authority (NATA) accredited	Yes	Australian Laboratory Services (ALS) were NATA accredited for all the analyses performed.
Required number of duplicate samples analysed	Yes	Quality control samples submitted for the laboratory analysis of the main potential contaminants of concern included intra-laboratory duplicate samples.
Acceptable QC sample results	Yes	Where they were able to be calculated (i.e. measurable concentrations in both samples), all of the RPD values for the duplicate sample pairs were less than 50%.
Acceptable laboratory QC results	Yes	Primary laboratory RPD values, spike and blank results were considered acceptable in all samples.

4.4.1 QA/QC summary

In summary, it is considered that:

- The field QA/QC programs were generally undertaken with regard to relevant legislation, standards and/or guidelines and were sufficient for obtaining samples that are representative of site conditions; and
- The overall laboratory QA/QC procedures and results were adequate, such that the laboratory analytical results obtained are of acceptable quality for addressing the key objectives outlined in Section 1.2

5 Conclusions and Recommendations

Tonkin was commissioned by Grieve Gillett Architects (the client) to undertake a Detailed Site Investigation (DSI) for a portion of land encompassing two allotments, identified as Lot 51 Old Port Wakefield Road and the northern portion of the neighbouring Lot 53 Wells Road, Two Wells, herein referred to as 'the site'. Lot 51 is located within the northern portion of the site and fronts Old Port Wakefield Road. Lot 53 is situated to the south of Lot 51, the northern portion of which is to be included within the development area and is located adjacent the existing metropolitan fire service (MFS) shed on Lot 52.

This DSI follows on from the preliminary site investigation (PSI) previously undertaken for the site by Tonkin. The works were necessitated to inform the classification and disposal, reuse or specific requirements for surplus soils prior to construction works, as well as to identify any potential risks to human health or the environment that may be encountered during construction and excavation works.

Based on the data obtained, the Qualitative Tier 1 review of the analytical data and subsequent statistical analysis of the data set Tonkin can confirm that:

- There were no physical or olfactory indications of contamination observed during field works.
- Fill material was only identified within the northern portion of the site and was directly associated with the gravel sheeting of the parking area.
- Concentrations of all analytes were below the health investigation level for an ongoing commercial land use, hence there is no risk posed to either site construction personnel or future users of the site.
- There were no exceedances of the ecological criteria for an ongoing commercial land use, hence there is no risk posed to onsite or offsite ecological receptors from the site.
- Naturally elevated concentrations of copper exceeding the waste fill criteria for offsite soil disposal were detected within one sample (BH02) at 0.5m depth.

On the basis of the above conclusions and the Tier 1 Qualitative review of the data set, the following recommendations regarding soil management onsite are made.

If natural soils at a depth of >0.5m bgl require excavation within the northwest corner of the site as a part of the development they should be retained onsite and used as fill material if possible, as there is no health or ecological risk posed by the soil. If however excavation at depth is required within this area and soils are unable to be retained and re-used onsite as fill material then it is recommended that soils are stockpiled onsite and classified appropriately prior to offsite disposal.

With the exception of the afore mentioned area, results from the remainder of locations were found to be below the waste fill criteria and hence suggested that soils in these areas were suitable for offsite disposal as waste fill or re-use onsite.

6 Limitations

The opinions and conclusions presented in this report are specific to the conditions of the site and the state of legislation currently enacted as at the date of this report. Tonkin does not make any representation or warranty that the opinions and conclusions in this report will be applicable in the future as there may be changes in the condition of the site, applicable legislation or other factors that would affect the opinions and conclusions contained in this report.

Tonkin has used the degree of skill and care ordinarily exercised by reputable members of our profession practising in the same or similar locality. This report has been prepared for Grieve Gillett Architects for the specific purpose identified in the report. Tonkin accepts no liability or responsibility to any third party for the accuracy of any information contained in the report or any opinion or conclusion expressed in the report. Neither the whole of the report nor any part or reference thereto may be in any way used, relied upon or reproduced by any third party without Tonkin's prior written approval.

Appendix A – Borehole Logs and Core Photographs

ENGINEERING BOREHOLE LOG

Borehole No: **BH01**

Client:	Grieve Gillett Architects	**Total Depth (mBGL):**	4	**Commenced:**	08/01/2025
Project:	Two Wells Ambulance Station	**Elevation (mAHD):**	11.71	**Completed:**	08/01/2025
Project No:	241697	**Easting:**	271950.19	**Logged By:**	LA
Contractor:	Lab + Field	**Northing:**	6169213.33	**Checked By:**	JNB
Equipment:	Rockmaster	**Coordinates:**	54		

Method	Elevation (m)	Water	Depth (m)	Graphic Log	Group Symbol	Material Description	Moisture	Consistency/ Density	Sample Interval	Samples	DCP (0 5 10 15 20 25)	Field Tests	Comments / Observations
SA	11.71					ASPHALT.							
					F	FILL. Sandy GRAVEL. pale brown, fine to coarse sized, fine to coarse grained sand, trace low plasticity silt.	D	D		0.05 - 0.2 m ENV QC1			
PT			0.50		GC	Calcareous Clayey GRAVEL. low to medium plasticity clay, pale grey brown, fine to coarse sized, with fine to coarse grained sand.		D-VD		0.5 - 0.6 m ENV			Calcrete Layer
	10.71		1										
					CL-CI	Calcareous Sandy CLAY. low to medium plasticity, pale reddish brown, fine to coarse grained sand, with fine to coarse sized gravel, inorganic.	M-D	VSt		1.1 - 1.2 m ENV		1.5, PP 600	
			1.50										
					CL-CI	Calcareous Sandy CLAY. low to medium plasticity, pale reddish brown, fine to coarse grained sand, trace fine to coarse sized gravel.	w < PL			1.7 - 1.8 m ENV			
	9.71		2							2 - 2.1 m ENV			
					CI-CH	_ CLAY. medium to high plasticity, red brown, trace fine to medium grained sand, inorganic.							
			2.50										
	8.71		3									3, PP 600	
					CI-CH	_ CLAY. medium to high plasticity, red brown mottled pale grey, with fine to medium grained sand, inorganic.							with calcareous pockets
			3.50										
	7.71												
						BH01 Target Depth Reached at 4m (Target Depth Reached)							
	6.71												

Photo description	BH01		
Client	Grieve Gillett Architects		
Location	120 Port Wakefield Hwy, Two Wells SA 5501, Australia		
Project name	Two Wells Ambulance Station		
Project No	241697	**Scale**	Not to Scale
BH No	BH01	**BH Depth**	CorePhoto

ENGINEERING BOREHOLE LOG

Borehole No: **BH02**

Client:	Grieve Gillett Architects	**Total Depth (mBGL):**	1	**Commenced:**	08/01/2025
Project:	Two Wells Ambulance Station	**Elevation (mAHD):**	12.33	**Completed:**	08/01/2025
Project No:	241697	**Easting:**	271959.81	**Logged By:**	LA
Contractor:	Lab + Field	**Northing:**	6169231.33	**Checked By:**	JNB
Equipment:	Rockmaster	**Coordinates:**	54		

Method	Elevation (m)	Water	Depth (m)	Graphic Log	Group Symbol	Material Description	Moisture	Consistency/ Density	Sample Interval	Samples	DCP (0 5 10 15 20 25)	Field Tests	Comments / Observations
SA	12.33					ASPHALT.							
					GW	FILL. Sandy GRAVEL. grey brown, fine to coarse sized, fine to coarse grained sand.	D	VD		0.1 - 0.2 m ENV			
										0.3 - 0.4 m ENV	8		
			0.50			Calcareous Sandy GRAVEL. pale grey brown, fine to coarse sized, fine to coarse grained sand.				0.5 - 0.6 m ENV	12		Calcrete layer_ @1.0 both push tube and auger refusal
					GW			D-VD					
	11.33									0.9 - 1 m ENV			
						BH02 refusal Encountered at 1m (Push tube and Auger Refusal)							
	10.33												
	9.33												
	8.33												
	7.33												

Photo description	BH02		
Client	Grieve Gillett Architects		
Location	120 Port Wakefield Hwy, Two Wells SA 5501, Australia		
Project name	Two Wells Ambulance Station		
Project No	241697	**Scale**	Not to Scale
BH No	BH02	**BH Depth**	CorePhoto

ENGINEERING BOREHOLE LOG

Borehole No: **BH03**

Client:	Grieve Gillett Architects	**Total Depth (mBGL):**	4	**Commenced:**	08/01/2025
Project:	Two Wells Ambulance Station	**Elevation (mAHD):**	11.91	**Completed:**	08/01/2025
Project No:	241697	**Easting:**	271970.59	**Logged By:**	LA
Contractor:	Lab + Field	**Northing:**	6169213.15	**Checked By:**	JNB
Equipment:	Rockmaster	**Coordinates:**	54		

Method	Elevation (m)	Depth (m)	Graphic Log	Group Symbol	Material Description	Moisture	Consistency/ Density	Sample Interval	Samples	DCP (0 5 10 15 20 25)	Field Tests	Comments / Observations
SA	11.91	0		F	FILL. Sandy GRAVEL. grey brown, fine to coarse sized, fine to coarse grained sand, trace low plasticity silt.	D	D-VD		0 - 0.2 m ENV QC2			
		0.50		GW	Calcareous Sandy GRAVEL. pale grey brown, fine to coarse sized, fine to coarse grained sand, with low plasticity silt.		VD		0.3 - 0.4 m ENV			Calcrete layer
	10.91	1		CL-CI	Calcareous Sandy CLAY. low to medium plasticity, pale reddish brown, fine to coarse grained sand, trace fine to medium sized gravel.	w < PL	VSt		1.1 - 1.2 m ENV	8 8 6 5		
PT		1.50		CI-CH	_ CLAY. medium to high plasticity, red brown, trace fine to medium grained sand, inorganic.				1.4 - 1.5 m E...			
	9.91	2							1.5 - 1.9 m GEO PI+ PSD		1.8, PP 600	
		2.50										
	8.91	3									3, PP 600	
		3.50										
	7.91				**BH03 Target Depth Reached at 4m (Target Depth Reached)**							
	6.91											

Photo description	BH03		
Client	Grieve Gillett Architects		
Location	120 Port Wakefield Hwy, Two Wells SA 5501, Australia		
Project name	Two Wells Ambulance Station		
Project No	241697	**Scale**	Not to Scale
BH No	BH03	**BH Depth**	CorePhoto

ENGINEERING BOREHOLE LOG

Borehole No: **BH04**

Client:	Grieve Gillett Architects	**Total Depth (mBGL):**	1.5	**Commenced:**	08/01/2025
Project:	Two Wells Ambulance Station	**Elevation (mAHD):**	11.86	**Completed:**	08/01/2025
Project No:	241697	**Easting:**	271958.29	**Logged By:**	LA
Contractor:	Lab + Field	**Northing:**	6169195.03	**Checked By:**	JNB
Equipment:	Rockmaster	**Coordinates:**	54		

Method	Elevation (m)	Water	Depth (m)	Graphic Log	Group Symbol	Material Description	Moisture	Consistency/ Density	Sample Interval	Samples	DCP (0 5 10 15 20 25)	Field Tests	Comments / Observations
SA	11.86				F	FILL. Sandy GRAVEL. grey brown, fine to coarse sized, fine to coarse grained sand, with low plasticity silt.	D	D		0.1 - 0.2 m ENV			
PT					SW	Calcareous Gravelly SAND. pale grey brown, fine to coarse grained, fine to coarse sized gravel, with low plasticity silt.		D-VD		0.3 - 0.4 m ENV	11 11		Calcrete layer
			0.50							0.5 - 1 m BULK CBR+PI+PSD			
	10.86		1		CL-CI	Calcareous Sandy CLAY. low to medium plasticity, pale reddish grey brown, fine to coarse grained sand, trace fine to coarse sized gravel, inorganic.	w < PL	VSt		1 - 1.1 m ENV			
					CI-CH	_ CLAY. medium to high plasticity, red brown, trace fine to medium grained sand, inorganic.				1.3 - 1.4 m ENV		1.3, PP 600	
						BH04 Target Depth Reached at 1.5m (Target Depth Reached)							

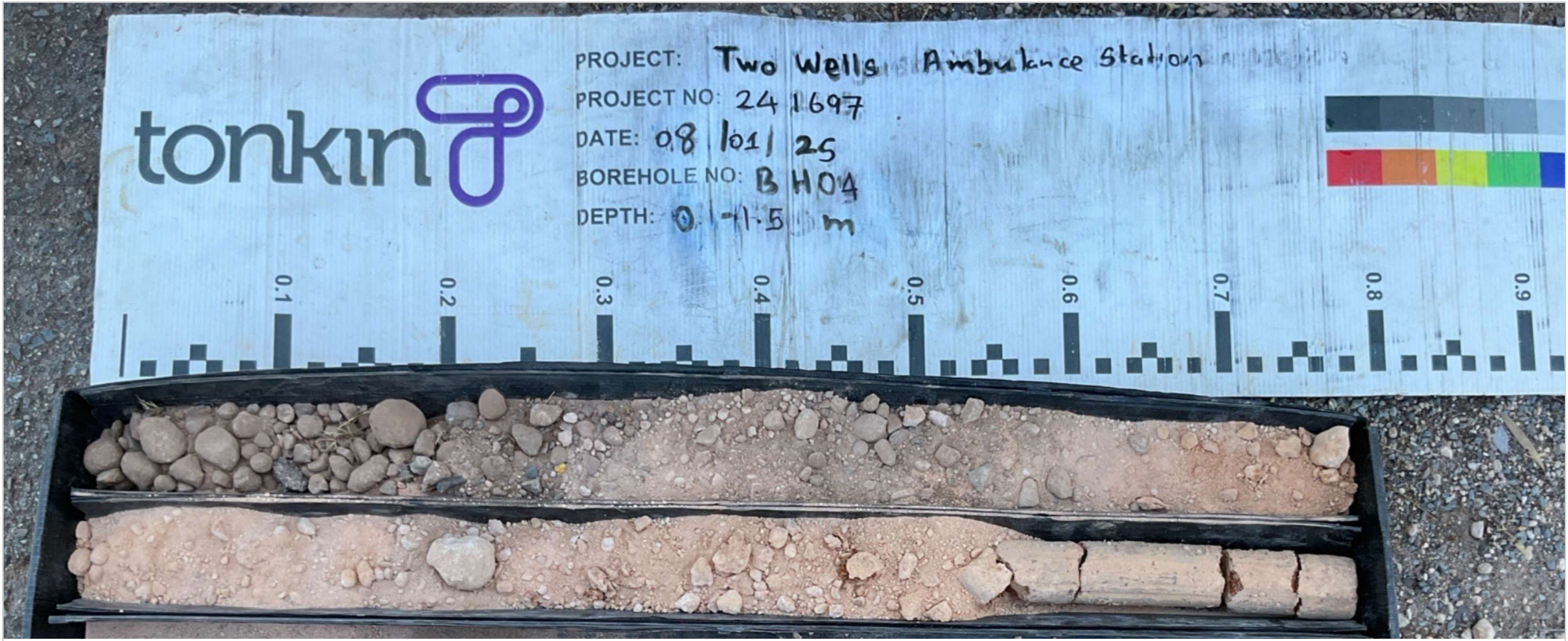

Photo description	BH04		
Client	Grieve Gillett Architects		
Location	120 Port Wakefield Hwy, Two Wells SA 5501, Australia		
Project name	Two Wells Ambulance Station		
Project No	241697	**Scale**	Not to Scale
BH No	BH04	**BH Depth**	CorePhoto

ENGINEERING BOREHOLE LOG

Borehole No: **BH05**

Client:	Grieve Gillett Architects	**Total Depth (mBGL):**	1.5	**Commenced:**	08/01/2025
Project:	Two Wells Ambulance Station	**Elevation (mAHD):**	12.49	**Completed:**	08/01/2025
Project No:	241697	**Easting:**	271940.08	**Logged By:**	LA
Contractor:	Lab + Field	**Northing:**	6169185.40	**Checked By:**	JNB
Equipment:	Rockmaster	**Coordinates:**	54		

Method	Elevation (m)	Water	Depth (m)	Graphic Log	Group Symbol	Material Description	Moisture	Consistency/ Density	Sample Interval	Samples	DCP (0 5 10 15 20 25)	Field Tests	Comments / Observations
PT	12.49				TS	Topsoil. Silty SAND. brown, fine to medium grained.	D	MD		0 - 0.1 m ENV	3, 4		
						Calcareous Sandy GRAVEL. pale grey brown, fine to coarse sized, fine to coarse grained sand, with low plasticity silt.				0.2 - 0.4 m ENV QC3	17		
										0.3 - 0.8 m BULK CBR	13		
			0.50		GW			D-VD					Calcrete Layer
	11.49		1							0.8 - 0.9 m ENV			
					CL-CI	Calcareous Sandy CLAY, low to medium plasticity, pale grey brown, fine to coarse grained sand, trace fine to medium sized gravel, inorganic.	w < PL	St-VSt		1.2 - 1.4 m ENV			
						BH05 Target Depth Reached at 1.5m (Target Depth Reached)							

Photo description	BH05		
Client	Grieve Gillett Architects		
Location	120 Port Wakefield Hwy, Two Wells SA 5501, Australia		
Project name	Two Wells Ambulance Station		
Project No	241697	**Scale**	Not to Scale
BH No	BH05	**BH Depth**	CorePhoto

Appendix B – Tabulated Analytical Data

					Metals													
					Arsenic	Barium	Beryllium	Boron	Cadmium	Chromium (hexavalent)	Chromium (III+VI)	Cobalt	Copper	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Vanadium	Zinc
					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL					5	10	1	50	1	0.5	2	2	5	50	5	5	0.1	2	5	5	5
NEPM 2013 Table 1B(5) EIL - Comm/Ind					160						680		320		1,800			410			1,000
NEPM 2013 Table 1B(6) ESLs for Comm/Ind, Fine Soil																					
SA EPA Waste Fill Criteria					20	300	20		3	1		170	60		300	500	1	60			200
SA EPA Intermediate Waste - Total Dry Weight Concentrations					200		40		30	200		170	2,000		1,200	6,000	30	600			14,000
SA EPA Low-level Contaminated - Total Dry Weight Concentrations					750		150		60	750		1,000	7,500		5,000	10,000	110	3,000			50,000
Location Code	**Date**	**Field ID**	**Sample Type**	**Depth**																	
BH01	**08 Jan 2025**	**BH01_0.05-0.2**	**Normal**	**0.05-0.2**	<5				<1		12		26		8		<0.1	12			19
BH01	**08 Jan 2025**	**BH01_0.5-0.6**	**Normal**	**0.5-0.6**	<5				<1		16		11		<5		<0.1	12			22
BH01	**08 Jan 2025**	**BH01_2.0-2.1**	**Normal**	**2.0-2.1**																	
BH02	**08 Jan 2025**	**BH02_0.1-0.2**	**Normal**	**0.1-0.2**	<5	80	<1	<50	<1	<0.5	18	7	32		9	159	<0.1	14	<5	30	22
BH02	**08 Jan 2025**	**BH02_0.5-0.6**	**Normal**	**0.5-0.6**	<5				<1		18		**179**		24		<0.1	15			37
BH03	**08 Jan 2025**	**BH03_0-0.2**	**Normal**	**0-0.2**	<5				<1		14		18		7		<0.1	13			19
BH03	**08 Jan 2025**	**BH03_0.3-0.4**	**Normal**	**0.3-0.4**	<5				<1		11		18		6		<0.1	16			18
BH04	**08 Jan 2025**	**BH04_0.1-0.2**	**Normal**	**0.1-0.2**	<5				<1		13		24		34		<0.1	12			254
BH04	**08 Jan 2025**	**BH04_0.3-0.4**	**Normal**	**0.3-0.4**	6				<1		11		16		12		<0.1	13			82
BH05	**08 Jan 2025**	**BH05_0-0.1**	**Normal**	**0-0.1**	<5				<1		5		8		7		<0.1	3			20
BH06	**08 Jan 2025**	**BH06_0-0.2**	**Normal**	**0-0.2**	<5				<1		6		15		21		<0.1	4			51
BH03	**08 Jan 2025**	**QC2**	**Normal**		<5				<1		16		18		6		<0.1	14			18
BH03	**08 Jan 2025**	**BH03_0.3-0.4**	**Normal**	**0.3-0.4**	<5				<1		11		18		6		<0.1	16			18
BH03	**08 Jan 2025**	**QC2**	**Normal**		<5				<1		16		18		6		<0.1	14			18
RPD %											*37%*		*0%*		*0%*			*13%*			*0%*

Environmental Standards
NEPM, NEPM 2013 Table 1B(7) Management Limits Comm / Ind, Fine Soil
2013, NEPM 2013 Table 1B(6) ESLs for Comm/Ind, Fine Soil
NEMP, PFAS National Environmental Management Plan, Version 2.0 - January 2020
Standard for the production and use of Waste Derived Fill, Table 8, 2013, SA EPA Waste Fill Criteria
Standard for the production and use of Waste Derived Fill, Table 9, 2013, SA EPA Intermediate Waste - Total Dry Weight Concentrations
Current criteria for the classification of waste—including Industrial and Commercial Waste (Listed) and Waste Soil , 2010, SA EPA Low-level Contaminated - Total Dry Weight Concentrations
2013, NEPM 2013 Table 1A(1) HILs Comm/Ind D Soil

					TPH					TRH							BTEX							
					C6-C9 Fraction	C10-C14 Fraction	C15-C28 Fraction	C29-C36 Fraction	C10-C36 Fraction (Sum)	C6-C10 Fraction (F1)	C6-C10 (F1 minus BTEX)	>C10-C16 Fraction (F2)	>C10-C16 Fraction (F2 minus Naphthalene)	>C16-C34 Fraction (F3)	>C34-C40 Fraction (F4)	>C10-C40 Fraction (Sum)	Naphthalene (VOC)	Benzene	Toluene	Ethylbenzene	Xylene (m & p)	Xylene (o)	Xylene Total	Total BTEX
					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL					10	50	100	100	50	10	10	50	50	100	100	50	1	0.2	0.5	0.5	0.5	0.5	0.5	0.2
NEPM 2013 Table 1B(5) EIL - Comm/Ind																	370							
NEPM 2013 Table 1B(6) ESLs for Comm/Ind, Fine Soil											215	170	170	2,500	6,600			95	135	185			95	
SA EPA Waste Fill Criteria					65				1,000									1	1.4	3.1			14	
SA EPA Intermediate Waste - Total Dry Weight Concentrations					100				1,000									5	50	100			180	
SA EPA Low-level Contaminated - Total Dry Weight Concentrations					1,000				10,000									15	500	1,000			1,800	
Location Code	**Date**	**Field ID**	**Sample Type**	**Depth**																				
BH01	**08 Jan 2025**	**BH01_0.05-0.2**	**Normal**	**0.05-0.2**	<10	<50	<100	140	140	<10	<10	<50	<50	170	120	290	<1	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2
BH01	**08 Jan 2025**	**BH01_0.5-0.6**	**Normal**	**0.5-0.6**																				
BH01	**08 Jan 2025**	**BH01_2.0-2.1**	**Normal**	**2.0-2.1**																				
BH02	**08 Jan 2025**	**BH02_0.1-0.2**	**Normal**	**0.1-0.2**	<10	<50	<100	<100	<50	<10	<10	<50	<50	<50	<50	<50	<1	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH02	**08 Jan 2025**	**BH02_0.5-0.6**	**Normal**	**0.5-0.6**																				
BH03	**08 Jan 2025**	**BH03_0-0.2**	**Normal**	**0-0.2**	<10	<50	<100	<100	<50	<10	<10	<50	<50	<50	<50	<50	<1	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH03	**08 Jan 2025**	**BH03_0.3-0.4**	**Normal**	**0.3-0.4**																				
BH04	**08 Jan 2025**	**BH04_0.1-0.2**	**Normal**	**0.1-0.2**	<10	<50	<100	<100	<50	<10	<10	<50	<50	<50	<50	<50	<1	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH04	**08 Jan 2025**	**BH04_0.3-0.4**	**Normal**	**0.3-0.4**																				
BH05	**08 Jan 2025**	**BH05_0-0.1**	**Normal**	**0-0.1**																				
BH06	**08 Jan 2025**	**BH06_0-0.2**	**Normal**	**0-0.2**																				
BH03	**08 Jan 2025**	**QC2**	**Normal**		<10	<50	<100	<100	<50	<10	<10	<50	<50	<50	<50	<50	<1	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH03	**08 Jan 2025**	**BH03_0.3-0.4**	**Normal**	**0.3-0.4**																				
BH03	**08 Jan 2025**	**QC2**	**Normal**		<10	<50	<100	<100	<50	<10	<10	<50	<50	<50	<50	<50	<1	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
RPD %																								

Environmental Standards

NEPM, NEPM 2013 Table 1B(7) Management Limits Comm / Ind, Fine Soil
2013, NEPM 2013 Table 1B(6) ESLs for Comm/Ind, Fine Soil
NEMP, PFAS National Environmental Management Plan, Version 2.0 - January 2020
Standard for the production and use of Waste Derived Fill, Table 8, 2013, SA EPA Waste Fill Criteria
Standard for the production and use of Waste Derived Fill, Table 9, 2013, SA EPA Intermediate Waste - Total Dry Weight Concentrations
Current criteria for the classification of waste—including Industrial and Commercial Waste (Listed) and Waste Soil , 2010, SA EPA Low-level Co
2013, NEPM 2013 Table 1A(1) HILs Comm/Ind D Soil

					PAH																
					Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a) pyrene	Benzo(b+j)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	Phenanthrene	Pyrene	Benzo(a)pyrene TEQ calc (Half)	Benzo(a)pyrene TEQ (LOR)	Benzo(a)pyrene TEQ calc (Zero)	PAHs (Sum of total)
					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL					0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
NEPM 2013 Table 1B(5) EIL - Comm/Ind																		370						
NEPM 2013 Table 1B(6) ESLs for Comm/Ind, Fine Soil									1.4															
SA EPA Waste Fill Criteria									1															5
SA EPA Intermediate Waste - Total Dry Weight Concentrations									2															40
SA EPA Low-level Contaminated - Total Dry Weight Concentrations									5															200
Location Code	**Date**	**Field ID**	**Sample Type**	**Depth**																				
BH01	**08 Jan 2025**	**BH01_0.05-0.2**	**Normal**	**0.05-0.2**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	<0.5	1.2	<0.5
BH01	**08 Jan 2025**	**BH01_0.5-0.6**	**Normal**	**0.5-0.6**																				
BH01	**08 Jan 2025**	**BH01_2.0-2.1**	**Normal**	**2.0-2.1**																				
BH02	**08 Jan 2025**	**BH02_0.1-0.2**	**Normal**	**0.1-0.2**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	<0.5	1.2	<0.5
BH02	**08 Jan 2025**	**BH02_0.5-0.6**	**Normal**	**0.5-0.6**																				
BH03	**08 Jan 2025**	**BH03_0-0.2**	**Normal**	**0-0.2**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	<0.5	1.2	<0.5
BH03	**08 Jan 2025**	**BH03_0.3-0.4**	**Normal**	**0.3-0.4**																				
BH04	**08 Jan 2025**	**BH04_0.1-0.2**	**Normal**	**0.1-0.2**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	<0.5	1.2	<0.5
BH04	**08 Jan 2025**	**BH04_0.3-0.4**	**Normal**	**0.3-0.4**																				
BH05	**08 Jan 2025**	**BH05_0-0.1**	**Normal**	**0-0.1**																				
BH06	**08 Jan 2025**	**BH06_0-0.2**	**Normal**	**0-0.2**																				
BH03	**08 Jan 2025**	**QC2**	**Normal**		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	<0.5	1.2	<0.5
BH03	**08 Jan 2025**	**BH03_0.3-0.4**	**Normal**	**0.3-0.4**																				
BH03	**08 Jan 2025**	**QC2**	**Normal**		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	<0.5	1.2	<0.5
RPD %																								

Environmental Standards

NEPM, NEPM 2013 Table 1B(7) Management Limits Comm / Ind, Fine Soil
2013, NEPM 2013 Table 1B(6) ESLs for Comm/Ind, Fine Soil
NEMP, PFAS National Environmental Management Plan, Version 2.0 - January 2020
Standard for the production and use of Waste Derived Fill, Table 8, 2013, SA EPA Waste Fill Criteria
Standard for the production and use of Waste Derived Fill, Table 9, 2013, SA EPA Intermediate Waste - Total Dry Weight Concentrations
Current criteria for the classification of waste—including Industrial and Commercial Waste (Listed) and Waste Soil , 2010, SA EPA Low-level Co
2013, NEPM 2013 Table 1A(1) HILs Comm/Ind D Soil

					Phenols												
					3&4-Methylphenol (m&p-cresol)	2,4,5-Trichlorophenol	2,4,6-Trichlorophenol	2,4-Dichlorophenol	2,4-Dimethylphenol	2,6-Dichlorophenol	2-Chlorophenol	2-Methylphenol	2-Nitrophenol	4-chloro-3-methylphenol	Pentachlorophenol	Phenol	Phenolics Total
					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL					1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	2	0.5	0.5
NEPM 2013 Table 1B(5) EIL - Comm/Ind																	
NEPM 2013 Table 1B(6) ESLs for Comm/Ind, Fine Soil																	
SA EPA Waste Fill Criteria																	0.5
SA EPA Intermediate Waste - Total Dry Weight Concentrations																	17,000
SA EPA Low-level Contaminated - Total Dry Weight Concentrations																	50,000
Location Code	**Date**	**Field ID**	**Sample Type**	**Depth**													
BH01	**08 Jan 2025**	**BH01_0.05-0.2**	**Normal**	**0.05-0.2**													
BH01	**08 Jan 2025**	**BH01_0.5-0.6**	**Normal**	**0.5-0.6**													
BH01	**08 Jan 2025**	**BH01_2.0-2.1**	**Normal**	**2.0-2.1**													
BH02	**08 Jan 2025**	**BH02_0.1-0.2**	**Normal**	**0.1-0.2**	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<0.5	<0.5
BH02	**08 Jan 2025**	**BH02_0.5-0.6**	**Normal**	**0.5-0.6**													
BH03	**08 Jan 2025**	**BH03_0-0.2**	**Normal**	**0-0.2**													
BH03	**08 Jan 2025**	**BH03_0.3-0.4**	**Normal**	**0.3-0.4**													
BH04	**08 Jan 2025**	**BH04_0.1-0.2**	**Normal**	**0.1-0.2**													
BH04	**08 Jan 2025**	**BH04_0.3-0.4**	**Normal**	**0.3-0.4**													
BH05	**08 Jan 2025**	**BH05_0-0.1**	**Normal**	**0-0.1**													
BH06	**08 Jan 2025**	**BH06_0-0.2**	**Normal**	**0-0.2**													
BH03	**08 Jan 2025**	**QC2**	**Normal**														
BH03	**08 Jan 2025**	**BH03_0.3-0.4**	**Normal**	**0.3-0.4**													
BH03	**08 Jan 2025**	**QC2**	**Normal**														
RPD %																	

Environmental Standards
NEPM, NEPM 2013 Table 1B(7) Management Limits Comm / Ind, Fine Soil
2013, NEPM 2013 Table 1B(6) ESLs for Comm/Ind, Fine Soil
NEMP, PFAS National Environmental Management Plan, Version 2.0 - January 2020
Standard for the production and use of Waste Derived Fill, Table 8, 2013, SA EPA Waste Fill Criteria
Standard for the production and use of Waste Derived Fill, Table 9, 2013, SA EPA Intermediate Waste - Total Dry Weight Concentrations
Current criteria for the classification of waste—including Industrial and Commercial Waste (Listed) and Waste Soil , 2010, SA EPA Low-level Co
2013, NEPM 2013 Table 1A(1) HILs Comm/Ind D Soil

					Organochlorine Pesticides																	
					4,4-DDE	Aldrin	Aldrin + Dieldrin	Chlordane	Chlordane (cis)	Chlordane (trans)	DDD	DDT	DDT+DDE+DDD	Dieldrin	Endosulfan	Endosulfan I	Endosulfan II	Endosulfan sulphate	Endrin	Endrin aldehyde	Endrin ketone	Heptachlor epoxide	Methoxychlor
					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL					0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.2	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.2
NEPM 2013 Table 1B(5) EIL - Comm/Ind												640											
NEPM 2013 Table 1B(6) ESLs for Comm/Ind, Fine Soil																							
SA EPA Waste Fill Criteria							2	2				2											
SA EPA Intermediate Waste - Total Dry Weight Concentrations							2	2				2											
SA EPA Low-level Contaminated - Total Dry Weight Concentrations							50	50				50											
Location Code	**Date**	**Field ID**	**Sample Type**	**Depth**																			
BH01	**08 Jan 2025**	**BH01_0.05-0.2**	**Normal**	**0.05-0.2**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.08	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2
BH01	**08 Jan 2025**	**BH01_0.5-0.6**	**Normal**	**0.5-0.6**																			
BH01	**08 Jan 2025**	**BH01_2.0-2.1**	**Normal**	**2.0-2.1**																			
BH02	**08 Jan 2025**	**BH02_0.1-0.2**	**Normal**	**0.1-0.2**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.08	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2
BH02	**08 Jan 2025**	**BH02_0.5-0.6**	**Normal**	**0.5-0.6**																			
BH03	**08 Jan 2025**	**BH03_0-0.2**	**Normal**	**0-0.2**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.08	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2
BH03	**08 Jan 2025**	**BH03_0.3-0.4**	**Normal**	**0.3-0.4**																			
BH04	**08 Jan 2025**	**BH04_0.1-0.2**	**Normal**	**0.1-0.2**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.08	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2
BH04	**08 Jan 2025**	**BH04_0.3-0.4**	**Normal**	**0.3-0.4**																			
BH05	**08 Jan 2025**	**BH05_0-0.1**	**Normal**	**0-0.1**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.08	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2
BH06	**08 Jan 2025**	**BH06_0-0.2**	**Normal**	**0-0.2**																			
BH03	**08 Jan 2025**	**QC2**	**Normal**		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.08	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2
BH03	**08 Jan 2025**	**BH03_0.3-0.4**	**Normal**	**0.3-0.4**																			
BH03	**08 Jan 2025**	**QC2**	**Normal**		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.08	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2
RPD %																							

Environmental Standards
NEPM, NEPM 2013 Table 1B(7) Management Limits Comm / Ind, Fine Soil
2013, NEPM 2013 Table 1B(6) ESLs for Comm/Ind, Fine Soil
NEMP, PFAS National Environmental Management Plan, Version 2.0 - January 2020
Standard for the production and use of Waste Derived Fill, Table 8, 2013, SA EPA Waste Fill Criteria
Standard for the production and use of Waste Derived Fill, Table 9, 2013, SA EPA Intermediate Waste - Total Dry Weight Concentrations
Current criteria for the classification of waste—including Industrial and Commercial Waste (Listed) and Waste Soil , 2010, SA EPA Low-level Co
2013, NEPM 2013 Table 1A(1) HILs Comm/Ind D Soil

					Organophosphorus Pesticides																	
					Dichlorvos	Demeton-S-methyl	Monocrotophos	Dimethoate	Diazinon	Chlorpyrifos	Parathion-methyl	Malathion	Fenthion	Chlorpyrifos	Parathion	Pirimphos-ethyl	Chlorfenvinphos	Bromophos-ethyl	Fenamiphos	Prothiofos	Ethion	Carbophenothion	Azinphos Methyl
					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL					0.05	0.05	0.2	0.05	0.05	0.05	0.2	0.2	0.05	0.05	0.2	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.2
NEPM 2013 Table 1B(5) EIL - Comm/Ind																							
NEPM 2013 Table 1B(6) ESLs for Comm/Ind, Fine Soil																							
SA EPA Waste Fill Criteria																							
SA EPA Intermediate Waste - Total Dry Weight Concentrations																							
SA EPA Low-level Contaminated - Total Dry Weight Concentrations																							
Location Code	**Date**	**Field ID**	**Sample Type**	**Depth**																			
BH01	**08 Jan 2025**	**BH01_0.05-0.2**	**Normal**	**0.05-0.2**	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.2	<0.2	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2
BH01	**08 Jan 2025**	**BH01_0.5-0.6**	**Normal**	**0.5-0.6**																			
BH01	**08 Jan 2025**	**BH01_2.0-2.1**	**Normal**	**2.0-2.1**																			
BH02	**08 Jan 2025**	**BH02_0.1-0.2**	**Normal**	**0.1-0.2**	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.2	<0.2	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2
BH02	**08 Jan 2025**	**BH02_0.5-0.6**	**Normal**	**0.5-0.6**																			
BH03	**08 Jan 2025**	**BH03_0-0.2**	**Normal**	**0-0.2**	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.2	<0.2	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2
BH03	**08 Jan 2025**	**BH03_0.3-0.4**	**Normal**	**0.3-0.4**																			
BH04	**08 Jan 2025**	**BH04_0.1-0.2**	**Normal**	**0.1-0.2**	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.2	<0.2	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2
BH04	**08 Jan 2025**	**BH04_0.3-0.4**	**Normal**	**0.3-0.4**																			
BH05	**08 Jan 2025**	**BH05_0-0.1**	**Normal**	**0-0.1**	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.2	<0.2	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2
BH06	**08 Jan 2025**	**BH06_0-0.2**	**Normal**	**0-0.2**																			
BH03	**08 Jan 2025**	**QC2**	**Normal**		<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.2	<0.2	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2
BH03	**08 Jan 2025**	**BH03_0.3-0.4**	**Normal**	**0.3-0.4**																			
BH03	**08 Jan 2025**	**QC2**	**Normal**		<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.2	<0.2	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2
RPD %																							

Environmental Standards
NEPM, NEPM 2013 Table 1B(7) Management Limits Comm / Ind, Fine Soil
2013, NEPM 2013 Table 1B(6) ESLs for Comm/Ind, Fine Soil
NEMP, PFAS National Environmental Management Plan, Version 2.0 - January 2020
Standard for the production and use of Waste Derived Fill, Table 8, 2013, SA EPA Waste Fill Criteria
Standard for the production and use of Waste Derived Fill, Table 9, 2013, SA EPA Intermediate Waste - Total Dry Weight Concentrations
Current criteria for the classification of waste—including Industrial and Commercial Waste (Listed) and Waste Soil , 2010, SA EPA Low-level Co
2013, NEPM 2013 Table 1A(1) HILs Comm/Ind D Soil

	Triazines	Pyrethoids	PCBs	Perfluoroalkyl Sulfonic		Inorganics	
	Atrazine	Bifenthrin	PCBs (Sum of total)	Sum of PFHxS and PFOS	PFOA	Moisture Content	Cyanide Total
			mg/kg	0.0002	0.0002	%	mg/kg
EQL	0.05	0.05	0.1			1	1
NEPM 2013 Table 1B(5) EIL - Comm/Ind							
NEPM 2013 Table 1B(6) ESLs for Comm/Ind, Fine Soil							
SA EPA Waste Fill Criteria			2				500
SA EPA Intermediate Waste - Total Dry Weight Concentrations			2				1,000
SA EPA Low-level Contaminated - Total Dry Weight Concentrations			50				3,500
Location Code	**Date**	**Field ID**	**Sample Type**	**Depth**							
BH01	**08 Jan 2025**	**BH01_0.05-0.2**	**Normal**	**0.05-0.2**						5.9	
BH01	**08 Jan 2025**	**BH01_0.5-0.6**	**Normal**	**0.5-0.6**						12	
BH01	**08 Jan 2025**	**BH01_2.0-2.1**	**Normal**	**2.0-2.1**						18.7	
BH02	**08 Jan 2025**	**BH02_0.1-0.2**	**Normal**	**0.1-0.2**	<0.05	<0.05	<0.1			6.6	<1
BH02	**08 Jan 2025**	**BH02_0.5-0.6**	**Normal**	**0.5-0.6**						8.2	
BH03	**08 Jan 2025**	**BH03_0-0.2**	**Normal**	**0-0.2**						5	
BH03	**08 Jan 2025**	**BH03_0.3-0.4**	**Normal**	**0.3-0.4**						6	
BH04	**08 Jan 2025**	**BH04_0.1-0.2**	**Normal**	**0.1-0.2**						4.8	
BH04	**08 Jan 2025**	**BH04_0.3-0.4**	**Normal**	**0.3-0.4**						5.6	
BH05	**08 Jan 2025**	**BH05_0-0.1**	**Normal**	**0-0.1**						3.6	
BH06	**08 Jan 2025**	**BH06_0-0.2**	**Normal**	**0-0.2**				0.001	<0.0002	1.7	
BH03	**08 Jan 2025**	**QC2**	**Normal**							4.6	
BH03	**08 Jan 2025**	**BH03_0.3-0.4**	**Normal**	**0.3-0.4**						6	
BH03	**08 Jan 2025**	**QC2**	**Normal**							4.6	
RPD %											

Environmental Standards
NEPM, NEPM 2013 Table 1B(7) Management Limits Comm / Ind, Fine Soil
2013, NEPM 2013 Table 1B(6) ESLs for Comm/Ind, Fine Soil
NEMP, PFAS National Environmental Management Plan, Version 2.0 - January 2020
Standard for the production and use of Waste Derived Fill, Table 8, 2013, SA EPA Waste Fill Criteria
Standard for the production and use of Waste Derived Fill, Table 9, 2013, SA EPA Intermediate Waste - Total Dry Weight Concentrations
Current criteria for the classification of waste—including Industrial and Commercial Waste (Listed) and Waste Soil , 2010, SA EPA Low-level Co
2013, NEPM 2013 Table 1A(1) HILs Comm/Ind D Soil

Package 3 (Total Data Set)

Sample Number	Depth	Copper	Notes
BH01_0.05-0.2	0.05-0.2	26	
BH01_0.5-0.6	0.5-0.6	11	
BH01_2.0-2.1	2.0-2.1	18	
BH02_0.1-0.2	0.1-0.2	32	
BH02_0.5-0.6	0.5-0.6	**179**	
BH03_0-0.2	0-0.2		
BH03_0.3-0.4	0.3-0.4	18	
BH04_0.1-0.2	0.1-0.2	24	
BH04_0.3-0.4	0.3-0.4	16	
BH05_0-0.1	0-0.1	8	
BH06_0-0.2	0-0.2	15	
QC2		18	
Arithmetic Mean		33.182	sample mean of replicate results
Standard Deviation		48.830	sample standard deviation of replicate results
CV = SD / mean		1.472	CV gives a measure of spread of the replicates, which is different from CV of underlying distribution
Count (r)		11	For ISM, the sample size in the UCL calculation is the number of replicates, not the number of increments.
alpha (95% = 0.05)		0.05	standard choice is alpha = 0.05
t(alpha, df=r-1)		1.81	from Student's t distribution
Student's t UCL		59.87	Note that the UCL for these relatively small sample sizes will typically exceed the maximum.
Chebychev UCL		**97.36**	The calculated UCL should be used (do not use the maximum).

If the CV is < 1.2 then you should use the Students T

Adopted Criterion	Waste Fill Criteria	60
Standard Deviation		48.83
Maximum Value		179
250% WF Criterion		150
50% WF Criterion		30

Waste Fill Acceptance?		
Is the STD dev < 50% of the adopted criteria?		NO
Are all values <2.5 x the adopted criteria?		NO

Inputs
Select contaminant from list below
Zn
Below needed to calculate fresh and aged ACLs
Enter cation exchange capacity (silver thiourea method) (values from 0 to 100 cmolc/kg dwt)
16.9
Enter soil pH (calcium chloride method) (values from 1 to 14)
7.7
Below needed to calculate fresh and aged ABCs
Measured background concentration (mg/kg). Leave blank if no measured value
or for fresh ABCs only
Enter iron content (aqua regia method) (values from 0 to 50%) to obtain estimate of background concentration
2.16
or for aged ABCs only
Enter State (or closest State)
SA
Enter traffic volume (high or low)
low

Outputs		
Land use	Zn soil-specific EILs (mg contaminant/kg dry soil)	
	Fresh	Aged
National parks and areas of high conservation value	75	190
Urban residential and open public spaces	250	670
Commercial and industrial	390	1000

Inputs
Select contaminant from list below
Cr_III
Below needed to calculate fresh and aged ACLs
Enter % clay (values from 0 to 100%)
10
Below needed to calculate fresh and aged ABCs
Measured background concentration (mg/kg). Leave blank if no measured value
or for fresh ABCs only
Enter iron content (aqua regia method) (values from 0 to 50%) to obtain estimate of background concentration
2.16
or for aged ABCs only
Enter State (or closest State)
SA
Enter traffic volume (high or low)
low

Outputs		
Land use	Cr III soil-specific EILs (mg contaminant/kg dry soil)	
	Fresh	Aged
National parks and areas of high conservation value	80	140
Urban residential and open public spaces	190	410
Commercial and industrial	300	680

Inputs
Select contaminant from list below
Ni
Below needed to calculate fresh and aged ACLs
Enter cation exchange capacity (silver thiourea method) (values from 0 to 100 cmolc/kg dwt)
16.9
Below needed to calculate fresh and aged ABCs
Measured background concentration (mg/kg). Leave blank if no measured value
or for fresh ABCs only
Enter iron content (aqua regia method) (values from 0 to 50%) to obtain estimate of background concentration
2.16
or for aged ABCs only
Enter State (or closest State)
SA
Enter traffic volume (high or low)
low

Outputs		
Land use	Ni soil-specific EILs (mg contaminant/kg dry soil)	
	Fresh	Aged
National parks and areas of high conservation value	20	45
Urban residential and open public spaces	85	240
Commercial and industrial	160	410

Inputs
Select contaminant from list below
Cu
Below needed to calculate fresh and aged ACLs
Enter cation exchange capacity (silver thiourea method) (values from 0 to 100 cmolc/kg dwt)
16.9
Enter soil pH (calcium chloride method) (values from 1 to 14)
7.7
Enter organic carbon content (%OC) (values from 0 to 50%)
0.5
Below needed to calculate fresh and aged ABCs
Measured background concentration (mg/kg). Leave blank if no measured value
or for fresh ABCs only
Enter iron content (aqua regia method) (values from 0 to 50%) to obtain estimate of background concentration
2.16
or for aged ABCs only
Enter State (or closest State)
SA
Enter traffic volume (high or low)
low

Outputs		
Land use	Cu soil-specific EILs (mg contaminant/kg dry soil)	
	Fresh	Aged
National parks and areas of high conservation value	60	85
Urban residential and open public spaces	120	220
Commercial and industrial	170	320

Appendix C – Laboratory NATA Certificates

CERTIFICATE OF ANALYSIS

Work Order	: **EM2500166**	Page	: 1 of 21
Client	: **TONKIN CONSULTING**	Laboratory	: Environmental Division Melbourne
Contact	: Dean Noske	Contact	: Customer Services EM
Address	: LEVEL 2, 170 FROME STREET ADELAIDE SA, AUSTRALIA 5000	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: ----	Telephone	: +61-3-8549 9600
Project	: 241697.0000	Date Samples Received	: 09-Jan-2025 11:30
Order number	:	Date Analysis Commenced	: 15-Jan-2025
C-O-C number	: 241697	Issue Date	: 20-Jan-2025 11:41
Sampler	: LA		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 27		
No. of samples analysed	: 12		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, 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*
Eric Chau	Metals Team Leader	Melbourne Inorganics, Springvale, VIC
Nancy Wang	2IC Organic Chemist	Melbourne Inorganics, Springvale, VIC
Nancy Wang	2IC Organic Chemist	Melbourne Organics, Springvale, VIC
Nikki Stepniewski	Senior Inorganic Instrument Chemist	Melbourne Inorganics, Springvale, VIC

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.

- ALS is not NATA accredited for the analysis of Exchangeable Cations on Alkaline Soils when performed under ALS Method ED006.
- 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.
- EP068: Where reported, Total Chlordane (sum) is the sum of the reported concentrations of cis-Chlordane and trans-Chlordane at or above the LOR.
- EP068: Where reported, Total OCP is the sum of the reported concentrations of all Organochlorine Pesticides at or above 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.
- EP231X: Poor matrix spike recovery for sample EM2500332-001 due to sample matrix interference.
- ED007 and ED008: When Exchangeable Al is reported from these methods, it should be noted that Rayment & Lyons (2011) suggests Exchange Acidity by 1M KCl - Method 15G1 (ED005) is a more suitable method for the determination of exchange acidity (H+ + Al3+).
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration or as per USEPA 1633 limits where LISTED. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS and also conform to QSM 5.4 (US DoD) requirements.

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	BH01_0.05-0.2	BH01_0.5-0.6	BH01_2.0-2.1	BH02_0.1-0.2	BH02_0.5-0.6
			Sampling date / time	08-Jan-2025 00:00	08-Jan-2025 00:00	08-Jan-2025 00:00	08-Jan-2025 00:00	08-Jan-2025 00:00
Compound	CAS Number	LOR	Unit	EM2500166-001	EM2500166-002	EM2500166-005	EM2500166-006	EM2500166-008
				Result	Result	Result	Result	Result
EA001: pH in soil using 0.01M CaCl extract								
pH (CaCl2)	----	0.1	pH Unit	----	----	7.7	----	----
EA002-AD: pH (Soils) dried at 40°C								
pH Value	----	0.1	pH Unit	----	----	8.8	----	----
EA010-AD: Conductivity (Soils) dried at 40°C								
Electrical Conductivity @ 25°C	----	1	µS/cm	----	----	553	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	5.9	12.0	18.7	6.6	8.2
ED006: Exchangeable Cations on Alkaline Soils								
ø Exchangeable Calcium	----	0.2	meq/100g	----	----	5.2	----	----
ø Exchangeable Magnesium	----	0.2	meq/100g	----	----	7.1	----	----
ø Exchangeable Potassium	----	0.2	meq/100g	----	----	1.4	----	----
ø Exchangeable Sodium	----	0.2	meq/100g	----	----	3.1	----	----
ø Cation Exchange Capacity	----	0.2	meq/100g	----	----	16.9	----	----
ø Exchangeable Calcium Percent	----	0.2	%	----	----	31.1	----	----
ø Exchangeable Magnesium Percent	----	0.2	%	----	----	42.3	----	----
ø Exchangeable Potassium Percent	----	0.2	%	----	----	8.0	----	----
ø Exchangeable Sodium Percent	----	0.2	%	----	----	18.5	----	----
ø Calcium/Magnesium Ratio	----	0.2	-	----	----	0.7	----	----
ø Magnesium/Potassium Ratio	----	0.2	-	----	----	5.3	----	----
EG005(ED093)T: Total Metals by ICP-AES								
Barium	7440-39-3	10	mg/kg	----	----	----	80	----
Beryllium	7440-41-7	1	mg/kg	----	----	----	<1	----
Boron	7440-42-8	50	mg/kg	----	----	----	<50	----
Cobalt	7440-48-4	2	mg/kg	----	----	----	7	----
Iron	7439-89-6	0.005	%	----	----	2.16	----	----
Manganese	7439-96-5	5	mg/kg	----	----	----	159	----
Selenium	7782-49-2	5	mg/kg	----	----	----	<5	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	BH01_0.05-0.2	BH01_0.5-0.6	BH01_2.0-2.1	BH02_0.1-0.2	BH02_0.5-0.6
				Sampling date / time	08-Jan-2025 00:00	08-Jan-2025 00:00	08-Jan-2025 00:00	08-Jan-2025 00:00	08-Jan-2025 00:00
Compound	CAS Number	LOR	Unit		EM2500166-001	EM2500166-002	EM2500166-005	EM2500166-006	EM2500166-008
					Result	Result	Result	Result	Result
EG005(ED093)T: Total Metals by ICP-AES - Continued									
Vanadium	7440-62-2	5	mg/kg		----	----	----	30	----
Arsenic	7440-38-2	5	mg/kg		<5	<5	----	<5	<5
Cadmium	7440-43-9	1	mg/kg		<1	<1	----	<1	<1
Chromium	7440-47-3	2	mg/kg		12	16	----	18	18
Copper	7440-50-8	5	mg/kg		26	11	----	32	179
Lead	7439-92-1	5	mg/kg		8	<5	----	9	24
Nickel	7440-02-0	2	mg/kg		12	12	----	14	15
Zinc	7440-66-6	5	mg/kg		19	22	----	22	37
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	----	<0.1	<0.1
EG048: Hexavalent Chromium (Alkaline Digest)									
Hexavalent Chromium	18540-29-9	0.5	mg/kg		----	----	----	<0.5	----
EK028SF: Weak Acid Dissociable CN by Segmented Flow Analyser									
Weak Acid Dissociable Cyanide	----	1	mg/kg		----	----	----	<1	----
EP004: Organic Matter									
Organic Matter	----	0.5	%		----	----	<0.5	----	----
Total Organic Carbon	----	0.5	%		----	----	<0.5	----	----
EP066: Polychlorinated Biphenyls (PCB)									
Total Polychlorinated biphenyls	----	0.1	mg/kg		----	----	----	<0.1	----
EP068A: Organochlorine Pesticides (OC)									
alpha-BHC	319-84-6	0.05	mg/kg		<0.05	----	----	<0.05	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg		<0.05	----	----	<0.05	----
beta-BHC	319-85-7	0.05	mg/kg		<0.05	----	----	<0.05	----
gamma-BHC - (Lindane)	58-89-9	0.05	mg/kg		<0.05	----	----	<0.05	----
delta-BHC	319-86-8	0.05	mg/kg		<0.05	----	----	<0.05	----
Heptachlor	76-44-8	0.05	mg/kg		<0.05	----	----	<0.05	----
Aldrin	309-00-2	0.05	mg/kg		<0.05	----	----	<0.05	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	BH01_0.05-0.2	BH01_0.5-0.6	BH01_2.0-2.1	BH02_0.1-0.2	BH02_0.5-0.6
				Sampling date / time	08-Jan-2025 00:00	08-Jan-2025 00:00	08-Jan-2025 00:00	08-Jan-2025 00:00	08-Jan-2025 00:00
Compound	CAS Number	LOR	Unit		EM2500166-001	EM2500166-002	EM2500166-005	EM2500166-006	EM2500166-008
					Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued									
Heptachlor epoxide	1024-57-3	0.05	mg/kg		<0.05	----	----	<0.05	----
^ Total Chlordane (sum)	----	0.05	mg/kg		<0.05	----	----	----	----
trans-Chlordane	5103-74-2	0.05	mg/kg		<0.05	----	----	<0.05	----
alpha-Endosulfan	959-98-8	0.05	mg/kg		<0.05	----	----	<0.05	----
cis-Chlordane	5103-71-9	0.05	mg/kg		<0.05	----	----	<0.05	----
Dieldrin	60-57-1	0.05	mg/kg		<0.05	----	----	<0.05	----
4.4`-DDE	72-55-9	0.05	mg/kg		<0.05	----	----	<0.05	----
Endrin	72-20-8	0.05	mg/kg		<0.05	----	----	<0.05	----
beta-Endosulfan	33213-65-9	0.05	mg/kg		<0.05	----	----	<0.05	----
^ Endosulfan (sum)	115-29-7	0.05	mg/kg		<0.08	----	----	<0.05	----
4.4`-DDD	72-54-8	0.05	mg/kg		<0.05	----	----	<0.05	----
Endrin aldehyde	7421-93-4	0.05	mg/kg		<0.05	----	----	<0.05	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg		<0.05	----	----	<0.05	----
4.4`-DDT	50-29-3	0.2	mg/kg		<0.2	----	----	<0.2	----
Endrin ketone	53494-70-5	0.05	mg/kg		<0.05	----	----	<0.05	----
Methoxychlor	72-43-5	0.2	mg/kg		<0.2	----	----	<0.2	----
Mirex	2385-85-5	0.20	mg/kg		----	----	----	<0.20	----
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg		<0.05	----	----	<0.05	----
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.05	mg/kg		<0.05	----	----	<0.05	----
EP068B: Organophosphorus Pesticides (OP)									
Dichlorvos	62-73-7	0.05	mg/kg		<0.05	----	----	<0.05	----
Demeton-S-methyl	919-86-8	0.05	mg/kg		<0.05	----	----	<0.05	----
Monocrotophos	6923-22-4	0.2	mg/kg		<0.2	----	----	<0.2	----
Dimethoate	60-51-5	0.05	mg/kg		<0.05	----	----	<0.05	----
Diazinon	333-41-5	0.05	mg/kg		<0.05	----	----	<0.05	----
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg		<0.05	----	----	<0.05	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	BH01_0.05-0.2	BH01_0.5-0.6	BH01_2.0-2.1	BH02_0.1-0.2	BH02_0.5-0.6
				Sampling date / time	08-Jan-2025 00:00	08-Jan-2025 00:00	08-Jan-2025 00:00	08-Jan-2025 00:00	08-Jan-2025 00:00
Compound	CAS Number	LOR	Unit		EM2500166-001	EM2500166-002	EM2500166-005	EM2500166-006	EM2500166-008
					Result	Result	Result	Result	Result
EP068B: Organophosphorus Pesticides (OP) - Continued									
Parathion-methyl	298-00-0	0.2	mg/kg		<0.2	----	----	<0.2	----
Malathion	121-75-5	0.05	mg/kg		<0.05	----	----	<0.05	----
Fenthion	55-38-9	0.05	mg/kg		<0.05	----	----	<0.05	----
Chlorpyrifos	2921-88-2	0.05	mg/kg		<0.05	----	----	<0.05	----
Parathion	56-38-2	0.2	mg/kg		<0.2	----	----	<0.2	----
Pirimphos-ethyl	23505-41-1	0.05	mg/kg		<0.05	----	----	<0.05	----
Chlorfenvinphos	470-90-6	0.05	mg/kg		<0.05	----	----	<0.05	----
Bromophos-ethyl	4824-78-6	0.05	mg/kg		<0.05	----	----	<0.05	----
Fenamiphos	22224-92-6	0.05	mg/kg		<0.05	----	----	<0.05	----
Prothiofos	34643-46-4	0.05	mg/kg		<0.05	----	----	<0.05	----
Ethion	563-12-2	0.05	mg/kg		<0.05	----	----	<0.05	----
Carbophenothion	786-19-6	0.05	mg/kg		<0.05	----	----	<0.05	----
Azinphos Methyl	86-50-0	0.05	mg/kg		<0.05	----	----	<0.05	----
EP068C: Triazines									
Atrazine	1912-24-9	0.05	mg/kg		----	----	----	<0.05	----
EP068D: Pyrethroids									
Bifenthrin	82657-04-3	0.05	mg/kg		----	----	----	<0.05	----
EP075(SIM)A: Phenolic Compounds									
Phenol	108-95-2	0.5	mg/kg		----	----	----	<0.5	----
2-Chlorophenol	95-57-8	0.5	mg/kg		----	----	----	<0.5	----
2-Methylphenol	95-48-7	0.5	mg/kg		----	----	----	<0.5	----
3- & 4-Methylphenol	1319-77-3	1	mg/kg		----	----	----	<1	----
2-Nitrophenol	88-75-5	0.5	mg/kg		----	----	----	<0.5	----
2.4-Dimethylphenol	105-67-9	0.5	mg/kg		----	----	----	<0.5	----
2.4-Dichlorophenol	120-83-2	0.5	mg/kg		----	----	----	<0.5	----
2.6-Dichlorophenol	87-65-0	0.5	mg/kg		----	----	----	<0.5	----
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg		----	----	----	<0.5	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	BH01_0.05-0.2	BH01_0.5-0.6	BH01_2.0-2.1	BH02_0.1-0.2	BH02_0.5-0.6
				Sampling date / time	08-Jan-2025 00:00	08-Jan-2025 00:00	08-Jan-2025 00:00	08-Jan-2025 00:00	08-Jan-2025 00:00
Compound	CAS Number	LOR	Unit		EM2500166-001	EM2500166-002	EM2500166-005	EM2500166-006	EM2500166-008
					Result	Result	Result	Result	Result
EP075(SIM)A: Phenolic Compounds - Continued									
2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg		----	----	----	<0.5	----
2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg		----	----	----	<0.5	----
Pentachlorophenol	87-86-5	2	mg/kg		----	----	----	<2	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		<0.5	----	----	<0.5	----
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	----	----	<0.5	----
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	----	----	<0.5	----
Fluorene	86-73-7	0.5	mg/kg		<0.5	----	----	<0.5	----
Phenanthrene	85-01-8	0.5	mg/kg		<0.5	----	----	<0.5	----
Anthracene	120-12-7	0.5	mg/kg		<0.5	----	----	<0.5	----
Fluoranthene	206-44-0	0.5	mg/kg		<0.5	----	----	<0.5	----
Pyrene	129-00-0	0.5	mg/kg		<0.5	----	----	<0.5	----
Benz(a)anthracene	56-55-3	0.5	mg/kg		<0.5	----	----	<0.5	----
Chrysene	218-01-9	0.5	mg/kg		<0.5	----	----	<0.5	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		<0.5	----	----	<0.5	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		<0.5	----	----	<0.5	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg		<0.5	----	----	<0.5	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		<0.5	----	----	<0.5	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	----	----	<0.5	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		<0.5	----	----	<0.5	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		<0.5	----	----	<0.5	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		<0.5	----	----	<0.5	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		**0.6**	----	----	**0.6**	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		**1.2**	----	----	**1.2**	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	----	----	<10	----
C10 - C14 Fraction	----	50	mg/kg		<50	----	----	<50	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	BH01_0.05-0.2	BH01_0.5-0.6	BH01_2.0-2.1	BH02_0.1-0.2	BH02_0.5-0.6
				Sampling date / time	08-Jan-2025 00:00	08-Jan-2025 00:00	08-Jan-2025 00:00	08-Jan-2025 00:00	08-Jan-2025 00:00
Compound	CAS Number	LOR	Unit		EM2500166-001	EM2500166-002	EM2500166-005	EM2500166-006	EM2500166-008
					Result	Result	Result	Result	Result
EP080/071: Total Petroleum Hydrocarbons - Continued									
C15 - C28 Fraction	----	100	mg/kg		<100	----	----	<100	----
C29 - C36 Fraction	----	100	mg/kg		**140**	----	----	<100	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg		**140**	----	----	<50	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	----	----	<10	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		<10	----	----	<10	----
>C10 - C16 Fraction	----	50	mg/kg		<50	----	----	<50	----
>C16 - C34 Fraction	----	100	mg/kg		**170**	----	----	<100	----
>C34 - C40 Fraction	----	100	mg/kg		**120**	----	----	<100	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		**290**	----	----	<50	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		<50	----	----	<50	----
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	----	----	<0.2	----
Toluene	108-88-3	0.5	mg/kg		<0.5	----	----	<0.5	----
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	----	----	<0.5	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	----	----	<0.5	----
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	----	----	<0.5	----
^ Sum of BTEX	----	0.2	mg/kg		<0.2	----	----	<0.2	----
^ Total Xylenes	----	0.5	mg/kg		<0.5	----	----	<0.5	----
Naphthalene	91-20-3	1	mg/kg		<1	----	----	<1	----
EP066S: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	0.1	%		----	----	----	**101**	----
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		**106**	----	----	**105**	----
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		**66.4**	----	----	**61.3**	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	BH01_0.05-0.2	BH01_0.5-0.6	BH01_2.0-2.1	BH02_0.1-0.2	BH02_0.5-0.6
				Sampling date / time	08-Jan-2025 00:00	08-Jan-2025 00:00	08-Jan-2025 00:00	08-Jan-2025 00:00	08-Jan-2025 00:00
Compound	CAS Number	LOR	Unit		EM2500166-001	EM2500166-002	EM2500166-005	EM2500166-006	EM2500166-008
					Result	Result	Result	Result	Result
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		**93.4**	----	----	**95.3**	----
2-Chlorophenol-D4	93951-73-6	0.5	%		**99.2**	----	----	**101**	----
2.4.6-Tribromophenol	118-79-6	0.5	%		**87.2**	----	----	**82.9**	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		**91.0**	----	----	**93.8**	----
Anthracene-d10	1719-06-8	0.5	%		**97.4**	----	----	**100**	----
4-Terphenyl-d14	1718-51-0	0.5	%		**94.0**	----	----	**100**	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		**82.3**	----	----	**80.6**	----
Toluene-D8	2037-26-5	0.2	%		**82.8**	----	----	**80.0**	----
4-Bromofluorobenzene	460-00-4	0.2	%		**86.6**	----	----	**82.8**	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	BH03_0-0.2	BH03_0.3-0.4	BH04_0.1-0.2	BH04_0.3-0.4	BH05_0-0.1
			Sampling date / time	08-Jan-2025 00:00	08-Jan-2025 00:00	08-Jan-2025 00:00	08-Jan-2025 00:00	08-Jan-2025 00:00
Compound	CAS Number	LOR	Unit	EM2500166-010	EM2500166-011	EM2500166-014	EM2500166-015	EM2500166-018
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	**5.0**	**6.0**	**4.8**	**5.6**	**3.6**
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	<5	<5	**6**	<5
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	**14**	**11**	**13**	**11**	**5**
Copper	7440-50-8	5	mg/kg	**18**	**18**	**24**	**16**	**8**
Lead	7439-92-1	5	mg/kg	**7**	**6**	**34**	**12**	**7**
Nickel	7440-02-0	2	mg/kg	**13**	**16**	**12**	**13**	**3**
Zinc	7440-66-6	5	mg/kg	**19**	**18**	**254**	**82**	**20**
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
beta-BHC	319-85-7	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
gamma-BHC - (Lindane)	58-89-9	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
delta-BHC	319-86-8	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
Heptachlor	76-44-8	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
Aldrin	309-00-2	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
^ Total Chlordane (sum)	----	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
Dieldrin	60-57-1	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
Endrin	72-20-8	0.05	mg/kg	<0.05	----	<0.05	----	<0.05

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	BH03_0-0.2	BH03_0.3-0.4	BH04_0.1-0.2	BH04_0.3-0.4	BH05_0-0.1
				Sampling date / time	08-Jan-2025 00:00	08-Jan-2025 00:00	08-Jan-2025 00:00	08-Jan-2025 00:00	08-Jan-2025 00:00
Compound	CAS Number	LOR	Unit		EM2500166-010	EM2500166-011	EM2500166-014	EM2500166-015	EM2500166-018
					Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued									
beta-Endosulfan	33213-65-9	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
^ Endosulfan (sum)	115-29-7	0.05	mg/kg		<0.05	----	<0.09	----	<0.05
4.4`-DDD	72-54-8	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
4.4`-DDT	50-29-3	0.2	mg/kg		<0.2	----	<0.2	----	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
Methoxychlor	72-43-5	0.2	mg/kg		<0.2	----	<0.2	----	<0.2
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
EP068B: Organophosphorus Pesticides (OP)									
Dichlorvos	62-73-7	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
Demeton-S-methyl	919-86-8	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
Monocrotophos	6923-22-4	0.2	mg/kg		<0.2	----	<0.2	----	<0.2
Dimethoate	60-51-5	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
Diazinon	333-41-5	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
Parathion-methyl	298-00-0	0.2	mg/kg		<0.2	----	<0.2	----	<0.2
Malathion	121-75-5	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
Fenthion	55-38-9	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
Chlorpyrifos	2921-88-2	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
Parathion	56-38-2	0.2	mg/kg		<0.2	----	<0.2	----	<0.2
Pirimphos-ethyl	23505-41-1	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
Chlorfenvinphos	470-90-6	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
Bromophos-ethyl	4824-78-6	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
Fenamiphos	22224-92-6	0.05	mg/kg		<0.05	----	<0.05	----	<0.05

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	BH03_0-0.2	BH03_0.3-0.4	BH04_0.1-0.2	BH04_0.3-0.4	BH05_0-0.1
				Sampling date / time	08-Jan-2025 00:00	08-Jan-2025 00:00	08-Jan-2025 00:00	08-Jan-2025 00:00	08-Jan-2025 00:00
Compound	CAS Number	LOR	Unit		EM2500166-010	EM2500166-011	EM2500166-014	EM2500166-015	EM2500166-018
					Result	Result	Result	Result	Result
EP068B: Organophosphorus Pesticides (OP) - Continued									
Prothiofos	34643-46-4	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
Ethion	563-12-2	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
Carbophenothion	786-19-6	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
Azinphos Methyl	86-50-0	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		<0.5	----	<0.5	----	----
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	----	<0.5	----	----
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	----	<0.5	----	----
Fluorene	86-73-7	0.5	mg/kg		<0.5	----	<0.5	----	----
Phenanthrene	85-01-8	0.5	mg/kg		<0.5	----	<0.5	----	----
Anthracene	120-12-7	0.5	mg/kg		<0.5	----	<0.5	----	----
Fluoranthene	206-44-0	0.5	mg/kg		<0.5	----	<0.5	----	----
Pyrene	129-00-0	0.5	mg/kg		<0.5	----	<0.5	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg		<0.5	----	<0.5	----	----
Chrysene	218-01-9	0.5	mg/kg		<0.5	----	<0.5	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		<0.5	----	<0.5	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		<0.5	----	<0.5	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg		<0.5	----	<0.5	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		<0.5	----	<0.5	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	----	<0.5	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		<0.5	----	<0.5	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		<0.5	----	<0.5	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		<0.5	----	<0.5	----	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		**0.6**	----	**0.6**	----	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		**1.2**	----	**1.2**	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	----	<10	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	BH03_0-0.2	BH03_0.3-0.4	BH04_0.1-0.2	BH04_0.3-0.4	BH05_0-0.1
				Sampling date / time	08-Jan-2025 00:00	08-Jan-2025 00:00	08-Jan-2025 00:00	08-Jan-2025 00:00	08-Jan-2025 00:00
Compound	CAS Number	LOR	Unit		EM2500166-010	EM2500166-011	EM2500166-014	EM2500166-015	EM2500166-018
					Result	Result	Result	Result	Result
EP080/071: Total Petroleum Hydrocarbons - Continued									
C10 - C14 Fraction	----	50	mg/kg		<50	----	<50	----	----
C15 - C28 Fraction	----	100	mg/kg		<100	----	<100	----	----
C29 - C36 Fraction	----	100	mg/kg		<100	----	<100	----	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg		<50	----	<50	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	----	<10	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		<10	----	<10	----	----
>C10 - C16 Fraction	----	50	mg/kg		<50	----	<50	----	----
>C16 - C34 Fraction	----	100	mg/kg		<100	----	<100	----	----
>C34 - C40 Fraction	----	100	mg/kg		<100	----	<100	----	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		<50	----	<50	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		<50	----	<50	----	----
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	----	<0.2	----	----
Toluene	108-88-3	0.5	mg/kg		<0.5	----	<0.5	----	----
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	----	<0.5	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	----	<0.5	----	----
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	----	<0.5	----	----
^ Sum of BTEX	----	0.2	mg/kg		<0.2	----	<0.2	----	----
^ Total Xylenes	----	0.5	mg/kg		<0.5	----	<0.5	----	----
Naphthalene	91-20-3	1	mg/kg		<1	----	<1	----	----
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		**109**	----	**106**	----	**104**
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		**63.0**	----	**65.3**	----	**60.8**
EP075(SIM)S: Phenolic Compound Surrogates									

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	BH03_0-0.2	BH03_0.3-0.4	BH04_0.1-0.2	BH04_0.3-0.4	BH05_0-0.1
				Sampling date / time	08-Jan-2025 00:00	08-Jan-2025 00:00	08-Jan-2025 00:00	08-Jan-2025 00:00	08-Jan-2025 00:00
Compound	CAS Number	LOR	Unit		EM2500166-010	EM2500166-011	EM2500166-014	EM2500166-015	EM2500166-018
					Result	Result	Result	Result	Result
EP075(SIM)S: Phenolic Compound Surrogates - Continued									
Phenol-d6	13127-88-3	0.5	%		89.8	----	90.2	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%		95.5	----	97.0	----	----
2.4.6-Tribromophenol	118-79-6	0.5	%		82.8	----	88.5	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		88.0	----	90.5	----	----
Anthracene-d10	1719-06-8	0.5	%		93.4	----	96.5	----	----
4-Terphenyl-d14	1718-51-0	0.5	%		89.9	----	90.8	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		75.5	----	80.6	----	----
Toluene-D8	2037-26-5	0.2	%		73.9	----	81.5	----	----
4-Bromofluorobenzene	460-00-4	0.2	%		75.9	----	86.2	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	BH06_0-0.2	QC2	----	----	----
			Sampling date / time	08-Jan-2025 00:00	08-Jan-2025 00:00	----	----	----
Compound	CAS Number	LOR	Unit	EM2500166-022	EM2500166-026	--------	--------	--------
				Result	Result	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	**1.7**	**4.6**	----	----	----
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	<5	----	----	----
Cadmium	7440-43-9	1	mg/kg	<1	<1	----	----	----
Chromium	7440-47-3	2	mg/kg	**6**	**16**	----	----	----
Copper	7440-50-8	5	mg/kg	**15**	**18**	----	----	----
Lead	7439-92-1	5	mg/kg	**21**	**6**	----	----	----
Nickel	7440-02-0	2	mg/kg	**4**	**14**	----	----	----
Zinc	7440-66-6	5	mg/kg	**51**	**18**	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	----	----	----
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	----	<0.05	----	----	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	----	<0.05	----	----	----
beta-BHC	319-85-7	0.05	mg/kg	----	<0.05	----	----	----
gamma-BHC - (Lindane)	58-89-9	0.05	mg/kg	----	<0.05	----	----	----
delta-BHC	319-86-8	0.05	mg/kg	----	<0.05	----	----	----
Heptachlor	76-44-8	0.05	mg/kg	----	<0.05	----	----	----
Aldrin	309-00-2	0.05	mg/kg	----	<0.05	----	----	----
Heptachlor epoxide	1024-57-3	0.05	mg/kg	----	<0.05	----	----	----
^ Total Chlordane (sum)	----	0.05	mg/kg	----	<0.05	----	----	----
trans-Chlordane	5103-74-2	0.05	mg/kg	----	<0.05	----	----	----
alpha-Endosulfan	959-98-8	0.05	mg/kg	----	<0.05	----	----	----
cis-Chlordane	5103-71-9	0.05	mg/kg	----	<0.05	----	----	----
Dieldrin	60-57-1	0.05	mg/kg	----	<0.05	----	----	----
4.4`-DDE	72-55-9	0.05	mg/kg	----	<0.05	----	----	----
Endrin	72-20-8	0.05	mg/kg	----	<0.05	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	BH06_0-0.2	QC2	----	----	----
				Sampling date / time	08-Jan-2025 00:00	08-Jan-2025 00:00	----	----	----
Compound	CAS Number	LOR	Unit		EM2500166-022	EM2500166-026	--------	--------	--------
					Result	Result	----	----	----
EP068A: Organochlorine Pesticides (OC) - Continued									
beta-Endosulfan	33213-65-9	0.05	mg/kg		----	<0.05	----	----	----
^ **Endosulfan (sum)**	115-29-7	0.05	mg/kg		----	<0.05	----	----	----
4.4`-DDD	72-54-8	0.05	mg/kg		----	<0.05	----	----	----
Endrin aldehyde	7421-93-4	0.05	mg/kg		----	<0.05	----	----	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg		----	<0.05	----	----	----
4.4`-DDT	50-29-3	0.2	mg/kg		----	<0.2	----	----	----
Endrin ketone	53494-70-5	0.05	mg/kg		----	<0.05	----	----	----
Methoxychlor	72-43-5	0.2	mg/kg		----	<0.2	----	----	----
^ **Sum of Aldrin + Dieldrin**	309-00-2/60-57-1	0.05	mg/kg		----	<0.05	----	----	----
^ **Sum of DDD + DDE + DDT**	72-54-8/72-55-9/50-2	0.05	mg/kg		----	<0.05	----	----	----
EP068B: Organophosphorus Pesticides (OP)									
Dichlorvos	62-73-7	0.05	mg/kg		----	<0.05	----	----	----
Demeton-S-methyl	919-86-8	0.05	mg/kg		----	<0.05	----	----	----
Monocrotophos	6923-22-4	0.2	mg/kg		----	<0.2	----	----	----
Dimethoate	60-51-5	0.05	mg/kg		----	<0.05	----	----	----
Diazinon	333-41-5	0.05	mg/kg		----	<0.05	----	----	----
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg		----	<0.05	----	----	----
Parathion-methyl	298-00-0	0.2	mg/kg		----	<0.2	----	----	----
Malathion	121-75-5	0.05	mg/kg		----	<0.05	----	----	----
Fenthion	55-38-9	0.05	mg/kg		----	<0.05	----	----	----
Chlorpyrifos	2921-88-2	0.05	mg/kg		----	<0.05	----	----	----
Parathion	56-38-2	0.2	mg/kg		----	<0.2	----	----	----
Pirimphos-ethyl	23505-41-1	0.05	mg/kg		----	<0.05	----	----	----
Chlorfenvinphos	470-90-6	0.05	mg/kg		----	<0.05	----	----	----
Bromophos-ethyl	4824-78-6	0.05	mg/kg		----	<0.05	----	----	----
Fenamiphos	22224-92-6	0.05	mg/kg		----	<0.05	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	BH06_0-0.2	QC2	----	----	----
				Sampling date / time	08-Jan-2025 00:00	08-Jan-2025 00:00	----	----	----
Compound	CAS Number	LOR	Unit		EM2500166-022	EM2500166-026	--------	--------	--------
					Result	Result	----	----	----
EP068B: Organophosphorus Pesticides (OP) - Continued									
Prothiofos	34643-46-4	0.05	mg/kg		----	<0.05	----	----	----
Ethion	563-12-2	0.05	mg/kg		----	<0.05	----	----	----
Carbophenothion	786-19-6	0.05	mg/kg		----	<0.05	----	----	----
Azinphos Methyl	86-50-0	0.05	mg/kg		----	<0.05	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		----	<0.5	----	----	----
Acenaphthylene	208-96-8	0.5	mg/kg		----	<0.5	----	----	----
Acenaphthene	83-32-9	0.5	mg/kg		----	<0.5	----	----	----
Fluorene	86-73-7	0.5	mg/kg		----	<0.5	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg		----	<0.5	----	----	----
Anthracene	120-12-7	0.5	mg/kg		----	<0.5	----	----	----
Fluoranthene	206-44-0	0.5	mg/kg		----	<0.5	----	----	----
Pyrene	129-00-0	0.5	mg/kg		----	<0.5	----	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg		----	<0.5	----	----	----
Chrysene	218-01-9	0.5	mg/kg		----	<0.5	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		----	<0.5	----	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		----	<0.5	----	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg		----	<0.5	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		----	<0.5	----	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		----	<0.5	----	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		----	<0.5	----	----	----
^ **Sum of polycyclic aromatic hydrocarbons**	----	0.5	mg/kg		----	<0.5	----	----	----
^ **Benzo(a)pyrene TEQ (zero)**	----	0.5	mg/kg		----	<0.5	----	----	----
^ **Benzo(a)pyrene TEQ (half LOR)**	----	0.5	mg/kg		----	**0.6**	----	----	----
^ **Benzo(a)pyrene TEQ (LOR)**	----	0.5	mg/kg		----	**1.2**	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		----	<10	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	BH06_0-0.2	QC2	----	----	----
				Sampling date / time	08-Jan-2025 00:00	08-Jan-2025 00:00	----	----	----
Compound	CAS Number	LOR	Unit		EM2500166-022	EM2500166-026	--------	--------	--------
					Result	Result	----	----	----
EP080/071: Total Petroleum Hydrocarbons - Continued									
C10 - C14 Fraction	----	50	mg/kg		----	<50	----	----	----
C15 - C28 Fraction	----	100	mg/kg		----	<100	----	----	----
C29 - C36 Fraction	----	100	mg/kg		----	<100	----	----	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg		----	<50	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		----	<10	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		----	<10	----	----	----
>C10 - C16 Fraction	----	50	mg/kg		----	<50	----	----	----
>C16 - C34 Fraction	----	100	mg/kg		----	<100	----	----	----
>C34 - C40 Fraction	----	100	mg/kg		----	<100	----	----	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		----	<50	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		----	<50	----	----	----
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		----	<0.2	----	----	----
Toluene	108-88-3	0.5	mg/kg		----	<0.5	----	----	----
Ethylbenzene	100-41-4	0.5	mg/kg		----	<0.5	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		----	<0.5	----	----	----
ortho-Xylene	95-47-6	0.5	mg/kg		----	<0.5	----	----	----
^ Sum of BTEX	----	0.2	mg/kg		----	<0.2	----	----	----
^ Total Xylenes	----	0.5	mg/kg		----	<0.5	----	----	----
Naphthalene	91-20-3	1	mg/kg		----	<1	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		**0.0010**	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	BH06_0-0.2	QC2	----	----	----
				Sampling date / time	08-Jan-2025 00:00	08-Jan-2025 00:00	----	----	----
Compound	CAS Number	LOR	Unit		EM2500166-022	EM2500166-026	--------	--------	--------
					Result	Result	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids - Continued									
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		**0.0003**	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		**0.0003**	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	----	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	----	----	----	----
EP231P: PFAS Sums									
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.0010**	----	----	----	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		**0.0016**	----	----	----	----
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		----	**107**	----	----	----
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		----	**64.4**	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		----	**89.1**	----	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%		----	**94.8**	----	----	----
2.4.6-Tribromophenol	118-79-6	0.5	%		----	**80.8**	----	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		----	**87.0**	----	----	----
Anthracene-d10	1719-06-8	0.5	%		----	**92.5**	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	BH06_0-0.2	QC2	----	----	----
				Sampling date / time	08-Jan-2025 00:00	08-Jan-2025 00:00	----	----	----
Compound	CAS Number	LOR	Unit		EM2500166-022	EM2500166-026	--------	--------	--------
					Result	Result	----	----	----
EP075(SIM)T: PAH Surrogates - Continued									
4-Terphenyl-d14	1718-51-0	0.5	%		**----**	**92.0**	**----**	**----**	**----**
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		**----**	**86.5**	**----**	**----**	**----**
Toluene-D8	2037-26-5	0.2	%		**----**	**84.6**	**----**	**----**	**----**
4-Bromofluorobenzene	460-00-4	0.2	%		**----**	**87.6**	**----**	**----**	**----**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**98.0**	**----**	**----**	**----**	**----**
13C8-PFOA	----	0.0002	%		**101**	**----**	**----**	**----**	**----**

Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP066S: PCB Surrogate			
Decachlorobiphenyl	2051-24-3	36	140
EP068S: Organochlorine Pesticide Surrogate			
Dibromo-DDE	21655-73-2	62	128
EP068T: Organophosphorus Pesticide Surrogate			
DEF	78-48-8	40	139
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	54	125
2-Chlorophenol-D4	93951-73-6	65	123
2.4.6-Tribromophenol	118-79-6	34	122
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	61	125
Anthracene-d10	1719-06-8	62	130
4-Terphenyl-d14	1718-51-0	67	133
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	51	125
Toluene-D8	2037-26-5	55	125
4-Bromofluorobenzene	460-00-4	56	124
EP231S: PFAS Surrogate			
13C4-PFOS	----	68	136
13C8-PFOA	----	69	133

QUALITY CONTROL REPORT

Work Order	: **EM2500166**	Page	: 1 of 15
Client	: **TONKIN CONSULTING**	Laboratory	: Environmental Division Melbourne
Contact	: Dean Noske	Contact	: Customer Services EM
Address	: LEVEL 2, 170 FROME STREET ADELAIDE SA, AUSTRALIA 5000	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: ----	Telephone	: +61-3-8549 9600
Project	: 241697.0000	Date Samples Received	: 09-Jan-2025
Order number	:	Date Analysis Commenced	: 15-Jan-2025
C-O-C number	: 241697	Issue Date	: 20-Jan-2025
Sampler	: LA		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 27		
No. of samples analysed	: 12		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, 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*
Eric Chau	Metals Team Leader	Melbourne Inorganics, Springvale, VIC
Nancy Wang	2IC Organic Chemist	Melbourne Inorganics, Springvale, VIC
Nancy Wang	2IC Organic Chemist	Melbourne Organics, Springvale, VIC
Nikki Stepniewski	Senior Inorganic Instrument Chemist	Melbourne Inorganics, Springvale, VIC

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**

				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: 6311184)									
EM2500166-001	BH01_0.05-0.2	EG005T: Beryllium	7440-41-7	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Barium	7440-39-3	10	mg/kg	90	90	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	12	12	0.0	No Limit
		EG005T: Cobalt	7440-48-4	2	mg/kg	6	6	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	12	13	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	26	33	22.3	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	8	8	0.0	No Limit
		EG005T: Manganese	7439-96-5	5	mg/kg	148	130	12.8	0% - 20%
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Vanadium	7440-62-2	5	mg/kg	27	28	4.4	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	19	22	16.0	No Limit
		EG005T: Boron	7440-42-8	50	mg/kg	<50	<50	0.0	No Limit
		EG005T: Iron	7439-89-6	50	mg/kg	10800	10900	0.7	0% - 20%
EM2500166-022	BH06_0-0.2	EG005T: Beryllium	7440-41-7	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Barium	7440-39-3	10	mg/kg	30	30	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	6	6	0.0	No Limit
		EG005T: Cobalt	7440-48-4	2	mg/kg	<2	<2	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	4	4	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 (%)*
EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 6311184) - continued									
EM2500166-022	BH06_0-0.2	EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	15	15	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	21	22	0.0	No Limit
		EG005T: Manganese	7439-96-5	5	mg/kg	59	58	0.0	0% - 50%
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Vanadium	7440-62-2	5	mg/kg	10	9	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	51	50	2.0	0% - 50%
		EG005T: Boron	7440-42-8	50	mg/kg	<50	<50	0.0	No Limit
		EG005T: Iron	7439-89-6	50	mg/kg	4540	4380	3.7	0% - 20%
EA001: pH in soil using 0.01M CaCl extract (QC Lot: 6309842)									
EM2500166-005	BH01_2.0-2.1	EA001: pH (CaCl2)	----	0.1	pH Unit	7.7	7.7	0.0	0% - 20%
EM2500278-005	Anonymous	EA001: pH (CaCl2)	----	0.1	pH Unit	7.3	7.3	0.0	0% - 20%
EA002-AD: pH (Soils) dried at 40°C (QC Lot: 6313978)									
EM2500166-005	BH01_2.0-2.1	EA002-AD: pH Value	----	0.1	pH Unit	8.8	8.8	0.0	0% - 20%
EA010-AD: Conductivity (Soils) dried at 40°C (QC Lot: 6313977)									
EM2500166-005	BH01_2.0-2.1	EA010-AD: Electrical Conductivity @ 25°C	----	1	µS/cm	553	552	0.0	0% - 20%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 6311282)									
EM2500166-001	BH01_0.05-0.2	EA055: Moisture Content	----	0.1 (1.0)*	%	5.9	6.0	3.1	No Limit
EM2500166-022	BH06_0-0.2	EA055: Moisture Content	----	0.1 (1.0)*	%	1.7	2.3	29.5	No Limit
ED006: Exchangeable Cations on Alkaline Soils (QC Lot: 6313981)									
EM2500166-005	BH01_2.0-2.1	ED006: Calcium/Magnesium Ratio	----	0.1 (0.2)*	-	0.7	0.7	0.0	No Limit
		ED006: Magnesium/Potassium Ratio	----	0.1 (0.2)*	-	5.3	5.3	0.0	0% - 20%
		ED006: Exchangeable Calcium Percent	----	0.2	%	31.1	31.1	0.0	0% - 20%
		ED006: Exchangeable Magnesium Percent	----	0.2	%	42.3	42.4	0.0	0% - 20%
		ED006: Exchangeable Potassium Percent	----	0.2	%	8.0	8.0	0.0	0% - 20%
		ED006: Exchangeable Sodium Percent	----	0.2	%	18.5	18.5	0.0	0% - 20%
		ED006: Exchangeable Calcium	----	0.2	meq/100g	5.2	5.4	3.3	0% - 20%
		ED006: Exchangeable Magnesium	----	0.2	meq/100g	7.1	7.4	3.5	0% - 20%
		ED006: Exchangeable Potassium	----	0.2	meq/100g	1.4	1.4	0.0	No Limit
		ED006: Exchangeable Sodium	----	0.2	meq/100g	3.1	3.2	3.5	0% - 50%
		ED006: Cation Exchange Capacity	----	0.2	meq/100g	16.9	17.5	3.4	0% - 20%
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 6311185)									
EM2500166-001	BH01_0.05-0.2	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EM2500166-022	BH06_0-0.2	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EG048: Hexavalent Chromium (Alkaline Digest) (QC Lot: 6311124)									
EM2500166-006	BH02_0.1-0.2	EG048G: Hexavalent Chromium	18540-29-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EM2500275-007	Anonymous	EG048G: Hexavalent Chromium	18540-29-9	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 (%)*
EK028SF: Weak Acid Dissociable CN by Segmented Flow Analyser (QC Lot: 6312645)									
EM2500166-006	BH02_0.1-0.2	EK028SF: Weak Acid Dissociable Cyanide	----	1	mg/kg	<1	<1	0.0	No Limit
EP004: Organic Matter (QC Lot: 6311128)									
EM2500166-005	BH01_2.0-2.1	EP004: Organic Matter	----	0.5	%	<0.5	<0.5	0.0	No Limit
		EP004: Total Organic Carbon	----	0.5	%	<0.5	<0.5	0.0	No Limit
EP066: Polychlorinated Biphenyls (PCB) (QC Lot: 6311107)									
EM2500166-006	BH02_0.1-0.2	EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EP068A: Organochlorine Pesticides (OC) (QC Lot: 6311106)									
EM2500166-006	BH02_0.1-0.2	EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: gamma-BHC - (Lindane)	58-89-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Mirex	2385-85-5	0.05 (0.20)*	mg/kg	<0.20	<0.20	0.0	No Limit
		EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
EP068B: Organophosphorus Pesticides (OP) (QC Lot: 6311106)									
EM2500166-006	BH02_0.1-0.2	EP068: Dichlorvos	62-73-7	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Dimethoate	60-51-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Diazinon	333-41-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Malathion	121-75-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Fenthion	55-38-9	0.05	mg/kg	<0.05	<0.05	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 (%)
EP068B: Organophosphorus Pesticides (OP) (QC Lot: 6311106) - continued									
EM2500166-006	BH02_0.1-0.2	EP068: Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Prothiofos	34643-46-4	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Ethion	563-12-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Carbophenothion	786-19-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP068: Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
EP068C: Triazines (QC Lot: 6311106)									
EM2500166-006	BH02_0.1-0.2	EP068: Atrazine	1912-24-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
EP068D: Pyrethroids (QC Lot: 6311106)									
EM2500166-006	BH02_0.1-0.2	EP068: Bifenthrin	82657-04-3	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
EP075(SIM)A: Phenolic Compounds (QC Lot: 6311104)									
EM2500166-006	BH02_0.1-0.2	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.0	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.0	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 6311104)									
EM2500166-006	BH02_0.1-0.2	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

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: 6311104) - continued									
EM2500166-006	BH02_0.1-0.2	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	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		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
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 6309739)									
EM2500166-001	BH01_0.05-0.2	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EM2500172-073	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 6311105)									
EM2500166-006	BH02_0.1-0.2	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 Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 6309739)									
EM2500166-001	BH01_0.05-0.2	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
EM2500172-073	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 6311105)									
EM2500166-006	BH02_0.1-0.2	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: BTEXN (QC Lot: 6309739)									
EM2500166-001	BH01_0.05-0.2	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	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit
EM2500172-073	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	108-38-3 106-42-3	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 (%)*
EP080: BTEXN (QC Lot: 6309739) - continued									
EM2500172-073	Anonymous	EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 6311772)									
EM2500332-002	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EM2500423-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002 (0.0010)*	mg/kg	<0.0010	<0.0010	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002 (0.0020)*	mg/kg	0.0022	0.0024	7.2	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 6311772)									
EM2500332-002	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EM2500423-001	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	0.0002	0.0003	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002 (0.0010)*	mg/kg	<0.0010	<0.0010	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 6311772)									
EM2500332-002	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EM2500423-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	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 (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 6311772) - continued									
EM2500423-001	Anonymous	EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 6311772)									
EM2500332-002	Anonymous	EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EM2500423-001	Anonymous	EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0022	0.0024	8.7	0% - 50%
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0024	0.0027	11.8	0% - 50%

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**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 6311184)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	123 mg/kg	106	70.0	130
EG005T: Barium	7440-39-3	10	mg/kg	<10	99.3 mg/kg	106	70.0	130
EG005T: Beryllium	7440-41-7	1	mg/kg	<1	0.67 mg/kg	89.7	70.0	130
EG005T: Boron	7440-42-8	50	mg/kg	<50	----	----	----	----
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	1.23 mg/kg	77.4	50.0	130
EG005T: Chromium	7440-47-3	2	mg/kg	<2	20.2 mg/kg	114	70.0	130
EG005T: Cobalt	7440-48-4	2	mg/kg	<2	11.2 mg/kg	103	70.0	130
EG005T: Copper	7440-50-8	5	mg/kg	<5	55.9 mg/kg	106	70.0	130
EG005T: Iron	7439-89-6	50	mg/kg	<50	33227 mg/kg	120	70.0	130
EG005T: Lead	7439-92-1	5	mg/kg	<5	62.4 mg/kg	104	70.0	130
EG005T: Manganese	7439-96-5	5	mg/kg	<5	590 mg/kg	102	70.0	130
EG005T: Nickel	7440-02-0	2	mg/kg	<2	15.4 mg/kg	103	70.0	130
EG005T: Selenium	7782-49-2	5	mg/kg	<5	----	----	----	----
EG005T: Vanadium	7440-62-2	5	mg/kg	<5	61.3 mg/kg	108	70.0	130
EG005T: Zinc	7440-66-6	5	mg/kg	<5	162 mg/kg	81.5	70.0	130
EA001: pH in soil using 0.01M CaCl extract (QCLot: 6309842)								
EA001: pH (CaCl2)	----	----	pH Unit	----	4 pH Unit	100	98.8	101
				----	7 pH Unit	100	99.3	101
EA002-AD: pH (Soils) dried at 40°C (QCLot: 6313978)								
EA002-AD: pH Value	----	----	pH Unit	----	4 pH Unit	100	98.8	101
				----	7 pH Unit	100	99.3	101
EA010-AD: Conductivity (Soils) dried at 40°C (QCLot: 6313977)								
EA010-AD: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	1413 µS/cm	101	90.0	110
ED006: Exchangeable Cations on Alkaline Soils (QCLot: 6313981)								
ED006: Exchangeable Calcium	----	0.2	meq/100g	<0.2	33 meq/100g	82.2	66.6	101
ED006: Exchangeable Magnesium	----	0.2	meq/100g	<0.2	32 meq/100g	95.9	66.9	120
ED006: Exchangeable Potassium	----	0.2	meq/100g	<0.2	2.2 meq/100g	101	72.8	119
ED006: Exchangeable Sodium	----	0.2	meq/100g	<0.2	5.6 meq/100g	75.1	67.5	112
ED006: Cation Exchange Capacity	----	0.2	meq/100g	<0.2	----	----	----	----
ED006: Exchangeable Calcium Percent	----	0.2	%	<0.2	----	----	----	----

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED006: Exchangeable Cations on Alkaline Soils (QCLot: 6313981) - continued								
ED006: Exchangeable Magnesium Percent	----	0.2	%	<0.2	----	----	----	----
ED006: Exchangeable Potassium Percent	----	0.2	%	<0.2	----	----	----	----
ED006: Exchangeable Sodium Percent	----	0.2	%	<0.2	----	----	----	----
ED006: Calcium/Magnesium Ratio	----	0.1	-	<0.1	----	----	----	----
ED006: Magnesium/Potassium Ratio	----	0.1	-	<0.1	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS (QCLot: 6311185)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	0.64 mg/kg	111	69.0	128
EG048: Hexavalent Chromium (Alkaline Digest) (QCLot: 6311124)								
EG048G: Hexavalent Chromium	18540-29-9	0.5	mg/kg	<0.5	20 mg/kg	86.4	70.0	130
EK028SF: Weak Acid Dissociable CN by Segmented Flow Analyser (QCLot: 6312645)								
EK028SF: Weak Acid Dissociable Cyanide	----	1	mg/kg	<1	20 mg/kg	95.6	70.0	130
EP004: Organic Matter (QCLot: 6311128)								
EP004: Organic Matter	----	0.5	%	<0.5	77 %	103	70.0	130
EP004: Total Organic Carbon	----	0.5	%	<0.5	43.5 %	106	70.0	130
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 6311107)								
EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	1 mg/kg	109	68.0	133
EP068A: Organochlorine Pesticides (OC) (QCLot: 6311106)								
EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	0.5 mg/kg	91.3	71.8	126
EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	0.5 mg/kg	98.7	72.2	125
EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	0.5 mg/kg	100	70.0	124
EP068: gamma-BHC - (Lindane)	58-89-9	0.05	mg/kg	<0.05	0.5 mg/kg	94.8	69.1	124
EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	95.5	69.2	125
EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	0.5 mg/kg	83.5	66.6	122
EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	0.5 mg/kg	95.6	68.8	123
EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	0.5 mg/kg	97.2	67.2	124
EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	0.5 mg/kg	96.3	66.0	126
EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	0.5 mg/kg	101	70.2	126
EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	0.5 mg/kg	96.5	72.1	124
EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	0.5 mg/kg	92.1	68.0	122
EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	0.5 mg/kg	95.6	68.9	124
EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	0.5 mg/kg	88.5	55.8	130
EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	0.5 mg/kg	84.8	67.9	124
EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	0.5 mg/kg	80.4	72.0	127
EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	0.5 mg/kg	82.6	66.3	131

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report		
					Spike	Spike Recovery (%)	Acceptable Limits (%)
				Result	Concentration	LCS	Low	High
EP068A: Organochlorine Pesticides (OC) (QCLot: 6311106) - continued								
EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	0.5 mg/kg	109	62.4	131
EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	0.5 mg/kg	80.4	55.4	130
EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	0.5 mg/kg	84.4	68.8	128
EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	0.5 mg/kg	71.9	55.5	132
EP068: Mirex	2385-85-5	0.05	mg/kg	<0.05	0.5 mg/kg	98.3	92.4	102
EP068B: Organophosphorus Pesticides (OP) (QCLot: 6311106)								
EP068: Dichlorvos	62-73-7	0.05	mg/kg	<0.05	0.5 mg/kg	98.1	65.6	127
EP068: Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	79.0	63.0	129
EP068: Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	0.5 mg/kg	64.0	10.0	136
EP068: Dimethoate	60-51-5	0.05	mg/kg	<0.05	0.5 mg/kg	70.4	58.3	128
EP068: Diazinon	333-41-5	0.05	mg/kg	<0.05	0.5 mg/kg	76.7	69.0	122
EP068: Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	0.5 mg/kg	89.5	68.0	122
EP068: Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	0.5 mg/kg	104	59.6	124
EP068: Malathion	121-75-5	0.05	mg/kg	<0.05	0.5 mg/kg	66.4	63.8	128
EP068: Fenthion	55-38-9	0.05	mg/kg	<0.05	0.5 mg/kg	77.9	71.1	124
EP068: Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	0.5 mg/kg	71.3	67.4	126
EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	0.5 mg/kg	113	57.9	122
EP068: Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	0.5 mg/kg	84.3	66.2	123
EP068: Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	0.5 mg/kg	91.6	59.8	123
EP068: Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	0.5 mg/kg	76.2	65.4	127
EP068: Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	0.5 mg/kg	81.6	52.1	128
EP068: Prothiofos	34643-46-4	0.05	mg/kg	<0.05	0.5 mg/kg	79.5	65.2	122
EP068: Ethion	563-12-2	0.05	mg/kg	<0.05	0.5 mg/kg	74.4	63.2	124
EP068: Carbophenothion	786-19-6	0.05	mg/kg	<0.05	0.5 mg/kg	76.0	65.9	127
EP068: Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	0.5 mg/kg	63.4	43.1	131
EP068C: Triazines (QCLot: 6311106)								
EP068: Atrazine	1912-24-9	0.05	mg/kg	<0.05	0.5 mg/kg	94.1	72.5	126
EP068D: Pyrethroids (QCLot: 6311106)								
EP068: Bifenthrin	82657-04-3	0.05	mg/kg	<0.05	0.5 mg/kg	82.1	67.9	128
EP075(SIM)A: Phenolic Compounds (QCLot: 6311104)								
EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	3 mg/kg	92.5	81.2	121
EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	3 mg/kg	92.9	83.2	120
EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	3 mg/kg	94.5	81.6	123
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	6 mg/kg	92.7	79.7	129

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP075(SIM)A: Phenolic Compounds (QCLot: 6311104) - continued								
EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	3 mg/kg	90.4	49.8	129
EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	3 mg/kg	91.6	81.5	127
EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	3 mg/kg	89.2	74.2	125
EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	3 mg/kg	92.1	79.8	121
EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	3 mg/kg	90.6	71.5	121
EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	3 mg/kg	88.8	67.8	119
EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	3 mg/kg	88.0	64.5	126
EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	6 mg/kg	72.9	10.0	118
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 6311104)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	3 mg/kg	95.3	85.7	123
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	3 mg/kg	94.8	81.0	123
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	3 mg/kg	94.2	83.6	120
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	3 mg/kg	93.4	81.3	126
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	3 mg/kg	95.6	79.4	123
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	3 mg/kg	91.4	81.7	127
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	3 mg/kg	93.3	78.3	124
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	3 mg/kg	92.5	79.9	128
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	3 mg/kg	95.2	76.9	123
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	3 mg/kg	96.4	80.9	130
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	3 mg/kg	88.1	70.0	121
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	3 mg/kg	101	80.4	130
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	3 mg/kg	89.5	70.2	123
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	3 mg/kg	89.5	67.9	122
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	3 mg/kg	89.6	65.8	123
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	3 mg/kg	92.2	65.8	127
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6309739)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	36 mg/kg	90.5	58.6	131
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6311105)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	790 mg/kg	102	75.0	128
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	2730 mg/kg	102	82.0	123
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	1410 mg/kg	99.4	82.4	121
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6309739)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	45 mg/kg	90.4	59.3	128

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6311105)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	1080 mg/kg	103	77.0	130
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	3640 mg/kg	101	81.5	120
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	270 mg/kg	98.2	73.3	137
EP080: BTEXN (QCLot: 6309739)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	2 mg/kg	90.8	61.6	117
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	2 mg/kg	89.5	65.8	125
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	2 mg/kg	89.1	65.8	124
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	4 mg/kg	92.2	64.8	134
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	2 mg/kg	93.9	68.7	132
EP080: Naphthalene	91-20-3	1	mg/kg	<1	0.5 mg/kg	89.6	61.8	123
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 6311772)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.00111 mg/kg	90.3	72.0	128
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00114 mg/kg	82.4	67.0	130
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	85.3	68.0	136
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 6311772)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	86.3	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	84.7	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	85.8	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	84.5	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	88.2	69.0	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 6311772)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	88.7	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00119 mg/kg	88.6	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.0012 mg/kg	94.5	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.00121 mg/kg	79.2	70.0	130
EP231P: PFAS Sums (QCLot: 6311772)								
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	----	----	----	----

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: 6311184)							
EM2500166-002	BH01_0.5-0.6	EG005T: Arsenic	7440-38-2	50 mg/kg	104	78.0	124
		EG005T: Cadmium	7440-43-9	50 mg/kg	84.9	79.7	116
		EG005T: Chromium	7440-47-3	50 mg/kg	83.8	79.0	121
		EG005T: Copper	7440-50-8	250 mg/kg	106	80.0	120
		EG005T: Lead	7439-92-1	250 mg/kg	90.2	80.0	120
		EG005T: Nickel	7440-02-0	50 mg/kg	83.9	78.0	120
		EG005T: Zinc	7440-66-6	250 mg/kg	82.7	80.0	120
EG035T: Total Recoverable Mercury by FIMS (QCLot: 6311185)							
EM2500166-002	BH01_0.5-0.6	EG035T: Mercury	7439-97-6	0.5 mg/kg	102	70.0	130
EG048: Hexavalent Chromium (Alkaline Digest) (QCLot: 6311124)							
EM2500172-001	Anonymous	EG048G: Hexavalent Chromium	18540-29-9	20 mg/kg	60.5	58.0	114
EM2500172-001	Anonymous	EG048G: Hexavalent Chromium	18540-29-9	20 mg/kg	75.9	58.0	114
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 6311107)							
EM2500287-031	Anonymous	EP066: Total Polychlorinated biphenyls	----	1 mg/kg	104	63.2	144
EP068A: Organochlorine Pesticides (OC) (QCLot: 6311106)							
EM2500166-006	BH02_0.1-0.2	EP068: gamma-BHC - (Lindane)	58-89-9	0.5 mg/kg	100	51.4	139
		EP068: Heptachlor	76-44-8	0.5 mg/kg	88.3	49.1	130
		EP068: Aldrin	309-00-2	0.5 mg/kg	98.4	38.4	135
		EP068: Dieldrin	60-57-1	0.5 mg/kg	101	58.4	136
		EP068: Endrin	72-20-8	0.5 mg/kg	99.5	33.0	146
		EP068: 4.4`-DDT	50-29-3	0.5 mg/kg	76.2	20.0	133
EP068B: Organophosphorus Pesticides (OP) (QCLot: 6311106)							
EM2500166-006	BH02_0.1-0.2	EP068: Diazinon	333-41-5	0.5 mg/kg	82.7	65.1	135
		EP068: Chlorpyrifos-methyl	5598-13-0	0.5 mg/kg	97.4	56.3	127
		EP068: Pirimphos-ethyl	23505-41-1	0.5 mg/kg	89.4	55.0	133
		EP068: Bromophos-ethyl	4824-78-6	0.5 mg/kg	85.6	55.1	133
		EP068: Prothiofos	34643-46-4	0.5 mg/kg	91.3	43.8	128
EP075(SIM)A: Phenolic Compounds (QCLot: 6311104)							
EM2500166-010	BH03_0-0.2	EP075(SIM): Phenol	108-95-2	3 mg/kg	107	77.1	119
		EP075(SIM): 2-Chlorophenol	95-57-8	3 mg/kg	108	78.9	123
		EP075(SIM): 2-Nitrophenol	88-75-5	3 mg/kg	102	43.8	136
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	3 mg/kg	103	61.5	120
		EP075(SIM): Pentachlorophenol	87-86-5	3 mg/kg	100	15.3	139
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 6311104)							
EM2500166-010	BH03_0-0.2	EP075(SIM): Acenaphthene	83-32-9	3 mg/kg	106	77.2	116
		EP075(SIM): Pyrene	129-00-0	3 mg/kg	106	65.5	136

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: 6309739)							
EM2500166-006	BH02_0.1-0.2	EP080: C6 - C9 Fraction	----	28 mg/kg	67.9	33.4	124
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6311105)							
EM2500166-010	BH03_0-0.2	EP071: C10 - C14 Fraction	----	790 mg/kg	97.3	71.2	125
		EP071: C15 - C28 Fraction	----	2730 mg/kg	97.3	75.6	122
		EP071: C29 - C36 Fraction	----	1410 mg/kg	96.1	78.0	120
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6309739)							
EM2500166-006	BH02_0.1-0.2	EP080: C6 - C10 Fraction	C6_C10	33 mg/kg	65.9	30.8	120
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6311105)							
EM2500166-010	BH03_0-0.2	EP071: >C10 - C16 Fraction	----	1080 mg/kg	95.2	72.2	128
		EP071: >C16 - C34 Fraction	----	3640 mg/kg	96.5	76.5	119
		EP071: >C34 - C40 Fraction	----	270 mg/kg	92.9	66.8	138
EP080: BTEXN (QCLot: 6309739)							
EM2500166-006	BH02_0.1-0.2	EP080: Benzene	71-43-2	2 mg/kg	94.6	54.4	127
		EP080: Toluene	108-88-3	2 mg/kg	93.2	57.1	131
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 6311772)							
EM2500332-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00111 mg/kg	82.7	72.0	128
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00114 mg/kg	78.8	67.0	130
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	77.0	68.0	136
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 6311772)							
EM2500332-001	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	89.6	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	86.4	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	84.3	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	81.2	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	77.9	69.0	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 6311772)							
EM2500332-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	89.1	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00119 mg/kg	89.0	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	89.3	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00121 mg/kg	# 51.2	70.0	130

SF11: CHAIN OF CUSTODY

REF: 241697

Job No:	241697.0000			**Laboratory Name:**	Eurofins
Details:	Two Wells Ambulance Station			**Laboratory Address:**	6 Monterey Road, Dandenong South VIC 3175
Date Sample	8/01/2025	**Sampled by:**	**Laki Abesekara**	**Laboratory Contact:**	Karl Bulow **phone:** (03) 8564 5000
Consultant:	Tonkin	**Address:**	Level 2, 170 Frome St, Adelaide 5000	**Quotation No:**	Pricebook 2023 **email:** karl.bulow@eurofinsanz.com
Contact:	**Dean Noke**	**Phone:**	(08) 8273 3100	**Delivery by:**	
Email:	dean.noske@tonkin.com.au	**Email:**	environmental@tonkin.com.au	**Consignment Note:**	

Lab Sample Identification	Sample Identification	Matrix Container / Preservation	P-21/1 Screen	S-2 Eight Metals	S-7 TRH/ BTEXN/ PAH	S-12 OC/OP	PFAS - Short Suite	P-22 NEPM Screen									Notes / Deviations from Standard Protocols
	BH01_0.05-0.2			1	1	1											**Please email results to our LabSync Email at ESdat_AU+TonkinConsulting@ESdatLabSync.net**
	BH01_0.5-0.6			1													
	BH01_1.1-1.2																
	BH01_1.7-1.8																
	BH01_2.0-2.1							1									
	BH02_0.1-0.2		1														
	BH02_0.3-0.4																
	BH02_0.5-0.6			1													
	BH02_0.9-1.0																
	BH03_0-0.2			1	1	1											
	BH03_0.3-0.4			1													
	BH03_1.1-1.2																
	BH03_1.4-1.5																
	BH04_0.1-0.2			1	1	1											
	BH04_0.3-0.4			1													
	BH04_1.0-1.1																
	BH04_1.3-1.4																
	BH05_0-0.1			1		1											
	BH05_0.2-0.4																
	BH05_0.8-0.9																**Sample Preservation:**
Number of Samples:			1	8	3	4	0	1									**Samples must be transported and stored in a chilled or cold condition at all times**

Relinquished by:	Relinquished by:	Relinquished by:
Date and time:	Date and time:	Date and time:
Company: Tonkin	Company:	Company:
Signature	Signature	Signature
Received in good condition by:	Received in good condition by:	Received in good condition by:
Date and Time:	Date and Time:	Date and Time:
Company:	Company:	Company:
Signature	Signature	Signature

COC must remain with samples

ANALYSING LABORATORY:
Please email sample receipt to the environmental@tonkin.com.au email IMMEDIATELY on receipt of samples and return original COC with final results

SF11: CHAIN OF CUSTODY

REF: 241697

Job No:	241697.0000			**Laboratory Name:**	Eurofins
Details:	Two Wells Ambulance Station			**Laboratory Address:**	6 Monterey Road, Dandenong South VIC 3175
Date Sampled:	8/01/2025	**Sampled by:**	**Laki Abesekara**	**Laboratory Contact:**	Karl Bulow **phone:** (03) 8564 5000
Consultant:	Tonkin	**Address:**	Level 2, 170 Frome St, Adelaide 5000	**Quotation No:**	Pricebook 2023 **email:** karl.bulow@eurofinsanz.com
Contact:	**Dean Noke**	**Phone:**	(08) 8273 3100	**Delivery by:**	
Email:	dean.noske@tonkin.com.au	**Email:**	environmental@tonkin.com.au	**Consignment Note:**	

Lab Sample Identification	Sample Identification	Matrix Container / Preservation	P-21/1 Screen	S-2 Eight Metals	S-7 TRH/ BTEXN/ PAH	S-12 OC/OP	PFAS - Short Suite										Notes / Deviations from Standard Protocols
	BH05_1.2-1.4	Soil															**Please email results to our LabSync Email at ESdat_AU+TonkinConsulting@ESdatLabSync.net**
	BH06_0-0.2	Soil		1			1										
	BH06_0.2-0.4	Soil															
	BH06_0.6-0.7	Soil															
	QC1	Soil															
	QC2	Soil		1	1	1											
	QC3	Soil															
																	Sample Preservation:
	Number of Samples:		0	2	1	1	1										**Samples must be transported and stored in a chilled or cold condition at all times**

Relinquished by:	Relinquished by:	Relinquished by:
Date and time:	Date and time:	Date and time:
Company: Tonkin	Company:	Company:
Signature	Signature	Signature
Received in good condition by:	Received in good condition by:	Received in good condition by:
Date and Time:	Date and Time:	Date and Time:
Company:	Company:	Company:
Signature	Signature	Signature

COC must remain with samples

ANALYSING LABORATORY:
Please email sample receipt to the environmental@tonkin.com.au email IMMEDIATELY on receipt of samples and return original COC with final results