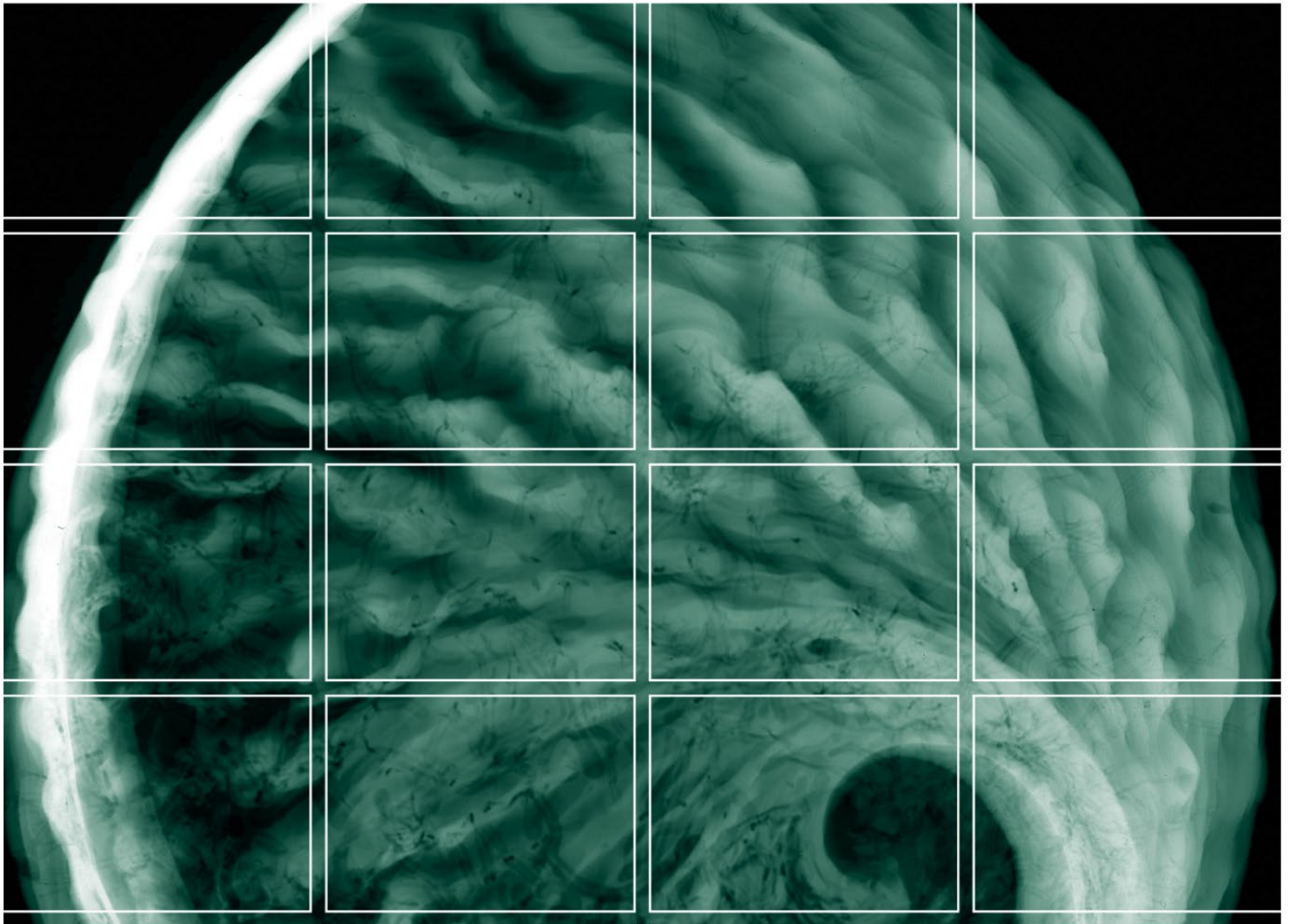




Acciona Construction Pty Ltd & Ferrovial
Construction Pty Ltd Joint Venture

Station Box Detailed Site Investigation

The Bays Construction Site

27 June 2022

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27 June 2022

Station Box Detailed Site Investigation

The Bays Construction Site



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1. INTRODUCTION

1.1 General

Environmental Resources Management Australia Pty Ltd (ERM) was commissioned by Acciona Construction Pty Ltd & Ferrovial Construction Pty Ltd Joint Venture (AFJV) to conduct a Detailed Site Investigation (DSI) within the 'Station Box' portion of The Bays Construction Site. The Bays Construction Site is located within the White Bay industrial area adjacent to the former White Bay Power Station at 41 James Craig Road, Rozelle, NSW 2039 (the 'Site'). The Station Box is to be excavated for the Sydney Metro as part of the Central Tunnelling Package.

The Bays Construction Site location and the Station Box Area are depicted within *Appendix C – Figure 1*.

A separate DSI report titled *Detailed Site Investigation, The Bays Construction Site, Sydney Metro West, Central Tunnelling Package* (ERM, 2021), hereafter referred to as 'The Bays Construction Site DSI' has been prepared for the portion of the Bays Construction Site that will not be excavated for the Station Box. The Station Box area was excluded from The Bays Construction Site DSI to enable works to commence outside the Station Box while collection of data within the Station Box was still underway. The Station Box land use is also distinct from the Construction Site in general, because its entire footprint will be excavated to a depth of approximately 30 m below current ground level, and all spoil within that volume will be removed from The Bays Construction Site to appropriate reuse or disposal.

In-situ waste classification reports for the Station Box materials were prepared separately to this Station Box DSI document, and these are to be provided in a separate Waste Classification Report.

Historical data obtained during previous environmental investigations (Senversa, 2021, Golder Douglas 2020 and JBS&G 2017) are used within this DSI Report. Limited data gaps were identified and investigative works were completed by ERM to close these data gaps.

1.2 Objectives

The objectives of the DSI at The Bays were:

- to obtain enough information to enable the proposed excavation to be conducted with appropriate in-situ waste classification of materials required to be excavated and removed from site;
- to obtain enough environmental data to provide a characterisation of the site in accordance with the applicable NSW and Australian guidance;
- to provide a DSI in compliance with the Conditions of Approval for Sydney Metro West – Concept and Stage 1 Construction (SSI 10038) ("the CoA"), specifically Condition D71 which reads:

*Before commencement of any construction that would result in the disturbance of moderate to high risk contaminated sites as identified in the documents identified in **Condition A1** of this schedule, **Detailed Site Investigations** (for contamination) must be conducted to determine the full nature and extent of the contamination. The **Detailed Site Investigation Report(s)** and the subsequent report(s), must be prepared, or reviewed and approved, by consultants certified under either the Environment Institute of Australia and New Zealand's Certified Environmental Practitioner (Site Contamination) scheme (CEnvP(SC)) or the Soil Science Australia Certified Professional Soil Scientist Contaminated Site Assessment and Management (CPSS CSAM) scheme. The **Detailed Site Investigations** must be undertaken in accordance with guidelines made or approved under section 105 of Contaminated Land Management Act 1997 (NSW). The **Detailed Site Investigation** for Sydney Olympic Park metro construction site must be prepared in consultation with SOPA; and*

- to provide a DSI in compliance with the requirements of the Sydney Metro West Central Tunnelling Works Design and Construction Deed ("the Deed") contract no. 00013/13033 between Sydney Metro and AFJV. The requirements of the Deed are provided in *Section 1.3* below.

1.3 Requirements of the Deed

With respect to the provision of DSIs, the Deed requires (clause 12.19):

- (a) *Except for Preliminary Works, the Tunnelling Contractor must perform and submit to the Principal's Representative and the Independent Certifier a Detailed Site Investigation prior to commencing any excavation activities:*
 - (i) *at any Area of Contamination Concern; and*
 - (ii) *to the extent otherwise required under the Planning Approvals.*
- (b) *Notwithstanding clause 12.19(a), the Tunnelling Contractor may also perform additional Detailed Site Investigations carried out in other areas of the Construction Site or outside the Construction Site if the Tunnelling Contractor deems it necessary to manage the risks associated with contaminated land and to appropriately plan for Remediation. Any additional Detailed Site Investigation performed in accordance with this clause 12.19(b) must also be submitted to the Principal's Representative and the Independent Certifier.*
- (c) *Each Detailed Site Investigation:*
 - (i) *must*
 - (A) *investigate areas of proposed excavation or disturbance;*
 - (B) *investigate land within the Construction Site or Extra Land surrounding the areas of proposed excavation or disturbance with respect to the potential migration of Contamination via groundwater, ground gas, vapour and odour into the areas of excavation or disturbance; and*
 - (C) *characterise risks to the construction, operation and maintenance of Sydney Metro West and its infrastructure from Contamination,*
 - (ii) *be prepared in accordance with Law, Good Industry Practice, the Planning Approvals, all guidelines made or approved by the EPA and any other requirements of this deed;*
 - (iii) *be reviewed and approved by a Certified Contaminated Land Consultant; and*
 - (iv) *characterise the risk of Contamination migrating from the Construction Site as a result of the Tunnelling Contractor's Activities;*
- (d) *In addition to the requirements set out in clause 12.19(c), each Detailed Site Investigation performed within an Area of Contamination Concern must:*
 - (i) *To be reviewed and endorsed by an Accredited Site Auditor; and*
 - (ii) *Be accompanied by an Interim Site Audit Advice prepared by the Accredited Site Auditor when submitted to the Principal's Representative and the Independent Certifier in accordance with clause 12.19(a).*
- (e) *In addition to the requirements set out in clauses 12.19(c) and 12.19(d), each Detailed Site Investigation performed within a Key Contaminated Area must in accordance with the relevant EPA guidelines:*
 - (i) *determine and delineate the lateral and vertical extent of Contamination within each Key Contaminated Area;*

- (ii) *include in-situ classification of Solid Waste at sampling densities not less than that specified within the NEPM (2013) and the Industrial Waste Resources Guidelines (7), Sampling and Analysis: Soil Sampling (EPA Victoria 2010), except for Virgin Excavated Natural Material (VENM) and Excavated Natural Material (ENM) which are to be classified in accordance with the requirements of the Protection of the Environment Operations Act 1997 (NSW);*
- (iii) *classify the Solid Waste in accordance with the Waste Classification Guidelines using a statistical approach where relevant;*
- (iv) *be suitably detailed so as to inform the development of the Remediation Action Plan, any Remediation Cost Estimate and any Agreed Remediation Scope and to characterise contamination risk to the construction, operation and maintenance of Sydney Metro West (including but not limited to soil, groundwater, ground gas, vapour and odour risks arising from Contamination within the area of proposed excavation or disturbance or migrating into the area of proposed excavation or disturbance); and*
- (v) *without limiting the Tunnelling Contractor's obligations under clause 12.20A(h), characterise the risk of any PFAS contained in Solid Wastes in respect of The Bays PFAS Key Contaminated Area.*

This report addresses the CoA and Deed requirements for DSI in the Station Box. The Bays Station Box includes the PFAS Key Contaminated Area, which is also addressed as part of this report. The Deed requirements for waste classification are met by the four waste classification reports for the Station Box (ERM, 2022a, b, c and d).

It is noted that Contamination is defined in the Deed as: The presence in, on or under land or water or any other aspect of the Environment of:

a) a substance (whether occurring naturally or otherwise) which is at a concentration above at which the substance is normally present in, on or under land or water or any other aspect of the Environment in the same locality, being a presence that presents a risk of harm to human health or any aspect of the environment; or

b) any natural or artificial substance whether solid, liquid or gas (alone or in combination with any other substance) which is toxic, flammable or otherwise capable of causing harm to humans or the environment,

but excluding any Hazardous Material.

ERM notes that this definition of contamination differs from the definition within the Contaminated Land Management Act 1997 (CLM Act).

1.4 Scope of Works

The scope of works included the following tasks:

- Excavation of three borehole locations inside the Station Box Area and collection of samples to address data gaps;
- Laboratory analysis of soil samples for relevant contaminants of potential concern (COPC); and
- Preparation of a report that summarises the results of the investigation along with the data from previous site investigations. The report is to include comparison of analytical results against relevant human health and ecological screening levels.

This report has been prepared in general accordance with the applicable guidelines made or approved under s105 of the Contaminated Land Management Act 1997, including relevant sections of the National Environment Protection (Assessment of Site Contamination) Measure 1999 (ASC NEPM) (NEPC, 2013) and the Contaminated Land Guidelines: Consultants reporting on contaminated land (NSW EPA, 2020).

2. SITE SETTING

2.1 Site Description and Identification

The Site is located within the White Bay industrial area, adjacent to the former White Bay Power Station in Rozelle. Sydney Metro is licensing approximately 5.6 hectares (ha) of the Site from the Port Authority of NSW (PANSW), and a smaller portion of land (around 0.7 ha) from Place Management NSW (PMNSW), for the construction of The Bays Station of Sydney Metro West. Site identification details are summarised in *Table 1*.

Table 1: Site Identification

ITEM	DESCRIPTION
Site Name	The Bays Construction Site
Site Address	Robert Street, Rozelle, 2039
Property Identification	Part Lot 201 Deposited Plan 1274455
Environmental Plan	Sydney Regional Environmental Plan No. 26 – City West
Current Land Use	Industrial area adjacent to former White Bay Power Station

Refer to *Figure 1 – Appendix A* for Site Location and Layout.

The Site is an irregular shape and divided into two main portions. This includes a broader Site area that will be used as a construction support zone during the station construction and the Station Box Area where spoil will be excavated for the construction of The Bays Metro Station. This report relates to the Station Box only. Throughout this report, 'the Site' means the whole Construction Site area. The "Station Box" means the Station Box footprint only.

The Station Box occupies an area of 7,070 m² that will be excavated to approximately 30 m bgl for the construction of The Bays Station. The approximate in-situ volume of material to be excavated is therefore estimated to be 212,100 m³.

2.2 Environmental Setting

The following subsections provide a brief overview of the environmental conditions surrounding and underlying the Site and the Station Box derived from previous investigations.

2.2.1 Surrounding Land Use

The Site is located in an area primarily used for commercial/industrial land uses with general residential housing located beyond the industrial areas to the north and west of the Site.

Based on a desktop review of aerial photographs, previous reports and publically available information, the surrounding land uses to the Site include the following:

- North – Commercial and light industrial premises immediately adjacent to the Site, with general residential housing and small pockets of recreation park areas beyond;
- East – Glebe container terminal and Industrial port uses immediately adjacent, with the natural waterways of White Bay beyond;
- South – Light industrial and commercial marine uses with Rozelle Bay beyond; and
- West – The former White Bay power station and general residential land uses.

2.2.2 Topography and Hydrology

The Site is described as predominantly level with minor modifications associated with construction features on Site. The western portion of the Site lies at an elevation of approximately 10 m AHD and falls toward White Bay to an elevation of approximately 5 m AHD. Substantial filling of low lying and estuarine areas occurred during the construction of the ANZAC Bridge. Drainage infrastructure associated with the historical use of the Site as a power station is present in some portions of the Site.

Surface water is expected to move across the Site until it enters drainage infrastructure and discharges into White Bay.

2.2.3 Geology and Soils

It has been previously reported that the 1:100 000 Department of Mineral Resources Sydney Geological Series Sheet 9130 (1983) indicates the Site and the Station Box are underlain by three geological types:

- Man-made fill comprising dredged and estuarine sand and mud, demolition rubble, industrial and household waste;
- Quaternary silty to peaty quartz sand, silt and clay, ferruginous and humic cementation in places with common shell layers; and
- Wianamatta group medium to coarse-grained quartz Hawkesbury sandstone, very minor shale and laminate lenses.

The 1:100 000 Department of Natural Resources Sydney Soil Landscape Series Sheet 9130 (1983) is reported as describing the Site as primarily lying within a disturbed soil landscape.

JBS&G (2017) reported fill material thicknesses generally between 0.5 m and 4.2 m, noting that the base of the fill was not able to be identified in some locations. Golder Douglas (2020) noted that the area has been extensively filled and interpreted fill to extend to up to 10 m in thickness. Senversa (2021) interpreted fill being of variable depth (generally 0 m-7 m) across the Site, with fill reported to extend to 11 m in one location in the Station Box. Greater fill depth was logged in bores completed in the central area of the Station Box. Reported depth of fill was much shallower in the south eastern portion of the Station Box where shallow bedrock was encountered at around 1 m bgl.

Natural soil underlying the fill material was described by Senversa (2021) as clayey sands, silty sands, sandy silts and sandy clays. The natural soils has been identified to comprise Potential Acid Sulfate Soils (PASS) in areas of alluvial/marine soils underlying portions of the Site.

2.2.4 Hydrogeology

Groundwater monitoring wells have been installed on Site during previous investigation works. The proposed scope for this investigation does not include groundwater monitoring as the groundwater monitoring data completed during the most recent investigation is considered sufficient for inclusion in this DSI. Regular groundwater monitoring for the purposes of groundwater management during construction is planned but is not included in the scope of works covered by this DSI.

Previous environmental investigations have reported no beneficial reuse of groundwater in proximity to the Site. Groundwater is reported as being shallow with hydraulic levels just above sea level, e.g 0.5 m AHD, and tidal influence has been observed. The groundwater flow direction has been reported by JBS&G to vary slightly, flowing east towards White Bay in the eastern portion of the Site and south towards Blackwattle Bay in the central and southern portions of the Site. White Bay is directly to the east of the Site, while Blackwattle Bay is located approximately 170 m south of the Site.

JBS&G also reported potential groundwater mounding was occurring in the north western portion of the Site and a dyke has been identified which is likely to also impact the local groundwater flow regime.

2.3 Site History Summary

A review of historical information and previous investigations undertaken has indicated that the Site has primarily been used for commercial/industrial purposes including use as a dock, coal storage and processing, railways, ash handling and storage. Substantial filling of the Site has been reported including prior to the construction of the White Bay Power Station, during the construction of the ANZAC Bridge, and for land reclamation.

All of the above-mentioned site uses are relevant to the Station Box area. A former rail embankment bisects the station box area, and deep fill is a characteristic of the western portion of the Station Box. Buildings are absent from the station box area, with the area used as a dockyard and for storage in recent history.

3. SUMMARY OF PREVIOUS INVESTIGATIONS

The following previous investigations have been completed at the Site:

- Site Wide Remedial Concept Plan (SWRCP) (JBS&G, 2015);
- Detailed Site Investigation White Bay Power Station, Proposed Lot 1 (JBS&G, 2017a);
- Detailed Site Investigation White Bay Power Station, Proposed Lot 2 (JBS&G, 2017b);
- Addendum Final Geotechnical Data Report – White Bay Pavement Investigation (Golder-Douglas, April 2020);
- Factual Contamination Assessment Report – Geotechnical Investigation (Golder-Douglas, May 2020);
- Contamination Assessment Report – The Bays Precinct, Stage 1 Early Works Package (Golder-Douglas, June 2020);
- Factual Contamination Investigation Report – The Bays (Senversa, 2021);
- Groundwater Monitoring Report— Sydney Metro West Geotechnical Investigation (Golder-Douglas, 2018);
- Groundwater Monitoring Report- Stage 2 Locations – Sydney Metro West Geotechnical Investigation (Golder-Douglas, May 2021); and
- Groundwater Monitoring Report- Stage 3 Locations – Sydney Metro West Groundwater Monitoring Report (Golder-Douglas, June 2021).

A summary of works conducted in each of these previous investigations is provided within The Bays Construction Site DSI report.

Portions of each of these reports are relevant to the Station Box area. None of the above-mentioned reports were prepared specifically for the Station Box, as they were all completed as either site wide, precinct wide, or Sydney Metro alignment wide investigations.

This DSI reported herein uses the data from these reports that fall within the Station Box area to draw conclusions on site suitability and waste classification (noting that waste classification is reported separately).

4. SITE INVESTIGATION

4.1 Data Quality Objectives

ERM prepared a sampling, analysis and quality plan (SAQP) (ERM, 2021) to define the type and quality of data required to achieve the project objectives.

The Data Quality Objectives (DQOs) developed and presented in the SAQP (ERM, 2021) that are relevant to the Station Box are summarised in the subsections below.

4.1.1 Step 1: State the Problem

Given the proposed development works, the Station Box is to be assessed during the DSI for suitability for a land use consistent with the definition of 'Commercial/Industrial' provided in the ASC NEPM. Sixty sample points had been completed within the 0.707 ha Station Box area during previous investigations. This is greater than the minimum of 17 sampling points specified as recommended for a 0.7 ha site within the Sampling Design Guidelines (NSW EPA, 1995). Therefore, a sufficient number of sampling points have been completed during the historical sampling programs as defined by compliance with the minimum sampling points required by site area specified in the Sampling Design Guidelines (NSW EPA, 1995).

Waste classification is required for spoil to be excavated from the Station Box in accordance with the Waste Classification Guidelines (NSW EPA, 2014). Section 12.19 (e) (ii) of the Deed specifies a sampling density for in-situ classification of no less than Industrial Waste Resources Guidelines (IWRG) 7, Sampling and Analysis: Soil Sampling (EPA Victoria 2009). Virgin Excavated Natural Material (VENM) and Excavated Natural Material (ENM) are to be classified in accordance with the requirements of the NSW Protection of the Environment Operations Act 1997.

The IWRG sampling rate relevant for soil volumes >200 m³ is 1 per 250 m³, using the 95% Upper Confidence Limit (UCL) of the mean.

As advised by the client, the below table outlines the approximate volumes of spoil to be excavated from the Station Box and associated sample density achieved from the previous Senversa (2021) and Golder-Douglas (2020) investigations.

Table 2: Previous Fill & Natural Soil Sample Summary

Material Type	Approximate Volume (m3)	No. Primary Chemical Sample collected	IWRG (2009) Table 3 Minimum number of samples 95% UCL average	Additional Samples required to meet IWRG rate
Fill (Fill and PASS Fill, as described in In-situ waste classification reports W01 and W02)	25,910	196	104	No
Natural Soils/ Rock (VENM and PASS- VENM , as described in In-situ waste classification reports W01 and W02)	186,190	160	745	Yes*

*If the rock/natural soil is VENM or ENM, IWRG sample density requirements do not need to be met.

The table above indicates that sufficient data already exists to provide appropriate in-situ classification of fill material, but that natural soils and rock are currently below the IWRG sampling density. Volumes of natural soil and rock that can be classified as VENM or ENM do not need to meet the IWRG sampling frequency. Should the natural soil be classified as PASS, additional sampling may be required, however this can (and should) be completed following treatment.

Data available to assess the vertical extent of PASS spoil is limited, with the recent Senversa investigation typically including only one Chromium Suite analysis, and two field (pH(f) and pH(fox)) analyses per bore. This investigation seeks to enhance the understanding of the vertical extent of PASS in the Station Box excavation, and to enable the identification of the appropriate level of treatment (liming rate) for any PASS requiring treatment. Recent environmental data (Senversa, 2021) included detection of PFAS in rock samples in two boreholes within the station box, at depths between 15 and 29 m below ground level (bgl). PFAS detection creates a potential issue for the rock spoil classification as VENM. Senversa (2021) considered the results were potentially due to cross contamination. This investigation seeks to assess whether the PFAS detections were representative of the rock, or whether cross contamination is a more likely origin for the concentrations detected in the Senversa results.

4.1.2 Step 2: Identify the Decision

Decisions to be made are:

- Do contaminant concentrations in soils comply with the adopted site assessment criteria?
- Do soils pose an unacceptable risk to human health or the environment?
- Is the Site characterisation sufficient for preparation of a Remediation Action Plan?
- Can the in-situ materials be classified under the Waste Classification Guidelines or a relevant Resource Recovery Order?
- Can a liming rate be calculated should treatment of PASS be required?
- Can the rock to be excavated from the Station Box be classified as VENM?
- If some of the rock cannot be classified as VENM (due to low level PFAS) what is the likely volume of PFAS impacted rock?

4.1.3 Step 3: Identify inputs to the Decision

The inputs required to make the above decisions are as follows:

- Historical information gathered from the review of previous reports;
- Results of the field investigations and laboratory analysis; and
- Relevant legislation and guidelines.

4.1.4 Step 4: Define the Study Boundaries

- Spatial Boundaries – the physical investigation discussed within this Station Box DSI focus on data gaps in the previously undertaken investigation works, within the lateral confines of the Station Box boundary and to a vertical extent of 30m bgl.

Refer to *Figure 1* for site boundaries.

- Temporal Boundaries – Results of previous investigation reports including those by JBS&G (2017), Golder Douglas (2020) and Senversa (2021) have been included within this DSI Report along with the supplementary data collected by ERM (2021), as such the temporal boundary will comprise the period of these investigations until the issue date of this DSI report.

4.1.5 Step 5: Develop a Decision Rule

Soil from the Station Box will be screened against relevant criteria i.e those relevant to commercial/industrial use. Screening results will primarily be used to highlight potential risks to construction workers and the environment.

As the material to a depth of approximately 30 m will be removed from the Station Box for the Metro Station construction, screening results for material within the Station Box are not directly applicable for future site users (and the soils outside the station box have been used to evaluate this potential exposure within The Bays Construction Site DSI). Despite this, the Station Box soil and groundwater screening will also be used to assess potential risks to future users of the station in order to ensure any contamination that may extend beyond the Station Box area and be present just beyond the walls of the Station Box is evaluated.

Soil from the Station Box will also be screened against waste classification guidelines and evaluated against the definitions of VENM and PASS.

The rock in the Station Box will be able to be classified as VENM if:

- Additional samples from rock at similar depth and location to the existing samples containing PFAS do not have detectable PFAS concentrations;
- All available rock samples from the vicinity of the Station Box are reviewed and do not contain detectable PFAS;
- The weight of evidence supports the conclusion that the Senversa 2021 PFAS detections are the result of cross contamination and should not be considered evidence that the rock to be excavated from the Station Box is impacted; and
- No other anthropogenic contaminants are detected in the rock.

If any of the above criteria are unfulfilled, the rock in the vicinity of the borehole with PFAS detections in rock will not be able to be classified as VENM. Further action will be required including analysis of additional samples.

Soil in the Station Box will be classified as PASS if:

- Field peroxide testing indicates PASS. (i.e. more than one of the following occurs, in accordance with ASSMAC, 1998):
 - Change in colour of the soil from grey to brown;
 - Effervescence;
 - The release of sulfur smelling gases;
 - A lowering of the soil pH by more than one unit; and
 - A final pH of <3.5;
- Net acidity as determined by chromium suite analysis is >0.03%S (if that acidity is sulfide related).

Soil that is not VENM will be classified in accordance with the NSW EPA (2014) Waste Classification Guidelines. Data will be used to calculate 95% UCLs for comparison against the CT1/SCC1, CT2/SCC2 and TCLP1 and TCLP2 values unless they are considered to be outliers to the dataset. Outliers should be determined following computation of the ProUCL outlier test (Rosner's) and comparison with box plot and Q-Q graphs as recommended within Chapter 7 of ProUCL 5.1 Guide in determining outliers.

4.1.6 Step 6: Specify the Performance or Acceptance Criteria

The acceptable limits on decision errors applied during the review of the results was based on the Data Quality Indicators (DQIs) of precision, accuracy, representativeness, comparability and completeness outlined in *Table 4*, in accordance with Schedule B (3) - Guidelines on Laboratory Analysis of the ASC NEPM.

The potential for significant decision errors was minimised by:

- Completing a robust Quality Assurance/Quality Control (QA/QC) assessment of the investigation data and application of the probability that 95% of data will satisfy the DQIs, therefore a limit on the decision error would be 5% that a conclusive statement may be incorrect;
- Achieving appropriate sampling and analytical density; and
- Ensuring that the assessment criteria selected was appropriate for current and future land use scenarios.

4.1.7 Step 7: Optimise the Design for Obtaining Data

The following DQIs were developed to assess field and laboratory procedures and statistically verify the validity of the data:

Table 3: Data Quality Indicators

Item	Indicator
Date Precision and Accuracy	
Relative Percentage Difference (RPD)	If: >10 x laboratory Limit of Reporting (LOR), then < 30% inorganics and 50% organics (field); <10 x laboratory LOR: Assessed on individual basis (field) >5 x laboratory LOR: 50% (laboratory) <5 x laboratory LOR: No Limit (laboratory)
Laboratory Performance	Based on acceptance criteria of laboratory as specified on certificate of analysis, includes: blank samples, matrix spikes, control samples, and surrogate spike samples. Use of analytical laboratories with adequately trained and experienced testing staff experienced in the analyses undertaken, with appropriate NATA certification.
Fieldwork Performance	Use of trained and qualified field staff; same sampler(s) used for all recoveries. Appropriate sampling methods used, minimising the opportunity for cross-contamination.
Sample Coverage	Representative coverage of potential contaminants, based on site history, site activities and site features.
Data Representativeness	
Sample and Analysis Selection	Representativeness of all contaminants of concern.
Trip Blanks	No detection above LOR
Trip Spikes	Recoverable concentrations of volatiles between 60-140%
Rinsate	No detection above LOR
Laboratory Selection	Adequate laboratory internal quality control and quality assurance methods, complying with the ASC NEPM.

Item	Indicator
Documentation Completeness	
Documentation Review	Review of acquired documented information pertaining to Site history
Fieldwork Observations	Preparation of bore logs, sample location plans.
Chain of Custody Records	Laboratory sample receipt information received confirming receipt of samples intact and appropriate chain of custody.
	NATA registered laboratory results certificates provided.
Data Completeness	
Laboratory Requirements	Analysis for all contaminants of concern according to the SAQP.
	Field duplicate sample numbers complying with ASC NEPM.
	Trip spike/trip blank samples prepared and sent with field samples regularly.
Comparability	
Fieldwork Performance	Use of consistent test methods for each sample.
	Using appropriate and consistent techniques for sample recovery.
	Using experienced sampler.
Laboratory Performance	Use of NATA registered laboratories.
	Test methods comparable between primary and secondary laboratory.
	Acceptable RPD's between original samples and field duplicates and inter-laboratory triplicate samples.
	LOR should not exceed the Site Assessment Criteria.

4.2 Investigation Methodology and Analysis

Fieldwork was undertaken by ERM Environmental Scientists between 30 November 2021 and 03 December 2021 in accordance with the scope of works outlined in *Section 1.4* and ERM's standard work procedures. Field works involved sampling at three borehole locations inside the Station Box (noting that one of the three locations, BH07, was marginally outside the station box due to site constraints but data is considered to be representative of the conditions in the nearby station box). Samples collected were primarily to enable vertical characterisation of potential acid sulfate soils, and to determine whether PFAS is present in the rock.

4.2.1 Sample Collection

Soil/rock samples were collected and logged in accordance with ERM's standard operating procedures. The following field procedures were implemented:

- Soil/rock was logged by an appropriately trained and experienced scientist to record the following information: soil/rock type, colour, grain size, sorting, angularity, inclusions, moisture condition, structure, visual signs of contamination, in general accordance with AS 1726-1993;
- Soil samples for field screening were placed in a sealed "zip-lock" bag and screened using a PID fitted with a 10.6 eV lamp, calibrated at the beginning of each working day;
- Field acid sulfate soil testing was conducted at half metre intervals using a pH meter calibrated at the beginning of each working day;
- Soil samples were collected where field acid sulfate soil indicators were present, or where additional chemical or asbestos data was required in accordance with the Sampling and Analysis Quality Plan (SAQP);

- Soil samples were reported to be transferred to appropriate sample containers (i.e. laboratory supplied bags for acid sulfate soil samples, PFAS jars for soils to be analysed for PFAS and plastic bags for asbestos). Job number; sample identification number; sample details and date of sampling were recorded on sample labels affixed to the sample containers. Samples were then reported to be placed into a chilled ice box;
- Fresh disposable nitrile gloves, were utilised during sampling; and
- All non-disposable equipment used in the sampling program was decontaminated prior to use and between samples to prevent cross contamination. Decontamination of equipment involved:
 - Cleaning equipment in potable water to remove gross contamination;
 - Cleaning in a solution of Liquinox; and
 - Rinsing in clean demineralised water.

4.2.2 Sample Handling and Laboratory Analysis

Samples were recorded on a chain of custody form. The soil samples were transported under standard chain-of-custody protocols to NATA accredited laboratories for analysis. Copies of the chain of custody forms, signed by laboratory, that acknowledged sample receipt date and time, samples received in good condition and properly chilled and documentation received in proper order.

5. SITE ASSESSMENT CRITERIA

5.1 Soils

Based on the proposed future land use of the Station Box, ERM assessed the soil data against the 'Commercial/Industrial' land use criteria as defined in the ASC NEPM. Due to the prevalent sands and gravels previously reported within fill materials in the Station Box (Senversa, 2021) the health-based screening levels for sand (coarse) soils have been adopted.

Screening levels applicable to the assessment of soils include:

- ASC NEPM 1999 (NEPC 2013) Health Investigation Level (HIL);
 - HIL D – Commercial / Industrial;
- ASC NEPM 1999 (NEPC 2013) Management Limits;
 - Commercial Industrial;
- CRC CARE (2011) Soil Health Screening Levels for Direct Contact;
 - HSL-D – Commercial / Industrial;
- CRC CARE (2011) Soil Health Screening Level (HSL);
 - Intrusive maintenance worker (shallow trench); and
- HEPA (2020) NEMP Human health investigation levels for soil;
 - Industrial/commercial (HIL-D).

Human health criteria for indoor vapour inhalation are not directly relevant, because the soils being screened will have been removed from the Site for appropriate off-site reuse or disposal. The soil results have, however, been screened against the following vapour intrusion criteria in order to identify any potential risks due to contamination that could extend outside of the Station Box area and remain within the construction site area close to the walls of the Station Box.

- ASC NEPM 1999 (NEPC 2013) Health Screening Level (HSL);
 - HSL D – Commercial / Industrial (Sand, 0m-<1m);

Ecological investigation and screening levels are not considered relevant as soils will be taken off site.

5.2 Groundwater

ERM did not conduct groundwater sampling, however historical data is available and is screened against the following:

- NHMRC (2008) Recommended Recreational Guidelines (Australian Drinking Water Guidelines multiplied by a factor of 10, and used as a conservative proxy screening value for incidental exposure of workers to groundwater during construction). Equivalent WHO and Health Canada drinking water guidelines have been adopted where an Australian guideline is not available;
- ANZG (2018) Default Target Values for slightly to moderately disturbed ecosystems (95%/99% species protection), marine water;
- NEMP Interim Default Values for PFAS for slightly to moderately disturbed ecosystems (99% species protection), marine water;
- NEMP Recreational Water guidelines for PFAS (used as NHMRC 2008); and
- ASC NEPM 1999 (NEPC 2013) Groundwater Health Screening Levels for Vapour Intrusion (HSL D Commercial Industrial, Sand, 2-<4m).

5.3 Soil Vapour

ERM did not conduct soil vapour sampling, however historical data is available and is screened against the following in this DSI.

- CRC Care (2011);
 - Intrusive maintenance worker (sand soil type).

Human health criteria for indoor vapour inhalation are not directly relevant, because the soils will have been removed from the Site for appropriate off-site reuse or disposal. The soil vapour results have, however, been screened against the following vapour intrusion criteria in order to identify any potential risks due to contamination that could extend outside of the Station Box area and remain within the construction site area close to the walls of the Station Box.

- ASC NEPM 1999 (NEPC 2013)
 - Soil Vapour Health Screening Levels for Vapour Intrusion (HSL D Commercial Industrial, Sand, 0-<1m).

6. RESULTS – ERM INVESTIGATION

Site works were conducted in accordance with the methodology stated in *Section 4* between 30 November 2021 and 03 December 2021.

The investigation locations are presented in *Figure 3*. Detailed descriptions of the soils observed during fieldworks are presented on the borehole logs in *Appendix B*. Soil analytical results from the ERM investigation are presented alongside the other historical Station Box data in the summary tables in *Appendix D*, and laboratory certificates are presented in *Appendix E*.

6.1 Subsurface Conditions

The fill material encountered near the surface was between 1 and 3.5m deep and consisted of hardstanding and gravel with bitumen and sandstone. A sandy clay fill was present at ERM_BH08.

Dark grey sands, sandy clays and clayey sands (marine sediments) were encountered below the coarse fill material.

Sandstone was encountered at 20.8m at ERM_BH07, at 14 m at ERM_BH08 and at 18 m at ERM_BH09A.

6.1.1 Field Screening

PID readings ranged from 0.1 ppm to 1.7 ppm at boreholes BH08 and BH09A. PID screening results were slightly higher at BH07, ranging between 0.5 and 7.5 ppm. PID readings are shown on the bore logs provided in *Appendix B*.

Field pH tests performed at every half metre indicated the material sampled was PASS at a number of depths at each of the three boreholes. Samples were collected for confirmatory laboratory analysis. Field pH testing results are provided in *Appendix F*.

6.1.2 Soil Laboratory Results

6.1.2.1 Potential Acid Sulfate Soils

Samples analysed for PASS (chromium suite) exceeded the ASSMAC (1998) action criteria at the following depths within ERM's three station box boreholes:

- ERM_BH07: 1m, 1.5m, 4m, 6m, 6.5m, 7m, 9m, 11m, 11.5m, 12m, 13m, 13.5m, 14m, 14.5m;
- ERM_BH09A: 2m, 16m; and
- ERM_BH08: 12.5m.

6.1.2.2 PFAS

PFAS was not detected in rock samples collected from the target depths sampled to replicate the locations where low level PFAS had been detected in the Senversa (2021) report. These samples were ERM_BH08 at 15m, 25m and 29m, BH07 at 25m and BH09A at 25m. Duplicate and triplicate samples collected from these locations and depths also had no PFAS detected.

PFAS compounds (PFPeA/PFOS) were detected in shallow samples ERM_BH07_1.0 and ERM_BH09A_0.5, indicating cross contamination from shallower material could have occurred during the Senversa investigation.

6.1.2.3 Asbestos

Asbestos was not detected in the one sample analysed for asbestos (ERM_BH09A_0.5).

7. DATA QUALITY EVALUATION

7.1 ERM 2021 Investigation

A QA/QC assessment detailing field procedures, laboratory methods and an analysis of QA/QC sampling results from the investigation is provided in *Appendix G*. Overall, the sample data collected by ERM is considered to be of a suitable standard to be used in this report.

7.2 Previous Investigations

As the conceptual site model presented in this report will incorporate historical data from previous investigations, the quality assurance and quality assurance evaluations within the previous investigation reports were reviewed to ensure any unsuitable data is excluded from the conceptual site model evaluation. Items to note are provided in the table below.

Table 4: Summary of Previous Investigations

Investigation Report	Summary of Quality Assurance/ Quality Control
JBS&G (2017) Detailed Site Investigation White Bay Power Station Proposed Lot 1	JBS&G's evaluation of their data is that the data set is of an acceptable quality upon which to draw conclusions regarding the environmental condition of the assessment area. ERM's review concurs with this assessment.
JBS&G (2017) Detailed Site Investigation White Bay Power Station Proposed Lot 2	JBS&G's evaluation of their data is that the data set is of an acceptable quality upon which to draw conclusions regarding the environmental condition of the assessment area. ERM's review concurs with this assessment.
Golder-Douglas (2018) Groundwater Monitoring Report – Sydney Metro West Geotechnical Investigation	Golder Douglas note that although variances and non-conformances with acceptable criteria were noted, that these are considered unlikely to affect the validity of the data. The precision of most duplicates of organic compounds was acceptable and variability in PAH and TRH attributed to variance in laboratory handling, extraction and measurement procedures.
Golder Douglas (2020) Geotechnical Investigation Factual Report – White Bay Pavement Investigation	Golder Douglas note that although variances and non-conformances with acceptable criteria were noted, that these are considered unlikely to affect the validity of the data. The quality of the data was concluded to be acceptable for environmental interpretive purposes. ERM's review concurs with this assessment.
Golder-Douglas (May 2021) Groundwater Monitoring Report – Stage 2 Locations – Sydney Metro West Geotechnical Investigation	Golder Douglas note that although variances and non-conformances with acceptable criteria were noted, that these are considered unlikely to affect the validity of the data. The quality of the data was concluded to be acceptable for environmental interpretive purposes. ERM's review concurs with this assessment
Golder-Douglas (June 2021) Sydney Metro West- Groundwater Monitoring Report – Stage 3 Locations –	Golder Douglas note that although variances and non-conformances with acceptable criteria were noted, that these are considered unlikely to affect the validity of the data. The quality of the data was concluded to be acceptable for environmental interpretive purposes. ERM's review concurs with this assessment

Investigation Report	Summary of Quality Assurance/ Quality Control
Senversa (2021) Factual Contamination Investigation Report – The Bays, Sydney Metro West, White Bay Site Investigation	While Senversa concluded the investigation data was of adequate quality for the intended purpose in forming conclusions relating to the characterisation of pre-existing contamination at the site, they list the following as key aspects to consider relating to data quality: ■ Interpretation of depth of fill in some areas of the site ■ The rock core analytical process which required rock crushing prior to extraction and analysis ■ Lower level certainty in the detection of PFAS in four rock samples collected from S59 and S65 within the Station Box ■ Lower level certainty in the identification of anthropogenic waste material in fill due to the reliance on use of soil bores at many locations and access constraints from pavement and buildings. ERM has taken these comments into account in developing the conceptual site model.

8. CONCEPTUAL SITE MODEL

8.1 Overview

A Conceptual Site Model (CSM) is the qualitative description of plausible mechanisms by which human and/or environmental receptors may be exposed to site contamination. For exposure to be considered possible, some mechanism ('pathway') must exist by which impact from a given source can reach a given receptor. This is classed as a source-pathway-receptor (SPR) linkage.

The following section presents a summary of the potential sources, pathways and receptors applicable to the Station Box portion of the Site, as well as identifying potential source-pathway-receptor (SPR) linkages, based on the data collected by JBS&G (2017), Golder-Douglas (2018), Golder-Douglas (2020), Golder-Douglas (May 2021), Golder-Douglas (June 2021), Senversa (2021) and ERM (2021). The identification of SPR linkages forms a key part of developing the Conceptual Site Model (CSM).

The potential for SPR linkages to exist has been assessed assuming current commercial / industrial site use in the current site configuration, and future removal of all excavated material from the Site. The assessment is based on ERM's understanding of the proposed Station Box construction, review of previous investigations, the findings of the current investigations and knowledge of the prevailing conditions at the Site.

8.2 Potential Sources of Contamination

Based on the previous investigations supplied to ERM, the known and suspected Areas of Environmental Concern (AECs), along with the Contaminants of Potential Concern (COPC) are summarised in *Table 5*.

Table 5: AECs and COPCs

Areas of Environmental Concern	Contaminants of Potential Concern
Fill associated with previous land reclamation works	Heavy Metals, TRH, PCBs, Pesticides/Herbicides, asbestos and PFAS
Former Building Footprints	Heavy Metals, TRH, PCBs, Pesticides/Herbicides, PAH and asbestos
Former Storage Tanks	Heavy Metals, TRH/VOCs, BTEXN, PAH, Phenols and asbestos
Former Coal Storage, Processing Yards and Ash Handling Areas	Heavy Metals, TRH/VOCs, PAH, PCBs
Contiguous Fly Ash Areas	Heavy Metals, TRH, PAH, PCBs
Hawkesbury Sandstone at depth	PFAS (source unknown) (detected at S59 and S65)
Natural estuarine soils below fill	Potential Acid Sulfate Soil (PASS) (action criteria exceeded at SWM_ERV020, SWM_ENV_023 and SWM_ENV022)

8.3 Nature and Extent of Contamination Present

The media on Site previously identified as potentially contaminated are:

- soils (fill material and underlying natural soils);
- rock; and
- groundwater.

Environmental investigations have been completed by JBS&G (2017), Golder-Douglas (2018), Golder-Douglas (2020) Golder-Douglas (May 2021), Golder-Douglas (June 2021), Senversa (2021) and ERM (2021) which have informed the following summary. *Figure 2* shows ERM's locations and the historical data points from JBS&G (2017), Golder-Douglas (2020) and Senversa (2021).

Data relevant to the Station Box from the above mentioned investigations have been screened against the nominated assessment criteria in *Tables 1 to 12* in *Appendix D*.

The data is discussed in the following subsections.

8.3.1 Soil /Rock

Fill materials on Site have been reported to comprise concrete, bitumen, roadbase (basalt), sandstone gravels and re-worked marine sediments with some anthropogenic inclusions. Natural soils below the fill consist of marine/estuarine sands and clay, with Hawkesbury Sandstone underlying the sands and clays.

As the soil profile was substantially different across the length of the station box, (e.g. depth of the estuarine sediments is substantially deeper in the western portion of the Station Box, when compared to the eastern portion, the Station Box), the Station Box was divided into grids to aid in waste classification. The classification of soils by grid area was to enable specification of the differing depths of the spoil/waste types across the Station Box, and to define clear spatial extents for the spoil types referred to within the in-situ waste classification reports. These grids are presented in *Figure 3*, *Appendix A*. Waste classification is separated into four separate reports: Fill, PASS Fill, PASS Natural Marine Sediments, and VENM (natural marine sediments and rock) (ERM, 2022a, b, c and d.). The depth range of each of these material types within each grid is shown on *Figure 3*.

Human health criteria (commercial/industrial – direct contact) were exceeded at one location (E66 at 1.7-2m) for TRH C16-C34 fraction. TRH Management Limits were also exceeded at three locations (E66 at 1.7-2m, ENV026 at 3m, and S64 at 4-4.1m).

Station Box soils exceeded the health screening level for vapour intrusion (HSL D) for F1 TRH (C₆-C₁₀ less BTEX) in 4 of the 345 samples analysed for TRH. This guideline, while not directly applicable to station box soil as it will be removed, was applied to assess potential vapour intrusion should the soil contamination identified extend to the areas immediately outside of the Station Box area.

Human health criteria (commercial/industrial – direct contact) for lead was exceeded in one sample (ENV024_2.0). No other metals concentrations exceeded the adopted human health screening levels.

PAHs were detected at numerous locations across the site. Carcinogenic PAHs as benzo(a)pyrene TEQ exceeded the adopted human health screening criteria at two sample locations (ENV022, 1.2 m, and ENV024, 2 m).

PCBs were detected in one sample location (S62-0-0.1) at a concentration below the adopted screening criteria.

Pesticides were detected at one sample location (dieldrin and aldrin C27, 1-1.1m). All pesticide results were below the adopted screening criteria.

PFAS analysis was conducted during the Senversa, Golder Douglas and ERM investigations and while PFAS compounds were detected in some soil samples, concentrations were below the adopted human health criteria. PFAS was not detected in rock samples collected by ERM. Data collected by ERM supports the hypothesis that previous detections of PFAS in rock were due to cross contamination, and rock can therefore be classified as VENM.

Potential Acid Sulfate Soils have also been reported to be present on Site within the natural soils. Net acidity values have been reported above the relevant action criteria at some locations. Results show PASS is present at the following depths within each grid (See *Figure 3*):

- Grid 1: 0.5 m-15 m;
- Grid 2: 1.5 m to 16.5 m;
- Grid 3: 3.5 m to 6.5 m;
- Grid 4: 3.5m to 5m; and
- There is no PASS within Grid 5.

HIL D asbestos criterion was exceeded for fibrous asbestos and asbestos fines in two locations (S59_0.05 and S19_0.45). ERM is also aware that fragments of asbestos containing material have been identified in nearby fill material during geotechnical drilling at the Site.

8.3.2 Groundwater

The historical data for groundwater within the Station Box reports metals (cobalt and manganese) and isopropylbenzene in groundwater at concentrations exceeding ecological criteria at some locations. A number of other substituted benzenes were also detected, and all are likely related to petroleum hydrocarbons which were detected in the same samples. Groundwater data from Station Box wells are screened against the adopted screening criteria in *Tables 8a 9a 10a and 11a*.

The historical data from wells across the wider Construction site area was also evaluated as groundwater ingress may occur during dewatering. Metals (cadmium, cobalt, copper, lead, manganese, mercury, nickel and zinc), PFAS and TRH in groundwater were present at concentrations exceeding the adopted ecological criteria at some locations. TDS and iron concentrations exceeded the recreational guideline value at some locations. PFAS concentrations were reported above the human health recreational guideline criteria in one groundwater sample (C64, located in the south western corner of the site). Groundwater data from Construction Site wells are screened against the adopted screening criteria in *Tables 8b 9b 10b and 11b*.

8.3.3 Soil Vapour

Soil vapour was sampled at four Station Box locations by JBS&G (2017) and no COPCs were detected within the soil vapour (*Table 12*).

8.4 Potential Receptors

The potential sensitive receptors for contaminants present within the Station Box include:

- Present (Central Tunnelling Package and future Sydney Metro construction workforce) who may potentially be exposed to COPCs through direct contact with impacted soils and groundwater, and/or inhalation of dust associated with impacted soils;
- General public / passers-by during construction works (dust and odour, potential direct contact with soil via trucks transporting waste spoil if sheeting/wheel washing inadequate);
- Current and future recreational users of White Bay and/or Rozelle Bay (exposure via discharge from construction water treatment plant, groundwater movement); and
- Aquatic ecological receptors in White Bay and/or Rozelle Bay (exposure via discharge from construction water treatment plant, groundwater movement).

8.5 Potential Exposure Pathways

The following potential pathways of exposure that may result from impact to soil, groundwater or air are likely relevant to the Station Box:

- Discharge of groundwater to surface water (White Bay, Rozelle Bay);
- Direct contact with impacted soil or groundwater; and
- Inhalation of asbestos fibres and/or dust.

8.6 Contamination Migration Potential

The construction works has potential to affect the distribution of contamination, particularly due to dewatering of the Station Box which is likely to result in groundwater flow moving towards the Station Box. Water pumped from the Station Box during construction will be directed to a water treatment plant, and discharged into White Bay. The Station Box dewatering is therefore considered to be the most significant mechanism for creating potential migration of contaminated groundwater.

Further, disturbance created by excavation works could increase contaminant leachability into groundwater, create dust, and/or mobilise soil vapours. These potential migration pathways are assessed as follows:

8.6.1 Migration via dewatering

Groundwater monitoring data for inside the Station Box indicates groundwater quality exceeds ecological criteria for some analytes, however no significant groundwater impact has been identified. The groundwater monitoring network and dataset is considered a sufficient basis to provide adequate groundwater characterisation. Whilst groundwater flow patterns will be affected, it is not considered likely that the change in flow direction will create migration that would result in a change to the risk profile at the site.

Ongoing groundwater monitoring is recommended (and is understood to be planned) to provide data on changes to groundwater throughout the duration of the works.

8.6.2 Migration via water treatment and discharge

Treatment and discharge of groundwater potentially leads to a more rapid pathway for groundwater to enter White Bay/Rozelle Bay than currently exists via groundwater flow. The groundwater currently has reported exceedances of ecological criteria for some analytes and untreated discharge could increase risks to ecology of the receiving waterways.

The water treatment plant discharges will be regulated by NSW EPA under an Environmental Protection Licence, and this will provide sufficient regulation and management of potential impacts from discharges. The migration risk is therefore considered adequately managed.

8.6.3 Migration of vapours and odours

There was no evidence from the combined investigations for significant sources of either soil vapour or odorous materials. Therefore the risk of creating migration of vapours or odours is considered low.

8.6.4 Mobilisation of soil contaminants

The soil contaminants of concern were primarily petroleum hydrocarbons, PAH compounds and asbestos. Whilst mobilisation of this soil contamination is unlikely to result in significant groundwater contamination, disturbance of PASS may result in a drop in soil pH, which could result in increased mobilisation of COPCs.

There were some detections of PFAS compounds in soils, and these are highly mobile. However, there were no exceedances of either human health or ecological criteria, and any increase in PFAS leachability is not considered likely to have potential to affect groundwater concentrations.

The creation of dust is potentially significant due to the presence of asbestos, including some fibrous asbestos, in fill materials. Management of this risk will be necessary.

8.7 Potentially Complete Source Pathway Receptor Linkages

A Source-Pathway-Receptor (SPR) linkage is considered to be present when a pathway links a source with a receptor. These linkages explain when there may be risks to the receptor, either now or in future.

The assessment of the SPR linkages for the soil and groundwater conditions at the Station Box is summarised in *Table 6* below

Table 6: SPR linkage assessment

Source	Pathway / Transport Mechanism	Receptor(s)	SPR linkage status
Soil Conditions	Direct Contact	Current: Sydney Metro construction workforce General public / passers-by/ future site users	Potentially complete: Human health criteria (commercial/industrial) exceeded for carcinogenic PAHs (benzo(a)pyrene TEQ) at two sample locations (ENV022, 1.2m, and ENV024, 2m). Human health criteria (commercial/industrial – direct contact) was also exceeded at one location (E66 at 1.7-2m) for TRH C16-C34 fraction.
	Inhalation of vapours		Not complete: No detection of COPCs in soil vapour samples. Soil results were below intrusive maintenance worker vapour screening criteria. Soil results were below vapour intrusion screening levels (sand 0-<1 m) except in 4 of the 345 samples. This guideline, while not directly applicable to the station box soil, as it will be removed, was applied to assess potential vapour intrusion should soil contamination identified extend to the areas immediately outside of the Station Box area. The potential for vapour intrusion based on four samples exceeding the Tier 1 screening criteria is low. The lines of evidence that support this are: ■ The HSLs are designed for enclosed structures that are not open to ambient air which can result in the advective negative pressures that draw air from the subsurface that draw air into the indoor air space. ■ The HSLs have conservative assumptions that are based on enclosed residential air spaces and do not consider likely vapour intrusion potential for commercial buildings. ■ The petroleum hydrocarbon impacts identified are older, and less volatile fractions. The HSLs assume fresh petrol impacts in soil. ■ The size of the station box and the indoor air space is very large relative to the isolated impacts identified in four of the samples. ■ The impacts are not extensive both vertically within the soil profile, or horizontally, with delineation of impacts indicating isolated pockets of impacts. ■ Soil vapour samples did not indicate any vapour issues.
	Inhalation of dust		Potentially complete: HIL D asbestos criterion was exceeded for fibrous asbestos and asbestos fines in two locations (S59_0.05 and S19_0.45). ERM is also aware that fragments of asbestos containing material have been identified in nearby fill material during geotechnical drilling at the site.
	Exposure to flammable or odorous material		Potentially complete. TRH Management Limits were exceeded at three locations (E66 at 1.7-2m, ENV026 at 3m, and S64 at 4-4.1m).

Source	Pathway / Transport Mechanism	Receptor(s)	SPR linkage status
			Should odorous soils be present within the walls of the station box, these are not considered to warrant any action as: ■ odorous soils identified at the site are isolated (not extensive across large areas or depths); ■ any odours able to emanate through the station box wall will undergo a significant amount of air dilution; ■ the data suggests odour is not likely to be present in soils below 5m bgl and these shallow areas of the station box are expected to have a large amount of air exchange with the outdoor air; and ■ odours are considered to be an aesthetic consideration rather than a human health risk.
	Disturbance of PASS	Aquatic ecological organisms in White Bay / Rozelle Bay Terrestrial flora/fauna on Site	Potentially complete. PASS identified in the Station Box above action criteria. .
Groundwater Conditions	Direct Contact /Ingestion	Current: Sydney Metro construction workforce	Potentially complete (current and future construction workers). Excavations at the site may result in workers coming in contact with groundwater exceeding recreational criteria: Incomplete (future site users): Future users of either the Sydney Metro station or the development land are not considered potentially exposed to impacted groundwater because there will be no pathway for direct contact.
	Inhalation of vapours		Incomplete: contaminant data does not indicate vapour in groundwater will present a risk.
	Direct Contact /Ingestion	Aquatic ecological organisms in White Bay / Rozelle Bay Terrestrial flora/fauna on Site	Potentially complete for aquatic organisms: Groundwater samples from exceeded the ecological screening criteria (metals in particular) Incomplete for terrestrial ecology: not likely to be groundwater dependent

In summary the potentially viable SPR linkages comprise:

- Potential risks to Sydney Metro construction and intrusive maintenance workforces via direct contact with soil or inhalation of dust (potentially including asbestos fibres);
- Potential risks to the general public / passers-by from dust generated by construction activity; and
- Potential risks to aquatic organisms in White Bay / Rozelle Bay from discharge of impacted groundwater.

Each of these potentially viable SPR linkages can be eliminated via appropriate management of spoil, appropriate health and safety systems preventing direct contact, and appropriate treatment of water from dewatering prior to discharge.

ERM considers that the Station Box is suitable for the Sydney Metro station excavation, subject to appropriate waste and PASS management during construction, appropriate management and treatment of groundwater, and appropriate health and safety systems preventing construction workers having direct contact with soils.

9. CONCLUSIONS

Extensive investigation has been completed across the Site since 2017. Three additional boreholes were drilled and the soils were logged and sampled in order to address some areas of data gap including determining the extent of PFAS in rock, and the vertical extent of PASS.

Relevant historical data from JBS&G (2017), Golder-Douglas (2020), Golder-Douglas (2018), Golder-Douglas (May 2021), Golder-Douglas (June 2021) and Senversa (2021) was used in conjunction with data from the three additional boreholes completed by ERM allowed the following conclusions to be made relating to soil at the site:

- The combined soil data set is considered to provide site characterisation in accordance with the requirements of guidance made or approved under s105 of the Contaminated Land Management Act 1997;
- Fill materials in the Station Box have been reported to comprise concrete, bitumen, roadbase (basalt), sandstone gravels and re-worked marine sediments with some anthropogenic inclusions. Natural soils below the fill consist of marine/estuarine sands and clay, with Hawkesbury Sandstone underlying the sands and clays;
- As the depth of the estuarine sediments is substantially deeper in the western portion of the Station Box, when compared to the eastern portion, the Station Box was divided into grids and a spoil type/waste classification depth profile was developed (*Figure 3*);
- Soil samples exceeded human health criteria (commercial/industrial – direct contact) at one location (E66 at 1.7-2m) for TRH C16-C34 fraction. TRH Management Limits were also exceeded at three locations (E66 at 1.7-2m, ENV026 at 3m, and S64 at 4-4.1m);
- Metal concentrations in soil did not exceed the human health screening levels;
- PAHs were detected in soil at numerous locations across the site. Carcinogenic PAHs as benzo(a)pyrene TEQ exceeded the human health screening criteria at two sample locations (ENV022, 1.2m, and ENV024, 2m);
- PCBs were detected in soil at one sample location (S62-0-0.1) at a concentration below the screening criteria;
- Pesticides were detected at one soil sample location (dieldrin and aldrin C27, 1-1.1m). All pesticide results were below the screening criteria;
- PFAS analysis was conducted during the Senversa, Golder Douglas and ERM investigations and while PFAS compounds were detected in some soil samples, concentrations were below human health criteria. PFAS was not detected in rock samples collected by ERM. Data collected by ERM supports the hypothesis that previous detections of PFAS in rock were due to cross contamination, and rock can be classified as VENM;
- Potential Acid Sulfate Soils have also been reported to be present on Site within the natural soils. Net acidity values have been reported above the relevant action criteria at some locations. Results show PASS is at the following depths within each grid (*See Figure 3*):
 - Grid 1: 0.5m-15m;
 - Grid 2: 1.5m to 16.5m;
 - Grid 3: 3.5m to 6.5m;
 - Grid 4: 3.5m to 5m; and
 - There is no PASS within grid 5.
- HIL D asbestos criterion was exceeded for fibrous asbestos and asbestos fines in two locations (S59_0.05 and S19_0.45). ERM is also aware that fragments of asbestos containing material have been identified in nearby fill material during geotechnical drilling at the site;

- No significantly odorous soil was encountered, and odours are not considered likely to present a risk to the construction site; and
- No significant concentrations of volatile substances were noted, and soil vapour results indicated no significant risk from soil vapours.

The conclusions relevant to groundwater at the site are as follows:

- The combined groundwater data set for inside the Station Box is considered to provide site characterisation in accordance with the requirements of guidance made or approved under s105 of the Contaminated Land Management Act 1997;
- Groundwater at some locations exceeded ecological criteria for one or more of cobalt, manganese and isopropylbenzene. Petroleum hydrocarbons were detected in groundwater at three locations (no screening criteria);
- No detections of PFAS were reported within samples inside the Station Box; and
- Dewatering of the Station Box is likely to result in groundwater flow changing from the current flow towards White Bay / Rozelle Bay to a flow pattern where some of the groundwater below the Site flows towards the Station Box. This is not considered likely to result in any significant change to the overall quality of groundwater beneath the site, or to the risk profile.

In summary the potentially viable SPR linkages that require remediation action (further assessment, remediation or management) comprise:

- Potential risks to Sydney Metro construction workforces via direct contact with soil, groundwater or inhalation of dust (potentially including asbestos fibres);
- Potential risks to the general public / passers-by from dust generated by construction activity; and
- Potential risks to aquatic organisms in White Bay / Rozelle Bay from discharge of impacted groundwater.

For the Sydney Metro Station Box there are considered to be no potential risks to future site users or workforce, since it is understood there will be no exposed soil and no access to groundwater within the developed Station Box. Four soil samples out of the 345 analysed exceeded vapour intrusion criteria used to assess the potential scenario of contaminants extending beyond the station box and present within 1 m of the station box wall. Multiple lines of evidence were used to conclude the HSLs were overly conservative for the Station Box and the data observed and vapour intrusion risks are unlikely. This is corroborated with soil vapour data that did not indicate any vapour issues.

Similarly, any odorous soils that may be encountered are not considered to warrant any action as the data indicates odorous soils are shallow (<5m bgl) and isolated (not extensive across large areas or depths). Odours are not likely to penetrate the concrete walls of the station box and any odours that are able to emanate through the station box wall would undergo a significant amount of air dilution and exchange with outdoor air.

ERM considers that the Site is suitable for the Sydney Metro station use, subject to appropriate construction health and safety management, appropriate waste management during construction, and appropriate management and treatment of groundwater.

Remediation action is not required to make the Station Box suitable for use, because;

- 100% of the soil and rock inside the Station Box footprint is required to be removed for construction purposes, and management of site materials are to be conducted in accordance with a Soil and Groundwater Management Plan; and
- There are no viable potential SPR linkages that would remain following completion of construction works, with the exception of long term drainage of the Station Box and tunnels. ERM understands that there will be a permanent water treatment plant, regulated by an Environmental Protection Licence.

A Remediation Action Plan (RAP) is therefore not required for the Station Box for the purposes of making the site suitable for use, and a RAP is not required for the Station Box area to meet CoA D72 within the Conditions of Approval for Sydney Metro West – Concept and Stage 1 Construction (SSI 10038). Despite this, soil and groundwater within the Station Box does meet the definition of ‘contamination’ within the Deed, and so AFJV are required to prepare a RAP to comply with their contractual obligations.

A Remediation Action Plan is required for the area of The Bays Construction Site that is external to the Station Box for the purposes of making the site suitable for use.

Two separate RAPs will therefore be prepared for the Site – a ‘Commercial RAP’ for the Station Box area – prepared in accordance with the Project Deed requirements and focussed on the management of spoil during excavation works and The Bays Construction Site RAP which is being prepared for the remainder of The Bays site area for the purposes of rendering the site suitable for use in accordance with the requirements of the Contaminated Lands Management Act (1997), guidelines prepared under the Act and the ASC NEPM 1999 (NEPC 2013). Considerations will need to be made for the sustainability of future actions during remediation planning.

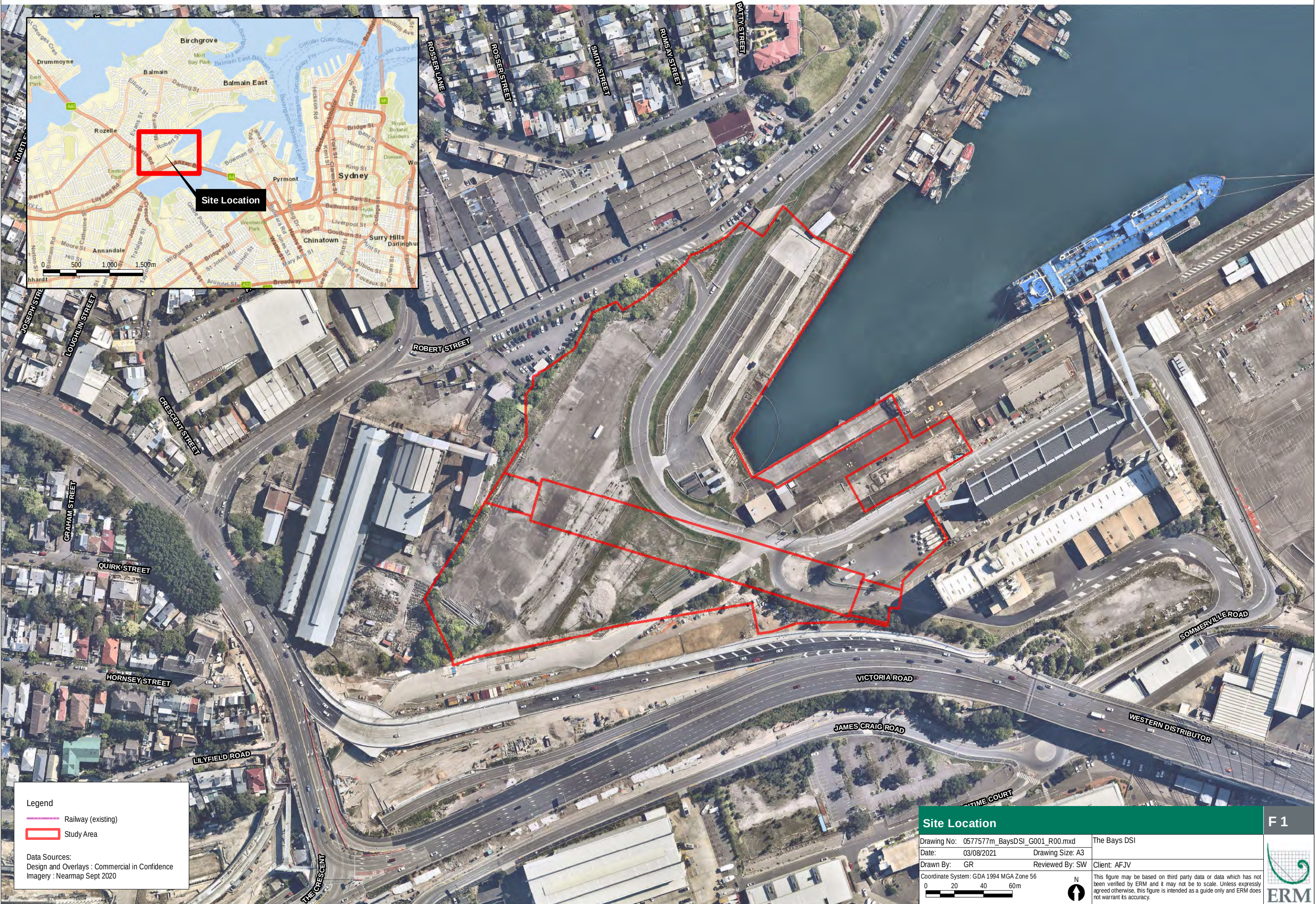
Waste classification for the Station Box has been completed and is presented in four separate waste classification reports.

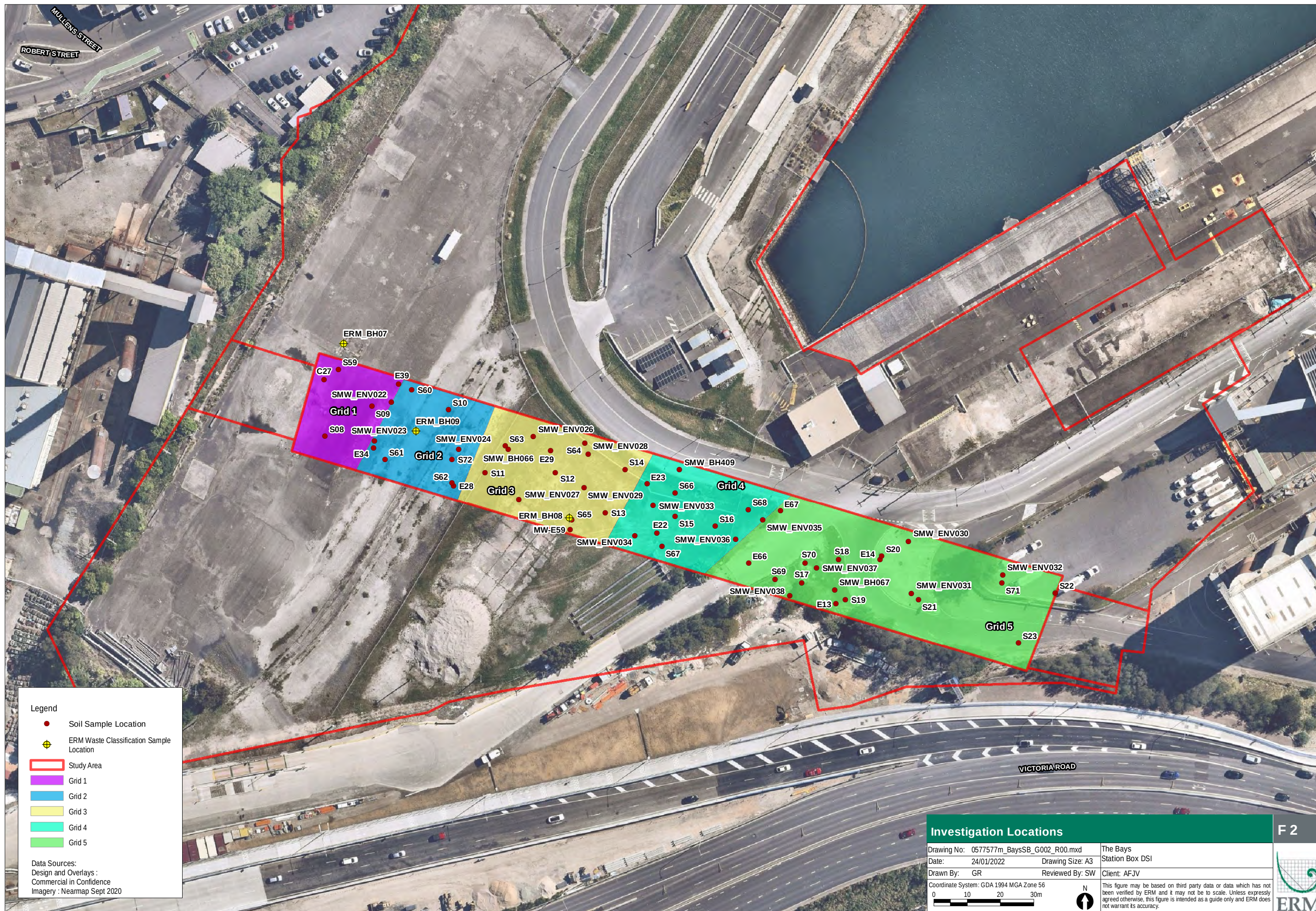
ERM considers that the applicable requirements of the Deed and the project CoA have been complied with.

10. REFERENCES

- AS 4482.1-2005. Guide to the investigation and sampling of sites with potentially contaminated soil. Part 1: Volatile and Semi-volatile compounds. Standards Australia.
- AS 4482.2-1999. Guide to the investigation and sampling of sites with potentially contaminated soil. Part 2: Volatile substances. Standards Australia.
- CRC Care (2010) Health screening levels for petroleum hydrocarbons in soil and groundwater. Summary, CRC CARE Technical Report no. 10
- CRC Care (2017) Technical Report no. 39. Risk based management and remediation guidance for benzo(a)pyrene.
- EPA Victoria (2009) Industrial Waste Resource Guidelines: Soil Sampling. Publication IWRG702.
- ERM (2021), Sampling and Analysis Quality Plan (SAQP), The Bays Construction Site
- ERM (2022a), Station Box Waste Classification – W01 – ‘FILL’, The Bays Construction Site, Ref: 0577577_R02_Waste Class_The Bays FILL_F01, 07 February 2022
- ERM (2022b), Station Box Waste Classification – W02 – ‘PASS FILL’, The Bays Construction Site, Ref: 0577577_R02_W02) Waste Class_The Bays PASS FILL_F01, 07 February 2022
- ERM (2022c), Station Box Waste Classification – W03 – ‘Natural PASS’, The Bays Construction Site, Ref: 0577577_R02_W03_Waste Class_The Bays Natural PASS_F04, 02 March 2022
- ERM (2022d), Station Box Waste Classification – W04 – ‘Non ASS Natural Materials / VENM’, The Bays Construction Site, Ref: 0577577_R02_W04_Waste Class_The Bays VENM_F01, 07 February 2022
- Friebel, E & Nadebaum, P. (2011). Health screening levels for petroleum hydrocarbons in soil and groundwater. Summary, CRC CARE Technical Report no. 10. CRC for Contamination Assessment and Remediation of the Environment
- Golder-Douglas (2018) Groundwater Monitoring Report – 00013/11180 Sydney Metro West Geotechnical Investigation. 1791865-003-R-GWMM-RevA
- Golder-Douglas (May 2021) Groundwater Monitoring Report – Stage 2 Locations – Sydney Metro West Geotechnical Investigation. 1791865-023-R-GWM Stage 2 Rev1
- Golder-Douglas (June 2021) Sydney Metro West- 00013/11180 Sydney Metro West Groundwater Monitoring Report – Stage 3 Locations. 1791865-026-R-GWM Stage 3 RevC
- Golder-Douglas (April 2020) Addendum Final Geotechnical Data Report – White Bay Pavement Investigation. The Bays Precinct, Stage 1 Early Works Package, White Bay, Rozelle, NSW.
- Golder-Douglas (May 2020) Factual Contamination Assessment Report – Geotechnical Investigation, The Bays Precinct, Stage 1 Early Works Package, White Bay, Rozelle, NSW.
- Golder-Douglas (June 2020). Contamination Assessment Report, The Bays Precinct, Stage 1 Early Works Package, White Bay, Rozelle, NSW.
- HEPA & DoEE (2020) PFAS National Environmental Management Plan Version 2.0, Heads of EPAs Australia and New Zealand (HEPA) and the Australian Government Department of the Environment and Energy (DoEE).
- JBS&G (2015), Site Wide Remedial Concept Plan: The Bays Precinct Urban Transformation Area.
- JBS&G (2017), Detailed Site Investigation White Bay Power Station Proposed Lot 1; Roberts Street, Rozelle, NSW
- JBS&G (2017), Detailed Site Investigation White Bay Power Station Proposed Lot 2; Roberts Street, Rozelle, NSW
- NEPC (2013). National Environment Protection (Assessment of Site Contamination) Measure 1999 (ASC NEPM). National Environment Protection Council.
- NSW EPA (2020). Contaminated Land Guidelines: Consultants reporting on contaminated land. New South Wales Environment Protection Authority.
- Senversa (2021), Factual Contamination Investigation Report – The Bays, Sydney Metro West, White Bay Site Investigation, dated 21st May 2021 (Ref:000013/11868).

APPENDIX A FIGURES





- Legend
- Soil Sample Location
 - ⊕ ERM Waste Classification Sample Location
 - ▭ Study Area
 - ▭ Grid 1
 - ▭ Grid 2
 - ▭ Grid 3
 - ▭ Grid 4
 - ▭ Grid 5

Data Sources:
Design and Overlays :
Commercial in Confidence
Imagery : Neamap Sept 2020

Investigation Locations

Drawing No: 0577577m_BaysSB_G002_R00.mxd
Date: 24/01/2022
Drawn By: GR

Drawing Size: A3
Reviewed By: SW

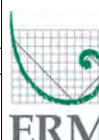
The Bays
Station Box DSI
Client: AFJV

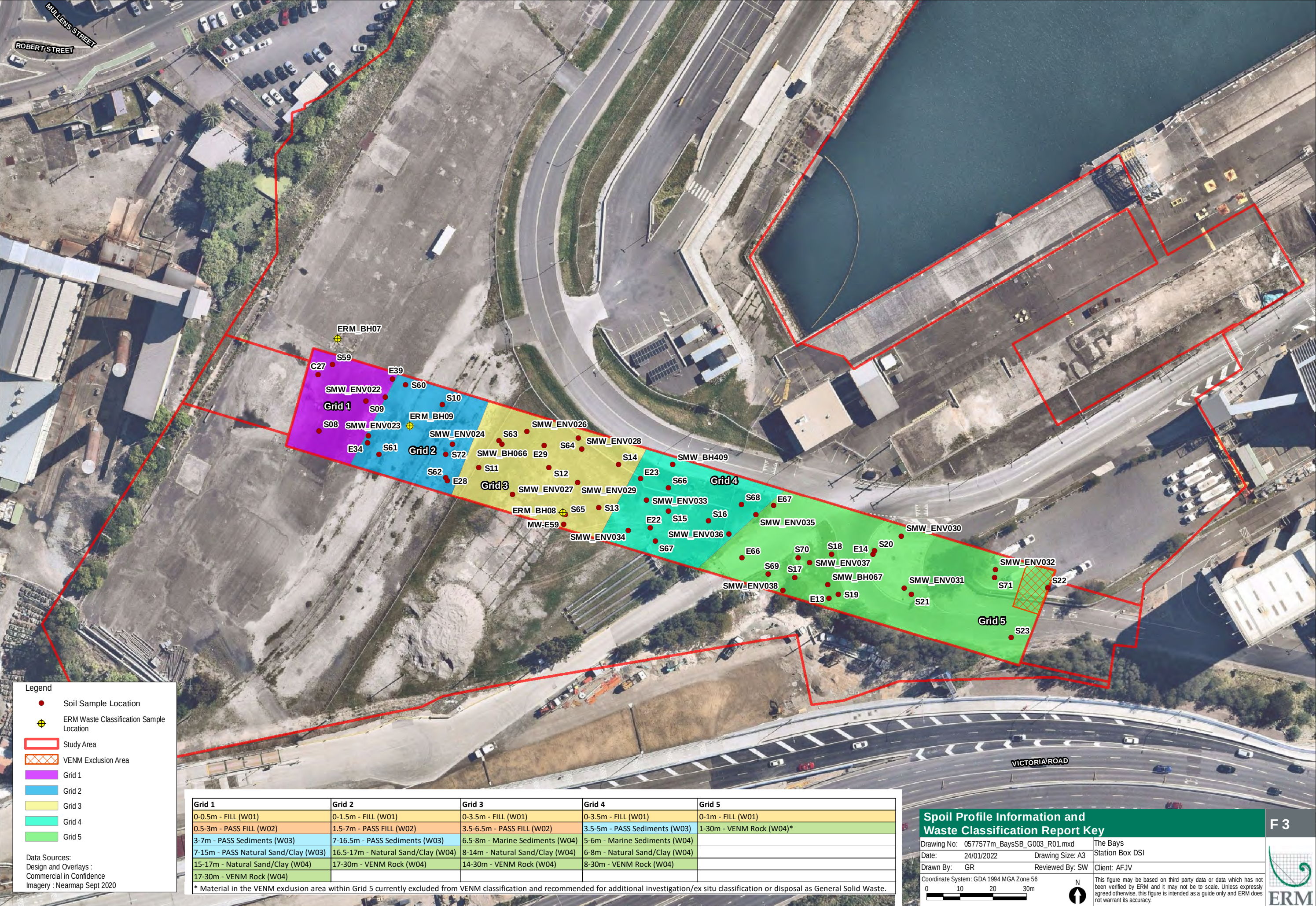
Coordinate System: GDA 1994 MGA Zone 56
0 10 20 30m



This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy.

F 2





Legend

- Soil Sample Location
- ERM Waste Classification Sample Location
- Study Area
- VENM Exclusion Area
- Grid 1
- Grid 2
- Grid 3
- Grid 4
- Grid 5

Data Sources:
Design and Overlays :
Commercial in Confidence
Imagery : Nearmap Sept 2020

Grid 1	Grid 2	Grid 3	Grid 4	Grid 5
0-0.5m - FILL (W01)	0-1.5m - FILL (W01)	0-3.5m - FILL (W01)	0-3.5m - FILL (W01)	0-1m - FILL (W01)
0.5-3m - PASS FILL (W02)	1.5-7m - PASS FILL (W02)	3.5-6.5m - PASS FILL (W02)	3.5-5m - PASS Sediments (W03)	1-30m - VENM Rock (W04)*
3-7m - PASS Sediments (W03)	7-16.5m - PASS Sediments (W03)	6.5-8m - Marine Sediments (W04)	5-6m - Marine Sediments (W04)	
7-15m - PASS Natural Sand/Clay (W03)	16.5-17m - Natural Sand/Clay (W04)	8-14m - Natural Sand/Clay (W04)	6-8m - Natural Sand/Clay (W04)	
15-17m - Natural Sand/Clay (W04)	17-30m - VENM Rock (W04)	14-30m - VENM Rock (W04)	8-30m - VENM Rock (W04)	
17-30m - VENM Rock (W04)				
* Material in the VENM exclusion area within Grid 5 currently excluded from VENM classification and recommended for additional investigation/ex situ classification or disposal as General Solid Waste.				

Spoil Profile Information and Waste Classification Report Key

Drawing No: 0577577m_BaysSB_G003_R01.mxd	The Bays Station Box DSI
Date: 24/01/2022	Drawing Size: A3
Drawn By: GR	Reviewed By: SW
Client: AFJV	
Coordinate System: GDA 1994 MGA Zone 56	
0 10 20 30m	
N	
This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy.	

APPENDIX B BORELOGS



BORE LOG ID ERM_BH07

Client: AFJV	Drilling Method: Continuous Coring	Elevation (Ground): 3.492
Project No: 0577577	Hole Diam./Width (mm): 200	Elevation (Case): -
Project Name: Sydney Metro West	Surface Completion: Backfill	Easting (MGA): 331535.122
Site Address: Port Access Road, Rozelle	Final Water Level (m bgl): 2.5	Northing (MGA): 6251084.263
Drilling Date: 30/11/2021 - 2/12/2021		

Comments:	Log By: TR Checked By: JL
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Material Description	Symbol	Depth (m)	% Recovery	Sample Type	Analysed	PID	Samples	Additional Observations
CONCRETE: Concrete slab								
FILL: Grey, gravelly fill with glass and bitumen		1			Y	1.9	ERM_BH07_1.0	
SAND: Dark grey sands, damp, poorly sorted with shells					Y	1.6	ERM_BH07_1.5	
		2				2.5		
		3				3		
SANDY CLAY: Dark grey/black sandy clay, fine with organic matter, soft, medium-high plasticity		4			Y	5.1	ERM_BH07_4.0	
SAND: Dark grey sands, damp, poorly sorted with shells		5				7.5		
SANDY CLAY: Dark grey/black sandy clay, high plasticity, soft		6			Y	5.5	ERM_BH07_6.0	
		7			Y		ERM_BH07_6.5	
					Y	7.2	ERM_BH07_7.0	
					Y		ERM_BH07_7.5	
SAND: Grey sands, moist, well sorted, wet at 9m		8				7.1		
		9			Y	1.2	ERM_BH07_9.0	
SANDY CLAY: Grey sandy clay, medium to fine grained, plastic, well sorted, moist		10				1.3		
		11			Y	1.4	ERM_BH07_11.0	
SANDY CLAY: Grey/dark grey sandy clay, moist, plastic, homogenous		12			Y		ERM_BH07_11.5	
					Y	2.5	ERM_BH07_12.0	
SAND: Dark grey/black sand, moist, slight sulfur odour		13			Y	1.5	ERM_BH07_13.0	
					Y		ERM_BH07_13.5	
		14			Y	1.8	ERM_BH07_14.0	
					Y		ERM_BH07_14.5	
SAND: Dark grey sand, moist, sorted, lighter grey with depth, more consolidated and firmer		15				1.5		

Material Description	Symbol	Depth (m)	% Recovery	Sample Type	Analysed	PID	Samples	Additional Observations
		16				1.7		
		17				1.8		
		18			Y	1.7	ERM_BH07_18.0	
		19			Y	1.8	ERM_BH07_19.0	
		20			Y	1.5	ERM_BH07_20.0	
CLAYEY SAND: Orange/grey clayey sand, hard, sorted low plasticity		21				1.7		
SAND: Brown sand, wet, sorted, medium grained, coarse		22				1.1		
SANDSTONE: Grey/brown rock, hard, consolidated		23				0.9		
		24				0.5		
SANDSTONE: Grey sandstone, rock, hard, uniform with some dark grey banding, hard and brittle at 28-29m		25			Y	0.7	ERM_BH07_25.0	20211202_D05
		26				0.6		
		27						
		28						
		29						
Termination Depth at:30 m		30						
		31						
		32						
		33						
		34						



BORE LOG ID ERM_BH08

Client: AFJV	Drilling Method: Continuous Coring	Elevation (Ground): 3.557
Project No: 0577577	Hole Diam./Width (mm): 200	Elevation (Case): -
Project Name: Sydney Metro West	Surface Completion: Backfill	Easting (MGA): 331490.103
Site Address: Port Access Road, Rozelle	Final Water Level (m bgl): 3.5	Northing (MGA): 6251110.218
Drilling Date: 29/11/2021 - 1/12/2021		

Comments:	Log By: TR Checked By: JL
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Material Description	Symbol	Depth (m)	% Recovery	Sample Type	Analysed	PID	Samples	Additional Observations
FILL: Brown gravelly, sandy clay fill with bitumen, plastic, sandstone, loose, soft, poorly sorted		1			Y	1.2	ERM_BH08_1.0	
FILL: Dark brown sandy clay fill, shell fragments, damp, poorly sorted		2				1		
		3				1.1		
SAND: Orange/brown yellow sand, poorly sorted, damp/wet		4				1.4		
SAND: Grey/brown sediment, wet, shells, organic matter, poorly sorted		5				1.3		
		6				1.4		
		7				1.5		
		8				1.7		
SAND: Grey brown sand, sorted, wet		9			Y	1.1	ERM_BH08_9	
		10			Y	1.2	ERM_BH08_10	
SAND: Orange brown/red sands, wet, sorted		11			Y	1.1	ERM_BH08_11	
CLAYEY SAND: Grey clayey sand, wet, soft, sorted, well formed		12			Y	1.3	ERM_BH08_12	
CLAYEY SAND: Red/orange clayey sand, soft, moist, sorted		13			Y	1.5	ERM_BH08_13	
SANDSTONE: Orange/yellow sandstone, red sand inclusions, loose-firm sorted		14			Y	1.5	ERM_BH08_14	
SAND: Red sand, sorted, wet, medium grain		15			Y	1.1	ERM_BH08_15.0	20211130_D02; 20211201_T02

Material Description	Symbol	Depth (m)	% Recovery	Sample Type	Analysed	PID	Samples	Additional Observations
		16				1.2		
		17				1.2		
		18				1.3		
		19				1.5		
		20				1.2		
		21				1.1		
		22				1.2		
		23				1.2		
		24				0.8		
		25			Y	1	ERM_BH08_25.0	20211201_T04
		26				1.2		
		27				0.5		Limited water return at 27m, may indicate fracture/void.
		28				0.8		
		29			Y	0.7	ERM_BH08_29.0	
Termination Depth at:30 m		30				0.7		
		31						
		32						
		33						
		34						



BORE LOG ID ERM_BH09A

Client: AFJV	Drilling Method: Continuous Coring	Elevation (Ground): 3.452
Project No: 0577577	Hole Diam./Width (mm): 200	Elevation (Case): -
Project Name: Sydney Metro West	Surface Completion: Backfill	Easting (MGA): 331494.93
Site Address: Port Access Road, Rozelle	Final Water Level (m bgl): 3	Northing (MGA): 6251119.823
Drilling Date: 2/12/2021 - 3/12/2021		

Comments:	Log By: TR Checked By: JL
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Material Description	Symbol	Depth (m)	% Recovery	Sample Type	Analysed	PID	Samples	Additional Observations
FILL: Grey/brown gravelly fill, bitumen								
CONCRETE: Concrete slab					Y	1.1	ERM_BH09A_0.5	
FILL: Black/grey gravelly fill, dry, loose, poorly sorted, minor plastic		1				0.6		
						0.7		
		2			Y	0.8	ERM_BH09A_2.0	
SAND: Grey/yellow clayey sand fill, medium-course grained, crushed shell fragments, damp						0.6		
SAND: Grey clayey sand, wet, shell fragments		3				0.8		
						0.9		
		4				0.6		
SAND: Grey/yellow clayey sand fine to medium grained, wet, shell fragments								Core loss due to wet material
		5				0.8		Complete core loss 5-8.2m
		6						
		7						
		8						
SAND: Grey clayey sand, medium-coarse grained, shell fragments, wet						0.7		
CLAYEY SAND: Pale grey clayey sand, fine grained, moist		9				1		
						0.7		
		10				0.8		
SANDY CLAY: Grey sandy clay, high plasticity, moist, stiff						0.6		
		11				1		
						0.8		
CLAY: Dark brown/black clay, high plasticity, soft		12				1.1		
						0.6		
		13				1.2		
						0.8		
SAND: Dark brown sand, medium to coarse grained, moist		14			Y	0.8		
						0.7	ERM_BH09A_14.5	
		15			Y	0.5	ERM_BH09A_15.5	

Material Description	Symbol	Depth (m)	% Recovery	Sample Type	Analysed	PID	Samples	Additional Observations
		16			Y	0.8	ERM_BH09A_16.0	
		17			Y	0.5	ERM_BH09A_17.0	
SAND: Red sand, wet, sorted		18				0.6		
SANDSTONE: Grey sandstone, medium-coarse grained,		19				1.1		
SANDSTONE: Grey sandstone, hard, medium-fine grained, dark grey banding, gravels at 28.5m		20				0.3		
		21				0.3		
		22				0.2		
		23				0.3		
		24				0.2		
		25			Y	0.3	ERM_BH09A_25.0	
		26				0.5		
		27				0.2		
		28				0.1		
		29				0.1		
Termination Depth at:30 m		30				0.2		
		31						
		32						
		33						
		34						

APPENDIX C PHOTO LOG



Project Photo Log DSI-Station Box – R03 – 0577577



Photograph 1

Material observed at BH07 at 1.0 mBGL – FILL: gravelly fill, grey with glass and bitumen inclusions.



Photograph 2

Material observed at BH08 at 1.0 mBGL – FILL: dark brown sandy clay, shell fragments, damp



Photograph 3

Material observed at BH08 at 3.0mBGL – FILL: dark brown sandy clay.



Photograph 4

Material observed at BH09 at 1.0 mBGL – FILL: gravelly fill, black/grey, dry, loose, poorly sorted, minor plastic.



Project Photo Log DSI-Station Box – R03 – 0577577



Photograph 5

Material observed at BH07 at 16 mBGL – SAND: dark grey, moist, sorted, lighter grey with depth, more consolidated and firmer.



Photograph 6

Material observed at BH08 at 1.0 mBGL – FILL: dark brown sandy clay, shell fragments, damp



Photograph 7

Material observed at BH08 from 8.5 to 11.5 mBGL – grey brown SAND to orange brown SAND to grey clayey SAND.



Photograph 8

SANDSTONE observed at BH08 at a depth of 15.0 mBGL.



Project Photo Log DSI-Station Box – R03 – 0577577



Photograph 9

SANDSTONE observed at BH08 at a depth of 24.0 mBGL.



Photograph 10

Material observed at BH09A at 16.5 mBGL – SAND: light grey, coarse, sorted, moist, firmer with depth.



Photograph 11

Material observed at BH09A from 17 to 18 mBGL – SAND: red, wet sorted.



Photograph 12

Large gravels deposit observed within the SANDSTONE rock at 28.5 mBGL within BH09A.

APPENDIX D TABLES

Environmental Resources Management Australia Pty Ltd

Environmental Resources Management Australia Pty Ltd

Environmental Resources Management Australia Pty Ltd

Environmental Resources Management Australia Pty Ltd

[illegible]

Data Comments
#1 Reported Analyte LOR is higher than Requested Analyte LOR

[illegible]

[illegible]

	Sample_Depth_Avg	Sample_Depth_Range	Sampled_Date	Field_ID		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	0.9	<0.5	<0.5	<1	<0.5	0.9	<0.5	0.6	1.2	1.8	-	-	-	-	-	-	-	<1	-	<50	<100	<100		
ENV035	0.2	0.2	7/12/2018	ENV035_0.2		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
ENV035	0.5	0.5	7/12/2018	ENV035_0.5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
ENV035	1	1	7/12/2018	ENV035_1.0		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	0.6	<0.5	<0.5	<1	<0.5	0.8	<0.5	0.6	1.2	1.4	-	-	-	-	-	-	-	<1	-	<50	<100	<100	
ENV036	0.1	0.1	7/12/2018	ENV036_0.1		1	<0.5	1.2	<0.5	<0.5	0.8	<0.5	-	<0.5	1.1	<0.5	2.5	<0.5	<0.5	<1	1.4	2.8	1.4	1.7	2	10.8	-	-	-	-	-	-	-	<1	-	270	160	110	
ENV036	0.5	0.5	7/12/2018	ENV036_0.5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
ENV036	1	1	6/12/2018	ENV036_1.0		0.5	<0.5	0.5	<0.5	<0.5	0.5	<0.5	-	<0.5	<0.5	<0.5	1	<0.5	<0.5	<1	<0.5	1	0.6	0.9	1.2	3.5	-	-	-	-	-	-	-	-	-	<50	<100	<100	
ENV037	0.25	0.25	13/12/2018	ENV037_0.25		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	0.6	1.2	<0.5	-	-	-	-	-	-	-	<1	-	290	180	110		
ENV037	0.45	0.45	13/12/2018	ENV037_0.45		0.6	<0.5	1	<0.5	<0.5	0.7	<0.5	-	<0.5	0.8	<0.5	2.1	<0.5	<0.5	<1	0.8	2.1	1.1	1.4	1.7	8.1	-	-	-	-	-	-	-	-	-	<50	<100	<100	
ENV037	0.6	0.6	13/12/2018	ENV037_0.6		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	0.8	<0.5	<0.5	<1	<0.5	0.7	<0.5	0.6	1.2	1.5	-	-	-	-	-	-	-	<1	-	<50	<100	<100	
ENV038	0.2	0.2	13/12/2018	ENV038_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	<1	<0.5	<0.5	<0.5	0.6	1.2	<0.5	-	-	-	-	-	-	-	-	-	<50	<100	<100		
S08	0.45	0.4-0.5	10/03/2021	S08_0.4-0.5		<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	0.6	1.2	<0.5	-	-	-	-	-	-	-	-	-	<50	<100	<100		
S08	0.9	0.8-1	10/03/2021	S08_0.8-1.0		21.2	9.3	17.7	4	<0.5	21	10.4	-	7.9	18.3	2.3	40	2.7	8.9	<1-0.6	34	37.3	26.2	26.2	26.2	236	-	-	<0.5	<0.5	<0.5	<1	<0.5	<0.5	-	-	1160	440	720
S08	1.45	1.4-1.5	10/03/2021	S08_1.4-1.5		3.7	1	4.2	0.6	<0.5	4	2.5	-	1.6	3.8	<0.5	6.7	<0.5	2.1	<0.5	4.1	6.9	5.4	5.6	5.9														

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	Aromatics		Total Recoverable Hydrocarbons							BTEX							Chlorinated Hydrocarbons																	
	C10-C14 Fraction	C6-C9 Fraction	>C16-C34 Fraction	>C10-C16 Fraction minus naphthalene (F2)	>C10-C16 Fraction	>C34-C40 Fraction	>C10-C40 Fraction (Sum)	C6-C10 Fraction minus BTEX (F1)	C6-C10 Fraction	Benzene	Toluene	Ethylbenzene	Xylene (m & p)	Xylene (o)	Total Xylene	Total BTEX	1,1-dichloropropene	1,1-dichloroethane	1,1-dichloroethene	1,1,1,2-tetrachloroethane	1,1,1-trichloroethane	1,2-dibromo-3-chloropropane	1,1,2-trichloroethane	1,1,2,2-tetrachloroethane	1,2,3-trichloropropane	1,2-dichloroethane	1,3-dichloropropane	1,2-dichloropropane	2,2-dichloropropane	Bromochloromethane	Bromodichloromethane	Bromoform	Carbon tetrachloride	
																																		mg/kg
EQL	3	3	100	50	50	100	50	10	10	0.1	0.1	0.1	0.2	0.1	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.5	0.1	0.1	0.1
CRC Care (2011) Direct Contact Intrusive Maint. Worker			85000	62000		120000		82000		1100	120000	85000			130000																			
NEPM (1999) HIL D - Commercial/Industrial																																		
CRC Care (2011) Direct Contact HSL D - Comm/Ind			27000	20000		38000		26000		430	99000	27000			81000																			
NEPM (1999) HSL D (VI) - Commercial/Industrial Sand (0m-<1m)								260		3					230																			
CRC Care (2011) Intrusive Maint. Worker - VI Sand 0 to <2 m										77	NL	NL			NL																			
CRC Care (2011) Intrusive Maint. Worker - VI Sand 2 to <4 m										160	NL	NL			NL																			
CRC Care (2011) Intrusive Maint. Worker - VI Sand 4 m+										NL	NL	NL			NL																			
NEPM (1999) Management Limits - Commercial/Industrial (coarse)			3500		1000	10000			700																									
NEPM (1999) Management Limits - Commercial/Industrial (fine)			5000		1000	10000			800																									

LocCode	Sample_Depth_Avg	Sample_Depth_Range	Sampled_Date	Field_ID																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
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	Arocarbons		Total Recoverable Hydrocarbons							BTEX							Chlorinated I																	
	C10-C14 Fraction	C6-C9 Fraction	>C16- C34 Fraction	>C10- C16 Fraction minus naphthalene (F2)	>C10- C16 Fraction	>C34- C40 Fraction	>C10- C40 Fraction (Sum)	C6-C10 Fraction minus BTEX (F1)	C6-C10 Fraction	Benzene	Toluene	Ethylbenzene	Xylene (m & p)	Xylene (o)	Total Xylene	Total BTEX	1,1-dichloropropene	1,1-dichloroethane	1,1-dichloroethene	1,1,1,2-tetrachloroethane	1,1,1-trichloroethane	1,2-dibromo-3-chloropropane	1,1,2-trichloroethane	1,1,2,2-tetrachloroethane	1,2,3-trichloropropane	1,2-dichloroethane	1,3-dichloropropane	1,2-dichloropropane	2,2-dichloropropane	Bromochloromethane	Bromodichloromethane	Bromoform	Carbon tetrachloride	
																																		mg/kg
EQL	3	3	100	50	50	100	50	10	10	0.1	0.1	0.1	0.2	0.1	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.5	0.1	0.1	0.1	
CRC Care (2011) Direct Contact Intrusive Maint. Worker			85000	62000		120000		82000		1100	120000	85000			130000																			
NEPM (1999) HIL D - Commercial/Industrial																																		
CRC Care (2011) Direct Contact HSL D - Comm/Ind			27000	20000		38000		26000		430	99000	27000			81000																			
NEPM (1999) HSL D (VI) - Commercial/Industrial Sand (0m-<1m)								260		3					230																			
CRC Care (2011) Intrusive Maint. Worker - VI Sand 0 to <2 m										77	NL	NL			NL																			
CRC Care (2011) Intrusive Maint. Worker - VI Sand 2 to <4 m										160	NL	NL			NL																			
CRC Care (2011) Intrusive Maint. Worker - VI Sand 4 m+										NL	NL	NL			NL																			
NEPM (1999) Management Limits - Commercial/Industrial (coarse)			3500		1000	10000			700																									
NEPM (1999) Management Limits - Commercial/Industrial (fine)			5000		1000	10000			800																									

Code	Sample_Depth_Avg	Sample_Depth_Range	Sampled_Date	Field_ID																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											</
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	Arocarbons		Total Recoverable Hydrocarbons							BTEX							Chlorinated I																	
	C10-C14 Fraction	C6-C9 Fraction	>C16-C34 Fraction	>C10-C16 Fraction minus naphthalene (F2)	>C10-C16 Fraction	>C34-C40 Fraction	>C10-C40 Fraction (Sum)	C6-C10 Fraction minus BTEX (F1)	C6-C10 Fraction	Benzene	Toluene	Ethylbenzene	Xylene (m & p)	Xylene (o)	Total Xylene	Total BTEX	1,1-dichloropropene	1,1-dichloroethane	1,1-dichloroethene	1,1,1,2-tetrachloroethane	1,1,1-trichloroethane	1,2-dibromo-3-chloropropane	1,1,2-trichloroethane	1,1,2,2-tetrachloroethane	1,2,3-trichloropropane	1,2-dichloroethane	1,3-dichloropropane	1,2-dichloropropane	2,2-dichloropropane	Bromochloromethane	Bromodichloromethane	Bromoform	Carbon tetrachloride	
																																		mg/kg
EQL	3	3	100	50	50	100	50	10	10	0.1	0.1	0.1	0.2	0.1	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.5	0.1	0.1	0.1	0.1
CRC Care (2011) Direct Contact Intrusive Maint. Worker			85000	62000		120000		82000		1100	120000	85000			130000																			
NEPM (1999) HIL D - Commercial/Industrial																																		
CRC Care (2011) Direct Contact HSL D - Comm/Ind			27000	20000		38000		26000		430	99000	27000			81000																			
NEPM (1999) HSL D (VI) - Commercial/Industrial Sand (0m-<1m)								260		3					230																			
CRC Care (2011) Intrusive Maint. Worker - VI Sand 0 to <2 m										77	NL	NL			NL																			
CRC Care (2011) Intrusive Maint. Worker - VI Sand 2 to <4 m										160	NL	NL			NL																			
CRC Care (2011) Intrusive Maint. Worker - VI Sand 4 m+										NL	NL	NL			NL																			
NEPM (1999) Management Limits - Commercial/Industrial (coarse)			3500		1000	10000			700																									
NEPM (1999) Management Limits - Commercial/Industrial (fine)			5000		1000	10000			800																									

Code	Sample_Depth_Avg	Sample_Depth_Range	Sampled_Date	Field_ID																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											</
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	Arocarbons		Total Recoverable Hydrocarbons							BTEX							Chlorinated I																	
	C10-C14 Fraction	C6-C9 Fraction	>C16-C34 Fraction	>C10-C16 Fraction minus naphthalene (F2)	>C10-C16 Fraction	>C34-C40 Fraction	>C10-C40 Fraction (Sum)	C6-C10 Fraction minus BTEX (F1)	C6-C10 Fraction	Benzene	Toluene	Ethylbenzene	Xylene (m & p)	Xylene (o)	Total Xylene	Total BTEX	1,1-dichloropropene	1,1-dichloroethane	1,1-dichloroethene	1,1,1,2-tetrachloroethane	1,1,1-trichloroethane	1,2-dibromo-3-chloropropane	1,1,2-trichloroethane	1,1,2,2-tetrachloroethane	1,2,3-trichloropropane	1,2-dichloroethane	1,3-dichloropropane	1,2-dichloropropane	2,2-dichloropropane	Bromochloromethane	Bromodichloromethane	Bromoform	Carbon tetrachloride	
																																		mg/kg
EQL	3	3	100	50	50	100	50	10	10	0.1	0.1	0.1	0.2	0.1	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.5	0.1	0.1	0.1
CRC Care (2011) Direct Contact Intrusive Maint. Worker			85000	62000		120000		82000		1100	120000	85000			130000																			
NEPM (1999) HIL D - Commercial/Industrial																																		
CRC Care (2011) Direct Contact HSL D - Comm/Ind			27000	20000		38000		26000		430	99000	27000			81000																			
NEPM (1999) HSL D (VI) - Commercial/Industrial Sand (0m-<1m)								260		3					230																			
CRC Care (2011) Intrusive Maint. Worker - VI Sand 0 to <2 m										77	NL	NL			NL																			
CRC Care (2011) Intrusive Maint. Worker - VI Sand 2 to <4 m										160	NL	NL			NL																			
CRC Care (2011) Intrusive Maint. Worker - VI Sand 4 m+										NL	NL	NL			NL																			
NEPM (1999) Management Limits - Commercial/Industrial (coarse)			3500		1000	10000			700																									
NEPM (1999) Management Limits - Commercial/Industrial (fine)			5000		1000	10000			800																									

Code	Sample_Depth_Avg	Sample_Depth_Range	Sampled_Date	Field_ID																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
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[illegible]

	hydrocarbons																	Halogenated Benzenes										Halogenated Hydrocarbons					Halogenated Phen			
	Chlorodibromomethane	Chloroethane	Chloroform	Chloromethane	cis-1,4-Dichloro-2-butene	cis-1,2-dichloroethene	Dibromomethane	cis-1,3-dichloropropene	Dichloromethane	Hexachlorobutadiene	Pentachloroethane	Tetrachloroethene	trans-1,4-Dichloro-2-butene	trans-1,2-dichloroethene	trans-1,3-dichloropropene	Trichloroethene	Vinyl chloride	1,2,3-trichlorobenzene	1,2-dichlorobenzene	1,2,4-trichlorobenzene	1,3-dichlorobenzene	2-chlorotoluene	1,4-dichlorobenzene	4-chlorotoluene	Bromobenzene	Chlorobenzene	1,2-dibromoethane	Bromomethane	Dichlorodifluoromethane	Iodomethane	Trichlorofluoromethane	Pentachlorophenol	2-chlorophenol	2,6-dichlorophenol	2,4-dichlorophenol	
	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	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	0.1	0.5	0.1	0.5	0.5	0.1	0.1	0.1	0.5	0.1	0.5	0.1	0.5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.5	0.5	0.5	0.5	1	0.5	0.5	0.5	
CRC Care (2011) Direct Contact Intrusive Maint. Worker																																				
NEPM (1999) HIL D - Commercial/Industrial																																				
CRC Care (2011) Direct Contact HSL D - Comm/Ind																																				
NEPM (1999) HSL D (VI) - Commercial/Industrial Sand (0m-<1m)																																				
CRC Care (2011) Intrusive Maint. Worker - VI Sand 0 to <2 m																																				
CRC Care (2011) Intrusive Maint. Worker - VI Sand 2 to <4 m																																				
CRC Care (2011) Intrusive Maint. Worker - VI Sand 4 m+																																				
NEPM (1999) Management Limits - Commercial/Industrial (coarse)																																				
NEPM (1999) Management Limits - Commercial/Industrial (fine)																																				

Code	Sample_Depth_Avg	Sample_Depth_Range	Sampled_Date	Field_ID	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
ENV035	0.2	0.2	7/12/2018	ENV035_0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
ENV035	0.5	0.5	7/12/2018	ENV035_0.5	<0.5	<5	<0.5	<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	<5	<5	<0.5	<5	-	-	-	-	
ENV035	1	1	7/12/2018	ENV035_1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
ENV036	0.1	0.1	7/12/2018	ENV036_0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
ENV036	0.5	0.5	7/12/2018	ENV036_0.5	<0.5	<5	<0.5	<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	<5	<5	<0.5	<5	-	-	-	-	
ENV036	1	1	6/12/2018	ENV036_1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
ENV037	0.25	0.25	13/12/2018	ENV037_0.25	<0.5	<5	<0.5	<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	<5	<5	<0.5	<5	-	-	-	-	
ENV037	0.45	0.45	13/12/2018	ENV037_0.45	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
ENV037	0.6	0.6	13/12/2018	ENV037_0.6	<0.5	<5	<0.5	<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	<5	<5	<0.5	<5	-	-	-	-	
ENV038	0.2	0.2	13/12/2018	ENV038_0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
S08	0.45	0.4-0.5	10/03/2021	S08_0.4-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
S08	0.9	0.8-1	10/03/2021	S08_0.8-1.0	<0.5	<5	<0.5	<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	<5	<5	<5	<0.5	<5	<2	<0.5	<0.5	<0.5
S08	1.45	1.4-1.5	10/03/2021	S08_1.4-1.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
S08	2.15	2-2.3	24/03/2021	QC106	<0.5	<5	<0.5	<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	<5	<5	<5	<0.5	<5	<2	<0.5	<0.5	<0.5
S08	2.15	2-2.3	24/03/2021	S08_2.0-2.3	<0.5	<5	<0.5	<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	<5	<5	<5	<0.5	<5	<2	<0.5	<0.5	<0.5
S08	2.65	2.5-2.8	24/03/2021	S08_2.5-2.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S08	2.9	2.8-3	24/03/2021	S08_2.8-3.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S08	3.3	3.2-3.4	24/03/2021	QC206	<1	<1	<1	<1	-	<1	<1	<1	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<1	-	-	-	-	
S08	3.3	3.2-3.4	24/03/2021	S08_3.2-3.4	<0.5	<5	<0.5	<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	<5	<5	<5	<0.5	<5	<2	<0.5	<0.5	<0.5
S08	4.3	4.2-4.4	24/03/2021	S08_4.2-4.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S08	6.1	6-6.2	24/03/2021	S08_6.0-6.2	<0.5	<5	<0.5	<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	<5	<5	<5	<0.5	<5	<2	<0.5	<0.5	<0.5
S08	9.15	9-9.3	24/03/2021	S08_9.0-9.3	<0.5	<5	<0.5	<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	<5	<5	<5	<0.5	<5	<2	<0.5	<0.5	<0.5
S08	10.2	10.1-10.3	24/03/2021	S08_10.1-10.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S08	11.05	10.9-11.2	24/03/2021	S08_10.9-11.2	<0.5	<5	<0.5	<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	<5	<5	<5	<0.5	<5	<2	<0.5	<0.5	<0.5
S08	12.6	12.5-12.7	24/03/2021	S08_12.5-12.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S08	14.65	14.5-14.8	24/03/2021	S08_14.5-14.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S08	15	14.9-15.1	24/03/2021	S08_14.9-15.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S09	0.25	0.2-0.3	9/03/2021	S09_0.2-0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S09	0.9	0.8-1	10/03/2021	S09_0.8-1.0	<0.5	<5	<0.5	<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	<5	<5	<5	<0.5	<5	<2	<0.5	<0.5	<0.5
S09	3.1	3-3.2	10/03/2021	S09_3.0-3.2	<0.5	<5	<0.5	<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	<5	<5	<5	<0.5	<5	<2	<0.5	<0.5	<0.5
S09	6	5.8-6.2	10/03/2021	S09_5.8-6.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S10	0.55	0.5-0.6	9/03/2021	S10_0.5-0.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S10	1	0.9-1.1	10/03/2021	S10_0.9-1.1	<0.5	<5	<0.5	<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	<5	<5	<5	<0.5	<5	<2	<0.5	<0.5	<0.5
S10	2.75	2.5-3	10/03/2021	S10_2.5-3.0	<0.5	<5	<0.5	<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	<5	<5	<5	<0.5	<5	<2	<0.5	<0.5	<0.5
S10	5.65	5.5-5.8	10/03/2021	S10_5.5-5.8	<0.5	<5	<0.5	<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	<5	<5	<5	<0.5	<5	<2	<0.5	<0.5	<0.5
S11	0.55	0.5-0.6	15/03/2021	S11_0.5-0.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S11	1.55	1.5-1.6	15/03/2021	S11_1.5-1.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S11	1.55	1.5-1.6	15/03/2021	QC103	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S12	0.55	0.5-0.6	16/03/2021	S12_0.5-0.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S12	1.5	1.4-1.6	16/03/2021	QC204	<1	<1	<1	<1	-	<1	<1	<1	-	<1	-	<1	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<1	-	-	-	-	
S12	1.55	1.5-1.6	16/03/2021	S12_1.5-1.6	<0.5	<5	<0.5	<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	<5	<5	<5	<0.5	<5	<2	<0.5	<0.5	<0.5
S12	2.05	2-2.1	16/03/2021	S12_2.0-2.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S12	2.35																																				

[illegible]

Environmental Resources Management Australia Pty Ltd

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ols	MAH											Organotins						Solvents							
	2,4,6-trichlorophenol	2,4,5-trichlorophenol	1,2,4-trimethylbenzene	1,3,5-trimethylbenzene	Isopropylbenzene	n-butylbenzene	n-propylbenzene	p-isopropyltoluene	sec-butylbenzene	tert-butylbenzene	Styrene	Dibutyltin (as Sn)	Monobutyltin (as Sn)	Tributyltin (as Sn)	tributyltins	Dibutyltin	Monobutyltin	Methyl Ethyl Ketone (MEK)	2-hexanone (MBK)	4-Methyl-2-pentanone	Acetone	Allyl chloride	Carbon disulfide	Cyclohexane	Vinyl acetate
	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	µg/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	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.001	0.001	0.5	0.0005	0.001	0.001	0.5	5	0.5	0.5	0.5	0.5	0.5	5
CRC Care (2011) Direct Contact Intrusive Maint. Worker																									
NEPM (1999) HIL D - Commercial/Industrial																									
CRC Care (2011) Direct Contact HSL D - Comm/Ind																									
NEPM (1999) HSL D (VI) - Commercial/Industrial Sand (0m-<1m)																									
CRC Care (2011) Intrusive Maint. Worker - VI Sand 0 to <2 m																									
CRC Care (2011) Intrusive Maint. Worker - VI Sand 2 to <4 m																									
CRC Care (2011) Intrusive Maint. Worker - VI Sand 4 m+																									
NEPM (1999) Management Limits - Commercial/Industrial (coarse)																									
NEPM (1999) Management Limits - Commercial/Industrial (fine)																									

LocCode	Sample_Depth_Avg	Sample_Depth_Range	Sampled_Date	Field_ID	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
ENV035	0.2	0.2	7/12/2018	ENV035_0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
ENV035	0.5	0.5	7/12/2018	ENV035_0.5	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.0005	-	-	<5	<5	<5	-	-	<0.5	-	<5		
ENV035	1	1	7/12/2018	ENV035_1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
ENV036	0.1	0.1	7/12/2018	ENV036_0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
ENV036	0.5	0.5	7/12/2018	ENV036_0.5	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.0005	-	-	<5	<5	<5	-	-	<0.5	-	<5		
ENV036	1	1	6/12/2018	ENV036_1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
ENV037	0.25	0.25	13/12/2018	ENV037_0.25	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	<5	<5	<5	-	-	<0.5	-	<5		
ENV037	0.45	0.45	13/12/2018	ENV037_0.45	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
ENV037	0.6	0.6	13/12/2018	ENV037_0.6	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.0005	-	-	<5	<5	<5	-	-	<0.5	-	<5		
ENV038	0.2	0.2	13/12/2018	ENV038_0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
S08	0.45	0.4-0.5	10/03/2021	S08_0.4-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
S08	0.9	0.8-1	10/03/2021	S08_0.8-1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	<5	<5	<5	-	-	<0.5	-	<5		
S08	1.45	1.4-1.5	10/03/2021	S08_1.4-1.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
S08	2.15	2-2.3	24/03/2021	QC106	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	<5	<5	<5	-	-	<0.5	-	<5		
S08	2.15	2-2.3	24/03/2021	S08_2.0-2.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	<5	<5	<5	-	-	<0.5	-	<5		
S08	2.65	2.5-2.8	24/03/2021	S08_2.5-2.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-		
S08	2.9	2.8-3	24/03/2021	S08_2.8-3.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
S08	3.3	3.2-3.4	24/03/2021	QC206	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	-	-	-	-	-	-	-	-	<1	-		
S08	3.3	3.2-3.4	24/03/2021	S08_3.2-3.4	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.001	<0.001	<0.5	-	-	-	<5	<5	<5	-	<0.5	-	<5
S08	4.3	4.2-4.4	24/03/2021	S08_4.2-4.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
S08	6.1	6-6.2	24/03/2021	S08_6.0-6.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	<5	<5	<5	-	-	<0.5	-	<5		
S08	9.15	9-9.3	24/03/2021	S08_9.0-9.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	<5	<5	<5	-	-	<0.5	-	<5		
S08	10.2	10.1-10.3	24/03/2021	S08_10.1-10.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
S08	11.05	10.9-11.2	24/03/2021	S08_10.9-11.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	<5	<5	<5	-	-	<0.5	-	<5		
S08	12.6	12.5-12.7	24/03/2021	S08_12.5-12.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
S08	14.65	14.5-14.8	24/03/2021	S08_14.5-14.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
S08	15	14.9-15.1	24/03/2021	S08_14.9-15.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
S09	0.25	0.2-0.3	9/03/2021	S09_0.2-0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
S09	0.9	0.8-1	10/03/2021	S09_0.8-1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	<5	<5	<5	-	-	<0.5	-	<5		
S09	3.1	3-3.2	10/03/2021	S09_3.0-3.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	<5	<5	<5	-	-	<0.5	-	<5		
S09	6	5.8-6.2	10/03/2021	S09_5.8-6.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
S10	0.55	0.5-0.6	9/03/2021	S10_0.5-0.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
S10	1	0.9-1.1	10/03/2021	S10_0.9-1.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	<5	<5	<5	-	-	<0.5	-	<5		
S10	2.75	2.5-3	10/03/2021	S10_2.5-3.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	<5	<5	<5	-	-	<0.5	-	<5		
S10	5.65	5.5-5.8	10/03/2021	S10_5.5-5.8	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	<5	<5	<5	-	-	<0.5	-	<5		
S11	0.55	0.5-0.6	15/03/2021	S11_0.5-0.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
S11	1.55	1.5-1.6	15/03/2021	S11_1.5-1.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
S11	1.55	1.5-1.6	15/03/2021	QC103	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
S12	0.55	0.5-0.6	16/03/2021	S12_0.5-0.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
S12	1.5	1.4-1.6	16/03/2021	QC204	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	-	-	-	-	-	-	-	-	<1	-		
S12	1.55	1.5-1.6	16/03/2021	S12_1.5-1.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	<5	<5	<5	-	-	<0.5	-	<5		
S12	2.05	2-2.1	16/03/2021	S12_2.0-2.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
S12	2.35	2.3-2.4	16/03/2021	S12_2.3-2.4	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	<5	<5	<5	-	-	<0.5	-	<5		
S12	2.35	2.3-2.4	16/03/2021	QC104	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	<5	<5	<5	-	-	<0.5	-	<5		
S13	0.55	0.5-0.6	16/03/2021	S13_0.5-0.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
S13	0.95	0.9-1	16/03/2021	S13_0.9-1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
S14	0.55	0.5-0.6	16/03/2021	S14_0.5-0.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
S14	1	0.9-1.1	16/03/2021	S14_0.9-1.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
S15	0.05	0-0.1	16/03/2021	S15_0.0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
S15	1	0.9-1.1	16/03/2021	S15_0.9-1.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
S16	0.55	0.5-0.6	12/03/2021	S16_0.5-0.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	<5	<5	<5	-	-	<0.5	-	<5		

ols	MAH											Organotins						Solvents							
	2,4,6-trichlorophenol	2,4,5-trichlorophenol	1,2,4-trimethylbenzene	1,3,5-trimethylbenzene	Isopropylbenzene	n-butylbenzene	n-propylbenzene	p-isopropyltoluene	sec-butylbenzene	tert-butylbenzene	Styrene	Dibutyltin (as Sn)	Monobutyltin (as Sn)	Tributyltin (as Sn)	tributyltins	Dibutyltin	Monobutyltin	Methyl Ethyl Ketone (MEK)	2-hexanone (MBK)	4-Methyl-2-pentanone	Acetone	Allyl chloride	Carbon disulfide	Cyclohexane	Vinyl acetate
	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	µg/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	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.001	0.001	0.5	0.0005	0.001	0.001	0.5	5	0.5	0.5	0.5	0.5	0.5	5
CRC Care (2011) Direct Contact Intrusive Maint. Worker																									
NEPM (1999) HIL D - Commercial/Industrial																									
CRC Care (2011) Direct Contact HSL D - Comm/Ind																									
NEPM (1999) HSL D (VI) - Commercial/Industrial Sand (0m-<1m)																									
CRC Care (2011) Intrusive Maint. Worker - VI Sand 0 to <2 m																									
CRC Care (2011) Intrusive Maint. Worker - VI Sand 2 to <4 m																									
CRC Care (2011) Intrusive Maint. Worker - VI Sand 4 m+																									
NEPM (1999) Management Limits - Commercial/Industrial (coarse)																									
NEPM (1999) Management Limits - Commercial/Industrial (fine)																									

Code	Sample_Depth_Avg	Sample_Depth_Range	Sampled_Date	Field_ID																							
S16	2.45	2.3-2.6	12/03/2021	S16_2.3-2.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	<5	<5	<5	-	-	<0.5	-	<5
S16	4	3.8-4.2	12/03/2021	S16_3.8-4.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
S16	5.8	5.5-6.1	12/03/2021	S16_5.5-6.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
S17	0.05	0-0.1	16/03/2021	S17_0.0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
S18	0.175	0.15-0.2	17/03/2021	S18_0.15-0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
S18	0.9	0.8-1	17/03/2021	S18_0.8-1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
S19	0.45	0.4-0.5	18/03/2021	S19_0.4-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
S19	1.45	1.4-1.5	18/03/2021	S19_1.4-1.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	<5	<5	<5	-	-	<0.5	-	<5
S19	4.05	4-4.1	18/03/2021	S19_4.0-4.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
S19	5.05	5-5.1	18/03/2021	S19_5.0-5.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	<5	<5	<5	-	-	<0.5	-	<5
S20	0.45	0.4-0.5	17/03/2021	S20_0.4-0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	<5	<5	<5	-	-	<0.5	-	<5
S20	1.45	1.4-1.5	17/03/2021	S20_1.4-1.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	<5	<5	<5	-	-	<0.5	-	<5
S20	3.05	3-3.1	17/03/2021	S20_3.0-3.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
S20	5.05	5-5.1	17/03/2021	S20_5.0-5.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
S21	0.2	0.15-0.25	17/03/2021	S21_0.15-0.25	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	<5	<5	<5	-	-	<0.5	-	<5
S21	0.95	0.9-1	17/03/2021	S21_0.9-1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
S21	2.05	2-2.1	17/03/2021	S21_2.0-2.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	<5	<5	<5	-	-	<0.5	-	<5
S21	4.05	4-4.1	17/03/2021	S21_4.0-4.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
S22	0.6	0.5-0.7	26/04/2021	S22_0.5-0.7	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	<5	<5	<5	-	-	<0.5	-	<5
S22	1.9	1.8-2	26/04/2021	S22_1.8-2.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
S22	3.9	3.8-4	26/04/2021	S22_3.8-4.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
S22	5.9	5.8-6	26/04/2021	S22_5.8-6.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	<5	<5	<5	-	-	<0.5	-	<5
S23	0.25	0.2-0.3	6/04/2021	S23_0.2-0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
S23	0.55	0.5-0.6	6/04/2021	S23_0.5-0.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	<5	<5	<5	-	-	<0.5	-	<5
S23	1.05	1-1.1	6/04/2021	S23_1.0-1.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	<5	<5	<5	-	-	<0.5	-	<5
S23	3.02	2.97-3.07	6/04/2021	S23_2.97-3.07	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
S23	4.05	4-4.1	6/04/2021	S23_4.0-4.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	<5	<5	<5	-	-	<0.5	-	<5
S23	5.04	4.98-5.1	6/04/2021	S23_4.98-5.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
S23	6.05	6-6.1	6/04/2021	S23_6.0-6.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
S23	7.05	7-7.1	6/04/2021	S23_7.0-7.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	<5	<5	<5	-	-	<0.5	-	<5
S23	8.25	8.2-8.3	6/04/2021	S23_8.2-8.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
S23	9.09	9.04-9.14	6/04/2021	S23_9.04-9.14	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	<5	<5	<5	-	-	<0.5	-	<5
S23	10.05	10-10.1	6/04/2021	S23_10.0-10.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
S23	11.95	11.9-12	6/04/2021	S23_11.9-12.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
S23	14.05	14-14.1	6/04/2021	S23_14.0-14.1	-	-	-	-	-	-	-	-	-	-	-	-	-										

[illegible]

	ols		MAH										Organotins						Solvents							
	2,4,6-trichlorophenol	2,4,5-trichlorophenol	1,2,4-trimethylbenzene	1,3,5-trimethylbenzene	Isopropylbenzene	n-butylbenzene	n-propylbenzene	p-isopropyltoluene	sec-butylbenzene	tert-butylbenzene	Styrene	Dibutyltin (as Sn)	Monobutyltin (as Sn)	Tributyltin (as Sn)	tributyltins	Dibutyltin	Monobutyltin	Methyl Ethyl Ketone (MEK)	2-hexanone (MBK)	4-Methyl-2-pentanone	Acetone	Allyl chloride	Carbon disulfide	Cyclohexane	Vinyl acetate	
	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	µg/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	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.001	0.001	0.5	0.0005	0.001	0.001	0.5	5	0.5	0.5	0.5	0.5		5	
CRC Care (2011) Direct Contact Intrusive Maint. Worker																										
NEPM (1999) HIL D - Commercial/Industrial																										
CRC Care (2011) Direct Contact HSL D - Comm/Ind																										
NEPM (1999) HSL D (VI) - Commercial/Industrial Sand (0m-<1m)																										
CRC Care (2011) Intrusive Maint. Worker - VI Sand 0 to <2 m																										
CRC Care (2011) Intrusive Maint. Worker - VI Sand 2 to <4 m																										
CRC Care (2011) Intrusive Maint. Worker - VI Sand 4 m+																										
NEPM (1999) Management Limits - Commercial/Industrial (coarse)																										
NEPM (1999) Management Limits - Commercial/Industrial (fine)																										

LocCode	Sample_Depth_Avg	Sample_Depth_Range	Sampled_Date	Field_ID																					
S62	18.95	18.9-19	9/04/2021	S62_18.9-19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S62	21.05	21-21.1	9/04/2021	S62_21-21.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S62	22.05	22-22.1	9/04/2021	S62_22-22.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	<5	<5	<5	-	<0.5
S62	23.165	23.12-23.21	9/04/2021	S62_23.12-23.21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S62	25.05	25-25.1	9/04/2021	S62_25-25.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S62	27.05	27-27.1	9/04/2021	S62_27-27.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S62	28.05	28-28.1	9/04/2021	S62_28-28.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	<5	<5	<5	-	<0.5
S62	28.85	28.8-28.9	9/04/2021	S62_28.8-28.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S62	30.09	30.02-30.16	9/04/2021	S62_30.02-30.16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S63	0.05	0-0.1	11/03/2021	S63_0.0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S63	1.4	1.3-1.5	11/03/2021	S63_1.3-1.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	<5	<5	<5	-	<0.5
S63	3.1	3-3.2	16/03/2021	S63_3.0-3.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	<5	<5	<5	-	<0.5
S63	5.1	5-5.2	16/03/2021	S63_5.0-5.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S64	0.55	0.5-0.6	11/03/2021	S64_0.5-0.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	<5	<5	<5	-	<0.5
S64	1.55	1.5-1.6	11/03/2021	S64_1.5-1.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	<5	<5	<5	-	<0.5
S64	2.05	2-2.1	31/03/2021	QC210	-	-	<1	<1	<1	<1	<1	<1	<1	<1	-	-	-	-	-	-	-	-	-	-	<1
S64	2.05	2-2.1	31/03/2021	S64_2.0-2.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	<5	<5	<5	-	<0.5
S64	2.05	2-2.1	31/03/2021	QC110	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	<5	<5	<5	-	<0.5
S64	2.05	2-2.1	31/03/2021	S64_2.0-2.1	-	-	-	-	-	-	-	-	-	<0.5	-	-	<0.5	-	-	-	-	-	-	-	-
S64	3.05	3-3.1	31/03/2021	S64_3.0-3.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S64	4.05	4-4.1	31/03/2021	S64_4.0-4.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S64	5.05	5-5.1	31/03/2021	S64_5.0-5.1	<0.5	<0.5	<0.5	<0.5	1	1.6	1.9	<0.5	1.2	<0.5	<0.5	-	-	-	-	-	<5	<5	<5	-	<0.5
S64	6.05	6-6.1	31/03/2021	S64_6-6.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S64	7.05	7-7.1	31/03/2021	S64_7.0-7.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	<5	<5	<5	-	<0.5
S64	8.05	8-8.1	31/03/2021	S64_8.0-8.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S64	9.05	9-9.1	31/03/2021	S64_9.0-9.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S64	11.05	11-11.1	31/03/2021	S64_11-11.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	<5	<5	<5	-	<0.5
S64	13.05	13-13.1	31/03/2021	S64_13-13.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S64	14.05	14-14.1	31/03/2021	S64_14-14.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	<5	<5	<5	-	<0.5
S64	15.05	15-15.1	31/03/2021	S64_15-15.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S65	0.05	0-0.1	11/03/2021	S65_0.0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S65	0.55	0.5-0.6	11/03/2021	S65_0.5-0.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	<5	<5	<5	-	<0.5
S65	1.55	1.5-1.6	30/03/2021	QC208	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S65	1.55	1.5-1.6	30/03/2021	S65_1.5-1.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S65	1.55	1.5-1.6	30/03/2021	QC108	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S65	2.1	2-2.2	30/03/2021	S65_2.0-2.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	<5	<5	<5	-	<0.5
S65	3.05	3-3.1	30/03/2021	S65_3.0-3.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S65	3.05	3-3.1	30/03/2021	S65_3.0-3.1	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-
S65	4.1	4-4.2	30/03/2021	S65_4.0-4.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	<5	<5	<5	-	<0.5
S65	6.1	6-6.2	30/03/2021	QC209	-	-	<1	<1	<1	<1	<1	<1	<1	<1	-	-	-	-	-	-	-	-	-	-	<1
S65	6.1	6-6.2	30/03/2021	QC109	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	<5	<5	<5	-	<0.5
S65	6.1	6-6.2	30/03/2021	S65_6.0-6.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	<5	<5	<5	-	<0.5
S65	7.1	7-7.2	30/03/2021	S65_7.0-7.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S65	8.1	8-8.2	30/03/2021	S65_8.0-8.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	<5	<5	<5	-	<0.5
S65	10.15	10-10.3	30/03/2021	S65_10-10.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	<5	<5	<5	-	<0.5
S65	12.1	12-12.2	30/03/2021	S65_12-12.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S65	15.05	15-15.1	30/03/2021	S65_15-15.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	<5	<5	<5	-	<0.5
S65	17.05	17-17.1	30/03/2021	S65_17-17.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S65	18.975	18.95-19	30/03/2021	S65_18.95-19	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	<5	<5	<5	-	<0.5
S65	21.05	21-21.1	30/03/2021	S65_21-21.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S65	23.05	23-23.1	30/03/2021	S65_23-23.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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[illegible]

Environmental Resources Management Australia Pty Ltd

	Organophosphorus Pesticides																																		
	Irgarol	3,5-Dichlorobenzoic acid	Azinophos methyl	Bromophos-ethyl	Carbofenothion	Chlorfenvinphos	Chlorpyrifos	Chlorpyrifos-methyl	Demeton-S-methyl	Diazinon	Dichlorvos	Dimethoate	Ethion	Fenamiphos	Fenthion	Malathion	Methyl parathion	Monocrotophos	Parathion	Pirimphos-ethyl	Prothiofos	2,6-Dichlorophenoxyacetic acid	Dinoseb	Metribuzin	2,4,5-Trichlorophenoxy Acetic Acid	2,4,5-TP (Silvex)	Hedonal	2,4-dichlorophenoxybutanoic acid	2,4-Dichlorprop	2,4,6-Trichlorophenoxy-acetic acid	4-(2,4-Dichlorophenoxy)butyric Acid (2,4-DB)	2-Chlorophenoxyacetic acid	4-Chlorophenoxy acetic acid	Ametryn	
	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	mg/kg	µg/L	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			0.01	0.01	0.01	0.05	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01				0.02	0.02	0.02		0.02			0.02			
NEPM (1999) HIL D - Commercial/Industrial							2000																		5000		9000								

LocCode	Sample_Depth_Avg	Sample_Depth_Range	Sampled_Date	Field_ID																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										</
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Statistical Summary																																		
Number of Results	8	9	71	71	71	71	71	71	71	71	71	70	71	71	71	71	71	71	71	71	68	9	9	8	129	129	129	9	129	9	119	9	128	8
Number of Detects	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Minimum Concentration	<0.5	<0.5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.2	<0.05	<0.05	<0.5	<1	<0.5	<0.02	<0.02	<0.02	<0.5	<0.02	<0.5	<0.02	<0.5	<0.02	<0.5		
Maximum Concentration	<0.5	<0.5	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<1	<1	<0.25	<0.25	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.04	<0.5	<0.5	<0.5		
Average Concentration	0.25	0.25	0.028	0.028	0.028	0.028	0.028	0.028	0.028	0.028	0.028	0.028	0.028	0.028	0.028	0.11	0.11	0.11	0.028	0.028	0.25	0.5	0.25	0.028	0.028	0.028	0.25	0.028	0.25	0.011	0.25	0.028	0.25	
Standard Deviation	0	0	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.067	0.067	0.067	0.017	0.017	0	0	0	0.061	0.061	0.061	0	0.061	0	0.0031	0	0.061	0	
Number of Guideline Exceedances	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	129	0	129	0	0	0	0	0	0	0	
Number of Guideline Exceedances(Detects Only)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	129	0	129	0	0	0	0	0	0	0	

Data Comments
#1 Reported Analyte LOR is higher than Requested Analyte LOR

Herbicides																																		
	Acifluorfen	Actril (oxynil)	Atrazine	Bromoxnill	Clopyralid	Cyanazine	DCPA (Chlorthal) Diacid	Dicamba	Fluroxypyr	Hexazinone	2-Methyl-4-chlorophenoxyacetic acid	2-Methyl-4-Chlorophenoxy Butanoic Acid	Mecoprop	Picloram	Prometryn	Propazine	Simazine	Terbutryn	Terbutylazine	Triclopyr	Dieldrin	d-BHC	b-BHC	g-BHC (Lindane)	a-BHC	Aldrin	Aldrin + Dieldrin	chlordan	DDT	4,4-DDE	DDD	DDT+DDE+DDD		
	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	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					0.02			0.02	0.02		0.02	0.02	0.02	0.02						0.02	0.0005	0.0005	0.0005	0.00025	0.0005	0.0005	0.05	0.00025	0.0005	0.05	0.0005	0.0005		
NEPM (1999) HIL D - Commercial/Industrial											5000	5000	5000	35000													45	530				3600		

LocCode	Sample_Depth_Avg	Sample_Depth_Range	Sampled_Date	Field_ID																														
S71	4.9	4.8-5	26/04/2021	S71_4.8-5.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05
SMW_BH409	1	1	6/03/2020	SMW_BH409/1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05
SMW_BH409	2	2	6/03/2020	SMW_BH409/2.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05

Statistical Summary																																	
Number of Results	9	9	8	9	129	8	9	129	120	8	128	129	129	129	8	8	8	8	8	129	338	339	339	339	338	339	327	326	338	275	339	339	
Number of Detects	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	
Minimum Concentration	<2	<1	<0.5	<0.5	<0.02	<0.5	<0.5	<0.02	<0.02	<0.5	<0.02	<0.02	<0.02	<0.02	<0.5	<0.5	<0.5	<0.5	<0.5	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05		
Maximum Concentration	<2	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.04	<0.04	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25		
Average Concentration	1	0.5	0.25	0.25	0.028	0.25	0.25	0.028	0.011	0.25	0.028	0.028	0.028	0.028	0.25	0.25	0.25	0.25	0.25	0.028	0.027	0.026	0.026	0.026	0.026	0.027	0.027	0.096	0.026	0.026	0.029		
Standard Deviation	0	0	0	0	0.061	0	0	0.061	0.0031	0	0.061	0.061	0.061	0.061	0	0	0	0	0	0.061	0.0094	0.0089	0.0089	0.0089	0.0089	0.0089	0.0074	0.006	0.037	0.0051	0.0089	0.012	
Number of Guideline Exceedances	0	0	0	0	0	0	0	0	0	0	128	129	129	129	0	0	0	0	0	0	0	0	0	0	0	327	326	0	0	0	0	339	
Number of Guideline Exceedances(Detects Only)	0	0	0	0	0	0	0	0	0	0	128	129	129	129	0	0	0	0	0	0	0	0	0	0	0	327	326	0	0	0	0	339	

Data Comments

#1 Reported Analyte LOR is higher than Requested Analyte LOR

	Organochlorine Pesticides															Polychlorinated Biphenyls										
	Hexachlorobenzene	Endosulfan I	Endosulfan II	Endosulfan sulfate	Endrin	Chlordane (cis)	Chlordane (trans)	Endrin aldehyde	Endrin ketone	Heptachlor	Heptachlor epoxide	Methoxychlor	DDE	Endosulfan	Toxaphene	Aroclor 1016	Aroclor 1221	Aroclor 1232	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260	PCBs (Sum of total)			
EQL	0.0005	0.0005	0.0005	0.0005	0.0005	0.00025	0.00025	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.005			
NEPM (1999) HIL D - Commercial/Industrial	80				100					50		2500		2000	160								7			

LocCode	Sample_Depth_Avg	Sample_Depth_Range	Sampled_Date	Field_ID																				
BH066	0.5	0.5	28/05/2018	SMW_BH066_0.5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	-	-	-	-	-	-	<0.1
BH066	1	1	28/05/2018	SMW_BH066_1.0	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	-	-	-	-	-	-	<0.1
BH066	2.5	2.5	28/05/2018	SMW_BH066_2.5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	-	-	-	-	-	-	<0.1
BH066	6	6	28/05/2018	SMW_BH066_6.0	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	-	-	-	-	-	-	<0.1
BH067	0.25	0.25	5/06/2018	SMW_BH067_0.25	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	-	<0.05	-	-	-	-	-	-	<0.1
BH067	0.5	0.5	5/06/2018	SMW_BH067_0.5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	-	<0.05	-	-	-	-	-	-	<0.1
C27	1.05	1-1.1	16/02/2017	C27_1.0-1.1	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	<1	<0.1	<0.1	<0.1	<0.1	<0.1
C32	0.55	0.5-0.6	16/02/2017	C32_0.5-0.6	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	<1	<0.1	<0.1	<0.1	<0.1	<0.1
C32	1.55	1.5-1.6	16/02/2017	C32_1.5-1.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
E13	0.45	0.4-0.5	13/03/2017	E13_0.4-0.5	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	<0.05	<0.05	<0.05	<0.2	-	-	<1	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5
E13	1.55	1.5-1.6	13/03/2017	E13_1.5-1.6	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	<0.05	<0.05	<0.05	<0.2	-	-	<1	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5
E14	0.05	0-0.1	3/03/2017	E14_0-0.1	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	<0.05	<0.05	<0.05	<0.2	-	-	<1	<0.5	-	<0.5	<0.5	<0.5	<0.5
E14	1.25	1.2-1.3	3/03/2017	E14_1.2-1.3	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	<0.05	<0.05	<0.05	<0.2	-	-	<1	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5
E22	0.7	0.7	6/03/2017	E22:0.6-0.7	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	<0.05	<0.05	<0.05	<0.2	-	-	<1	<0.5	-	<0.5	<0.5	<0.5	<0.5
E22	4	4	6/03/2017	E22:3.8-4.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5
E23	0.5	0.5	6/03/2017	E23:0.4-0.5	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	<0.05	<0.05	<0.05	<0.2	-	-	<1	<0.5	-	<0.5	<0.5	<0.5	<0.5
E23	3.8	3.8	6/03/2017	E23:3.7-3.8	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	<0.05	<0.05	<0.05	<0.2	-	-	<1	<0.5	-	<0.5	<0.5	<0.5	<0.5
E28	0.85	0.8-0.9	3/03/2017	E28_0.8-0.9	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	<0.05	<0.05	<0.05	<0.2	-	-	<1	<0.5	-	<0.5	<0.5	<0.5	<0.5
E28	1.95	1.9-2	3/03/2017	E28_1.9-2.0	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	<0.05	<0.05	<0.05	<0.2	-	-	<1	<0.5	-	<0.5	<0.5	<0.5	<0.5
E28	4.15	4.1-4.2	3/03/2017	E28_4.1-4.2	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	<0.05	<0.05	<0.05	<0.2	-	-	<1	<0.5	-	<0.5	<0.5	<0.5	<0.5
E29	0.5	0.5	6/03/2017	E29:0.4-0.5	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	<0.05	<0.05	<0.05	<0.2	-	-	<1	<0.5	-	<0.5	<0.5	<0.5	<0.5
E29	2.7	2.7	6/03/2017	E29:2.6-2.7	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	<0.05	<0.05	<0.05	<0.2	-	-	<1	<0.5	-	<0.5	<0.5	<0.5	<0.5
E34	1.05	1-1.1	7/03/2017	E34-1.0-1.1	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	<0.05	<0.05	<0.05	<0.2	-	-	<1	<0.5	-	<0.5	<0.5	<0.5	<0.5
E39	0.55	0.5-0.6	7/03/2017	E39-0.5-0.6	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	<0.05	<0.05	<0.05	<0.2	-	-	<1	<0.5	-	<0.5	<0.5	<0.5	<0.5
E39	1.55	1.5-1.6	7/03/2017	E39-1.5-1.6	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	<0.05	<0.05	<0.05	<0.2	-	-	<1	<0.5	-	<0.5	<0.5	<0.5	<0.5
E59	0.05	0-0.1	3/03/2017	E59_0-0.1	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	<0.05	<0.05	<0.05	<0.2	-	-	<1	<0.5	-	<0.5	<0.5	<0.5	<0.5
E59	1.45	1.4-1.5	3/03/2017	E59_1.4-1.5	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	<0.05	<0.05	<0.05	<0.2	-	-	<1	<0.5	-	<0.5	<0.5	<0.5	<0.5
E59	3.05	3-3.1	3/03/2017	E59_3.0-3.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5
E66	0.45	0.4-0.5	2/03/2017	E66_0.4-0.5	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	<0.05	<0.05	<0.05	<0.2	-	-	<1	<0.5	-	<0.5	<0.5	<0.5	<0.5
E66	1.45	1.4-1.5	2/03/2017	E66_1.4-1.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5
E66	1.85	1.7-2	2/03/2017	E66_1.7-2.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5
ENV022	0	0	3/12/2018	ENV022_0.0	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	-	-	-	-	-	-	<0.1
ENV022	1.2	1.2	3/12/2018	ENV022_1.2	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<1	<0.25	<0.15	-	-	-	-	-	-	<0.2
ENV022	2	2	3/12/2018	ENV022_2.0	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	-	-	-	-	-	<0.1
ENV022	14	14	13/12/2018	ENV022_14.0	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	-	-	-	-	-	-	-
ENV022	16	16	13/12/2018	ENV022_16.0	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	-	-	-	-	-	-	-
ENV023	0.5	0.5	3/12/2018	ENV023_0.5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	-	-	-	-	-	-	<0.1
ENV023	1	1	3/12/2018	ENV023_1.0	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	-	-	-	-	-	-	<0.1
ENV023	2	2	4/12/2018	ENV023_2.0	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	-	-	-	-	-	-	-
ENV023	8	8	4/12/2018	ENV023_8.0	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	-	-	-	-	-	-	-
ENV024	0.5	0.5	4/12/2018	ENV024_0.5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	-	-	-	-	-	-	<0.1
ENV024	2	2	6/12/2018	ENV024_2.0	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<1	<0.25	<0.15	-	-	-	-	-	-	<0.2
ENV024	10	10	6/12/2018	ENV024_10.0	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	-	-	-	-	-	-	-
ENV024	14	14	6/12/2018	ENV024_14.0	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	-	-	-	-	-	-	-
ENV026	0.5	0.5	4/12/2018	ENV026_0.5	<0.05	<0.05	<0.05																	

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	Organochlorine Pesticides															Polychlorinated Biphenyls										
	Hexachlorobenzene	Endosulfan I	Endosulfan II	Endosulfan sulfate	Endrin	Chlordane (cis)	Chlordane (trans)	Endrin aldehyde	Endrin ketone	Heptachlor	Heptachlor epoxide	Methoxychlor	DDE	Endosulfan	Toxaphene	Aroclor 1016	Aroclor 1221	Aroclor 1232	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260	PCBs (Sum of total)			
EQL	0.0005	0.0005	0.0005	0.0005	0.0005	0.00025	0.00025	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.005			
NEPM (1999) HIL D - Commercial/Industrial	80				100					50		2500		2000	160								7			

LocCode	Sample_Depth_Avg	Sample_Depth_Range	Sampled_Date	Field_ID																			
S71	4.9	4.8-5	26/04/2021	S71_4.8-5.0	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	-	<0.05	-	-	-	-	-	<0.1
SMW_BH409	1	1	6/03/2020	SMW_BH409/1.0	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	-	<0.05	-	-	-	-	-	<0.1
SMW_BH409	2	2	6/03/2020	SMW_BH409/2.0	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	-	<0.05	-	-	-	-	-	<0.1

Statistical Summary																							
Number of Results	338	339	339	339	338	319	319	338	327	339	339	339	64	307	20	37	22	36	37	37	37	37	310
Number of Detects	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
Minimum Concentration	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
Maximum Concentration	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<1	<0.25	<0.15	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
Average Concentration	0.026	0.026	0.026	0.026	0.026	0.027	0.027	0.026	0.026	0.026	0.026	0.1	0.028	0.025	0.5	0.17	0.059	0.17	0.17	0.17	0.17	0.065	
Standard Deviation	0.0089	0.0089	0.0089	0.0089	0.0089	0.0092	0.0092	0.0089	0.0078	0.0089	0.0089	0.033	0.018	0.004	0	0.098	0.043	0.099	0.098	0.098	0.098	0.053	
Number of Guideline Exceedances	338	0	0	0	338	0	0	0	0	339	0	339	0	307	0	37	0	0	0	0	0	0	
Number of Guideline Exceedances(Detects Only)	338	0	0	0	338	0	0	0	0	339	0	339	0	307	0	37	0	0	0	0	0	0	

Data Comments
#1 Reported Analyte LOR is higher than Requested Analyte LOR

[illegible]

Data Comments
#1 Reported Analyte LOR is higher than Requested Analyte LOR

Environmental Resources Management Australia Pty Ltd

		Asbestos																						
EQL	NEPM (1999) HSL D Comm/Indust - Asbestos	Total Asbestos g/kg*	APPROVED IDENTIFIER:	Asbestos Type	Fibrous Asbestos >7mm	Asbestos from ACM in Soil	Asbestos (Fines and Fibrous <7mm)	Weight of sample	Asbestos from FA & AF in Soil	Description	Mass ACM	Asbestos Containing Material	Mass AF	Mass Asbestos in ACM	Mass asbestos in AF	Organic Fibre	Mass Asbestos in FA	Synthetic Mineral Fibre	Mass Asbestos in FA & AF	Mass FA	Weight Used for % Calculation	Asbestos fibres	Asbestos (Trace)	
		mg/kg	-	-	g	%w/w	g	g	%w/w	-	g	g	g	g	g	g	g/kg	g	g/kg	g	g	kg	g/kg	Fibres
					0.0004		0.0004	0.01	0.001			0.1				0.1		0.1			0.0001	0.1	5	

LocCode	Sample_Depth_Avg	Sample_Depth_Range	Sampled_Date	Field_ID																									
E59	1.5	1-2	3/03/2017	E59_1.0-2.0	0	-	-	-	-	-	16,300	-	-	0	-	-	0	-	-	-	-	-	-	-	-	-	-	-	-
E59	2.1	2-2.2	3/03/2017	E59_2.0-2.2	0	-	-	-	-	-	16,300	-	-	0	-	-	0	-	-	-	-	-	-	-	-	-	-	-	-
E66	0.5	0-1	2/03/2017	E66_0-1.0	0	-	-	-	-	-	16,300	-	-	0	-	-	0	-	-	-	-	-	-	-	-	-	-	-	-
E66	1.5	1-2	2/03/2017	E66_1.0-2.0	0	-	-	-	-	-	16,300	-	-	0	-	-	0	-	-	-	-	-	-	-	-	-	-	-	-
E66	2.15	2-2.3	2/03/2017	E66_2.0-2.3	0	-	-	-	-	-	16,300	-	-	0	-	-	0	-	-	-	-	-	-	-	-	-	-	-	-
E67	0.05	0-0.1	2/03/2017	E67_0-0.1	-	-	-	-	0	-	674	0	-	0	-	0	0	0	-	0	-	0	-	0	-	0	-	-	-
E67	0.5	0-1	2/03/2017	E67_0-1.0	0	-	-	-	-	-	16,300	-	-	0	-	-	0	-	-	-	-	-	-	-	-	-	-	-	-
E67	1.05	1-1.1	2/03/2017	E67_1.0-1.1	-	-	-	-	0	-	665	0	-	0	-	0	0	0	-	0	-	0	-	0	-	0	-	-	-
E67	1.5	1-2	2/03/2017	E67_1.0-2.0	0	-	-	-	-	-	16,300	-	-	0	-	-	0	-	-	-	-	-	-	-	-	-	-	-	-
E67	2.05	2-2.1	2/03/2017	E67_2.0-2.1	-	-	-	-	0	-	659	0	-	0	-	0	0	0	-	0	-	0	-	0	-	0	-	-	-
E67	2.5	2-3	2/03/2017	E67_2.0-3.0	0	-	-	-	-	-	16,300	-	-	0	-	-	0	-	-	-	-	-	-	-	-	-	-	-	-
E67	3.05	3-3.1	2/03/2017	E67_3.0-3.1	0	-	-	-	-	-	16,300	-	-	0	-	-	0	-	-	-	-	-	-	-	-	-	-	-	-
ENV022	0	0	3/12/2018	ENV022_0.0	-	-	-	-	-	-	745	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ENV022	1.2	1.2	3/12/2018	ENV022_1.2	-	-	-	-	-	-	485	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ENV022	1.5	1.5	3/12/2018	ENV022_1.5	-	-	-	-	-	-	490	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ENV023	0.5	0.5	3/12/2018	ENV023_0.5	-	-	-	-	-	-	44	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ENV023	1	1	3/12/2018	ENV023_1.0	-	-	-	-	-	-	607	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ENV023	1.5	1.5	3/12/2018	ENV023_1.5	-	-	-	-	-	-	199	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ENV024	0	0	4/12/2018	ENV024_0.0	-	-	-	-	-	-	175	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ENV024	0.5	0.5	4/12/2018	ENV024_0.5	-	-	-	-	-	-	188	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ENV024	2	2	6/12/2018	ENV024_2.0	-	-	-	-	-	-	142	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ENV026	0.5	0.5	4/12/2018	ENV026_0.5	-	-	-	-	-	-	26.5	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ENV026	1	1	4/12/2018	ENV026_1.0	-	-	-	-	-	-	38.8	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ENV027	0.2	0.2	5/12/2018	ENV027_0.2	-	-	-	-	-	-	482	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ENV027	0.5	0.5	5/12/2018	ENV027_0.5	-	-	-	-	-	-	26.4	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ENV027	1.5	1.5	5/12/2018	ENV027_1.5	-	-	-	-	-	-	18.1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ENV028	0.5	0.5	5/12/2018	ENV028_0.5	-	-	-	-	-	-	641	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ENV028	1	1	5/12/2018	ENV028_1.0	-	-	-	-	-	-	441	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ENV028	1.5	1.5	5/12/2018	ENV028_1.5	-	-	-	-	-	-	560	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ENV028	2	2	17/12/2018	ENV028/2.0	-	-	-	-	-	-	365	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ENV029	0.2	0.2	5/12/2018	ENV029_0.2	-	-	-	-	-	-	595	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ENV029	1	1	5/12/2018	ENV029_1.0	-	-	-	-	-	-	320	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ENV029	2	2	10/12/2018	ENV029_2.0	-	-	-	-	-	-	188	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ENV030	0.65	0.65	14/12/2018	ENV030_0.65	-	-	-	-	-	-	16.5	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ENV030	1	1	14/12/2018	ENV030_1.0	-	-	-	-	-	-	16.5	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ENV031	0.35	0.35	13/12/2018	ENV031_0.35	-	-	-	-	-	-	13.5	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ENV031	0.5	0.5	13/12/2018	ENV031_0.5	-	-	-	-	-	-	12.6	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ENV032	0.15	0.1-0.2	13/12/2018	ENV032_0.1-0.2	-	-	-	-	-	-	12.3	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ENV032	0.5	0.5	13/12/2018	ENV032_0.5	-	-	-	-	-	-	7.92	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ENV033	0.2	0.2	5/12/2018	ENV033_0.2	-	-	-	-	-	-	622	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ENV033	0.5	0.5	5/12/2018	ENV033_0.5	-	-	-	-	-	-	586	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ENV033	1	1	5/12/2018	ENV033_1.0	-	-	-	-	-	-	388	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ENV034	0.2	0.2	5/12/2018	ENV034_0.2	-	-	-	-	-	-	564	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ENV034	0.5	0.5	5/12/2018	ENV034_0.5	-	-	-	-	-	-	544	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ENV034	2	2	10/12/2018	ENV034_2.0	-	-	-	-	-	-	19	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ENV035	0.2	0.2	7/12/2018	ENV035_0.2	-	-	-	-	-	-	380	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ENV035	1	1	7/12/2018	ENV035_1.0	-	-	-	-	-	-	400	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ENV036	0.1	0.1	7/12/2018	ENV036_0.1	-	-	-	-	-	-	383	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ENV036	1	1	6/12/2018	ENV036_1.0	-	-	-	-	-	-	531	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ENV037	0.25	0.25	13/12/2018	ENV037_0.25	-	-	-	-	-	-	25.1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ENV037	0.4	0.4	13/12/2018	ENV037_0.4	-	-	-	-	-	-	5.54	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ENV037	0.5	0.5	13/12/2018	ENV037_0.5	-	-	-	-	-	-	7.08	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ENV038	0.2	0.2	13/12/2018	ENV038_0.2	-	-	-	-	-	-	10.3	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ERM_BH09A	0.5	0.5	2/12/2021	ERM_BH09A_0.5	-	1 ^{#12}	1	-	-	-	324	-	1 ^{#11}	-	-	-	-	-	1 ^{#14}	-	0 ^{#15}	-	-	-	-	0 ^{#15}	0 ^{#15}	0 ^{#15}	0 ^{#15}
S08	0.45	0.4-0.5	10/03/2021	S08_0.4-0																									

		Asbestos																						
EQL	NEPM (1999) HSL D Comm/Indust - Asbestos	Total Asbestos g/kg*	APPROVED IDENTIFIER:	Asbestos Type	Fibrous Asbestos >7mm	Asbestos from ACM in Soil	Asbestos (Fines and Fibrous <7mm)	Weight of sample	Asbestos from FA & AF in Soil	Description	Mass ACM	Asbestos Containing Material	Mass AF	Mass Asbestos in ACM	Mass asbestos in AF	Organic Fibre	Mass Asbestos in FA	Synthetic Mineral Fibre	Mass Asbestos in FA & AF	Mass FA	Weight Used for % Calculation	Asbestos fibres	Asbestos (Trace)	
		mg/kg	-	-	g	%w/w	g	g	%w/w	-	g	g	g	g	g	g	g/kg	g	g/kg	g	g	kg	g/kg	Fibres
					0.0004		0.0004	0.01	0.001			0.1				0.1		0.1			0.0001	0.1	5	
						0.05			0.001															

LocCode	Sample_Depth_Avg	Sample_Depth_Range	Sampled_Date	Field_ID																				
S12	0.1	0-0.2	16/03/2021	S12_0.0-0.2	-	1 ^{#13}	1	-	-	-	370	-	1 ^{#9}	-	-	-	-	0 ^{#15}	-	0 ^{#15}	-	-	-	0 ^{#15}
S12	0.55	0.5-0.6	16/03/2021	S12_0.5-0.6	-	1 ^{#13}	1	<0.0004	-	<0.0004	273	<0.001	1 ^{#9}	-	-	-	-	0 ^{#15}	-	0 ^{#15}	-	-	0.273	0 ^{#15}
S12	0.55	0.5-0.6	16/03/2021	S12_0.5-0.6_frag	-	1 ^{#12}	1	-	-	-	1300	-	1 ^{#6}	-	-	-	-	1 ^{#14}	-	0 ^{#15}	-	-	-	0 ^{#15}
S13	0.55	0.5-0.6	16/03/2021	S13_0.5-0.6	-	1 ^{#13}	1	<0.0004	-	<0.0004	348	<0.001	1 ^{#9}	-	-	-	-	0 ^{#15}	-	0 ^{#15}	-	-	0.348	0 ^{#15}
S14	0.55	0.5-0.6	16/03/2021	S14_0.5-0.6	-	1 ^{#13}	1	<0.0004	-	<0.0004	353	<0.001	1 ^{#9}	-	-	-	-	0 ^{#15}	-	0 ^{#15}	-	-	0.353	0 ^{#15}
S15	0.05	0-0.1	16/03/2021	S15_0.0-0.1	-	1 ^{#13}	1	<0.0004	-	<0.0004	256	<0.001	1 ^{#9}	-	-	-	-	0 ^{#15}	-	0 ^{#15}	-	-	0.256	0 ^{#15}
S16	0.05	0-0.1	12/03/2021	S16_0.0-0.1	-	1 ^{#13}	1	-	-	-	395	-	1 ^{#9}	-	-	-	-	0 ^{#15}	-	0 ^{#15}	-	-	-	0 ^{#15}
S16	0.55	0.5-0.6	12/03/2021	S16_0.5-0.6	-	1 ^{#13}	1	<0.0004	-	<0.0004	459	<0.001	1 ^{#9}	-	-	-	-	0 ^{#15}	-	0 ^{#15}	-	-	0.459	0 ^{#15}
S16	2.45	2.3-2.6	12/03/2021	S16_2.3-2.6	-	1 ^{#13}	1	-	-	-	315	-	1 ^{#9}	-	-	-	-	0 ^{#15}	-	0 ^{#15}	-	-	-	0 ^{#15}
S17	0.05	0-0.1	16/03/2021	S17_0.0-0.1	-	1 ^{#13}	1	<0.0004	-	<0.0004	366	<0.001	1 ^{#10}	-	-	-	-	0 ^{#15}	-	0 ^{#15}	-	-	0.366	0 ^{#15}
S17	0.55	0.5-0.6	16/03/2021	S17_0.5-0.6	-	1 ^{#13}	1	-	-	-	239	-	1 ^{#10}	-	-	-	-	0 ^{#15}	-	0 ^{#15}	-	-	-	0 ^{#15}
S18	0.175	0.15-0.2	17/03/2021	S18_0.15-0.2	-	1 ^{#13}	1	<0.0004	-	<0.0004	558	<0.001	1 ^{#10}	-	-	-	-	0 ^{#15}	-	0 ^{#15}	-	-	0.558	0 ^{#15}
S18	0.55	0.5-0.6	17/03/2021	S18_0.5-0.6	-	1 ^{#13}	1	-	-	-	384	-	1 ^{#10}	-	-	-	-	0 ^{#15}	-	0 ^{#15}	-	-	-	0 ^{#15}
S18	0.9	0.8-1	17/03/2021	S18_0.8-1.0	-	1 ^{#13}	1	-	-	-	192	-	1 ^{#10}	-	-	-	-	0 ^{#15}	-	0 ^{#15}	-	-	-	0 ^{#15}
S19	0.2	0.15-0.25	18/03/2021	S19_0.15-0.25	-	1 ^{#13}	1	-	-	-	140	-	1 ^{#10}	-	-	-	-	0 ^{#15}	-	0 ^{#15}	-	-	-	0 ^{#15}
S19	0.45	0.4-0.5	18/03/2021	S19_0.4-0.5	-	1 ^{#13}	1 ^{#17}	<0.0004	-	0.0575	494	0.012	1 ^{#2}	-	-	-	-	0 ^{#15}	-	0 ^{#15}	-	-	0.494	1 ^{#14}
S19	0.95	0.9-1	18/03/2021	S19_0.9-1.0	-	1 ^{#13}	1	-	-	-	348	-	1 ^{#9}	-	-	-	-	0 ^{#15}	-	0 ^{#15}	-	-	-	0 ^{#15}
S20	0.2	0.15-0.25	17/03/2021	S20_0.15-0.25	-	1 ^{#13}	1	-	-	-	304	-	1 ^{#10}	-	-	-	-	0 ^{#15}	-	0 ^{#15}	-	-	-	0 ^{#15}
S20	0.45	0.4-0.5	17/03/2021	S20_0.4-0.5	-	1 ^{#13}	1	<0.0004	-	<0.0004	116	<0.001	1 ^{#9}	-	-	-	-	0 ^{#15}	-	0 ^{#15}	-	-	0.116	0 ^{#15}
S20	0.95	0.9-1	17/03/2021	S20_0.9-1.0	-	1 ^{#13}	1	-	-	-	392	-	1 ^{#10}	-	-	-	-	0 ^{#15}	-	0 ^{#15}	-	-	-	0 ^{#15}
S21	0.2	0.15-0.25	17/03/2021	S21_0.15-0.25	-	1 ^{#13}	1	<0.0004	-	<0.0004	151	<0.001	1 ^{#10}	-	-	-	-	0 ^{#15}	-	0 ^{#15}	-	-	0.151	0 ^{#15}
S21	0.45	0.4-0.5	17/03/2021	S21_0.4-0.5	-	1 ^{#13}	1	-	-	-	152	-	1 ^{#10}	-	-	-	-	0 ^{#15}	-	0 ^{#15}	-	-	-	0 ^{#15}
S21	0.95	0.9-1	17/03/2021	S21_0.9-1.0	-	1 ^{#13}	1	-	-	-	265	-	1 ^{#9}	-	-	-	-	0 ^{#15}	-	0 ^{#15}	-	-	-	0 ^{#15}
S22	0.6	0.5-0.7	26/04/2021	S22_0.5-0.7	-	1 ^{#12}	1	<0.0004	-	<0.0004	74.5	<0.001	1 ^{#8}	-	-	-	-	0 ^{#15}	-	0 ^{#15}	-	-	0.0745	0 ^{#15}
S59	0.25	0.2-0.3	16/03/2021	S59_0.2-0.3	-	1 ^{#13}	1	-	-	-	569	-	1 ^{#9}	-	-	-	-	0 ^{#15}	-	0 ^{#15}	-	-	-	0 ^{#15}
S59	0.55	0.5-0.6	16/03/2021	S59_0.5-0.6	-	1 ^{#13}	1	-	-	-	31	-	1 ^{#9}	-	-	-	-	0 ^{#15}	-	0 ^{#15}	-	-	-	0 ^{#15}
S59	1.05	1-1.1	9/03/2021	S59_1.0-1.1	-	1 ^{#13}	1	<0.0004	-	<0.0004	172	<0.001	1 ^{#9}	-	-	-	-	0 ^{#15}	-	0 ^{#15}	-	-	0.172	0 ^{#15}
S59	1.85	1.7-2	9/03/2021	S59_1.7-2.0	-	1 ^{#12}	1	-	-	-	318	-	1 ^{#8}	-	-	-	-	0 ^{#15}	-	0 ^{#15}	-	-	-	0 ^{#15}
S60	0.25	0.2-0.3	16/03/2021	S60_0.2-0.3	-	1 ^{#13}	1	-	-	-	314	-	1 ^{#9}	-	-	-	-	0 ^{#15}	-	0 ^{#15}	-	-	-	0 ^{#15}
S60	1.05	1-1.1	9/03/2021	S60_1.0-1.1	-	1 ^{#12}	1	-	-	-	513	-	1 ^{#8}	-	-	-	-	0 ^{#15}	-	0 ^{#15}	-	-	-	0 ^{#15}
S60	1.3	1.1-1.5	10/03/2021	S60_1.1-1.5	-	1 ^{#13}	1	-	-	-	23.2	-	1 ^{#9}	-	-	-	-	0 ^{#15}	-	0 ^{#15}	-	-	-	0 ^{#15}
S60	2.1	2-2.2	7/04/2021	S60_2.0-2.2	-	1 ^{#13}	1	-	-	-	320	-	1 ^{#9}	-	-	-	-	0 ^{#15}	-	0 ^{#15}	-	-	-	0 ^{#15}
S60	3.1	3-3.2	7/04/2021	S60_3.0-3.2	-	1 ^{#13}	1	-	-	-	585	-	1 ^{#9}	-	-	-	-	0 ^{#15}	-	0 ^{#15}	-	-	-	0 ^{#15}
S60	4.1	4-4.2	7/04/2021	S60_4.0-4.2	-	1 ^{#13}	1	-	-	-	655	-	1 ^{#9}	-	-	-	-	0 ^{#15}	-	0 ^{#15}	-	-	-	0 ^{#15}
S60	5.1	5-5.2	7/04/2021	S60_5.0-5.2	-	1 ^{#13}	1	-	-	-	303	-	1 ^{#9}	-	-	-	-	0 ^{#15}	-	0 ^{#15}	-	-	-	0 ^{#15}
S60	6.1	6-6.2	7/04/2021	S60_6.0-6.2	-	1 ^{#13}	1	-	-	-	640	-	1 ^{#9}	-	-	-	-	0 ^{#15}	-	0 ^{#15}	-	-	-	0 ^{#15}
S61	0.25	0.2-0.3	16/03/2021	S61_0.2-0.3	-	1 ^{#13}	1	-	-	-	533	-	1 ^{#9}	-	-	-	-	0 ^{#15}	-	0 ^{#15}	-	-	-	0 ^{#15}
S61	0.55	0.5-0.6	11/03/2021	S61_0.5-0.6	-	1 ^{#13}	1	<0.0004	-	<0.0004	244	<0.001	1 ^{#9}	-	-	-	-	0 ^{#15}	-	0 ^{#15}	-	-	0.244	0 ^{#15}
S61	0.95	0.9-1	11/03/2021	S61_0.9-1.0	-	1 ^{#13}	1	-	-	-	137	-	1 ^{#9}	-	-	-	-	0 ^{#15}	-	0 ^{#15}	-	-	-	0 ^{#15}
S61	1.45	1.4-1.5	11/03/2021	S61_1.4-1.5	-	1 ^{#13}	1	-	-	-	309	-	1 ^{#9}	-	-	-	-	0 ^{#15}	-	0 ^{#15}	-	-	-	0 ^{#15}
S61	2.2	2.1-2.3	11/03/2021	S61_2.1-2.3	-	1 ^{#13}	1	-	-	-	41.2	-	1 ^{#9}	-	-	-	-	0 ^{#15}	-	0 ^{#15}	-	-	-	0 ^{#15}
S62	0.05	0-0.1	9/03/2021	S62_0.0-0.1	-	1 ^{#13}	1	<0.0004	-	<0.0004	750	<0.001	1 ^{#9}	-	-	-	-	0 ^{#15}	-	0 ^{#15}	-	-	0.75	0 ^{#15}
S62	0.55	0.5-0.6	9/03/2021	S62_0.5-0.6	-	1 ^{#12}	1	-	-	-	600	-	1 ^{#8}	-	-	-	-	0 ^{#15}	-	0 ^{#15}	-	-	-	0 ^{#15}
S62	0.95	0.9-1	11/03/2021	S62_0.9-1.0	-	1 ^{#13}	1	-	-	-	198	-	1 ^{#9}	-	-	-	-	0 ^{#15}	-	0 ^{#15}	-	-	-	0 ^{#15}
S62	1.45	1.4-1.5	11/03/2021	S62_1.4-1.5	-	1 ^{#13}	1	-	-	-	215	-	1 ^{#9}	-	-	-	-	0 ^{#15}	-	0 ^{#15}	-	-	-	0 ^{#15}
S62	1.65	1.6-1.7	8/04/2021	S62_1.6-1.7	-	1 ^{#13}	1	-	-	-	432	-	1 ^{#9}	-	-	-	-	0 ^{#15}	-	0 ^{#15}	-	-	-	0 ^{#15}
S62	2.35	2.2-2.5	8/04/2021	S62_2.2-2.5	-	1 ^{#13}	1 ^{#17}	-	-	-	405	-	1 ^{#4}	-	-	-	-	0 ^{#15}	-	0 ^{#15}	-	-	-	0 ^{#15}
S62	4.1	4-4.2	8/04/2021	S62_4.0-4.2	-	1 ^{#13}	1	-	-	-	316	-	1 ^{#9}	-	-	-	-	0 ^{#15}	-	0 ^{#15}	-	-	-	0 ^{#15}
S62	6.15	6-6.3	8/04/2021	S62_6.0-6.3	-	1 ^{#13}	1</																	

	Asbestos																					
	Total Asbestos g/kg*	APPROVED IDENTIFIER:	Asbestos Type	Fibrous Asbestos >7mm	Asbestos from ACM in Soil	Asbestos (Fines and Fibrous <7mm)	Weight of sample	Asbestos from FA & AF in Soil	Description	Mass ACM	Asbestos Containing Material	Mass AF	Mass Asbestos in ACM	Mass asbestos in AF	Organic Fibre	Mass Asbestos in FA	Synthetic Mineral Fibre	Mass Asbestos in FA & AF	Mass FA	Weight Used for % Calculation	Asbestos fibres	Asbestos (Trace)
EQL	mg/kg	-	-	g	%w/w	g	g	%w/w	-	g	g	g	g	g	g/kg	g	g/kg	g	g	kg	g/kg	Fibres
NEPM (1999) HSL D Comm/Indust - Asbestos				0.0004		0.0004	0.01	0.001			0.1				0.1		0.1			0.0001	0.1	5

LocCode	Sample_Depth_Avg	Sample_Depth_Range	Sampled_Date	Field_ID		-	1 ^{#13}	1	-	-	-	626	-	1 ^{#9}	-	-	-	-	-	0 ^{#15}	-	0 ^{#15}	-	-	-	-	0 ^{#15}	0 ^{#15}
S66	0.45	0.4-0.5	11/03/2021	S66_0.4-0.5	-	1 ^{#13}	1	-	-	-	-	260	-	1 ^{#9}	-	-	-	-	-	0 ^{#15}	-	0 ^{#15}	-	-	-	-	0 ^{#15}	0 ^{#15}
S66	1.05	1-1.1	11/03/2021	S66_1.0-1.1	-	1 ^{#13}	1	-	-	-	-	270	-	1 ^{#9}	-	-	-	-	-	0 ^{#15}	-	0 ^{#15}	-	-	-	-	0 ^{#15}	0 ^{#15}
S66	1.55	1.5-1.6	1/04/2021	S66_1.5-1.6	-	1 ^{#13}	1	-	-	-	-	548	-	1 ^{#9}	-	-	-	-	-	0 ^{#15}	-	0 ^{#15}	-	-	-	-	0 ^{#15}	0 ^{#15}
S66	2.05	2-2.1	1/04/2021	S66_2.0-2.1	-	1 ^{#13}	1	-	-	-	-	397	-	1 ^{#9}	-	-	-	-	-	0 ^{#15}	-	0 ^{#15}	-	-	-	-	0 ^{#15}	0 ^{#15}
S66	3.05	3-3.1	1/04/2021	S66_3.0-3.1	-	1 ^{#13}	1	-	-	-	-	339	-	1 ^{#9}	-	-	-	-	-	0 ^{#15}	-	0 ^{#15}	-	-	-	-	0 ^{#15}	0 ^{#15}
S66	4.05	4-4.1	1/04/2021	S66_4.0-4.1	-	1 ^{#13}	1	-	-	-	-	602	-	1 ^{#9}	-	-	-	-	-	0 ^{#15}	-	0 ^{#15}	-	-	-	-	0 ^{#15}	0 ^{#15}
S66	5.05	5-5.1	1/04/2021	S66_5.0-5.1	-	1 ^{#13}	1	-	-	-	-	274	-	1 ^{#9}	-	-	-	-	-	0 ^{#15}	-	0 ^{#15}	-	-	-	-	0 ^{#15}	0 ^{#15}
S66	6.05	6-6.1	1/04/2021	S66_6.0-6.1	-	1 ^{#13}	1	-	-	-	-	726	-	1 ^{#9}	-	-	-	-	-	0 ^{#15}	-	0 ^{#15}	-	-	-	-	0 ^{#15}	0 ^{#15}
S67	0.05	0-0.1	11/03/2021	S67_0.0-0.1	-	1 ^{#13}	1	-	-	-	-	550	<0.001	1 ^{#9}	-	-	-	-	-	0 ^{#15}	-	0 ^{#15}	-	-	-	-	0 ^{#15}	0 ^{#15}
S67	0.65	0.6-0.7	11/03/2021	S67_0.6-0.7	-	1 ^{#13}	1	<0.0004	-	<0.0004	-	23	-	1 ^{#9}	-	-	-	-	-	0 ^{#15}	-	0 ^{#15}	-	-	-	0.55	0 ^{#15}	0 ^{#15}
S67	1.05	1-1.1	11/03/2021	S67_1.0-1.1	-	1 ^{#13}	1	-	-	-	-	700	-	1 ^{#9}	-	-	-	-	-	0 ^{#15}	-	0 ^{#15}	-	-	-	-	0 ^{#15}	0 ^{#15}
S67	2.05	2-2.1	31/03/2021	S67_2.0-2.1	-	1 ^{#13}	1	-	-	-	-	564	-	1 ^{#9}	-	-	-	-	-	0 ^{#15}	-	0 ^{#15}	-	-	-	-	0 ^{#15}	0 ^{#15}
S67	5.05	5-5.1	31/03/2021	S67_5.0-5.1	-	1 ^{#13}	1	-	-	-	-	590	<0.001	1 ^{#9}	-	-	-	-	-	1 ^{#14}	-	0 ^{#15}	-	-	-	-	0 ^{#15}	0 ^{#15}
S68	0.05	0-0.1	12/03/2021	S68_0.0-0.1	-	1 ^{#13}	1	<0.0004	-	<0.0004	-	444	-	1 ^{#9}	-	-	-	-	-	0 ^{#15}	-	0 ^{#15}	-	-	-	-	0 ^{#15}	0 ^{#15}
S68	0.55	0.5-0.6	12/03/2021	S68_0.5-0.6	-	1 ^{#13}	1	-	-	-	-	214	-	1 ^{#9}	-	-	-	-	-	0 ^{#15}	-	0 ^{#15}	-	-	-	-	0 ^{#15}	0 ^{#15}
S68	1.05	1-1.1	12/03/2021	S68_1.0-1.1	-	1 ^{#13}	1	-	-	-	-	580	-	1 ^{#9}	-	-	-	-	-	0 ^{#15}	-	0 ^{#15}	-	-	-	-	0 ^{#15}	0 ^{#15}
S68	1.55	1.5-1.6	12/03/2021	S68_1.5-1.6	-	1 ^{#13}	1	-	-	-	-	537	<0.001	1 ^{#9}	-	-	-	-	-	0 ^{#15}	-	0 ^{#15}	-	-	-	-	0 ^{#15}	0 ^{#15}
S69	0.05	0-0.1	10/03/2021	S69_0.0-0.1	-	1 ^{#13}	1	<0.0004	-	<0.0004	-	231	-	1 ^{#9}	-	-	-	-	-	0 ^{#15}	-	0 ^{#15}	-	-	-	-	0 ^{#15}	0 ^{#15}
S69	0.55	0.5-0.6	10/03/2021	S69_0.5-0.6	-	1 ^{#13}	1	-	-	-	-	362	-	1 ^{#9}	-	-	-	-	-	0 ^{#15}	-	0 ^{#15}	-	-	-	-	0 ^{#15}	0 ^{#15}
S70	0.175	0.15-0.2	17/03/2021	S70_0.15-0.2	-	1 ^{#13}	1	-	-	-	-	231	-	1 ^{#10}	-	-	-	-	-	0 ^{#15}	-	0 ^{#15}	-	-	-	-	0 ^{#15}	0 ^{#15}
S70	0.45	0.4-0.5	17/03/2021	S70_0.4-0.5	-	1 ^{#13}	1	<0.0004	-	<0.0004	-	209	<0.001	1 ^{#10}	-	-	-	-	-	0 ^{#15}	-	0 ^{#15}	-	-	-	-	0 ^{#15}	0 ^{#15}
S70	0.85	0.8-0.9	17/03/2021	S70_0.8-0.9	-	1 ^{#13}	1	-	-	-	-	196	-	1 ^{#10}	-	-	-	-	-	0 ^{#15}	-	0 ^{#15}	-	-	-	-	0 ^{#15}	0 ^{#15}
S71	0.05	0-0.1	26/04/2021	S71_0.0-0.1	-	1 ^{#12}	1	<0.0004	-	<0.0004	-	879	<0.001	1 ^{#8}	-	-	-	-	-	0 ^{#15}	-	0 ^{#15}	-	-	-	-	0 ^{#15}	0 ^{#15}
S72	0.05	0-0.1	17/03/2021	S72_0.0-0.1	-	1 ^{#13}	1	-	-	-	-	583	-	1 ^{#10}	-	-	-	-	-	0 ^{#15}	-	0 ^{#15}	-	-	-	-	0 ^{#15}	0 ^{#15}
S72	0.55	0.5-0.6	17/03/2021	S72_0.5-0.6	-	1 ^{#13}	1	-	-	-	-	860	-	1 ^{#10}	-	-	-	-	-	0 ^{#15}	-	0 ^{#15}	-	-	-	-	0 ^{#15}	0 ^{#15}
S72	1.05	1-1.1	17/03/2021	S72_1.0-1.1	-	1 ^{#13}	1	-	-	-	-	508	-	1 ^{#10}	-	-	-	-	-	0 ^{#15}	-	0 ^{#15}	-	-	-	-	0 ^{#15}	0 ^{#15}
S72	1.55	1.5-1.6	17/03/2021	S72_1.5-1.6	-	1 ^{#13}	1	-	-	-	-	491	-	1 ^{#10}	-	-	-	-	-	0 ^{#15}	-	0 ^{#15}	-	-	-	-	0 ^{#15}	0 ^{#15}
S72	2.05	2-2.1	17/03/2021	S72_2.0-2.1	-	1 ^{#13}	1	-	-	-	-	505	-	1 ^{#10}	-	-	-	-	-	0 ^{#15}	-	0 ^{#15}	-	-	-	-	0 ^{#15}	0 ^{#15}
S72	2.45	2.4-2.5	17/03/2021	S72_2.4-2.5	-	1 ^{#13}	1	-	-	-	-	553	-	1 ^{#10}	-	-	-	-	-	0 ^{#15}	-	0 ^{#15}	-	-	-	-	0 ^{#15}	0 ^{#15}
S72	3.05	3-3.1	17/03/2021	S72_3.0-3.1	-	1 ^{#13}	1	-	-	-	-	528	-	1 ^{#10}	-	-	-	-	-	0 ^{#15}	-	0 ^{#15}	-	-	-	-	0 ^{#15}	0 ^{#15}
SMW_BH409	1	1	6/03/2020	SMW_BH409/1.0	-	-	-	-	-	-	-	60.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

Statistical Summary

Number of Results	42	103	103	27	28	27	218	55	149	70	1	28	70	28	103	28	103	28	28	27	103	103
Number of Detects	42	103	103	0	28	1	218	29	149	70	1	28	70	28	103	28	103	28	28	27	103	103
Minimum Concentration	0	1	1	<0.0004	0	<0.0004	5.54	0	1	0	8.3	0	0	0	<0	0	<0	0	0	0.0745	<0	<0
Maximum Concentration	0	1	1	<0.0004	0	0.0575	16300	0.012	1	0	8.3	0.0005	0	0.0005	1	0.0086	0	0.0086	0.0107	0.879	1	0
Average Concentration	0	1	1	0.0002	0	0.0023	3482	0.00049	1	0		0.000018	0	0.000018	0.029	0.00031	0	0.00033	0.00038	0.42	0.019	0
Standard Deviation	0	0	0	0	0	0.011	6280	0.0016	0	0		0.000094	0	0.000094	0.17	0.0016	0	0.0016	0.002	0.21	0.14	0
Number of Guideline Exceedances	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances(Detects Only)	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Data Comments

- #1 Dark grey rocky soil containing one piece of asbestos cement sheeting approximately 50x40x5mm.
#2 Mid grey soil containing one piece of asbestos cement debris approximately 8x5x2mm.
#3 Mid brown soil containing one asbestos fibre bundle approximately 5x0.5x0.5mm.
#4 Mid brown soil containing one asbestos fibre bundle approximately 10x1x0.5mm.
#5 Mid brown soil containing one asbestos fibre bundle approximately 10x5x1mm.
#6 Several pieces of cement sheeting.
#7 Black rocky soil.
#8 Mid-brown soil.
#9 Mid brown soil.
#10 Mid grey soil.
#11 A soil sample.
#12 B.SCHRADER
#13 A. SMYLIE
#14 Yes
#15 No*
#16 No
#17 Ch

	Acid Neutralising Capacity - Acidity units	Liming rate without ANCE	pH-F (Field pH test)	pH-FOX (Field pH Peroxide test)	Reaction Ratings	Acid Neutralising Capacity	Acid Reacted Calcium	Acid Reacted Magnesium	acidity - Acid Reacted Calcium	acidity - Acid Reacted Magnesium	acidity - Excess Acid Neutralising Capacity	acidity - Peroxide Oxidisable Sulfur	acidity - Chromium Reducible Sulfur (a-22B)	Calcium in Peroxide	Chromium Reducible Sulfur	Excess Acid Neutralising Capacity	KCl Extractable Calcium	KCl Extractable Magnesium
	mole H+/t	kg CaCO3/t	pH Units	pH Units	-	%CaCO3	%	% Mg	mole H+/t	mole H+/t	mole H+/t	mole H+/t	mole H+/t	%	%S	% CaCO3	%	%
EQL	10	1	0.1	0.1	1	0.01	0.02	0.02	10	10	10	10	10	0.02	0.005	0.02	0.02	0.02
NSW ASS Manual Action Criteria >100t disturbed																		

LocCode	Sample_Depth_Avg	Sample_Depth_Range	Sampled_Date	Field_ID														
BH066	3	3	28/05/2018	SMW_BH066_3.0	-	-	9	5.8	3	-	-	-	-	-	-	-	-	-
BH066	6	6	28/05/2018	SMW_BH066_6.0	-	-	8.1	3.9	3	-	-	-	-	-	-	-	-	-
C32	3.55	3.5-3.6	16/02/2017	C32_3.5-3.6	-	-	-	-	-	0.79	0.09	390	71	-	500	-	1	-
E22	2	2	6/03/2017	E22:1.8-2.0	1900	-	-	-	-	9.3	-	-	-	-	-	-	-	-
E22	4	4	6/03/2017	E22:3.8-4.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E23	1.6	1.6	6/03/2017	E23:1.3-1.6	1200	-	-	-	-	6.2	-	-	-	-	-	-	-	-
E28	4.15	4.1-4.2	3/03/2017	E28 4.1-4.2	200	-	-	-	-	1	-	-	-	-	-	-	-	-
E59	3.05	3-3.1	3/03/2017	E59 3.0-3.1	260	-	-	-	-	1.3	-	-	-	-	-	-	-	-
E59	4.05	4-4.1	3/03/2017	E59 4.0-4.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ENV022	3	3	3/12/2018	ENV022_3.0	-	71	7	3.7	4	-	-	0.121	1530	99	1020	945	-	0.029
ENV022	12	12	13/12/2018	ENV022_12.0	-	-	4.9	2	3	-	-	-	-	-	-	-	-	-
ENV022	12	12	13/12/2018	ENV022-12.0	-	22	-	-	-	-	-	<0.02	<10	<10	-	152	-	0.069
ENV023	3	3	3/12/2018	ENV023_3.0	-	4	-	-	-	-	-	<0.02	535	<10	560	49	-	<0.02
ENV023	3	3	4/12/2018	ENV023_3.0	-	-	8	5.2	2	-	-	-	-	-	-	-	-	-
ENV024	3	3	5/12/2018	ENV024_3.0	-	-	8.7	6.3	2	-	-	-	-	-	-	-	-	-
ENV026	3.9	3.9	17/12/2018	ENV026_3.8-4.0	-	48	-	-	-	-	-	0.127	1140	105	779	647	-	0.059
ENV026	6	6	14/12/2018	ENV026_6.0	-	8	8.3	2.2	2	-	-	0.026	472	21	466	105	-	<0.02
ENV026	11	11	14/12/2018	ENV026_11.0	-	<1	8.1	4.8	2	-	-	0.024	<10	20	-	12	-	<0.02
ENV027	3.9	3.8-4	17/12/2018	ENV027/3.8-4.0	-	-	7.9	3.3	4	-	-	-	-	-	-	-	-	-
ENV027	9.75	9.7-9.8	17/12/2018	ENV027/9.7-9.8	-	-	8.3	5.8	2	-	-	-	-	-	-	-	-	-
ENV028	11.55	11.4-11.7	17/12/2018	ENV028/11.4-11.7	-	-	7	4.9	2	-	-	-	-	-	-	-	-	-
ENV028	11.55	11.55	17/12/2018	ENV028_11.4-11.7	-	<1	-	-	-	-	-	<0.02	<10	<10	-	<10	-	0.024
ENV029	6	6	10/12/2018	ENV029_6.0	-	28	8.9	3.5	3	-	-	0.077	452	63	236	375	-	0.027
ENV029	10	10	10/12/2018	ENV029_10.0	-	<1	6.2	4.8	3	-	-	<0.02	<10	<10	-	<10	-	0.026
ENV033	4	4	7/12/2018	ENV033_4.0	-	6	8.5	2.5	2	-	-	0.035	229	28	200	77	-	<0.02
ENV033	7	7	7/12/2018	ENV033_7.0	-	<1	8.1	5.8	3	-	-	<0.02	<10	<10	-	<10	-	<0.02
ENV034	4	4	10/12/2018	ENV034_4.0	-	-	9	6	2	-	-	-	-	-	-	-	-	-
ENV034	7	7	10/12/2018	ENV034_7.0	-	<1	8.5	6	3	-	-	<0.02	<10	<10	30	<10	-	0.051
ERM_BH07	1	1	30/11/2021	ERM_BH07_1.0	-	5	-	-	-	2.32	-	-	-	-	61	-	0.098	-
ERM_BH07	1.5	1.5	30/11/2021	ERM_BH07_1.5	-	6	-	-	-	2.69	-	-	-	-	75	-	0.12	-
ERM_BH07	4	4	1/12/2021	ERM_BH07_4.0	-	26	-	-	-	0.58	-	-	-	-	350	-	0.561	-
ERM_BH07	6	6	1/12/2021	ERM_BH07_6.0	-	14	-	-	-	0.41	-	-	-	-	189	-	0.302	-
ERM_BH07	6.5	6.5	1/12/2021	ERM_BH07_6.5	-	12	-	-	-	-	-	-	-	-	167	-	0.268	-
ERM_BH07	7	7	1/12/2021	ERM_BH07_7.0	-	8	-	-	-	0.39	-	-	-	-	111	-	0.178	-
ERM_BH07	7.5	7.5	1/12/2021	ERM_BH07_7.5	-	<1	-	-	-	-	-	-	-	-	11	-	0.018	-
ERM_BH07	9	9	1/12/2021	ERM_BH07_9.0	-	4	-	-	-	0.43	-	-	-	-	49	-	0.079	-
ERM_BH07	11	11	1/12/2021	ERM_BH07_11.0	-	25	-	-	-	0.85	-	-	-	-	333	-	0.534	-
ERM_BH07	11.5	11.5	1/12/2021	ERM_BH07_11.5	-	17	-	-	-	-	-	-	-	-	195	-	0.313	-
ERM_BH07	12	12	1/12/2021	ERM_BH07_12.0	-	12	-	-	-	-	-	-	-	-	68	-	0.109	-
ERM_BH07	13	13	1/12/2021	ERM_BH07_13.0	-	4	-	-	-	-	-	-	-	-	27	-	0.043	-
ERM_BH07	13.5	13.5	1/12/2021	ERM_BH07_13.5	-	2	-	-	-	-	-	-	-	-	20	-	0.032	-
ERM_BH07	14	14	1/12/2021	ERM_BH07_14.0	-	2	-	-	-	-	-	-	-	-	15	-	0.023	-
ERM_BH07	14.5	14.5	1/12/2021	ERM_BH07_14.5	-	1	-	-	-	-	-	-	-	-	16	-	0.025	-
ERM_BH08	12.5	12.5	30/11/2021	ERM_BH08_12.5	-	<1	-	-	-	-	-	-	-	-	<10	-	0.011	-
ERM_BH09A	2	2	2/12/2021	ERM_BH09A_2.0	-	3	-	-	-	3.89	-	-	-	-	35	-	0.056	-
ERM_BH09A	14.5	14.5	3/12/2021	ERM_BH09A_14.5	-	1	-	-	-	-	-	-	-	-	14	-	0.023	-
ERM_BH09A	15.5	15.5	3/12/2021	ERM_BH09A_15.5	-	1	-	-	-	-	-	-	-	-	11	-	0.018	-
ERM_BH09A	16	16	3/12/2021	ERM_BH09A_16.0	-	1	-	-	-	-	-	-	-	-	12	-	0.018	-
S08	3.3	3.2-3.4	24/03/2021	S08_3.2-3.4	-	-	8.1	2.8	4	-	-	-	-	-	-	-	-	-
S08	6.1	6-6.2	24/03/2021	S08_6.0-6.2	-	-	8.3	3.3	3	-	-	-	-	-	-	-	-	-
S08	11.05	10.9-11.2	24/03/2021	S08_10.9-11.2	-	-	6.6	4.3	1	-	-	-	-	-	-	-	-	-
S08	12.6	12.5-12.7	24/03/2021	S08_12.5-12.7	-	-	7.6	3.8	2	-	-	-	-	-	-	-	-	-
S08	14.65	14.5-14.8	24/03/2021	S08_14.5-14.8	-	<1	5.9	3.6	2	-	<0.02	<0.02	<10	<10	-	0.024	-	0.023
S09	6	5.8-6.2	10/03/2021	S09_5.8-6.2	-	5	8.2	4.9	4	-	0.338	<0.02	169	<10	146	69	-	<0.02

LocCode	Sample_Depth_Avg	Sample_Depth_Range	Sampled_Date	Field_ID
S12	0.55	0.5-0.6	16/03/2021	S12_0.5-0.6
S16	0.55	0.5-0.6	12/03/2021	S16_0.5-0.6
S59	2.7	2.6-2.8	24/03/2021	S59_2.6-2.8
S62	0.05	0-0.1	9/03/2021	S62_0.0-0.1
S62	2.35	2.2-2.5	8/04/2021	S62_2.2-2.5
S64	2.05	2-2.1	31/03/2021	S64_2.0-2.1

	Alkalinity				Major Ions															Physical Parameters			Inorganic Nitrogen			
	Bicarbonate Alkalinity (as CaCO3)	Carbonate Alkalinity (as CaCO3)	Hydroxide Alkalinity (as CaCO3)	Total Alkalinity (as CaCO3)	Calcium	Calcium (Filtered)	Chloride	Magnesium	Magnesium (Filtered)	Potassium	Potassium (Filtered)	Sulfate (as SO4)	Sulfate (as SO4) (Filtered)	Sulfate (as S)	Sodium	Sodium (Filtered)	Anions Total	Cations Total	Ionic Balance	Electrical Conductivity	Total Dissolved Solids	pH (Lab)	Ammonia (as N)	Nitrate (as N)	Nitrite (as N)	Total Oxidised Nitrogen (as N)
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	meq/L	meq/L	%	µS/cm	mg/L	pH Units	mg/L	mg/L	mg/L	mg/L
EQL	1	1	1	1	0.5	0.5	1	0.5	0.5	0.5	0.5	1	1	2	0.5	0.5	0.01	0.01	0.01	1	5	0.01	0.01	0.01	0.01	0.01
ANZG (2018) Marine Water - Slightly to moderately disturbed ecosystems																										
NHMRC (2008) Recommended Recreational Guidelines - Aesthetic							2500 ^{#4}					2500 ^{#4}	2500 ^{#4}		1800 ^{#4}	1800 ^{#4}					6000 ^{#4}	85 ^{#4}				
NHMRC (2008) Recommended Recreational Guidelines - Health							2500 ^{#5}					5000 ^{#5}	5000 ^{#5}													

LocCode	Field_ID	Sampled_Date																										
E59	E59	15/03/2017	320	<5	-	-	190	-	820	110	-	38	-	-	-	110	590	-	-	-	-	2900	-	-	2.1	1.4	-	-
SMW_BH066	SMW_BH066	23/04/2020	60	<1	<1	60	-	109	977	-	88	-	7	26	-	-	-	265	29.3	29.2	0.18	3280	2680	6.24	0.57	<0.01	<0.01	<0.01
SMW_BH067	SMW_BH067	23/04/2020	155	<1	<1	155	-	99	170	-	29	-	5	414	-	-	-	164	16.5	16.1	1.15	1620	1010	6.56	0.03	<0.01	<0.01	<0.01
SMW_ENV026	SMW_ENV026	22/01/2019	722	<1	<1	722	-	88	426	-	81	-	36	<1	-	-	-	290	26.4	24.6	3.62	2510	1330	7.64	7.7	0.02	<0.01	0.02
SMW_ENV026	SMW_ENV026	4/05/2021	706	<1	<1	706	-	125	355	-	63	-	31	-	3	-	-	281	24.2	24.4	0.53	-	1300	-	-	-	-	-
SMW_ENV027	SMW_ENV027	22/01/2019	622	<1	<1	622	-	171	28	-	21	-	14	10	-	-	-	41	13.4	12.4	3.96	1160	698	7.18	4.24	0.03	<0.01	0.03
SMW_ENV034	SMW_ENV034	22/01/2019	698	<1	<1	698	-	52	3110	-	165	-	92	372	-	-	-	1880	109	100	4.35	11,100	6440	7.8	3.56	0.03	<0.01	0.03
SMW_ENV034	SMW_ENV034	10/05/2021	728	<1	<1	728	-	81	4060	-	218	-	110	-	690	-	-	2640	143	140	1.34	-	8640	-	2.04	<0.01	-	-

Statistical Summary

Number of Results	8	8	7	7	1	7	8	1	7	1	7	5	2	1	1	7	7	7	7	6	7	5	7	7	5	5
Number of Detects	8	0	0	7	1	7	8	1	7	1	7	4	2	1	1	7	7	7	7	6	7	5	7	4	0	3
Minimum Concentration	60	<1	<1	60	190	52	28	110	21	38	5	<1	3	110	590	41	13.4	12.4	0.18	1160	698	6.24	0.03	<0.01	<0.01	<0.01
Maximum Concentration	728	<5	<1	728	190	171	4060	110	218	38	110	414	690	110	590	2640	143	140	4.35	11100	8640	7.8	7.7	1.4	<0.01	0.03
Average Concentration	501	0.75	0.5	527		104	1243		95		42	165				794	52	50	2.2	3762	3157	7.1	2.9	0.21	0.005	0.018
Standard Deviation	278	0.71	0	290		38	1500		72		42	209				1029	52	50	1.8	3681	3123	0.67	2.6	0.52	0	0.013
Number of Guideline Exceedances	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2	0	0	0	0	2	0	0	0	0	0
Number of Guideline Exceedances(Detects Only)	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2	0	0	0	0	2	0	0	0	0	0

Env Stds Comments

- #1:Apply LOSP 99
- #2:Apply LOSP 95
- #3:Apply LOSP Unknown
- #4:NHMRC (2011) Drinking Water Guidelines [2016] Aesthetic
- #5:Health Canada (2014) Guidelines for Canadian Drinking Water Quality
- #6:NHMRC (2011) Drinking Water Guidelines [2016] Health
- #7:WHO (2011) Drinking Water Quality

	Inorganics					Metals																
	Total Kjeldahl Nitrogen	Total Nitrogen (as N)	Phosphorus (as P)	Ortho-phosphate (as P)	Fluoride	Arsenic (Filtered)	Barium (Filtered)	Beryllium (Filtered)	Boron (Filtered)	Cadmium (Filtered)	Chromium (Filtered)	Chromium(VI) (Filtered)	Cobalt (Filtered)	Copper (Filtered)	Iron (Filtered)	Lead (Filtered)	Manganese (Filtered)	Mercury (Filtered)	Nickel (Filtered)	Selenium (Filtered)	Vanadium (Filtered)	Zinc (Filtered)
	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL	0.2	0.2	0.01	0.01	0.1	1	1	1	50	0.1	1	10	1	1	50	1	1	0.1	1	10	10	1
ANZG (2018) Marine Water - Slightly to moderately disturbed ecosystems										0.7 ^{#1}	4.4 ^{#2}	27 ^{#2}	1 ^{#2}	1.3 ^{#2}		4.4 ^{#2}	80 ^{#3}	0.1 ^{#1}	7 ^{#1}		100 ^{#2}	15 ^{#2}
NHMRC (2008) Recommended Recreational Guidelines - Aesthetic															3000 ^{#4}							30000 ^{#4}
NHMRC (2008) Recommended Recreational Guidelines - Health					15 ^{#6}	100 ^{#6}	20000 ^{#6}	600 ^{#6}	40000 ^{#6}	20 ^{#6}	500 ^{#7}	500 ^{#6}		20000 ^{#6}		100 ^{#6}	5000 ^{#6}	10 ^{#6}	200 ^{#6}	100 ^{#6}		

LocCode	Field_ID	Sampled_Date																					
E59	E59	15/03/2017	-	-	-	-	-	10	-	-	-	<0.2	4	-	-	<1	-	2	-	<0.1	<1	-	<5
SMW_BH066	SMW_BH066	23/04/2020	<0.1	<0.1	<0.05	<0.05	0.1	<1	-	-	-	<0.1	<1	-	<1	<1	89,500	<1	2120	<0.1	<1	-	<5
SMW_BH067	SMW_BH067	23/04/2020	<0.1	<0.1	<0.01	<0.01	0.1	<1	-	-	-	<0.1	<1	-	3	<1	28,900	<1	1060	<0.1	2	-	<5
SMW_ENV026	SMW_ENV026	22/01/2019	7.5	7.5	0.42	0.04	1	9	-	-	-	<0.1	<1	<10	<1	<1	1500	<1	39	<0.1	<1	-	6
SMW_ENV026	SMW_ENV026	4/05/2021	-	-	-	-	-	4	148	<1	1340	<0.1	<1	-	<1	<1	-	<1	273	<0.1	<1	<10	<5
SMW_ENV027	SMW_ENV027	22/01/2019	4.2	4.2	1	<0.01	0.4	7	-	-	-	<0.1	<1	<10	<1	<1	9560	<1	394	<0.1	<1	-	10
SMW_ENV034	SMW_ENV034	22/01/2019	3.4	3.4	<0.01	<0.01	1.5	6	-	-	-	<0.1	<1	<10	<1	<1	1950	<1	79	<0.1	<1	-	<5
SMW_ENV034	SMW_ENV034	10/05/2021	-	-	-	-	-	7	39	<1	3540	<0.1	<1	-	<1	<1	-	<1	139	<0.1	<1	<10	<5

Statistical Summary

Number of Results	5	5	5	5	5	8	2	2	2	8	8	3	7	8	5	8	7	8	8	2	2	8
Number of Detects	3	3	2	1	5	6	2	0	2	0	1	0	1	0	5	1	7	0	1	0	0	2
Minimum Concentration	<0.1	<0.1	<0.01	<0.01	0.1	<1	39	<1	1340	<0.1	<1	<10	<1	<1	1500	<1	39	<0.1	<1	<10	<10	<5
Maximum Concentration	7.5	7.5	1	<0.05	1.5	10	148	<1	3540	<0.2	4	<10	3	<1	89500	2	2120	<0.1	2	<10	<10	10
Average Concentration	3	3	0.29	0.016	0.62	5.5				0.056	0.94	5	0.86	0.5	26282	0.69	586	0.05	0.69			3.9
Standard Deviation	3.1	3.1	0.43	0.016	0.61	3.6				0.018	1.2	0	0.94	0	37045	0.53	760	0	0.53			2.8
Number of Guideline Exceedances	0	0	0	0	0	0	0	0	0	0	0	0	1	0	3	0	5	0	0	0	0	0
Number of Guideline Exceedances(Detects Only)	0	0	0	0	0	0	0	0	0	0	0	0	1	0	3	0	5	0	0	0	0	0

Env Stds Comments

- #1:Apply LOSP 99
- #2:Apply LOSP 95
- #3:Apply LOSP Unknown
- #4:NHMRC (2011) Drinking Water Guidelines [2016] Aesthetic
- #5:Health Canada (2014) Guidelines for Canadian Drinking Water Quality
- #6:NHMRC (2011) Drinking Water Guidelines [2016] Health
- #7:WHO (2011) Drinking Water Quality

	Organophosphorus Pesticides											Herbicides	Organochlorine Pesticides																							Pesticides	PCBs				
	Chlorfenvinphos	Chlorpyrifos	Chlorpyrifos-methyl	Diazinon	Dichlorvos	Dimethoate	Ethion	Fenthion	Malathion	Primphos-ethyl	Prothiofos	Pronamide	Dieldrin	d-BHC	b-BHC	g-BHC (Lindane)	a-BHC	Aldrin	Aldrin + Dieldrin	chlordane	DDT	4,4-DDE	DDD	DDT+DDE+DDD	Hexachlorobenzene	Endosulfan I	Endosulfan II	Endosulfan sulfate	Endrin	Chlordane (cis)	Chlordane (trans)	Endrin aldehyde	Endrin ketone	Heptachlor	Heptachlor epoxide	Methoxychlor	DDE	Chlorobenzilate	PCBs (Sum of total)		
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	
EQL	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	2	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	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	2	0.5	2	1	
ANZG (2018) Marine Water - Slightly to moderately disturbed ecosystems		0.009 ^{#1}		0.01 ^{#2}		0.15 ^{#2}			0.05 ^{#2}				0.01 ^{#3}			0.007 ^{#4}		0.003 ^{#4}		0.001 ^{#4}	0.0004 ^{#4}				0.05 ^{#5}				0.004 ^{#5}					0.0004 ^{#4}		0.04 ^{#4}					
NHMRC (2008) Recommended Recreational Guidelines - Aesthetic																																									
NHMRC (2008) Recommended Recreational Guidelines - Health	20 ^{#6}	100 ^{#6}	100 ^{#7}	40 ^{#6}	50 ^{#6}	70 ^{#6}	40 ^{#6}	70 ^{#6}	700 ^{#6}	5 ^{#6}		700 ^{#6}	0.2 ^{#8}		200 ^{#7}	100 ^{#6}	200 ^{#7}	0.2 ^{#8}	3 ^{#6}	2 ^{#9} 20 ^{#6}	90 ^{#6}	200 ^{#7}			2 ^{#8}			300 ^{#7}	6 ^{#9}					3 ^{#6}	0.4 ^{#8}	200 ^{#9}			10 ^{#8}		

LocCode	Field_ID	Sampled_Date																																						
SMW_ENV026	SMW_ENV026	22/01/2019	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<4	-	<4	-	<2	<4	<4	<2	<2	<2	<2	-	-	-	-	<2	<2	-	<2	<2	-	
SMW_ENV027	SMW_ENV027	22/01/2019	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<4	-	<4	-	<2	<4	<4	<2	<2	<2	<2	<2	-	-	-	-	<2	<2	-	<2	<2	-
SMW_ENV034	SMW_ENV034	22/01/2019	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<4	-	<4	-	<2	<4	<4	<2	<2	<2	<2	<2	-	-	-	-	<2	<2	-	<2	<2	-
SMW_ENV034	SMW_ENV034	10/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<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	<2	-	-	<1		

Statistical Summary																																						
Number of Results	3	3	3	3	3	3	3	3	3	3	3	3	4	4	4	4	4	4	4	1	4	1	4	4	4	4	4	4	1	1	1	1	4	4	1	3	3	1
Number of Detects	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Concentration	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<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	<2	<2	<2	<2	<1	
Maximum Concentration	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<4	<0.5	<4	<0.5	<2	<4	<4	<2	<2	<2	<2	<0.5	<0.5	<0.5	<0.5	<2	<2	<2	<2	<2	<1
Average Concentration	1	1	1	1	1	1	1	1	1	1	1	1	0.81	0.81	0.81	0.81	0.81	0.81	1.6	1.8		0.81	1.6	1.6	0.81	0.81	0.81	0.81					0.81	0.81	1	1		
Standard Deviation	0	0	0	0	0	0	0	0	0	0	0	0	0.38	0.38	0.38	0.38	0.38	0.38	0.88	0.5		0.38	0.88	0.88	0.38	0.38	0.38	0.38					0.38	0.38		0	0	
Number of Guideline Exceedances	0	3	0	3	0	3	0	0	3	0	0	0	4	0	0	4	0	4	3	1	4	0	0	0	4	0	0	0	4	0	0	0	4	4	1	0	0	0
Number of Guideline Exceedances(Detects Only)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Env Stds Comments
#1:Apply LOSP 95
#2:Apply Freshwater DGV (LOSP Unknown)
#3:Apply Freshwater LOSP Unknown
#4:Apply LOSP Unknown
#5:Apply LOSP 99
#6:NHMRC (2011) Drinking Water Guidelines [2016] Health
#7:EPHC (2008) Australian Guidelines for Water Recycling - Drinking Water
#8:US EPA (2012) Health Advisories for Drinking Water Contaminants
#9:WHO (2011) Drinking Water Quality



	Organophosphorus Pesticides												Herbicides	Organochlorine Pesticides									
	Chlorfenvinphos	Chlorpyrifos	Chlorpyrifos-methyl	Diazinon	Dichlorvos	Dimethoate	Ethion	Fenthion	Malathion	Pirimphos-ethyl	Prothiofos	Pronamide	Dieldrin	d-BHC	b-BHC	g-BHC (Lindane)	a-BHC	Aldrin	Aldrin + Dieldrin	chlordane	DDT	4,4-DDE	DDD
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	2	0.2	0.2	0.2	0.2	0.2	0.2	0.5	0.5	0.2	0.2	0.2
ANZG (2018) Marine Water - Slightly to moderately disturbed ecosystems		0.009 ^{#1}		0.01 ^{#2}		0.15 ^{#2}			0.05 ^{#2}				0.01 ^{#3}			0.007 ^{#4}		0.003 ^{#4}		0.001 ^{#4}	0.0004 ^{#4}		
NHMRC (2008) Recommended Recreational Guidelines - Health	20 ^{#6}	100 ^{#6}	100 ^{#7}	40 ^{#6}	50 ^{#6}	70 ^{#6}	40 ^{#6}	70 ^{#6}	700 ^{#6}	5 ^{#6}		700 ^{#6}	0.2 ^{#8}		200 ^{#7}	100 ^{#6}	200 ^{#7}	0.2 ^{#8}	3 ^{#6}	2 ^{#9}	20 ^{#6}	90 ^{#6}	200 ^{#7}

LocCode	Field_ID	Sampled_Date-Time																					
C64	C64	4/05/2021	-	-	-	-	-	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<0.5	<0.5
E62	E62	5/05/2021	-	-	-	-	-	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<0.5	<0.5
S02	S02_D	4/05/2021	-	-	-	-	-	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<0.5	<0.5
S02_S	S02_S	3/05/2021	-	-	-	-	-	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<0.5	<0.5
S06	S06	3/05/2021	-	-	-	-	-	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<0.5	<0.5
S40_D	S40_D	6/05/2021	-	-	-	-	-	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<0.5	<0.5
S40_S	S40_S	6/05/2021	-	-	-	-	-	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<0.5	<0.5
S51	S51	7/05/2021	-	-	-	-	-	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<0.5	<0.5
S54	QC221	5/05/2021	-	-	-	-	-	-	-	-	-	-	-	<0.2	<0.2	<0.2	<0.2	<0.2	-	-	<0.2	<0.5	<0.2
S54	S54	5/05/2021	-	-	-	-	-	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<0.5	<0.5
S55	S55	5/05/2021	-	-	-	-	-	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<0.5	<0.5
S58_D	S58_D	7/05/2021	-	-	-	-	-	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<0.5	<0.5
SMW_ENV020_D	SWM_ENV020_W	4/05/2021	-	-	-	-	-	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<0.5	<0.5
SMW_ENV021_S	SMW_ENV021_S	22/01/2019	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<4	-	<4	-	<2	
WB4	WB4	10/05/2021	-	-	-	-	-	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<0.5	<0.5

Statistical Summary

Number of Results	1	1	1	1	1	1	1	1	1	1	1	1	15	15	15	15	15	15	14	13	15	14	15
Number of Detects	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Concentration	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.5	<0.5	<0.2	<0.2	<0.2
Maximum Concentration	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<4	<0.5	<4	<0.5	<2	
Average Concentration													0.29	0.29	0.29	0.29	0.29	0.29	0.38	0.25	1	0.24	0.29
Standard Deviation													0.2	0.2	0.2	0.2	0.2	0.2	0.47	0	0.36	0.04	0.2
Number of Guideline Exceedances	0	1	0	1	0	1	0	0	1	0	0	0	15	0	0	15	0	15	1	13	15	0	0
Number of Guideline Exceedances(Detects Only)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Env Stds Comments

- #1:Apply LOSP 95
- #2:Apply Freshwater DGV (LOSP Unknown)
- #3:Apply Freshwater LOSP Unknown
- #4:Apply LOSP Unknown
- #5:Apply LOSP 99
- #6:NHMRC (2011) Drinking Water Guidelines [2016] Health
- #7:EPHC (2008) Australian Guidelines for Water Recycling - Drinking Water
- #8:US EPA (2012) Health Advisories for Drinking Water Contaminants
- #9:WHO (2011) Drinking Water Quality



	nochlorine Pesticides														Pesticides	Polychlorinated Biphenyls							
	DDT+DDE+DDD	Hexachlorobenzene	Endosulfan I	Endosulfan II	Endosulfan sulfate	Endrin	Chlordane (cis)	Chlordane (trans)	Endrin aldehyde	Endrin ketone	Heptachlor	Heptachlor epoxide	Methoxychlor	DDE	Chlorobenzilate	Aroclor 1016	Aroclor 1221	Aroclor 1232	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260	PCBs (Sum of total)
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL	0.5	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.5	0.2	0.2	0.2	0.5	2								1
ANZG (2018) Marine Water - Slightly to moderately disturbed ecosystems		0.05 ^{#5}				0.004 ^{#5}					0.0004 ^{#4}		0.04 ^{#4}						0.3 ^{#2}		0.01 ^{#2}		
NHMRC (2008) Recommended Recreational Guidelines - Health		2 ^{#8}			300 ^{#7}	6 ^{#9}					3 ^{#6}	0.4 ^{#8}	200 ^{#9}										10 ^{#8}

LocCode	Field_ID	Sampled_Date-Time																						
C64	C64	4/05/2021	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2	-	-	-	-	-	-	-	-	<1
E62	E62	5/05/2021	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2	-	-	-	-	-	-	-	-	<1
S02	S02_D	4/05/2021	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2	-	-	-	-	-	-	-	-	<1
S02_S	S02_S	3/05/2021	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2	-	-	-	-	-	-	-	-	<1
S06	S06	3/05/2021	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2	-	-	-	-	-	-	-	-	<1
S40_D	S40_D	6/05/2021	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2	-	-	-	-	-	-	-	-	<1
S40_S	S40_S	6/05/2021	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2	-	-	-	-	-	-	-	-	<1
S51	S51	7/05/2021	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2	-	-	-	-	-	-	-	-	<1
S54	QC221	5/05/2021	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	-	<0.2	<0.2	<0.2	-	-	<2	<2	<2	<2	<2	<2	<2	-
S54	S54	5/05/2021	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2	-	-	-	-	-	-	-	-	<1
S55	S55	5/05/2021	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2	-	-	-	-	-	-	-	-	<1
S58_D	S58_D	7/05/2021	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2	-	-	-	-	-	-	-	-	<1
SMW_ENV020_D	SWM_ENV020_W	4/05/2021	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2	-	-	-	-	-	-	-	-	<1
SMW_ENV021_S	SMW_ENV021_S	22/01/2019	<4	<4	<2	<2	<2	<2	-	-	-	-	<2	<2	-	<2	<2	-	-	-	-	-	-	-
WB4	WB4	10/05/2021	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2	-	-	-	-	-	-	-	-	<1

Statistical Summary

Number of Results	14	15	15	15	15	15	14	14	14	13	15	15	14	1	1	1	1	1	1	1	1	13
Number of Detects	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Concentration	<0.5	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.5	<0.2	<0.2	<0.2	<2	<2	<2	<2	<2	<2	<2	<2	<1
Maximum Concentration	<4	<4	<2	<2	<2	<2	<0.5	<0.5	<0.5	<0.5	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<1
Average Concentration	0.38	0.36	0.29	0.29	0.29	0.29	0.24	0.24	0.24	0.25	0.29	0.29	0.94									0.5
Standard Deviation	0.47	0.46	0.2	0.2	0.2	0.2	0.04	0.04	0.04	0	0.2	0.2	0.24									0
Number of Guideline Exceedances	0	15	0	0	0	15	0	0	0	0	15	14	14	0	0	0	0	0	1	0	1	0
Number of Guideline Exceedances(Detects Only)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Env Stds Comments

- #1:Apply LOSP 95
- #2:Apply Freshwater DGV (LOSP Unknown)
- #3:Apply Freshwater LOSP Unknown
- #4:Apply LOSP Unknown
- #5:Apply LOSP 99
- #6:NHMRC (2011) Drinking Water Guidelines [2016] Health
- #7:EPHC (2008) Australian Guidelines for Water Recycling - Drinking Water
- #8:US EPA (2012) Health Advisories for Drinking Water Contaminants
- #9:WHO (2011) Drinking Water Quality

	PAHs																					
	2-chloronaphthalene	Benz(a)anthracene	Acetophenone	Anthracene	Benzo(a)pyrene	Acenaphthylene	Acenaphthene	Benzo(b+g)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	7,12-dimethylbenz(a)anthracene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	3-methylcholanthrene	Indeno(1,2,3-c,d)pyrene	Napththalene	Phenanthrene	Pyrene	Benzo(a)pyrene TEQ (Zero)	Sum of Polycyclic aromatic hydrocarbons (PAH)
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL	2	0.05	2	0.05	0.01	0.05	0.05	0.05	0.05	0.05	0.05	2	0.05	0.05	0.05	2	0.05	0.05	0.05	0.05	0.5	0.05
ANZG (2018) Marine Water - Slightly to moderately disturbed ecosystems				0.01 ^{#1}	0.1 ^{#1}									1 ^{#1}				50 ^{#1}	0.6 ^{#1}			
NEPM (1999) Groundwater HSLs for vapour intrusion																						
NHMRC (2008) Recommended Recreational Guidelines - Aesthetic																						
NHMRC (2008) Recommended Recreational Guidelines - Health			4000 ^{#7}	1500 ^{#7}	0.1 ^{#8}		20000 ^{#9}								100000 ^{#9}			700 ^{#7}	1500 ^{#7}	1500 ^{#7}		

LocCode	Field_ID	Sampled_Date	-	<0.05	-	<0.05	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	0.1	<0.05	-	<0.05	<0.05	<0.05	0.1	-	0.2
E59	E59	15/03/2017	-	<0.05	-	<0.05	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.1	-	<0.2
SMW_BH066	SMW_BH066	23/04/2020	-	<1	-	<1	<0.5	<1	<1	<1	<1	<1	<1	-	<1	<1	<1	-	<1	<1	<1	<1	<0.5	<0.5
SMW_BH067	SMW_BH067	23/04/2020	-	<1	-	<1	<0.5	<1	<1	<1	<1	<1	<1	-	<1	<1	<1	-	<1	<1	<1	<1	<0.5	<0.5
SMW_ENV026	SMW_ENV026	22/01/2019	<2	<1	<2	<1	<0.5	<1	<1	<1	<1	<1	<1	<2	<1	<1	<1	<2	<1	<5 - 2.3	<1	<1	<0.5	2.3
SMW_ENV026	SMW_ENV026	24/04/2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SMW_ENV026	SMW_ENV026	4/05/2021	-	<1	-	<1	<0.5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<1	<1	<1	<0.5	<0.5	<0.5
SMW_ENV027	SMW_ENV027	22/01/2019	<2	<1	<2	<1	<0.5	<1	<1	<1	<1	<1	<1	<2	<1	<1	<1	<2	<1	<5 - 1.7	<1	<1	<0.5	1.7
SMW_ENV027	SMW_ENV027	24/04/2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SMW_ENV034	SMW_ENV034	22/01/2019	<2	<1	<2	<1	<0.5	<1	<1	<1	<1	<1	<1	<2	<1	<1	<1	<2	<1	<1	<1	<1	<0.5	<0.5
SMW_ENV034	SMW_ENV034	24/04/2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SMW_ENV034	SMW_ENV034	10/05/2021	-	<1	-	<1	<0.5	<1	<1	<1	<1	<1	<1	-	<1	<1	<1	-	<1	<1	<1	<0.5	<0.5	<0.5

Statistical Summary	3	8	3	8	8	8	8	8	8	8	8	8	3	8	8	8	3	8	8	8	8	7	8
Number of Results	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2	0	1	0	3
Number of Detects	<2	<0.05	<2	<0.05	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<2	<0.05	0.1	<0.05	<2	<0.05	<0.05	<0.05	0.1	<0.5	0.2
Minimum Concentration	<2	<1	<2	<1	<0.5	<1	<1	<1	<1	<1	<1	<2	<1	<1	<1	<1	<2	<1	2.3	<1	<1	<0.5	2.3
Maximum Concentration	1	0.44	1	0.44	0.22	0.44	0.44	0.44	0.44	0.44	0.44	1	0.44	0.45	0.44	1	0.44	0.88	0.44	0.45	0.25	0.68	0.68
Average Concentration	0	0.17	0	0.17	0.087	0.17	0.17	0.17	0.17	0.17	0.17	0	0.17	0.14	0.17	0	0.17	0.87	0.17	0.14	0	0.83	0.83
Standard Deviation	0	0	0	8	7	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0	0	0
Number of Guideline Exceedances	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances(Detects Only)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Env Stds Comments

#1:Apply LOSP 99

#2:Apply Freshwater LOSP Unknown

#3:Apply LOSP 95

#4:Apply Freshwater DGV (LOSP Unknown)

#5:Apply LOSP Unknown

#6:NHMRC (2011) Drinking Water Guidelines [2016] Aesthetic

#7:EPHC (2008) Australian Guidelines for Water Recycling - Drinking Water

#8:NHMRC (2011) Drinking Water Guidelines [2016] Health

#9:US EPA (2012) Health Advisories for Drinking Water Contaminants

#10:California EPA (2014) Public Health Goals for Drinking Water

#11:WHO (2011) Drinking Water Quality

#12:WHO (2020) Trichloroethene in drinking-water: Background document for development of WHO Guidelines for drinking-water quality. WHO/HEP/ECH/WSH/2020.10

	Phenols						Total Petroleum Hydrocarbons					Total Recoverable Hydrocarbons						Amino Aliphatics				nino Aromat	Anilines								
	2-methylphenol	2-nitrophenol	2,4-dimethylphenol	3-&4-Methylphenol (m&p-cresol)	4-chloro-3-methylphenol	Phenol	C10-C36 Fraction (Sum)	C29-C36 Fraction	C15-C28 Fraction	C10-C14 Fraction	C6-C9 Fraction	>C16- C34 Fraction	>C10- C16 Fraction minus naphthalene (F2)	>C10- C16 Fraction	>C34- C40 Fraction	>C10- C40 Fraction (Sum)	C6-C10 Fraction minus BTEX (F1)	C6- C10 Fraction	N-nitrosodiethylamine	N-nitrosodi-n-butylamine	N-nitrosodi-n-propylamine	N-Nitrosomethylethylamine	1-naphthylamine	N-Nitrosodiphenyl & Diphenylamine	2-nitroaniline	3-nitroaniline	4-chloroaniline	4-nitroaniline	2-methyl-5-nitroaniline	Aniline	
EQL	1	1	1	2	1	1	50	50	100	50	10	100	50	50	100	100	20	10	2	2	2	2	2	4	4	4	4	2	2	2	2
ANZG (2018) Marine Water - Slightly to moderately disturbed ecosystems			2 ^{#2}			400 ^{#3}																									8 ^{#4}
NEPM (1999) Groundwater HSLs for vapour intrusion																	6000														
NHMRC (2008) Recommended Recreational Guidelines - Aesthetic																															
NHMRC (2008) Recommended Recreational Guidelines - Health						1500 ^{#7}													0.1 ^{#7}												

LocCode	Field_ID	Sampled_Date	-	-	-	-	-	-	<100	<100	<100	<50	<20	<100	<50	<50	<100	-	<20	<20	-	-	-	-	-	-	-	-	-	-	-
E59	E59	15/03/2017	-	-	-	-	-	-	<100	<100	<100	<50	<20	<100	<50	<50	<100	<100	<100	<100	<20	<20	-	-	-	-	-	-	-	-	-
SMW_BH066	SMW_BH066	23/04/2020	-	-	-	-	-	-	<50	<50	<100	<50	<20	<100	<100	<100	<100	<100	<100	<20	<20	-	-	-	-	-	-	-	-	-	-
SMW_BH067	SMW_BH067	23/04/2020	-	-	-	-	-	-	<50	<50	<100	<50	<20	<100	<100	<100	<100	<100	<100	<20	<20	-	-	-	-	-	-	-	-	-	-
SMW_ENV026	SMW_ENV026	22/01/2019	<2	<2	<2	<4	<2	<2	60	<50	<100	60	610	<100	<100	<100	<100	<100	<100	<100	<100	650	650	<2	<2	<2	<2	<2	<4	<4	<2
SMW_ENV026	SMW_ENV026	24/04/2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SMW_ENV026	SMW_ENV026	4/05/2021	-	-	-	-	-	-	<50	<50	<100	<50	180	<100	<100	<100	<100	<100	<100	<100	200	200	-	-	-	-	-	-	-	-	-
SMW_ENV027	SMW_ENV027	22/01/2019	<2	<2	<2	<4	<2	<2	190	<50	<100	190	1850	<100	150	150	<100	150	1840	1840	<2	<2	<2	<2	<2	<4	<4	<4	<2	<2	<2
SMW_ENV027	SMW_ENV027	24/04/2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SMW_ENV034	SMW_ENV034	22/01/2019	<2	<2	<2	<4	<2	<2	<50	<50	<100	<50	<20	<100	<100	<100	<100	<100	<100	<20	<20	<2	<2	<2	<2	<4	<4	<4	<2	<2	<2
SMW_ENV034	SMW_ENV034	24/04/2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SMW_ENV034	SMW_ENV034	10/05/2021	<1	<1	<1	<2	<1	<1	<50	<50	<100	<50	<20	<100	<100	<100	<100	<100	<20	<20	-	-	-	-	-	-	-	-	-	-	-

Statistical Summary			4	4	4	4	4	4	8	8	8	8	8	8	8	8	8	7	8	8	3	3	3	3	3	3	3	3	3	3		
Number of Results			0	0	0	0	0	0	2	0	0	2	3	0	1	1	0	1	3	3	0	0	0	0	0	0	0	0	0	0	0	
Number of Detects			<1	<1	<1	<2	<1	<1	<50	<50	<100	<50	<20	<100	<50	<50	<100	<100	<20	<20	<2	<2	<2	<2	<2	<4	<4	<4	<2	<2	<2	
Minimum Concentration			<2	<2	<2	<4	<2	<2	190	<100	<100	190	1850	<100	150	150	<100	150	1840	1840	<2	<2	<2	<2	<2	<4	<4	<4	<2	<2	<2	
Maximum Concentration			0.88	0.88	0.88	1.8	0.88	0.88	53	28	50	50	336	50	59	59	50	64	343	343	1	1	1	1	1	2	2	2	1	1	1	
Average Concentration			0.25	0.25	0.25	0.5	0.25	0.25	57	8.8	0	58	646	0	38	38	0	38	645	645	0	0	0	0	0	0	0	0	0	0	0	
Standard Deviation																																
Number of Guideline Exceedances			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0		
Number of Guideline Exceedances(Detects Only)			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		

Env Stds Comments

#1:Apply LOSP 99

#2:Apply Freshwater LOSP Unknown

#3:Apply LOSP 95

#4:Apply Freshwater DGV (LOSP Unknown)

#5:Apply LOSP Unknown

#6:NHMRC (2011) Drinking Water Guidelines [2016] Aesthetic

#7:EPHC (2008) Australian Guidelines for Water Recycling - Drinking Water

#8:NHMRC (2011) Drinking Water Guidelines [2016] Health

#9:US EPA (2012) Health Advisories for Drinking Water Contaminants

#10:California EPA (2014) Public Health Goals for Drinking Water

#11:WHO (2011) Drinking Water Quality

#12:WHO (2020) Trichloroethene in drinking-water: Background document for development of WHO Guidelines for drinking-water quality. WHO/HEP/ECH/WSH/2020.10

	BTEX							Chlorinated																	
	Benzene	Toluene	Ethylbenzene	Xylene (m & p)	Xylene (o)	Total Xylene	Total BTEX	1,1-dichloropropene	1,1-dichloroethane	1,1-dichloroethene	1,1,1,2-tetrachloroethane	1,1,1-trichloroethane	1,2-dibromo-3-chloropropane	1,1,2-trichloroethane	1,1,2,2-tetrachloroethane	1,2,3-trichloropropane	1,2-dichloroethane	1,3-dichloropropane	1,2-dichloropropane	2,2-dichloropropane	Bromochloromethane	Bromodichloromethane	Bromoform	Carbon tetrachloride	Chlorodibromomethane
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL	1	1	1	2	1	2	1	5	1	1	1	1	5	1	1	1	1	1	1	5	1	1	1	1	1
ANZG (2018) Marine Water - Slightly to moderately disturbed ecosystems	500 ^{#1}	180 ^{#3}	80 ^{#3}		350 ^{#4}					700 ^{#3}		270 ^{#3}		1900 ^{#3}	400 ^{#3}		1900 ^{#3}	1100 ^{#3}	900 ^{#3}					240 ^{#3}	
NEPM (1999) Groundwater HSLs for vapour intrusion	5000																								
NHMRC (2008) Recommended Recreational Guidelines - Aesthetic																									
NHMRC (2008) Recommended Recreational Guidelines - Health	10 ^{#8}	8000 ^{#8}	3000 ^{#8}			6000 ^{#8}			30 ^{#10}	300 ^{#8}	100 ^{#9}	4000000 ^{#9}	10 ^{#11}	60 ^{#9}	40 ^{#9}	10000 ^{#9}	30 ^{#8}		400 ^{#11}		400 ^{#7}	60 ^{#7}	1000 ^{#7}	30 ^{#8}	1000 ^{#7}

LocCode	Field_ID	Sampled_Date																							
E59	E59	15/03/2017	<1	<1	<1	<2	<1	<3	-	-	<1	<1	<1		<1	-	<1	<1	<1	<1	<1	-	<1	<1	<1
SMW_BH066	SMW_BH066	23/04/2020	<1	<2	<2	<2	<2	<2	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SMW_BH067	SMW_BH067	23/04/2020	<1	<2	<2	<2	<2	<2	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SMW_ENV026	SMW_ENV026	22/01/2019	<1	<2	<2	<2	<2	<2	<1	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	-	<5	<5	<5
SMW_ENV026	SMW_ENV026	24/04/2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SMW_ENV026	SMW_ENV026	4/05/2021	<1	<2	<2	<2	<2	<2	<1	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	-	<5	<5	<5
SMW_ENV027	SMW_ENV027	22/01/2019	<1	<2	<2	4	<2	4	4	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	-	<5	<5	<5	<5
SMW_ENV027	SMW_ENV027	24/04/2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SMW_ENV034	SMW_ENV034	22/01/2019	<1	<2	<2	<2	<2	<2	<1	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	-	<5	<5	<5	<5
SMW_ENV034	SMW_ENV034	24/04/2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SMW_ENV034	SMW_ENV034	10/05/2021	<1	<2	<2	<2	<2	<2	<1	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	-	<5	<5	<5	<5

Statistical Summary																									
Number of Results	8	8	8	8	8	8	7	5	6	6	6	6	5	6	6	6	6	6	6	5	1	6	6	6	6
Number of Detects	0	0	0	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Concentration	<1	<1	<1	<2	<1	<2	<1	<5	<1	<1	<1	<1	<5	<1	<1	<1	<1	<1	<1	<5	<1	<1	<1	<1	<1
Maximum Concentration	<1	<2	<2	4	<2	4	4	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<1	<5	<5	<5	<5
Average Concentration	0.5	0.94	0.94	1.4	0.94	1.4	1	2.5	2.2	2.2	2.2	2.2	2.5	2.2	2.2	2.2	2.2	2.2	2.2	2.5		2.2	2.2	2.2	2.2
Standard Deviation	0	0.18	0.18	1.1	0.18	1.1	1.3	0	0.82	0.82	0.82	0.82	0	0.82	0.82	0.82	0.82	0.82	0.82	0		0.82	0.82	0.82	0.82
Number of Guideline Exceedances	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances(Detects Only)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Env Stds Comments

#1:Apply LOSP 99

#2:Apply Freshwater LOSP Unknown

#3:Apply LOSP 95

#4:Apply Freshwater DGV (LOSP Unknown)

#5:Apply LOSP Unknown

#6:NHMRC (2011) Drinking Water Guidelines [2016] Aesthetic

#7:EPHC (2008) Australian Guidelines for Water Recycling - Drinking Water

#8:NHMRC (2011) Drinking Water Guidelines [2016] Health

#9:US EPA (2012) Health Advisories for Drinking Water Contaminants

#10:California EPA (2014) Public Health Goals for Drinking Water

#11:WHO (2011) Drinking Water Quality

#12:WHO (2020) Trichloroethene in drinking-water: Background document for development of WHO Guidelines for drinking-water quality. WHO/HEP/ECH/WSH/2020.10

	Hydrocarbons																				Explosives					
	Chloroethane	Chloroform	Chloromethane	cis-1,4-Dichloro-2-butene	cis-1,2-dichloroethene	Dibromomethane	cis-1,3-dichloropropene	1,3-Dichloropropene	Dichloromethane	Hexachlorobutadiene	Hexachlorocyclopentadiene	Pentachloroethane	Hexachloroethane	Tetrachloroethene	trans-1,4-Dichloro-2-butene	trans-1,2-dichloroethene	trans-1,3-dichloropropene	Trichloroethene	Vinyl chloride	1,3,5-Trinitrobenzene	2,4-Dinitrotoluene	2,6-dinitrotoluene	Nitrobenzene	1,2,3-trichlorobenzene	1,2-dichlorobenzene	1,2,4-trichlorobenzene
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL	1	1	1	5	1	1	1	10	1	2	10	5	2	1	5	1	1	1	1	2	4	4	2	5	1	2
ANZG (2018) Marine Water - Slightly to moderately disturbed ecosystems		370 ^{#1}							4000 ^{#3}			80 ^{#3}	290 ^{#4}	70 ^{#3}				330 ^{#3}	100 ^{#3}	4 ^{#2}	16 ^{#4}		550 ^{#4}	3 ^{#4}	160 ^{#4}	20 ^{#1}
NEPM (1999) Groundwater HSLs for vapour intrusion																										
NHMRC (2008) Recommended Recreational Guidelines - Aesthetic																										
NHMRC (2008) Recommended Recreational Guidelines - Health		2000 ^{#7}	40000 ^{#9}		1000 ^{#9}			1000 ^{#8}	40 ^{#8}	7 ^{#8}	20000 ^{#9}		100 ^{#9}	500 ^{#8}		10000 ^{#9}		80 ^{#12}	3 ^{#8}		5 ^{#9}	5 ^{#9}			15000 ^{#8}	7000 ^{#9}

LocCode	Field_ID	Sampled_Date																								
E59	E59	15/03/2017	<1	<5	<1	-	<1	<1	<1	-	<1	-	-	-	2	-	<1	<1	<1	<1	-	-	-	-	<1	-
SMW_BH066	SMW_BH066	23/04/2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SMW_BH067	SMW_BH067	23/04/2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SMW_ENV026	SMW_ENV026	22/01/2019	<50	<5	<50	<5	<5	<5	<10	-	<2	<10	<5	<2	<5	<5	<5	<5	<50	<2	<4	<4	<2	<5	<2	<2
SMW_ENV026	SMW_ENV026	24/04/2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SMW_ENV026	SMW_ENV026	4/05/2021	<50	<5	<50	<5	<5	<5	<5	-	<5	-	<5	-	<5	<5	<5	<5	<50	<5	-	-	-	<5	<5	<5
SMW_ENV027	SMW_ENV027	22/01/2019	<50	<5	<50	<5	<5	<5	<10	-	<2	<10	<5	<2	<5	<5	<5	<5	<50	<2	<4	<4	<2	<5	<2	<2
SMW_ENV027	SMW_ENV027	24/04/2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SMW_ENV034	SMW_ENV034	22/01/2019	<50	<5	<50	<5	<5	<5	<10	-	<2	<10	<5	<2	<5	<5	<5	<5	<50	<2	<4	<4	<2	<5	<2	<2
SMW_ENV034	SMW_ENV034	24/04/2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SMW_ENV034	SMW_ENV034	10/05/2021	<50	<5	<50	<5	<5	<5	-	-	<5	-	<5	-	<5	<5	<5	<5	<50	-	-	-	-	<5	<5	<5

Statistical Summary																										
Number of Results	6	6	6	5	6	6	6	3	1	5	3	5	3	6	5	6	6	6	6	3	3	3	3	5	6	5
Number of Detects	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Concentration	<1	<5	<1	<5	<1	<1	<1	<10	<1	<2	<10	<5	<2	2	<5	<1	<1	<1	<1	<2	<4	<4	<2	<5	<1	<2
Maximum Concentration	<50	<5	<50	<5	<5	<5	<5	<10	<1	<5	<10	<5	<2	<5	<5	<5	<5	<5	<50	<2	<4	<4	<2	<5	<5	<5
Average Concentration	21	2.5	21	2.5	2.2	2.2	2.2	5		1.6	5	2.5	1	2.4	2.5	2.2	2.2	2.2	21	1	2	2	1	2.5	1.4	1.6
Standard Deviation	10	0	10	0	0.82	0.82	0.82	0		0.82	0	0	0	0.2	0	0.82	0.82	0.82	10	0	0	0	0	0.86	0.82	
Number of Guideline Exceedances	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	5	0	0
Number of Guideline Exceedances(Detects Only)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Env Stds Comments

#1:Apply LOSP 99

#2:Apply Freshwater LOSP Unknown

#3:Apply LOSP 95

#4:Apply Freshwater DGV (LOSP Unknown)

#5:Apply LOSP Unknown

#6:NHMRC (2011) Drinking Water Guidelines [2016] Aesthetic

#7:EPHC (2008) Australian Guidelines for Water Recycling - Drinking Water

#8:NHMRC (2011) Drinking Water Guidelines [2016] Health

#9:US EPA (2012) Health Advisories for Drinking Water Contaminants

#10:California EPA (2014) Public Health Goals for Drinking Water

#11:WHO (2011) Drinking Water Quality

#12:WHO (2020) Trichloroethene in drinking-water: Background document for development of WHO Guidelines for drinking-water quality. WHO/HEP/ECH/WSH/2020.10

	Halogenated Benzenes							Halogenated Hydrocarbons					Halogenated Phenols						MAH				
	1,3-dichlorobenzene	2-chlorotoluene	1,4-dichlorobenzene	4-chlorotoluene	Bromobenzene	Chlorobenzene	Pentachlorobenzene	1,2-dibromoethane	Bromomethane	Dichlorodifluoromethane	Iodomethane	Trichlorofluoromethane	Pentachlorophenol	2-chlorophenol	2,6-dichlorophenol	2,4-dichlorophenol	2,4,6-trichlorophenol	2,4,5-trichlorophenol	1,2,4-trimethylbenzene	1,3,5-trimethylbenzene	Isopropylbenzene	n-butylbenzene	n-propylbenzene
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	mg/L
EQL	1	5	1	1	1	1	2	1	1	1	1	1	2	1	1	1	1	1	0.001	0.001	0.001	0.005	0.005
ANZG (2018) Marine Water - Slightly to moderately disturbed ecosystems	260 ^{#4}		60 ^{#4}			55 ^{#3}	1.5 ^{#1}						11 ^{#1}	340 ^{#4}	34 ^{#2}	120 ^{#4}	3 ^{#4}				0.03 ^{#3}		
NEPM (1999) Groundwater HSLs for vapour intrusion																							
NHMRC (2008) Recommended Recreational Guidelines - Aesthetic	200 ^{#6}																						
NHMRC (2008) Recommended Recreational Guidelines - Health		10000 ^{#9}	400 ^{#8}	10000 ^{#9}	6000 ^{#9}	3000 ^{#8}		10 ^{#8}	10 ^{#8}	100000 ^{#9}		200000 ^{#9}	100 ^{#8}	3000 ^{#8}	100 ^{#7}	2000 ^{#8}	200 ^{#8}			1000 ^{#9}	400 ^{#9}		

LocCode	Field_ID	Sampled_Date																						
E59	E59	15/03/2017	<1	-	<1	<1	<1	<1	-	<1	<1	<1	<1	<1	-	-	-	-	-	<0.001	<0.001	<0.001	-	-
SMW_BH066	SMW_BH066	23/04/2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
SMW_BH067	SMW_BH067	23/04/2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
SMW_ENV026	SMW_ENV026	22/01/2019	<2	<5	<2	<5	<5	<5	<2	<5	<50	<50	<5	<50	<4	<2	<2	<2	<2	<0.005	<0.005	0.02	<0.005	0.022
SMW_ENV026	SMW_ENV026	24/04/2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
SMW_ENV026	SMW_ENV026	4/05/2021	<5	<5	<5	<5	<5	<5	-	<5	<50	<50	<5	<50	-	-	-	-	-	<0.005	<0.005	0.006	<0.005	<0.005
SMW_ENV027	SMW_ENV027	22/01/2019	<2	<5	<2	<5	<5	<5	<2	<5	<50	<50	<5	<50	<4	<2	<2	<2	<2	<0.005	<0.005	0.05	0.006	0.074
SMW_ENV027	SMW_ENV027	24/04/2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
SMW_ENV034	SMW_ENV034	22/01/2019	<2	<5	<2	<5	<5	<5	<2	<5	<50	<50	<5	<50	<4	<2	<2	<2	<2	<0.005	<0.005	<0.005	<0.005	<0.005
SMW_ENV034	SMW_ENV034	24/04/2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
SMW_ENV034	SMW_ENV034	10/05/2021	<5	<5	<5	<5	<5	<5	-	<5	<50	<50	<5	<50	<2	<1	<1	<1	<1	<0.005	<0.005	<0.005	<0.005	<0.005

Statistical Summary																								
Number of Results	6	5	6	6	6	6	3	6	6	6	6	6	4	4	4	4	4	4	6	6	6	5	5	
Number of Detects	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	1	2	
Minimum Concentration	<1	<5	<1	<1	<1	<1	<2	<1	<1	<1	<1	<1	<2	<1	<1	<1	<1	<1	<0.001	<0.001	<0.001	<0.005	<0.005	
Maximum Concentration	<5	<5	<5	<5	<5	<5	<2	<5	<50	<50	<5	<50	<4	<2	<2	<2	<2	<2	<0.005	<0.005	0.05	0.006	0.074	
Average Concentration	1.4	2.5	1.4	2.2	2.2	2.2	1	2.2	21	21	2.2	21	1.8	0.88	0.88	0.88	0.88	0.88	0.0022	0.0022	0.014	0.0032	0.021	
Standard Deviation	0.86	0	0.86	0.82	0.82	0.82	0	0.82	10	10	0.82	10	0.5	0.25	0.25	0.25	0.25	0.25	0.00082	0.00082	0.019	0.0016	0.031	
Number of Guideline Exceedances	0	0	0	0	0	0	3	0	5	0	0	0	0	0	0	0	0	0	0	0	1	0	0	
Number of Guideline Exceedances(Detects Only)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	

Env Stds Comments

- #1:Apply LOSP 99
- #2:Apply Freshwater LOSP Unknown
- #3:Apply LOSP 95
- #4:Apply Freshwater DGV (LOSP Unknown)
- #5:Apply LOSP Unknown
- #6:NHMRC (2011) Drinking Water Guidelines [2016] Aesthetic
- #7:EPHC (2008) Australian Guidelines for Water Recycling - Drinking Water
- #8:NHMRC (2011) Drinking Water Guidelines [2016] Health
- #9:US EPA (2012) Health Advisories for Drinking Water Contaminants
- #10:California EPA (2014) Public Health Goals for Drinking Water
- #11:WHO (2011) Drinking Water Quality
- #12:WHO (2020) Trichloroethene in drinking-water: Background document for development of WHO Guidelines for drinking-water quality. WHO/HEP/ECH/WSH/2020.10

					Nitroaromatics			Organotins	Phthalates						Solvents							
	p-isopropyltoluene	sec-butylbenzene	tert-butylbenzene	Styrene	2-Picoline	4-aminobiphenyl	Pentachloronitrobenzene	tributyltins	Bis(2-ethylhexyl) phthalate	Butyl benzyl phthalate	Diethyl Phthalate	Dimethyl phthalate	Dibutyl Phthalate	Di-n-octyl phthalate	Methyl Ethyl Ketone (MEK)	2-hexanone (MBK)	4-Methyl-2-pentanone	Acetone	Allyl chloride	Carbon disulfide	Isophorone	Vinyl acetate
	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	ngSn/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL	0.005	0.005	0.005	0.001	2	2	2	2	10	2	2	2	2	2	1	50	1	1	1	1	2	50
ANZG (2018) Marine Water - Slightly to moderately disturbed ecosystems								6 ^{#3}	1 ^{#2}		1000 ^{#4}	3700 ^{#4}	10 ^{#4}						3 ^{#2}	20 ^{#2}	130 ^{#5}	
NEPM (1999) Groundwater HSLs for vapour intrusion																						
NHMRC (2008) Recommended Recreational Guidelines - Aesthetic																						
NHMRC (2008) Recommended Recreational Guidelines - Health				0.3 ^{#8}			300 ^{#8}		100 ^{#8}	700000 ^{#9}	3000000 ^{#9}		350 ^{#7}		400000 ^{#9}						4000 ^{#9}	

LocCode	Field_ID	Sampled_Date																					
E59	E59	15/03/2017	-	-	-	<0.001	-	-	-	-	-	-	-	-	-	<1	-	<1	20	<1	<1	-	-
SMW_BH066	SMW_BH066	23/04/2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
SMW_BH067	SMW_BH067	23/04/2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
SMW_ENV026	SMW_ENV026	22/01/2019	<0.005	<0.005	<0.005	<0.005	<2	<2	<2	-	<10	<2	<2	<2	<2	<50	<50	<50	-	-	<5	<2	<50
SMW_ENV026	SMW_ENV026	24/04/2020	-	-	-	-	-	-	-	<2	-	-	-	-	-	-	-	-	-	-	-	-	-
SMW_ENV026	SMW_ENV026	4/05/2021	<0.005	<0.005	<0.005	<0.005	-	-	-	-	-	-	-	-	-	<50	<50	<50	-	-	<5	-	<50
SMW_ENV027	SMW_ENV027	22/01/2019	<0.005	0.01	<0.005	<0.005	<2	<2	<2	-	<10	<2	<2	<2	<2	<50	<50	<50	-	-	<5	<2	<50
SMW_ENV027	SMW_ENV027	24/04/2020	-	-	-	-	-	-	-	<2	-	-	-	-	-	-	-	-	-	-	-	-	-
SMW_ENV034	SMW_ENV034	22/01/2019	<0.005	<0.005	<0.005	<0.005	<2	<2	<2	-	<10	<2	<2	<2	<2	<50	<50	<50	-	-	<5	<2	<50
SMW_ENV034	SMW_ENV034	24/04/2020	-	-	-	-	-	-	-	<2	-	-	-	-	-	-	-	-	-	-	-	-	-
SMW_ENV034	SMW_ENV034	10/05/2021	<0.005	<0.005	<0.005	<0.005	-	-	-	-	-	-	-	-	-	<50	<50	<50	-	-	<5	-	<50

Statistical Summary																						
Number of Results	5	5	5	6	3	3	3	3	3	3	3	3	3	3	6	5	6	1	1	6	3	5
Number of Detects	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Minimum Concentration	<0.005	<0.005	<0.005	<0.001	<2	<2	<2	<2	<10	<2	<2	<2	<2	<2	<1	<50	<1	20	<1	<1	<2	<50
Maximum Concentration	<0.005	0.01	<0.005	<0.005	<2	<2	<2	<2	<10	<2	<2	<2	<2	<2	<50	<50	<50	20	<1	<5	<2	<50
Average Concentration	0.0025	0.004	0.0025	0.0022	1	1	1	1	5	1	1	1	1	1	21	25	21			2.2	1	25
Standard Deviation	0	0.0034	0	0.00082	0	0	0	0	0	0	0	0	0	0	10	0	10			0.82	0	0
Number of Guideline Exceedances	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances(Detects Only)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Env Stds Comments

- #1:Apply LOSP 99
- #2:Apply Freshwater LOSP Unknown
- #3:Apply LOSP 95
- #4:Apply Freshwater DGV (LOSP Unknown)
- #5:Apply LOSP Unknown
- #6:NHMRC (2011) Drinking Water Guidelines [2016] Aesthetic
- #7:EPHC (2008) Australian Guidelines for Water Recycling - Drinking Water
- #8:NHMRC (2011) Drinking Water Guidelines [2016] Health
- #9:US EPA (2012) Health Advisories for Drinking Water Contaminants
- #10:California EPA (2014) Public Health Goals for Drinking Water
- #11:WHO (2011) Drinking Water Quality
- #12:WHO (2020) Trichloroethene in drinking-water: Background document for development of WHO Guidelines for drinking-water quality. WHO/HEP/ECH/WSH/2020.10

	SVOCs																
	2-(acetylamino) fluorene	3,3-Dichlorobenzidine	4-(dimethylamino) azobenzene	4-bromophenyl phenyl ether	4-chlorophenyl phenyl ether	4-Nitroquinoline-N-oxide	Azobenzene	Bis(2-chloroethoxy) methane	Bis(2-chloroethyl)ether	Carbazole	Dibenzofuran	Hexachloropropene	Methapyrene	N-nitrosomorpholine	N-nitrosopiperidine	N-nitrosopyrrolidine	Phenacetin
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	4	2
ANZG (2018) Marine Water - Slightly to moderately disturbed ecosystems																	
NEPM (1999) Groundwater HSLs for vapour intrusion																	
NHMRC (2008) Recommended Recreational Guidelines - Aesthetic																	
NHMRC (2008) Recommended Recreational Guidelines - Health														0.01 ⁸⁷			

LocCode	Field_ID	Sampled_Date															
E59	E59	15/03/2017	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SMW_BH066	SMW_BH066	23/04/2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SMW_BH067	SMW_BH067	23/04/2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SMW_ENV026	SMW_ENV026	22/01/2019	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<4	<2
SMW_ENV026	SMW_ENV026	24/04/2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SMW_ENV026	SMW_ENV026	4/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SMW_ENV027	SMW_ENV027	22/01/2019	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<4	<2
SMW_ENV027	SMW_ENV027	24/04/2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SMW_ENV034	SMW_ENV034	22/01/2019	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<4	<2
SMW_ENV034	SMW_ENV034	24/04/2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SMW_ENV034	SMW_ENV034	10/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Statistical Summary																	
Number of Results	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Number of Detects	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Concentration	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<4	<2
Maximum Concentration	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<4	<2
Average Concentration	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1
Standard Deviation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0
Number of Guideline Exceedances(Detects Only)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Env Stds Comments

#1:Apply LOSP 99

#2:Apply Freshwater LOSP Unknown

#3:Apply LOSP 95

#4:Apply Freshwater DGV (LOSP Unknown)

#5:Apply LOSP Unknown

#6:NHMRC (2011) Drinking Water Guidelines [2016] Aesthetic

#7:EPHC (2008) Australian Guidelines for Water Recycling - Drinking Water

#8:NHMRC (2011) Drinking Water Guidelines [2016] Health

#9:US EPA (2012) Health Advisories for Drinking Water Contaminants

#10:California EPA (2014) Public Health Goals for Drinking Water

#11:WHO (2011) Drinking Water Quality

#12:WHO (2020) Trichloroethene in drinking-water: Background document for development of WHO Guidelines for drinking-water quality. WHO/HEP/ECH/WSH/2020.10



Table 10b. Groundwater Summary (Previous Investigation Data) - Hydrocarbons, Volatile Organic Compounds and Organotins (Construction Site Wells)
The Bays
Sydney Metro West - 0577577

	Chlorinated Hydrocarbons																	
	1,1,1-trichloroethane	1,2-dibromo-3-chloropropane	1,1,2-trichloroethane	1,1,2,2-tetrachloroethane	1,1,2,3-trichloropropane	1,2-dichloroethane	1,3-dichloropropane	1,2-dichloropropane	2,2-dichloropropane	Bromochloromethane	Bromodichloromethane	Bromoform	Carbon tetrachloride	Chlorodibromomethane	Chloroethane	Chloroform	Chloromethane	cis-1,4-Dichloro-2-butene
EQL	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	5
ANZG (2018) Marine Water - Slightly to moderately disturbed ecosystems	270 ^{#3}		1900 ^{#3}	400 ^{#3}		1900 ^{#3}	1100 ^{#3}	900 ^{#3}					240 ^{#3}			370 ^{#1}		
NEPM (1999) Groundwater HSLs for vapour intrusion																		
NHMRC (2008) Recommended Recreational Guidelines - Aesthetic																		
NHMRC (2008) Recommended Recreational Guidelines - Health	4000000 ^{#9}	10 ^{#11}	60 ^{#9}	40 ^{#9}	10000 ^{#9}	30 ^{#8}		400 ^{#11}		400 ^{#7}	60 ^{#7}	1000 ^{#7}	30 ^{#8}	1000 ^{#7}		2000 ^{#7}	40000 ^{#9}	1000 ^{#9}

LocCode	Field_ID	Sampled_Date																	
C64	C64	27/02/2017	<1	-	<1	<1	<1	<1	<1	<1	-	-	<1	<1	<1	<1	<5	<1	-
C64	C64	4/05/2021	<5	<5	<5	<5	<5	<5	<5	<5	-	<5	<5	<5	<5	<50	<5	<50	<5
E58	E58	15/03/2017	<1	-	<1	<1	<1	<1	<1	<1	-	<1	<1	<1	<1	<1	<5	<1	-
E60	E60	15/03/2017	<1	-	<1	<1	<1	<1	<1	<1	-	<1	<1	<1	<1	<1	<5	<1	-
E60	E60	7/05/2021	<5	<5	<5	<5	<5	<5	<5	<5	-	<5	<5	<5	<5	<50	<5	<50	<5
E61	E61	15/03/2017	<1	-	<1	<1	<1	<1	<1	<1	-	<1	<1	<1	<1	<1	<5	<1	-
E62	E62	15/03/2017	<1	-	<1	<1	<1	<1	<1	<1	-	<1	<1	<1	<1	<1	<5	<1	-
E62	E62	5/05/2021	<5	<5	<5	<5	<5	<5	<5	<5	-	<5	<5	<5	<5	<5	<5	<50	<5
MW02	MW02	23/01/2012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW02	MW02	15/05/2012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW02	MW02	1/07/2012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW02	MW102	1/07/2015	<1	-	<1	<1	<1	<1	<1	<1	-	-	<1	<1	<1	<1	<5	<1	-
MW02	MW02	4/05/2021	<5	<5	<5	<5	<5	<5	<5	<5	-	<5	<5	<5	<5	<50	<5	<50	<5
MW104	MW104	1/07/2015	<1	-	<1	<1	<1	<1	<1	<1	-	-	<1	<1	<1	<1	<5	<1	-
MWB2	MWB2 (PB, 2002)	1/02/2003	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MWB2	MWB2	27/02/2017	<1	-	<1	<1	<1	<1	<1	<1	-	-	<1	<1	<1	<1	<5	<1	-
S02	S02_D	4/05/2021	<5	<5	<5	<5	<5	<5	<5	<5	-	<5	<5	<5	<5	<50	<5	<50	<5
S02_S	S02_S	3/05/2021	<5	<5	<5	<5	<5	<5	<5	<5	-	<5	<5	<5	<5	<50	<5	<50	<5
S06	S06	3/05/2021	<5	<5	<5	<5	<5	<5	<5	<5	-	-	<5	<5	<5	<50	<5	<50	<5
S40_D	S40_D	6/05/2021	<5	<5	<5	<5	<5	<5	<5	<5	-	<5	<5	<5	<5	<50	<5	<50	<5
S40_S	S40_S	6/05/2021	<5	<5	<5	<5	<5	<5	<5	<5	-	<5	<5	<5	<5	<50	<5	<50	<5
S51	S51	7/05/2021	<5	<5	<5	<5	<5	<5	<5	<5	-	<5	<5	<5	<5	<50	<5	<50	<5
S54	QC221	5/05/2021	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<1	<10	-
S54	S54	5/05/2021	<5	<5	<5	<5	<5	<5	<5	<5	-	<5	<5	<5	<5	<50	<5	<50	<5
S55	S55	5/05/2021	<5	<5	<5	<5	<5	<5	<5	<5	-	<5	<5	<5	<5	<50	<5	<50	<5
S58_D	S58_D	7/05/2021	<5	<5	<5	<5	<5	<5	<5	<5	-	<5	<5	<5	<5	<50	<5	<50	<5
S58_S	S58_S	6/05/2021	<5	<5	<5	<5	<5	<5	<5	<5	-	<5	<5	<5	<5	<50	<5	<50	<5
SMW_ENV020_D	SMW_ENV020_W	4/05/2021	<5	<5	<5	<5	<5	<5	<5	<5	-	<5	<5	<5	<5	<50	<5	<50	<5
SMW_ENV020_S	SMW_ENV020_S	4/05/2021	<5	<5	<5	<5	<5	<5	<5	<5	-	<5	<5	<5	<5	<50	<5	<50	<5
SMW_ENV021_S	SMW_ENV021_S	22/01/2019	<5	<5	<5	<5	<5	<5	<5	<5	-	<5	<5	<5	<5	<50	<5	<50	<5
SMW_ENV021_S	SMW_ENV021_S	27/04/2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SMW_ENV021_S	SMW_ENV021_S	10/05/2021	<5	<5	<5	<5	<5	<5	<5	<5	-	<5	<5	<5	<5	<50	<5	<50	<5
SMW_ENV021_W	SMW_ENV021_W	10/05/2021	<5	<5	<5	<5	<5	<5	<5	<5	-	<5	<5	<5	<5	<50	<5	<50	<5
WB4	WB4	1/07/2015	<1	-	<1	<1	<1	<1	<1	<1	-	-	<1	<1	<1	<1	<5	<1	-
WB4	WB4	27/02/2017	<1	-	<1	<1	<1	<1	<1	<1	-	-	<1	<1	<1	<1	<5	<1	-
WB4	WB4	10/05/2021	<5	<5	<5	<5	<5	<5	<5	<5	-	<5	<5	<5	<5	<50	<5	<50	<5

Statistical Summary																			
Number of Results	31	21	31	31	31	31	31	31	21	5	30	31	31	31	30	31	31	20	31
Number of Detects	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Concentration	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<5	<1
Maximum Concentration	<5	<5	<5	<5	<5	<5	<5	<5	<5	<1	<5	<5	<5	<5	<50	<5	<50	<5	<5
Average Concentration	1.8	2.4	1.8	1.8	1.8	1.8	1.8	1.8	2.4	0.5	1.8	1.8	1.8	1.8	16	2.4	16	2.5	1.8
Standard Deviation	0.97	0.44	0.97	0.97	0.97	0.97	0.97	0.97	0.44	0	0.98	0.97	0.97	0.97	12	0.36	12	0	0.97
Number of Guideline Exceedances	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances(Detects Only)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Env Stds Comments
#1:Apply LOSP 99
#2:Apply Freshwater LOSP Unknown
#3:Apply LOSP 95
#4:Apply Freshwater DGV (LOSP Unknown)
#5:Apply LOSP Unknown
#6:NHMRC (2011) Drinking Water Guidelines [2016] Aesthetic
#7:EPHC (2008) Australian Guidelines for Water Recycling - Drinking Water
#8:NHMRC (2011) Drinking Water Guidelines [2016] Health
#9:US EPA (2012) Health Advisories for Drinking Water Contaminants
#10:California EPA (2014) Public Health Goals for Drinking Water
#11:WHO (2011) Drinking Water Quality
#12:WHO (2020) Trichloroethene in drinking-water: Background document for development of WHO Guidelines for drinking-water quality. WHO/HEP/ECH/WSH/2020.10

Data Comments
#1 NIL (+)VE



Table 10b. Groundwater Summary (Previous Investigation Data) - Hydrocarbons, Volatile Organic Compounds and Organotins (Construction Site Wells)
The Bays
Sydney Metro West - 0577577

	Phthalates					SVOCs																	Organotins
	Butyl benzyl phthalate	Diethyl Phthalate	Dimethyl phthalate	Dibutyl Phthalate	Di-n-octyl phthalate	2-(acetylamino) fluorene	3,3-Dichlorobenzidine	4-(dimethylamino) azobenzene	4-bromophenyl phenyl ether	4-chlorophenyl phenyl ether	4-Nitroquinoline-N-oxide	Azobenzene	Bis(2-chloroethoxy) methane	Bis(2-chloroethyl)ether	Carbazole	Dibenzofuran	Hexachloropropene	Methapyriline	N-nitrosomorpholine	N-nitrosopiperidine	N-nitrosopyrrolidine	Phenacetin	tributyltins
µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	ngSn/L
EQL	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	4	2	2
ANZG (2018) Marine Water - Slightly to moderately disturbed ecosystems		1000 ^{#4}	3700 ^{#4}	10 ^{#4}																			6 ^{#3}
NEPM (1999) Groundwater HSLs for vapour intrusion																							
NHMRC (2008) Recommended Recreational Guidelines - Aesthetic																							
NHMRC (2008) Recommended Recreational Guidelines - Health	700000 ^{#9}	3000000 ^{#9}		350 ^{#7}															0.01 ^{#7}				

LocCode	Field_ID	Sampled_Date																					
C64	C64	27/02/2017	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C64	C64	4/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E58	E58	15/03/2017	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E60	E60	15/03/2017	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E60	E60	7/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E61	E61	15/03/2017	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E62	E62	15/03/2017	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E62	E62	5/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW02	MW02	23/01/2012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW02	MW02	15/05/2012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW02	MW02	1/07/2012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW02	MW102	1/07/2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW02	MW02	4/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW104	MW104	1/07/2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MWB2	MWB2 (PB, 2002)	1/02/2003	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MWB2	MWB2	27/02/2017	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S02	S02_D	4/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S02_S	S02_S	3/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S06	S06	3/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S40_D	S40_D	6/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S40_S	S40_S	6/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S51	S51	7/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S54	QC221	5/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S54	S54	5/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S55	S55	5/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S58_D	S58_D	7/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S58_S	S58_S	6/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SMW_ENV020_D	SWM_ENV020_W	4/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SMW_ENV020_S	SMW_ENV020_S	4/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SMW_ENV021_S	SMW_ENV021_S	22/01/2019	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<4	<2	-
SMW_ENV021_S	SMW_ENV021_S	27/04/2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<2
SMW_ENV021_S	SMW_ENV021_S	10/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SMW_ENV021_W	SMW_ENV021_W	10/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WB4	WB4	1/07/2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WB4	WB4	27/02/2017	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WB4	WB4	10/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Statistical Summary																							
Number of Results	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Number of Detects	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Concentration	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<4	<2	<2
Maximum Concentration	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<4	<2	<2
Average Concentration																							
Standard Deviation																							
Number of Guideline Exceedances	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Number of Guideline Exceedances(Detects Only)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Env Stds Comments
#1:Apply LOSP 99
#2:Apply Freshwater LOSP Unknown
#3:Apply LOSP 95
#4:Apply Freshwater DGV (LOSP Unknown)
#5:Apply LOSP Unknown
#6:NHMRC (2011) Drinking Water Guidelines [2016] Aesthetic
#7:EPHC (2008) Australian Guidelines for Water Recycling - Drinking Water
#8:NHMRC (2011) Drinking Water Guidelines [2016] Health
#9:US EPA (2012) Health Advisories for Drinking Water Contaminants
#10:California EPA (2014) Public Health Goals for Drinking Water
#11:WHO (2011) Drinking Water Quality
#12:WHO (2020) Trichloroethene in drinking-water: Background document for development of WHO Guidelines for drinking-water quality. WHO/HEP/ECH/WSH/2020.10

Data Comments
#1 NIL (+)VE

	Fluorotelomer Sulfonic Acids				Perfluoroalkane Carboxylic Aci										Perfluoroalkane Sulfonic Acids						Perfluoroalkyl Sulfonamides						PFAS Sums					
	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer Sulfonate (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorododecanoic acid (PFDoDA)	Perfluorononanoic acid (PFNA)	Perfluoropentanoic acid (PFPeA)	Perfluorotetradecanoic acid (PFTeDA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorobutanoic acid (PFBA)	Perfluorodecanoic acid (PFDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorooctanoic acid (PFOA)	Perfluorooctanesulfonic acid (PFOS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorodecanesulfonic acid (PFDS)	Perfluorobutane sulfonic acid (PFBS)	Sum of PFHxS and PFOS	N-ethyl PFO sulfonamidoethanol (EtFOSE)	N-methyl-PFO sulfonamidoacetic acid (MeFOSAA)	N-ethyl-PFO sulfonamidoacetic acid (NEtFOSAA)	N-ethyl PFO sulfonamide (EtFOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-methyl PFO sulfonamidoethanol (MeFOSE)	Perfluorooctane sulfonamide (FOSA)	Sum of PFAS	Sum of PFAS (WA DER List)	
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	
EQL	0.05	0.05	0.05	0.05	0.02	0.02	0.02	0.05	0.02	0.02	0.1	0.02	0.02	0.02	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.05	0.02	0.02	0.05	0.05	0.05	0.02	0.01	0.01
NEMP (2020) Interim Marine - Default slightly to moderately disturbed systems															19 ^{#1}	0.00023 ^{#1}																
NEMP (2020) Recreational Water															10 ^{#2}	2 ^{#2}		2 ^{#2}					2 ^{#2}									

LocCode	Field_ID	Sampled_Date																															
SMW_BH066	SMW_BH066	23/04/2020	<0.05	<0.05	<0.05	<0.05	-	-	<0.02	-	<0.02	<0.02	<0.1	-	-	-	<0.01	<0.01	-	<0.02	-	-	<0.02	<0.01	-	-	-	-	-	-	-	<0.01	
SMW_BH067	SMW_BH067	23/04/2020	<0.05	<0.05	<0.05	<0.05	-	-	<0.02	-	<0.02	<0.02	<0.1	-	-	-	<0.01	<0.01	-	<0.02	-	-	<0.02	<0.01	-	-	-	-	-	-	-	<0.01	
SMW_ENV026	SMW_ENV026	22/01/2019	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.01	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.02	<0.01	<0.01
SMW_ENV026	SMW_ENV026	4/05/2021	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.01	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.02	<0.01	<0.01
SMW_ENV027	SMW_ENV027	22/01/2019	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.01	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.02	<0.01	<0.01
SMW_ENV034	SMW_ENV034	22/01/2019	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.01	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.02	<0.01	<0.01
SMW_ENV034	SMW_ENV034	10/05/2021	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.01	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.02	<0.01	<0.01

Statistical Summary																																
Number of Results	7	7	7	7	5	5	7	5	7	7	7	5	5	5	7	7	5	7	5	5	7	7	5	5	5	5	5	5	5	7		
Number of Detects	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Minimum Concentration	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.01	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.02	<0.01	<0.01
Maximum Concentration	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.01	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.02	<0.01	<0.01
Average Concentration	0.025	0.025	0.025	0.025	0.01	0.01	0.01	0.025	0.01	0.01	0.05	0.01	0.01	0.01	0.005	0.005	0.01	0.01	0.01	0.01	0.01	0.005	0.025	0.01	0.01	0.025	0.025	0.025	0.01	0.005	0.005	
Standard Deviation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Number of Guideline Exceedances	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Number of Guideline Exceedances(Detects Only)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

Env Stds Comments
#1:99% level of protection be used for slightly to moderately disturbed systems.
#2:NHMRC (2019)

[illegible]Environmental Resources Management Australia Pty Ltd

	Halogenated Benzenes						genated Hydrocar		MAH									Solvents
	1,2,4-trichlorobenzene	1,3-dichlorobenzene	2-chlorotoluene	1,4-dichlorobenzene	4-chlorotoluene	Chlorobenzene	1,2-dibromoethane	Trichlorofluoromethane	1,2,4-trimethylbenzene	1,3,5-trimethylbenzene	Isopropylbenzene	n-butylbenzene	n-propylbenzene	p-isopropyltoluene	sec-butylbenzene	tert-butylbenzene	Styrene	2-Propanol
	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3
EQL	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	830	1670
CRC Care (2011) Intrusive Maint. Worker - Sand 0 to <2 m																		
CRC Care (2011) Intrusive Maint. Worker - Sand 2 to <4 m																		
CRC Care (2011) Intrusive Maint. Worker - Sand 4 to <8 m																		
CRC Care (2011) Intrusive Maint. Worker - Sand 8 m+																		

LocCode	Field_ID	Sampled_Date																
E75	E75	23/03/2017	<83.35	<83.35	<83.35	<83.35	<83.35	<83.35	<83.35	<83.35	<83.35	<83.35	<83.35	<83.35	<83.35	<83.35	<833.5	<1667
E76	E76	23/03/2017	<83.35	<83.35	<83.35	<83.35	<83.35	<83.35	<83.35	<83.35	<83.35	<83.35	<83.35	<83.35	<83.35	<83.35	<833.5	<1667
E80	E80	23/03/2017	<83.35	<83.35	<83.35	<83.35	<83.35	<83.35	<83.35	<83.35	<83.35	<83.35	<83.35	<83.35	<83.35	<83.35	<833.5	<1667
E81	E81	23/03/2017	<83.35	<83.35	<83.35	<83.35	<83.35	<83.35	<83.35	<83.35	<83.35	<83.35	<83.35	<83.35	<83.35	<83.35	<833.5	<1667

Statistical Summary																		
Number of Results	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Number of Detects	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Concentration	<83.35	<83.35	<83.35	<83.35	<83.35	<83.35	<83.35	<83.35	<83.35	<83.35	<83.35	<83.35	<83.35	<83.35	<83.35	<83.35	<833.5	<1667
Maximum Concentration	<83.35	<83.35	<83.35	<83.35	<83.35	<83.35	<83.35	<83.35	<83.35	<83.35	<83.35	<83.35	<83.35	<83.35	<83.35	<83.35	<833.5	<1667
Average Concentration	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	417	834
Standard Deviation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances(Detects Only)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

APPENDIX E LABORATORY CERTIFICATES

CERTIFICATE OF ANALYSIS

Work Order : **ES2143673**
Client : **ENVIRONMENTAL RESOURCES MANAGEMENT (ERM)**
Contact : MS JESSICA LAWRENCE
Address : LEVEL 15 309 KENT STREET
 SYDNEY NSW AUSTRALIA 2000
Telephone : +61 02 8584 8888
Project : 0577577 - The Bays
Order number : ----
C-O-C number : ----
Sampler : TRISTAN RODRIGUES
Site : ----
Quote number : EN/114
No. of samples received : 20
No. of samples analysed : 6

Page : 1 of 4
Laboratory : Environmental Division Sydney
Contact : Monica Wright
Address : 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone : +61-2-8784 8555
Date Samples Received : 01-Dec-2021 10:00
Date Analysis Commenced : 06-Dec-2021
Issue Date : 08-Dec-2021 17:57



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

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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ankit Joshi	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Ben Felgendrejeris	Senior Acid Sulfate Soil Chemist	Brisbane Acid Sulphate Soils, Stafford, QLD



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 Contact 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.



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	ERM_BH08_9	ERM_BH08_10	ERM_BH08_11	ERM_BH08_12	ERM_BH08_13
Sampling date / time					30-Nov-2021 00:00	30-Nov-2021 00:00	30-Nov-2021 00:00	30-Nov-2021 00:00	30-Nov-2021 00:00
Compound	CAS Number	LOR	Unit		ES2143673-010	ES2143673-011	ES2143673-012	ES2143673-013	ES2143673-014
				Result	Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		8.7	8.2	7.9	6.6	7.1
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		134	390	722	1120	1020
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		0.01	<0.01	<0.01	0.02	0.01



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	ERM_BH08_14	----	----	----	----
			Sampling date / time	30-Nov-2021 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	ES2143673-015	-----	-----	-----	-----
Result				----	----	----	----	----
EA002: pH 1:5 (Soils)								
pH Value	----	0.1	pH Unit	7.5	----	----	----	----
EA010: Conductivity (1:5)								
Electrical Conductivity @ 25°C	----	1	µS/cm	455	----	----	----	----
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	0.01	----	----	----	----

Inter-Laboratory Testing

Analysis conducted by ALS Brisbane, NATA accreditation no. 825, site no. 818 (Chemistry) 18958 (Biology).

(SOIL) ED042T: Total Sulfur by LECO

QUALITY CONTROL REPORT

Work Order	: ES2143673	Page	: 1 of 3
Client	: ENVIRONMENTAL RESOURCES MANAGEMENT (ERM)	Laboratory	: Environmental Division Sydney
Contact	: MS JESSICA LAWRENCE	Contact	: Monica Wright
Address	: LEVEL 15 309 KENT STREET SYDNEY NSW AUSTRALIA 2000	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: +61 02 8584 8888	Telephone	: +61-2-8784 8555
Project	: 0577577 - The Bays	Date Samples Received	: 01-Dec-2021
Order number	: ----	Date Analysis Commenced	: 06-Dec-2021
C-O-C number	: ----	Issue Date	: 08-Dec-2021
Sampler	: TRISTAN RODRIGUES		
Site	: ----		
Quote number	: EN/114		
No. of samples received	: 20		
No. of samples analysed	: 6		



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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ankit Joshi	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Ben Felgendrejeris	Senior Acid Sulfate Soil Chemist	Brisbane Acid Sulphate Soils, Stafford, QLD



General Comments

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

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

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

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA002: pH 1:5 (Soils) (QC Lot: 4056643)									
ES2143673-010	ERM_BH08_9	EA002: pH Value	----	0.1	pH Unit	8.7	8.8	1.6	0% - 20%
ES2144086-003	Anonymous	EA002: pH Value	----	0.1	pH Unit	5.5	5.4	2.2	0% - 20%
EA010: Conductivity (1:5) (QC Lot: 4056642)									
ES2143673-010	ERM_BH08_9	EA010: Electrical Conductivity @ 25°C	----	1	µS/cm	134	141	5.5	0% - 20%
ES2144086-003	Anonymous	EA010: Electrical Conductivity @ 25°C	----	1	µS/cm	12	12	0.0	0% - 50%
ED042T: Total Sulfur by LECO (QC Lot: 4057267)									
EB2134934-004	Anonymous	ED042T: Sulfur - Total as S (LECO)	----	0.01	%	0.32	0.33	4.5	0% - 20%



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

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

Sub-Matrix: **SOIL**

Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) LowHigh	
Method: Compound	CAS Number	LOR	Unit	Result				
EA010: Conductivity (1:5) (QCLot: 4056642)								
EA010: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	1412 µS/cm	97.4	92.0	108
ED042T: Total Sulfur by LECO (QCLot: 4057267)								
ED042T: Sulfur - Total as S (LECO)	----	0.01	%	<0.01	0.16 %	104	70.0	130

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.

- **No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.**

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: ES2143673	Page	: 1 of 4
Client	: ENVIRONMENTAL RESOURCES MANAGEMENT (ERM)	Laboratory	: Environmental Division Sydney
Contact	: MS JESSICA LAWRENCE	Telephone	: +61-2-8784 8555
Project	: 0577577 - The Bays	Date Samples Received	: 01-Dec-2021
Site	: ----	Issue Date	: 08-Dec-2021
Sampler	: TRISTAN RODRIGUES	No. of samples received	: 20
Order number	: ----	No. of samples analysed	: 6

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

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

Outliers : Analysis Holding Time Compliance

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

Outliers : Frequency of Quality Control Samples

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



Analysis Holding Time Compliance

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

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

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

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

Matrix: **SOIL**

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

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA002: pH 1:5 (Soils)								
Soil Glass Jar - Unpreserved (EA002)		30-Nov-2021	07-Dec-2021	07-Dec-2021	✔	07-Dec-2021	07-Dec-2021	✔
ERM_BH08_9,	ERM_BH08_10,							
ERM_BH08_11,	ERM_BH08_12,							
ERM_BH08_13,	ERM_BH08_14							
EA010: Conductivity (1:5)								
Soil Glass Jar - Unpreserved (EA010)		30-Nov-2021	07-Dec-2021	07-Dec-2021	✔	07-Dec-2021	04-Jan-2022	✔
ERM_BH08_9,	ERM_BH08_10,							
ERM_BH08_11,	ERM_BH08_12,							
ERM_BH08_13,	ERM_BH08_14							
ED042T: Total Sulfur by LECO								
Pulp Bag (ED042T)		30-Nov-2021	06-Dec-2021	29-May-2022	✔	06-Dec-2021	29-May-2022	✔
ERM_BH08_9,	ERM_BH08_10,							
ERM_BH08_11,	ERM_BH08_12,							
ERM_BH08_13,	ERM_BH08_14							



Quality Control Parameter Frequency Compliance

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

Matrix: **SOIL**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
Electrical Conductivity (1:5)	EA010	2	17	11.76	10.00	✔	NEPM 2013 B3 & ALS QC Standard
pH (1:5)	EA002	2	18	11.11	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Sulfur - Total as S (LECO)	ED042T	1	9	11.11	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Electrical Conductivity (1:5)	EA010	1	17	5.88	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Sulfur - Total as S (LECO)	ED042T	1	9	11.11	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Electrical Conductivity (1:5)	EA010	1	17	5.88	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Sulfur - Total as S (LECO)	ED042T	1	9	11.11	5.00	✔	NEPM 2013 B3 & ALS QC Standard



Brief Method Summaries

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

Analytical Methods	Method	Matrix	Method Descriptions
pH (1:5)	EA002	SOIL	In house: Referenced to Rayment and Lyons 4A1 and APHA 4500H+. pH is determined on soil samples after a 1:5 soil/water leach. This method is compliant with NEPM Schedule B(3).
Electrical Conductivity (1:5)	EA010	SOIL	In house: Referenced to Rayment and Lyons 3A1 and APHA 2510. Conductivity is determined on soil samples using a 1:5 soil/water leach. This method is compliant with NEPM Schedule B(3).
Sulfur - Total as S (LECO)	ED042T	SOIL	In house: Dried and pulverised sample is combusted in a high temperature furnace in the presence of strong oxidants / catalysts. The evolved S (as SO ₂) is measured by infra-red detector
Preparation Methods	Method	Matrix	Method Descriptions
1:5 solid / water leach for soluble analytes	EN34	SOIL	10 g of soil is mixed with 50 mL of reagent grade water and tumbled end over end for 1 hour. Water soluble salts are leached from the soil by the continuous suspension. Samples are settled and the water filtered off for analysis.
Dry and Pulverise (up to 100g)	GEO30	SOIL	#



CHAIN OF CUSTODY

ALS Laboratory: please tick →

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☐ Newcastle: 6 Rosegum Rd, Warabrook NSW 2304
 Ph: 02 4988 9433 E: samples.newcastle@alsenviro.com

☐ Brisbane: 32 Shand St, Stafford QLD 4053
 Ph: 07 3243 7222 E: samples.brisbane@alsenviro.com
☐ Townsville: 14-15 Deema Ct, Bohle QLD 4818
 Ph: 07 4798 0600 E: townsville.environmental@alsenviro.com

☐ Melbourne: 2-4 Wye
 Ph: 03 8549 8600 E: psn
☐ Adelaide: 2-11 Burma
 Ph: 08 8350 0890 E: adai

Environmental Division
Sydney

Work Order Reference
ES2143673



Telephone: + 61-2-8784 8555

CLIENT:	ERM	TURNAROUND REQUIREMENTS:	☐ Standard TAT (List due date): ☐ Non Standard or urgent TAT (List due date):	FOR LAB USE
OFFICE:	Sydney	(Standard TAT may be longer for some tests e.g., Ultra Trace Organics)		CHAIN OF CUSTODY Freezing / no redefining Random Sampling Other/comm
PROJECT:	0577577 - The Bays	ALS QUOTE NO.:		
ORDER NUMBER:				
PROJECT MANAGER:	Jessica Lawrence	CONTACT PH:	0404935554	
SAMPLER:	Tristan Rodrigues	SAMPLER MOBILE:	0417187687	
COC emailed to ALS? YES		EDD FORMAT (or default):		
Email Reports to:	jessica.lawrence@erm.com, tristan.rodrigues@erm.com	RELINQUISHED BY:	Tristan Rodrigues	RECEIVED BY:
Email Invoice to:	jessica.lawrence@erm.com	DATE/TIME:	30/11/21	DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: Please hold remaining sample.

ALS USE ONLY				SAMPLE DETAILS MATRIX: Solid(S) Water(W)		CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).							Additional Information	
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE codes below)	(refer to)	TOTAL BOTTLES	pH	Electrical conductivity	Total Sulfur						HOLD	Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc. Please use the lower hexavalent chromium LOR.
1	ERM_BH08_0.5	29/11/2021 0:00	Soil			2									X	
2	ERM_BH08_1.5	29/11/2021 0:00	Soil			1									X	
3	ERM_BH08_2.0	29/11/2021 0:00	Soil			2									X	
4	ERM_BH08_3.0	29/11/2021 0:00	Soil			2									X	
5	ERM_BH08_4.0	29/11/2021 0:00	Soil			2									X	
6	ERM_BH08_5.0	29/11/2021 0:00	Soil			2									X	
2	ERM_BH08_6.0	30/11/2021 0:00	Soil			2									X	
8	ERM_BH08_7	30/11/2021 0:00	Soil			2									X	
9	ERM_BH08_8	30/11/2021 0:00	Soil			2									X	
6	ERM_BH08_9	30/11/2021 0:00	Soil			2	X	X	X							Please hold remaining sample
11	ERM_BH08_10	30/11/2021 0:00	Soil			2	X	X	X							Please hold remaining sample
12	ERM_BH08_11	30/11/2021 0:00	Soil			2	X	X	X							Please hold remaining sample
TOTAL							3	3	3							

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic

V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;

Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.



CHAIN OF CUSTODY

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 Ph: 02 4968 8453 E: samples.newcastle@alsenviro.com

☐ Brisbane: 32 Shand St. Stafford QLD 4053
 Ph: 07 3243 7222 E: samples.brisbane@alsenviro.com
☐ Townsville: 14-15 Desma Ct. Bohle QLD 4818
 Ph: 07 4796 0600 E: townsville.environmental@alsenviro.com

☐ Melbourne: 2-4 Westall Rd. Springvale VIC 3171
 Ph: 03 8549 9600 E: samples.melbourne@alsenviro.com
☐ Adelaide: 2-1 Durma Rd. Peoraka SA 5095
 Ph: 08 8359 0890 E: adelaide@alsenviro.com

CLIENT:	ERM	TURNAROUND REQUIREMENTS :		☐ Standard TAT (List due date): ☐ Non Standard or urgent TAT (List due date):		FOR LABORATORY USE ONLY (Circle):	
OFFICE:	Sydney	(Standard TAT may be longer for some tests e.g., Ultra Trace Organics)				Custody Seal intact? Yes No N/A Freeze / freeze packs preserved upon receipt? Yes No N/A Random Sample Temperature checked? C Other comment:	
PROJECT:	0577577 - The Bays	ALS QUOTE NO.:		COC SEQUENCE NUMBER (Circle)			
ORDER NUMBER:				COC: 1 2 3 4 5 6 7			
PROJECT MANAGER:	Jessica Lawrence	CONTACT PH: 0404935554		CF: 1 2 3 4 5 6 7			
SAMPLER:	Tristan Rodrigues	SAMPLER MOBILE: 0417187687		RELINQUISHED BY:		RECEIVED BY:	
COC emailed to ALS? YES		EDD FORMAT (or default):		Tristan Rodrigues			
Email Reports to:	jessica.lawrence@erm.com, tristan.rodrigues@erm.com			DATE/TIME:		DATE/TIME:	
Email Invoice to:	jessica.lawrence@erm.com			30/11/21		11/12/21	

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE ONLY	SAMPLE DETAILS MATRIX: Solid(S) Water(W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).							Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE codes below	(refer to)	TOTAL BOTTLES	pH	Electrical conductivity	Total Sulfur				HOLD
13	ERM_BH08_12	30/11/2021 0:00	Soil			2	X	X	X				Please hold remaining sample
14	ERM_BH08_13	30/11/2021 0:00	Soil			2	X	X	X				Please hold remaining sample
15	ERM_BH08_14	30/11/2021 0:00	Soil			2	X	X	X				Please hold remaining sample
16	20211130_D01	30/11/2021 0:00	Soil			2						X	
17	20211130_T01	30/11/2021 0:00	Soil			2						X	Please forward duplicate sample to Eurofins
18	ERM_BH07_0.5	30/11/2021 0:00	Soil			2						X	
19	ERM_BH09_0.5	30/11/2021 0:00	Soil			1						X	
19	ERM_BH09_1.0	30/11/2021 0:00	Soil			1						X	
TOTAL						3	3	3					

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic

V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

MAIN OF CUSTODY

ALS Laboratory: please tick →

☐ Sydney: 217 Woodpark Rd, Smithfield NSW 2164
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☐ Newcastle: 5 Rosegem Rd, Warabrook NSW 2304
 Ph: 02 4962 9433 E: samples.newcastle@alsenviro.com

☐ Brisbane: 32 Shand St, Stafford QLD 4053
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☐ Townsville: 14-15 Desma Ct, Bohle QLD 4818
 Ph: 07 4786 0800 E: townsville.environmental@alsenviro.com

☐ Melbourne: 2-4 Wes
 Ph: 03 8548 5800 E: eam
☐ Adelaide: 2-11 Burma
 Ph: 08 8359 0669 E: adel

Environmental Division
 Sydney
 Work Order Reference
ES2143673



Telephone : + 61-2-8784 8555

ERM Sydney	TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)	☐ Standard TAT (List due date): ☐ Non Standard or urgent TAT (List due date):	FOR LABS Custody Seal Fries / Cert / m received Random Ser Other Comm
PROJECT: 0577577 - The Bays	ALS QUOTE NO.:	COC SEQUENCE NUMBER (Circle)	
ORDER NUMBER:		COC: 1 2 3 4 5 6 7 OF: 1 2 3 5 6 7	
PROJECT MANAGER: Jessica Lawrence	CONTACT PH: 0404935554	RELINQUISHED BY: Tristan Rodrigues	RECEIVED BY: <i>[Signature]</i>
SAMPLER: Tristan Rodrigues	SAMPLER MOBILE: 0417187687	DATE/TIME: 30/11/21	RELINQUISHED DATE/TIME:
COC emailed to ALS? YES		EDD FORMAT (or default):	
Email reports to: jessica.lawrence@erm.com, tristan.rodrigues@erm.com		Email invoice to: jessica.lawrence@erm.com	

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: Please hold remaining sample.

ALS USE ONLY		SAMPLE DETAILS MATRIX: Solid(S) Water(W)		CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).							Additional Information	
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE codes below	(refer to)	TOTAL BOTTLES	pH	Electrical conductivity	Total Sulfur				HOLD	Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc. Please use the lower hexavalent chromium LOR.
1	ERM_BH08_0.5	29/11/2021 0:00	Soil			2							X	
2	ERM_BH08_1.5	29/11/2021 0:00	Soil			1							X	
3	ERM_BH08_2.0	29/11/2021 0:00	Soil			2							X	
4	ERM_BH08_3.0	29/11/2021 0:00	Soil			2							X	
5	ERM_BH08_4.0	29/11/2021 0:00	Soil			2							X	
6	ERM_BH08_5.0	29/11/2021 0:00	Soil			2							X	
7	ERM_BH08_6.0	30/11/2021 0:00	Soil			2							X	
8	ERM_BH08_7	30/11/2021 0:00	Soil			2							X	
9	ERM_BH08_8	30/11/2021 0:00	Soil			2							X	
10	ERM_BH08_9	30/11/2021 0:00	Soil			2	X	X	X					Please hold remaining sample
11	ERM_BH08_10	30/11/2021 0:00	Soil			2	X	X	X					Please hold remaining sample
12	ERM_BH08_11	30/11/2021 0:00	Soil			2	X	X	X					Please hold remaining sample
TOTAL							3	3	3					

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 V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
 Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

Subcon / Forward Lab / Split WO
 Lab / Analysis: Eurofins
 Organised By / Date: 29/11/2021
 Relinquished By / Date: 30/11/2021
 Connote / Courier: 10-15
 WO No. ES2143673
 Attach By PO / Internal Sheet:



CHAIN OF CUSTODY

ALS Laboratory: please tick →

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☐ Adelaide: 2-1 Burma Rd, Para Hills SA 5095
 Ph: 08 8359 0890 E: adelaide@alsenviro.com

CLIENT: ERM	TURNAROUND REQUIREMENTS :		☐ Standard TAT (List due date): (Standard TAT may be longer for some tests e.g., Ultra Trace Organics)		FOR LABORATORY USE ONLY (Circle) Custody Seal intact? Yes No Free from frozen ice bricks presentation receipt? Yes No N/A Random Sample temperature on receipt: C Other comment:
OFFICE: Sydney	☐ Non Standard or urgent TAT (List due date):		COC SEQUENCE NUMBER (Circle) COC: 1 2 3 4 5 6 7 OF: 1 2 3 4 5 6 7		
PROJECT: 0577577 - The Bays	ALS QUOTE NO.:				
ORDER NUMBER:					
PROJECT MANAGER: Jessica Lawrence		CONTACT PH: 0404935554			
SAMPLER: Tristan Rodrigues	SAMPLER MOBILE: 0417187687		RELINQUISHED BY: Tristan Rodrigues		RECEIVED BY: <i>[Signature]</i>
COC emailed to ALS? YES		EDD FORMAT (or default):		DATE/TIME: 11/12/21	
Email Reports to: jessica.lawrence@erm.com, tristan.rodrigues@erm.com				DATE/TIME:	
Email Invoice to: jessica.lawrence@erm.com				DATE/TIME:	

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE ONLY	SAMPLE DETAILS MATRIX: Solid(S) Water(W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).							Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE codes below)	(refer to TOTAL BOTTLES	pH	Electrical conductivity	Total Sulfur				HOLD	
13	ERM_BH08_12	30/11/2021 0:00	Soil		2	X	X	X					Please hold remaining sample
14	ERM_BH08_13	30/11/2021 0:00	Soil		2	X	X	X					Please hold remaining sample
15	ERM_BH08_14	30/11/2021 0:00	Soil		2	X	X	X					Please hold remaining sample
16	20211130_D01	30/11/2021 0:00	Soil		2							X	
17	20211130_T01	30/11/2021 0:00	Soil		2							X	Please forward duplicate sample to Eurofins
18	ERM_BH07_0.5	30/11/2021 0:00	Soil		2							X	
18	ERM_BH09_0.5	30/11/2021 0:00	Soil		1							X	
19	ERM_BH09_1.0	30/11/2021 0:00	Soil		1							X	
TOTAL						3	3	3					

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic

V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;

Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

CERTIFICATE OF ANALYSIS

Work Order	: ES2143674	Page	: 1 of 10
Client	: ENVIRONMENTAL RESOURCES MANAGEMENT (ERM)	Laboratory	: Environmental Division Sydney
Contact	: MS JESSICA LAWRENCE	Contact	: Monica Wright
Address	: LEVEL 15 309 KENT STREET SYDNEY NSW AUSTRALIA 2000	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: +61 02 8584 8888	Telephone	: +61-2-8784 8555
Project	: 0577577 - The Bays	Date Samples Received	: 01-Dec-2021 10:00
Order number	: ----	Date Analysis Commenced	: 02-Dec-2021
C-O-C number	: ----	Issue Date	: 06-Dec-2021 16:23
Sampler	: TRISTAN RODRIGUES		
Site	: ----		
Quote number	: EN/114		
No. of samples received	: 8		
No. of samples analysed	: 8		



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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ben Felgendrejeris	Senior Acid Sulfate Soil Chemist	Brisbane Acid Sulphate Soils, Stafford, QLD
Edwandy Fadjjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Franco Lentini	LCMS Coordinator	Sydney Inorganics, Smithfield, NSW
Franco Lentini	LCMS Coordinator	Sydney Organics, Smithfield, NSW
Wisam Marassa	Inorganics Coordinator	Sydney Inorganics, Smithfield, NSW



General Comments

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

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

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

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

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

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

- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- EG035T: Poor matrix spike recovery was obtained for Mercury on sample ES2143435 #3. Confirmed by re-analysis.
- ASS: EA033 (CRS Suite):Retained Acidity not required because pH KCl greater than or equal to 4.5
- EP080: The trip spike and its control have been analysed for volatile TPH and BTEXN only. The trip spike and control were prepared in the lab using reagent grade sand spiked with petrol. The spike was dispatched from the lab and the control retained.
- ASS: EA033 (CRS Suite): Laboratory determinations of ANC needs to be corroborated by effectiveness of the measured ANC in relation to incubation ANC. Unless corroborated, the results of ANC testing should be discounted when determining Net Acidity for comparison with action criteria, or for the determination of the acidity hazard and required liming amounts.
- ASS: EA033 (CRS Suite): Liming rate is calculated and reported on a dry weight basis assuming use of fine agricultural lime (CaCO3) and using a safety factor of 1.5 to allow for non-homogeneous mixing and poor reactivity of lime. For conversion of Liming Rate from 'kg/t dry weight' to 'kg/m3 in-situ soil', multiply 'reported results' x 'wet bulk density of soil in t/m3'.
- 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. 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 (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	ERM_BH08_1.0	ERM_BH08_12.5	ERM_BH07_1.0	ERM_BH07_1.5	TS 3
Sampling date / time				29-Nov-2021 00:00	30-Nov-2021 00:00	30-Nov-2021 00:00	30-Nov-2021 00:00	26-Nov-2021 00:00	
Compound	CAS Number	LOR	Unit	ES2143674-001	ES2143674-002	ES2143674-003	ES2143674-004	ES2143674-006	
				Result	Result	Result	Result	Result	
EA033-A: Actual Acidity									
pH KCl (23A)	----	0.1	pH Unit	----	6.3	7.1	8.7	----	
Titratable Actual Acidity (23F)	----	2	mole H+ / t	----	<2	<2	<2	----	
sulfidic - Titratable Actual Acidity (s-23F)	----	0.02	% pyrite S	----	<0.02	<0.02	<0.02	----	
EA033-B: Potential Acidity									
Chromium Reducible Sulfur (22B)	----	0.005	% S	----	0.011	0.098	0.120	----	
acidity - Chromium Reducible Sulfur (a-22B)	----	10	mole H+ / t	----	<10	61	75	----	
EA033-C: Acid Neutralising Capacity									
Acid Neutralising Capacity (19A2)	----	0.01	% CaCO3	----	----	2.32	2.69	----	
acidity - Acid Neutralising Capacity (a-19A2)	----	10	mole H+ / t	----	----	465	537	----	
sulfidic - Acid Neutralising Capacity (s-19A2)	----	0.01	% pyrite S	----	----	0.74	0.86	----	
EA033-E: Acid Base Accounting									
ANC Fineness Factor	----	0.5	-	----	1.5	1.5	1.5	----	
Net Acidity (sulfur units)	----	0.02	% S	----	<0.02	<0.02	<0.02	----	
Net Acidity (acidity units)	----	10	mole H+ / t	----	<10	<10	<10	----	
Liming Rate	----	1	kg CaCO3/t	----	<1	<1	<1	----	
Net Acidity excluding ANC (sulfur units)	----	0.02	% S	----	<0.02	0.10	0.12	----	
Net Acidity excluding ANC (acidity units)	----	10	mole H+ / t	----	<10	61	75	----	
Liming Rate excluding ANC	----	1	kg CaCO3/t	----	<1	5	6	----	
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%	19.6	----	12.3	----	----	
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg	----	----	----	----	<0.2	
Toluene	108-88-3	0.5	mg/kg	----	----	----	----	7.5	
Ethylbenzene	100-41-4	0.5	mg/kg	----	----	----	----	1.7	
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	----	----	----	----	8.6	
ortho-Xylene	95-47-6	0.5	mg/kg	----	----	----	----	4.0	
^ Total Xylenes	----	0.5	mg/kg	----	----	----	----	12.6	
^ Sum of BTEX	----	0.2	mg/kg	----	----	----	----	21.8	
Naphthalene	91-20-3	1	mg/kg	----	----	----	----	<1	
EP231A: Perfluoroalkyl Sulfonic Acids									



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	ERM_BH08_1.0	ERM_BH08_12.5	ERM_BH07_1.0	ERM_BH07_1.5	TS 3
Sampling date / time					29-Nov-2021 00:00	30-Nov-2021 00:00	30-Nov-2021 00:00	30-Nov-2021 00:00	26-Nov-2021 00:00
Compound	CAS Number	LOR	Unit		ES2143674-001	ES2143674-002	ES2143674-003	ES2143674-004	ES2143674-006
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids - Continued									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	----	<0.0002	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	----	<0.0002	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	----	<0.0002	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	----	<0.0002	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	----	<0.0002	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	----	<0.0002	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	----	<0.001	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	----	0.0003	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	----	<0.0002	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	----	<0.0002	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	----	<0.0002	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	----	<0.0002	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	----	<0.0002	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	----	<0.0002	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	----	<0.0002	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	----	<0.0002	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	----	<0.0005	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	----	<0.0002	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	----	<0.0005	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	----	<0.0005	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	ERM_BH08_1.0	ERM_BH08_12.5	ERM_BH07_1.0	ERM_BH07_1.5	TS 3
Sampling date / time					29-Nov-2021 00:00	30-Nov-2021 00:00	30-Nov-2021 00:00	30-Nov-2021 00:00	26-Nov-2021 00:00
Compound	CAS Number	LOR	Unit		ES2143674-001	ES2143674-002	ES2143674-003	ES2143674-004	ES2143674-006
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	----	<0.0005	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	----	<0.0005	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	----	<0.0002	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	----	<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	----	<0.0005	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	----	<0.0005	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	----	<0.0005	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	----	<0.0005	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	----	0.0003	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	----	<0.0002	----	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	----	0.0003	----	----
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.2	%		----	----	----	----	88.1
Toluene-D8	2037-26-5	0.2	%		----	----	----	----	88.8
4-Bromofluorobenzene	460-00-4	0.2	%		----	----	----	----	86.2
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		111	----	96.5	----	----
13C8-PFOA	----	0.0002	%		95.5	----	93.5	----	----



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Sample ID

				TB	TSC 3	----	----	----
Sampling date / time				26-Nov-2021 00:00	26-Nov-2021 00:00	----	----	----
Compound	CAS Number	LOR	Unit	ES2143674-007	ES2143674-008	-----	-----	-----
				Result	Result	----	----	----
EP080: BTEXN								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	----	----	----
Toluene	108-88-3	0.5	mg/kg	<0.5	9.1	----	----	----
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	2.0	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	10.7	----	----	----
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	4.8	----	----	----
^ Total Xylenes	----	0.5	mg/kg	<0.5	15.5	----	----	----
^ Sum of BTEX	----	0.2	mg/kg	<0.2	26.6	----	----	----
Naphthalene	91-20-3	1	mg/kg	<1	<1	----	----	----
EP080S: TPH(V)/BTEX Surrogates								
1,2-Dichloroethane-D4	17060-07-0	0.2	%	92.9	94.6	----	----	----
Toluene-D8	2037-26-5	0.2	%	92.5	99.0	----	----	----
4-Bromofluorobenzene	460-00-4	0.2	%	90.2	91.1	----	----	----



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	20211129_R01	----	----	----	----
			Sampling date / time	29-Nov-2021 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	ES2143674-005	-----	-----	-----	-----
				Result	----	----	----	----
EG020T: Total Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	<0.001	----	----	----	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	----	----	----	----
Chromium	7440-47-3	0.001	mg/L	<0.001	----	----	----	----
Copper	7440-50-8	0.001	mg/L	<0.001	----	----	----	----
Nickel	7440-02-0	0.001	mg/L	<0.001	----	----	----	----
Lead	7439-92-1	0.001	mg/L	<0.001	----	----	----	----
Zinc	7440-66-6	0.005	mg/L	<0.005	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	----	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	----	----	----	----

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	20211129_R01	----	----	----	----
Sampling date / time				29-Nov-2021 00:00	----	----	----	----	
Compound	CAS Number	LOR	Unit	ES2143674-005	-----	-----	-----	-----	
				Result	----	----	----	----	
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	----	----	----	----	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	----	----	----	----	
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	----	----	----	----	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	----	----	----	----	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	----	----	----	----	
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	----	----	----	----	
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	----	----	----	----	
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	----	----	----	----	
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	----	----	----	----	
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	----	----	----	----	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	----	----	----	----	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	----	----	----	----	
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	----	----	----	----	
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	----	----	----	----	
Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----	
EP231S: PFAS Surrogate									



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	20211129_R01	----	----	----	----
				Sampling date / time	29-Nov-2021 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2143674-005	-----	-----	-----	-----
				Result		----	----	----	----
EP231S: PFAS Surrogate - Continued									
13C4-PFOS	----	0.02	%		116	----	----	----	----
13C8-PFOA	----	0.02	%		105	----	----	----	----



Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP080S: TPH(V)/BTEX Surrogates			
1,2-Dichloroethane-D4	17060-07-0	73	133
Toluene-D8	2037-26-5	74	132
4-Bromofluorobenzene	460-00-4	72	130
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Brisbane, NATA accreditation no. 825, site no. 818 (Chemistry) 18958 (Biology).

(SOIL) EA033-B: Potential Acidity

(SOIL) EA033-C: Acid Neutralising Capacity

(SOIL) EA033-D: Retained Acidity

(SOIL) EA033-A: Actual Acidity

(SOIL) EA033-E: Acid Base Accounting

QUALITY CONTROL REPORT

Work Order	: ES2143674	Page	: 1 of 12
Client	: ENVIRONMENTAL RESOURCES MANAGEMENT (ERM)	Laboratory	: Environmental Division Sydney
Contact	: MS JESSICA LAWRENCE	Contact	: Monica Wright
Address	: LEVEL 15 309 KENT STREET SYDNEY NSW AUSTRALIA 2000	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: +61 02 8584 8888	Telephone	: +61-2-8784 8555
Project	: 0577577 - The Bays	Date Samples Received	: 01-Dec-2021
Order number	: ----	Date Analysis Commenced	: 02-Dec-2021
C-O-C number	: ----	Issue Date	: 06-Dec-2021
Sampler	: TRISTAN RODRIGUES		
Site	: ----		
Quote number	: EN/114		
No. of samples received	: 8		
No. of samples analysed	: 8		



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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ben Felgendrejeris	Senior Acid Sulfate Soil Chemist	Brisbane Acid Sulphate Soils, Stafford, QLD
Edwandy Fadjjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Franco Lentini	LCMS Coordinator	Sydney Inorganics, Smithfield, NSW
Franco Lentini	LCMS Coordinator	Sydney Organics, Smithfield, NSW
Wisam Marassa	Inorganics Coordinator	Sydney Inorganics, Smithfield, NSW



General Comments

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

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

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

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **SOIL**

Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA033-A: Actual Acidity (QC Lot: 4053850)									
ES2143674-002	ERM_BH08_12.5	EA033: sulfidic - Titratable Actual Acidity (s-23F)	----	0.02	% pyrite S	<0.02	<0.02	0.0	No Limit
		EA033: Titratable Actual Acidity (23F)	----	2	mole H+ / t	<2	<2	0.0	No Limit
		EA033: pH KCl (23A)	----	0.1	pH Unit	6.3	6.3	0.0	0% - 20%
EA033-B: Potential Acidity (QC Lot: 4053850)									
ES2143674-002	ERM_BH08_12.5	EA033: Chromium Reducible Sulfur (22B)	----	0.005	% S	0.011	0.012	0.0	No Limit
		EA033: acidity - Chromium Reducible Sulfur (a-22B)	----	10	mole H+ / t	<10	<10	0.0	No Limit
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 4052074)									
EP2114615-010	Anonymous	EA055: Moisture Content	----	0.1	%	6.6	7.4	10.4	0% - 20%
ES2143280-001	Anonymous	EA055: Moisture Content	----	0.1	%	18.2	19.0	4.5	0% - 50%
EP080: BTEXN (QC Lot: 4049925)									
ES2143296-041	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
		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
ES2143296-051	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
		EP080: ortho-Xylene	95-47-6	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: 4049925) - continued									
ES2143296-051	Anonymous	EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4048665)									
EP2114223-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	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: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	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
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2114223-011	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	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: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0027	0.0030	7.8	0% - 50%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	0.0006	0.0006	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4048665)									
EP2114223-001	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	<0.0002	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: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP2114223-011	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: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4048665)									
EP2114223-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	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 (%)
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4048665) - continued									
EP2114223-001	Anonymous	EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2114223-011	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4048665)									
EP2114223-001	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
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2114223-011	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

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 Work Order : ES2143674
 Client : ENVIRONMENTAL RESOURCES MANAGEMENT (ERM)
 Project : 0577577 - The Bays



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: 4048665) - continued									
EP2114223-011	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
Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EG020T: Total Metals by ICP-MS (QC Lot: 4052437)									
ES2142998-001	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	0.0019	0.0018	6.7	0% - 50%
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	0.001	0.001	0.0	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	0.030	0.030	0.0	0% - 20%
		EG020A-T: Copper	7440-50-8	0.001	mg/L	0.096	0.099	2.5	0% - 20%
		EG020A-T: Lead	7439-92-1	0.001	mg/L	0.002	0.002	0.0	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.061	0.063	2.4	0% - 20%
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	9.05	9.26	2.3	0% - 20%
ES2143371-003	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	0.003	0.003	0.0	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	0.002	0.002	0.0	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	0.009	0.009	0.0	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 4050476)									
ES2143435-002	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0005	<0.0005	0.0	No Limit
ES2143435-012	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4051170)									
ES2143285-001	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4051170)									
ES2143285-001	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4051170) - continued									
ES2143285-001	Anonymous	EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4051170)									
ES2143285-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4051170)									
ES2143285-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4051170)									
ES2143285-001	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit



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

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

Sub-Matrix: **SOIL**

Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EA033-A: Actual Acidity (QCLot: 4053850)								
EA033: pH KCl (23A)	----	----	pH Unit	----	4.4 pH Unit	99.8	91.0	107
EA033: Titratable Actual Acidity (23F)	----	2	mole H+ / t	<2	19 mole H+ / t	92.2	70.0	124
EA033: sulfidic - Titratable Actual Acidity (s-23F)	----	0.02	% pyrite S	<0.02	----	----	----	----
EA033-B: Potential Acidity (QCLot: 4053850)								
EA033: Chromium Reducible Sulfur (22B)	----	0.005	% S	<0.005	0.246 % S	92.8	77.0	121
EA033: acidity - Chromium Reducible Sulfur (a-22B)	----	10	mole H+ / t	<10	----	----	----	----
EA033-C: Acid Neutralising Capacity (QCLot: 4053850)								
EA033: Acid Neutralising Capacity (19A2)	----	0.01	% CaCO3	<0.01	10 % CaCO3	101	91.0	112
EA033: acidity - Acid Neutralising Capacity (a-19A2)	----	10	mole H+ / t	<10	----	----	----	----
EA033: sulfidic - Acid Neutralising Capacity (s-19A2)	----	0.01	% pyrite S	<0.01	----	----	----	----
EP080: BTEXN (QCLot: 4049925)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	105	62.0	116
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	106	67.0	121
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	107	65.0	117
EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	2 mg/kg	106	66.0	118
	106-42-3							
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	107	68.0	120
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	103	63.0	119
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4048665)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.00125 mg/kg	106	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	89.6	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	86.8	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	86.4	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	83.2	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	90.4	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4048665)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	82.8	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	100	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	110	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	102	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	109	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.8	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.0	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	110	64.0	136



Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4048665) - continued								
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	114	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	114	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	94.6	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4048665)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	92.0	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	85.9	71.6	129
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	92.3	69.8	131
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	88.8	68.7	130
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	87.3	65.1	134
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	90.8	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	104	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4048665)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	92.4	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00125 mg/kg	92.0	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	102	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.00125 mg/kg	72.8	69.2	143
Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EG020T: Total Metals by ICP-MS (QCLot: 4052437)								
EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	97.6	82.0	114
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	95.7	84.0	112
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	97.0	86.0	116
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	94.4	83.0	118
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	94.3	85.0	115
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	96.3	84.0	116
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	96.2	79.0	117
EG035T: Total Recoverable Mercury by FIMS (QCLot: 4050476)								
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	89.9	77.0	111
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4051170)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	127	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	110	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	104	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	103	69.0	134



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4051170) - continued								
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	119	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	113	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4051170)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	98.4	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	116	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	123	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	124	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	125	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	111	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	120	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	121	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	120	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	125	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	114	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4051170)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	105	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	94.0	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	89.9	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	103	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	94.4	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	116	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	121	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4051170)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	105	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	113	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	104	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	107	71.4	144

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



Sub-Matrix: **SOIL**

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: BTEXN (QCLot: 4049925)							
ES2143296-041	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	111	70.0	130
		EP080: Toluene	108-88-3	2.5 mg/kg	115	70.0	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	122	70.0	130
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	118	70.0	130
			106-42-3				
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	123	70.0	130
		EP080: Naphthalene	91-20-3	2.5 mg/kg	126	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4048665)							
EP2114223-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00125 mg/kg	118	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00125 mg/kg	99.2	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00125 mg/kg	105	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00125 mg/kg	96.8	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00125 mg/kg	103	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.00125 mg/kg	100	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4048665)							
EP2114223-001	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	98.6	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	111	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	118	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	110	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	116	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	110	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	101	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	120	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	122	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.00125 mg/kg	122	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	99.2	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4048665)							
EP2114223-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	93.6	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	86.2	71.6	129
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	90.7	69.8	131
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	99.7	68.7	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	102	65.1	134
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	101	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	115	61.0	139

Sub-Matrix: **SOIL**

Sub-Matrix: SOIL				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4048665)							
EP2114223-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00125 mg/kg	91.6	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00125 mg/kg	88.8	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.00125 mg/kg	100	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00125 mg/kg	75.6	69.2	143

Sub-Matrix: **WATER**

Sub-Matrix: WATER				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG020T: Total Metals by ICP-MS (QCLot: 4052437)							
ES2143175-001	Anonymous	EG020A-T: Arsenic	7440-38-2	1 mg/L	116	70.0	130
		EG020A-T: Cadmium	7440-43-9	0.25 mg/L	115	70.0	130
		EG020A-T: Chromium	7440-47-3	1 mg/L	115	70.0	130
		EG020A-T: Copper	7440-50-8	1 mg/L	116	70.0	130
		EG020A-T: Lead	7439-92-1	1 mg/L	114	70.0	130
		EG020A-T: Nickel	7440-02-0	1 mg/L	115	70.0	130
		EG020A-T: Zinc	7440-66-6	1 mg/L	116	70.0	130

EG035T: Total Recoverable Mercury by FIMS (QCLot: 4050476)

ES2143435-003	Anonymous	EG035T: Mercury	7439-97-6	0.01 mg/L	# 34.3	70.0	130
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EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4051170)

ES2143285-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	118	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	108	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	100	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	101	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	114	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	112	53.0	142

EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4051170)

ES2143285-001	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	98.5	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	122	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	116	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	125	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	121	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	114	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	118	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	115	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	123	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	128	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	113	71.0	132

EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4051170)

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 Work Order : ES2143674
 Client : ENVIRONMENTAL RESOURCES MANAGEMENT (ERM)
 Project : 0577577 - The Bays



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4051170) - continued							
ES2143285-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	102	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	87.2	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	91.3	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	108	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	95.9	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	108	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	124	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4051170)							
ES2143285-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	99.8	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	101	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	107	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	102	71.4	144

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: ES2143674	Page	: 1 of 7
Client	: ENVIRONMENTAL RESOURCES MANAGEMENT (ERM)	Laboratory	: Environmental Division Sydney
Contact	: MS JESSICA LAWRENCE	Telephone	: +61-2-8784 8555
Project	: 0577577 - The Bays	Date Samples Received	: 01-Dec-2021
Site	: ----	Issue Date	: 06-Dec-2021
Sampler	: TRISTAN RODRIGUES	No. of samples received	: 8
Order number	: ----	No. of samples analysed	: 8

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

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

Outliers : Analysis Holding Time Compliance

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

Outliers : Frequency of Quality Control Samples

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

Page : 2 of 7
 Work Order : ES2143674
 Client : ENVIRONMENTAL RESOURCES MANAGEMENT (ERM)
 Project : 0577577 - The Bays



Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
EG035T: Total Recoverable Mercury by FIMS	ES2143435--003	Anonymous	Mercury	7439-97-6	34.3 %	70.0-130%	Recovery less than lower data quality objective

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
Method	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	1	12	8.33	10.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

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

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

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

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

Matrix: **SOIL**

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

Method	Sample Date	Extraction / Preparation			Analysis			
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
EA033-A: Actual Acidity								
Snap Lock Bag - frozen (EA033) ERM_BH08_12.5, ERM_BH07_1.5	ERM_BH07_1.0,	30-Nov-2021	06-Dec-2021	30-Nov-2022	✓	06-Dec-2021	06-Mar-2022	✓
EA033-B: Potential Acidity								
Snap Lock Bag - frozen (EA033) ERM_BH08_12.5, ERM_BH07_1.5	ERM_BH07_1.0,	30-Nov-2021	06-Dec-2021	30-Nov-2022	✓	06-Dec-2021	06-Mar-2022	✓
EA033-C: Acid Neutralising Capacity								
Snap Lock Bag - frozen (EA033) ERM_BH08_12.5, ERM_BH07_1.5	ERM_BH07_1.0,	30-Nov-2021	06-Dec-2021	30-Nov-2022	✓	06-Dec-2021	06-Mar-2022	✓
EA033-D: Retained Acidity								
Snap Lock Bag - frozen (EA033) ERM_BH08_12.5, ERM_BH07_1.5	ERM_BH07_1.0,	30-Nov-2021	06-Dec-2021	30-Nov-2022	✓	06-Dec-2021	06-Mar-2022	✓



Matrix: **SOIL**

Evaluation: * = Holding time breach ; ✓ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA033-E: Acid Base Accounting							
Snap Lock Bag - frozen (EA033) ERM_BH08_12.5, ERM_BH07_1.5	ERM_BH07_1.0, 30-Nov-2021	06-Dec-2021	30-Nov-2022	✓	06-Dec-2021	06-Mar-2022	✓
EA055: Moisture Content (Dried @ 105-110°C)							
Soil Glass Jar - Unpreserved (EA055) ERM_BH08_1.0	29-Nov-2021	----	----	----	02-Dec-2021	13-Dec-2021	✓
Soil Glass Jar - Unpreserved (EA055) ERM_BH07_1.0	30-Nov-2021	----	----	----	02-Dec-2021	14-Dec-2021	✓
EP080: BTEXN							
Soil Glass Jar - Unpreserved (EP080) TS 3, TSC 3	TB, 26-Nov-2021	02-Dec-2021	10-Dec-2021	✓	03-Dec-2021	10-Dec-2021	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE Soil Jar (EP231X) ERM_BH08_1.0	29-Nov-2021	02-Dec-2021	28-May-2022	✓	03-Dec-2021	11-Jan-2022	✓
HDPE Soil Jar (EP231X) ERM_BH07_1.0	30-Nov-2021	02-Dec-2021	29-May-2022	✓	03-Dec-2021	11-Jan-2022	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE Soil Jar (EP231X) ERM_BH08_1.0	29-Nov-2021	02-Dec-2021	28-May-2022	✓	03-Dec-2021	11-Jan-2022	✓
HDPE Soil Jar (EP231X) ERM_BH07_1.0	30-Nov-2021	02-Dec-2021	29-May-2022	✓	03-Dec-2021	11-Jan-2022	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE Soil Jar (EP231X) ERM_BH08_1.0	29-Nov-2021	02-Dec-2021	28-May-2022	✓	03-Dec-2021	11-Jan-2022	✓
HDPE Soil Jar (EP231X) ERM_BH07_1.0	30-Nov-2021	02-Dec-2021	29-May-2022	✓	03-Dec-2021	11-Jan-2022	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE Soil Jar (EP231X) ERM_BH08_1.0	29-Nov-2021	02-Dec-2021	28-May-2022	✓	03-Dec-2021	11-Jan-2022	✓
HDPE Soil Jar (EP231X) ERM_BH07_1.0	30-Nov-2021	02-Dec-2021	29-May-2022	✓	03-Dec-2021	11-Jan-2022	✓
EP231P: PFAS Sums							
HDPE Soil Jar (EP231X) ERM_BH08_1.0	29-Nov-2021	02-Dec-2021	28-May-2022	✓	03-Dec-2021	11-Jan-2022	✓
HDPE Soil Jar (EP231X) ERM_BH07_1.0	30-Nov-2021	02-Dec-2021	29-May-2022	✓	03-Dec-2021	11-Jan-2022	✓

Matrix: **WATER**

Evaluation: * = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation



Matrix: **WATER**

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

Method	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG020T: Total Metals by ICP-MS							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG020A-T) 20211129_R01	29-Nov-2021	03-Dec-2021	28-May-2022	✓	03-Dec-2021	28-May-2022	✓
EG035T: Total Recoverable Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG035T) 20211129_R01	29-Nov-2021	----	----	----	03-Dec-2021	27-Dec-2021	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X) 20211129_R01	29-Nov-2021	03-Dec-2021	28-May-2022	✓	03-Dec-2021	28-May-2022	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X) 20211129_R01	29-Nov-2021	03-Dec-2021	28-May-2022	✓	03-Dec-2021	28-May-2022	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X) 20211129_R01	29-Nov-2021	03-Dec-2021	28-May-2022	✓	03-Dec-2021	28-May-2022	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X) 20211129_R01	29-Nov-2021	03-Dec-2021	28-May-2022	✓	03-Dec-2021	28-May-2022	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X) 20211129_R01	29-Nov-2021	03-Dec-2021	28-May-2022	✓	03-Dec-2021	28-May-2022	✓



Quality Control Parameter Frequency Compliance

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

Matrix: **SOIL**

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

Quality Control Sample Type		Count		Rate (%)		Quality Control Specification	
Analytical Methods	Method	QC	Regular	Actual	Expected		Evaluation
Laboratory Duplicates (DUP)							
Chromium Suite for Acid Sulphate Soils	EA033	1	3	33.33	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Moisture Content	EA055	2	18	11.11	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	18	11.11	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	19	10.53	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Chromium Suite for Acid Sulphate Soils	EA033	1	3	33.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Chromium Suite for Acid Sulphate Soils	EA033	1	3	33.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	12	8.33	10.00	✖	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	18	11.11	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	2	15	13.33	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	12	8.33	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	18	5.56	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	15	6.67	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	12	8.33	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	18	5.56	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	15	6.67	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	12	8.33	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	18	5.56	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	15	6.67	5.00	✔	NEPM 2013 B3 & ALS QC Standard



Brief Method Summaries

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

Analytical Methods	Method	Matrix	Method Descriptions
Chromium Suite for Acid Sulphate Soils	EA033	SOIL	In house: Referenced to Ahern et al 2004. This method covers the determination of Chromium Reducible Sulfur (SCR); pHKCl; titratable actual acidity (TAA); acid neutralising capacity by back titration (ANC); and net acid soluble sulfur (SNAS) which incorporates peroxide sulfur. It applies to soils and sediments (including sands) derived from coastal regions. Liming Rate is based on results for samples as submitted and incorporates a minimum safety factor of 1.5.
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
TRH Volatiles/BTEX	EP080	SOIL	In house: Referenced to USEPA SW 846 - 8260. Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. Compliant with NEPM Schedule B(3) amended.
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.
Total Metals by ICP-MS - Suite A	EG020A-T	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Total Mercury by FIMS	EG035T	WATER	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl ₂)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the unfiltered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl ₂ which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM Schedule B(3).
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.
Preparation Methods	Method	Matrix	Method Descriptions
Drying at 85 degrees, bagging and labelling (ASS)	EN020PR	SOIL	In house



Preparation Methods	Method	Matrix	Method Descriptions
Methanolic Extraction of Soils for Purge and Trap	ORG16	SOIL	In house: Referenced to USEPA SW 846 - 5030A. 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
QuEChERS Extraction of Solids	ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.
Digestion for Total Recoverable Metals	EN25	WATER	In house: Referenced to USEPA SW846-3005. Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM Schedule B(3)
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.



CHAIN OF CUSTODY

ALS Laboratory: please tick →

□ Sydney: 277 Woodpark Rd. Smithfield NSW 2164
Ph: 02 8734 8555 E: samples.sydney@alsenviro.com
□ Newcastle: 5 Rosegem Rd. Warabrook NSW 2304
Ph: 02 4968 9433 E: samples.newcastle@alsenviro.com

□ Brisbane: 32 Shand St. Stafford QLD 4053
Ph: 07 3243 7222 E: samples.brisbane@alsenviro.com
□ Townsville: 14-15 Deema Ct. Bohle QLD 4818
Ph: 07 4796 9600 E: townsville.environmental@alsenviro.com

□ Melbourne: 2-4 Weslali Rd. Springvale VIC 3171
Ph: 03 8349 9800 E: samples.melbourne@alsenviro.com
□ Adelaide: 2-1 Burma Rd. Pooraka SA 5095
Ph: 08 8350 9890 E: adelaide@alsenviro.com

CLIENT:	ERM	TURNAROUND REQUIREMENTS:	☐ Standard TAT (List due date):	☐ Non Standard or urgent TAT (List due date): 2 day TAT please		FOR LABORATORY USE ONLY (Circle)	
OFFICE:	Sydney	(Standard TAT may be longer for some tests e.g., Ultra Trace Organics)			COC Sequence Number (Circle)		
PROJECT:	0577577 - The Bays	ALS QUOTE NO.:			Free ice / frozen vials present upon receipt? Yes No N/A		
ORDER NUMBER:					Random Sample Temperature on Receipt: °C Yes No N/A		
PROJECT MANAGER:	Jessica Lawrence	CONTACT PH:	0404935554		Other comment:		
SAMPLER:	Tristan Rodrigues	SAMPLER MOBILE:	0417187687		RECEIVED BY:		
COC emailed to ALS? YES	EDD FORMAT (or default):		Tristan Rodrigues		DATE/TIME:		
Email Reports to:	jessica.lawrence@erm.com, tristan.rodrigues@erm.com		DATE/TIME:		RECEIVED BY:		
Email Invoice to:	jessica.lawrence@erm.com		30/11/21		DATE/TIME:		
COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:							

ALS USE ONLY	SAMPLE DETAILS MATRIX: Solid(S) Water(W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE codes below)	(refer to TOTAL BOTTLES	PFAS (28 analytes)	ASS Cr suite	Asbestos presence/absence	S-16	8 metals	BTEXN	HOLD	Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc. Please use the lower hexavalent chromium LOR.	
1	ERM_BH08_1.0	29/11/2021 0:00	Soil		2	X								
2	ERM_BH08_12.5	30/11/2021 0:00	Soil		1		x							
3	ERM_BH07_1.0	30/11/2021 0:00	Soil		3	x	x							
4	ERM_BH07_1.5	30/11/2021 0:00	Soil		1		x							
5	20211129_R01	29/11/2021 0:00	Water			x				x				
6	TS 3	26.11.21	Soil								x			
7	TB	26.11.21	Soil								x			
8	TSC 3	26/11/21												
Subcon / Forward Lab / Split WO Lab/ Analysis: Brisbane Organised By / Date: ASS Cr Suite Relinquished By / Date: 2-4						TAT								Environmental Division Sydney Work Order Reference ES2143674 
TOTAL						6	3							

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; A = Unpreserved Bottle

Environmental Division
Sydney
Work Order Reference
ES2143674



Telephone + 61-2-8784 8555

CERTIFICATE OF ANALYSIS

Work Order : **ES2144108**
Client : **ENVIRONMENTAL RESOURCES MANAGEMENT (ERM)**
Contact : MS JESSICA LAWRENCE
Address : LEVEL 15 309 KENT STREET
 SYDNEY NSW AUSTRALIA 2000
Telephone : +61 02 8584 8888
Project : 0577577 - The Bays
Order number : ----
C-O-C number : ----
Sampler : TRISTAN RODRIGUES
Site : ----
Quote number : EN/114
No. of samples received : 39
No. of samples analysed : 12

Page : 1 of 5
Laboratory : Environmental Division Sydney
Contact : Monica Wright
Address : 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone : +61-2-8784 8555
Date Samples Received : 03-Dec-2021 10:10
Date Analysis Commenced : 09-Dec-2021
Issue Date : 10-Dec-2021 12:52



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

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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ben Felgendrejeris	Senior Acid Sulfate Soil Chemist	Brisbane Acid Sulphate Soils, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	Brisbane Acid Sulphate Soils, Stafford, QLD



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 Contact 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.

- ASS: EA033 (CRS Suite): Retained Acidity not required because pH KCl greater than or equal to 4.5
- ASS: EA033 (CRS Suite): Laboratory determinations of ANC needs to be corroborated by effectiveness of the measured ANC in relation to incubation ANC. Unless corroborated, the results of ANC testing should be discounted when determining Net Acidity for comparison with action criteria, or for the determination of the acidity hazard and required liming amounts.
- ASS: EA033 (CRS Suite): Liming rate is calculated and reported on a dry weight basis assuming use of fine agricultural lime (CaCO₃) and using a safety factor of 1.5 to allow for non-homogeneous mixing and poor reactivity of lime. For conversion of Liming Rate from 'kg/t dry weight' to 'kg/m³ in-situ soil', multiply 'reported results' x 'wet bulk density of soil in t/m³'.



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	ERM_BH07_6.0	ERM_BH07_6.5	ERM_BH07_7.0	ERM_BH07_9.0	ERM_BH07_11.0
Sampling date / time					01-Dec-2021 00:00	01-Dec-2021 00:00	01-Dec-2021 00:00	01-Dec-2021 00:00	01-Dec-2021 00:00
Compound	CAS Number	LOR	Unit		ES2144108-005	ES2144108-006	ES2144108-007	ES2144108-009	ES2144108-011
				Result	Result	Result	Result	Result	Result
EA033-A: Actual Acidity									
pH KCl (23A)	----	0.1	pH Unit		6.9	6.4	6.7	8.9	8.2
Titratable Actual Acidity (23F)	----	2	mole H+ / t		<2	<2	<2	<2	<2
sulfidic - Titratable Actual Acidity (s-23F)	----	0.02	% pyrite S		<0.02	<0.02	<0.02	<0.02	<0.02
EA033-B: Potential Acidity									
Chromium Reducible Sulfur (22B)	----	0.005	% S		0.302	0.268	0.178	0.079	0.534
acidity - Chromium Reducible Sulfur (a-22B)	----	10	mole H+ / t		189	167	111	49	333
EA033-C: Acid Neutralising Capacity									
Acid Neutralising Capacity (19A2)	----	0.01	% CaCO3		0.41	----	0.39	0.43	0.85
acidity - Acid Neutralising Capacity (a-19A2)	----	10	mole H+ / t		81	----	79	85	169
sulfidic - Acid Neutralising Capacity (s-19A2)	----	0.01	% pyrite S		0.13	----	0.13	0.14	0.27
EA033-E: Acid Base Accounting									
ANC Fineness Factor	----	0.5	-		1.5	1.5	1.5	1.5	1.5
Net Acidity (sulfur units)	----	0.02	% S		0.22	0.27	0.09	<0.02	0.35
Net Acidity (acidity units)	----	10	mole H+ / t		134	167	58	<10	220
Liming Rate	----	1	kg CaCO3/t		10	12	4	<1	16
Net Acidity excluding ANC (sulfur units)	----	0.02	% S		0.30	0.27	0.18	0.08	0.53
Net Acidity excluding ANC (acidity units)	----	10	mole H+ / t		189	167	111	49	333
Liming Rate excluding ANC	----	1	kg CaCO3/t		14	12	8	4	25



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	ERM_BH07_11.5	ERM_BH07_12.0	ERM_BH07_13.0	ERM_BH07_13.5	ERM_BH07_14.0
Sampling date / time					01-Dec-2021 00:00	01-Dec-2021 00:00	01-Dec-2021 00:00	01-Dec-2021 00:00	01-Dec-2021 00:00
Compound	CAS Number	LOR	Unit		ES2144108-012	ES2144108-013	ES2144108-014	ES2144108-015	ES2144108-016
				Result	Result	Result	Result	Result	Result
EA033-A: Actual Acidity									
pH KCl (23A)	----	0.1	pH Unit		4.7	4.5	4.8	5.2	5.1
Titrateable Actual Acidity (23F)	----	2	mole H+ / t		38	97	30	11	10
sulfidic - Titrateable Actual Acidity (s-23F)	----	0.02	% pyrite S		0.06	0.16	0.05	<0.02	<0.02
EA033-B: Potential Acidity									
Chromium Reducible Sulfur (22B)	----	0.005	% S		0.313	0.109	0.043	0.032	0.023
acidity - Chromium Reducible Sulfur (a-22B)	----	10	mole H+ / t		195	68	27	20	15
EA033-E: Acid Base Accounting									
ANC Fineness Factor	----	0.5	-		1.5	1.5	1.5	1.5	1.5
Net Acidity (sulfur units)	----	0.02	% S		0.37	0.26	0.09	0.05	0.04
Net Acidity (acidity units)	----	10	mole H+ / t		233	165	56	31	25
Liming Rate	----	1	kg CaCO3/t		17	12	4	2	2
Net Acidity excluding ANC (sulfur units)	----	0.02	% S		0.37	0.26	0.09	0.05	0.04
Net Acidity excluding ANC (acidity units)	----	10	mole H+ / t		233	165	56	31	25
Liming Rate excluding ANC	----	1	kg CaCO3/t		17	12	4	2	2



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	ERM_BH07_14.5	ERM_BH07_7.5			
Sampling date / time					01-Dec-2021 00:00	01-Dec-2021 00:00			
Compound	CAS Number	LOR	Unit		ES2144108-017	ES2144108-018			
				Result	Result				
EA033-A: Actual Acidity									
pH KCl (23A)	----	0.1	pH Unit		5.4	6.2	----	----	----
Titrateable Actual Acidity (23F)	----	2	mole H+ / t		4	<2	----	----	----
sulfidic - Titrateable Actual Acidity (s-23F)	----	0.02	% pyrite S		<0.02	<0.02	----	----	----
EA033-B: Potential Acidity									
Chromium Reducible Sulfur (22B)	----	0.005	% S		0.025	0.018	----	----	----
acidity - Chromium Reducible Sulfur (a-22B)	----	10	mole H+ / t		16	11	----	----	----
EA033-E: Acid Base Accounting									
ANC Fineness Factor	----	0.5	-		1.5	1.5	----	----	----
Net Acidity (sulfur units)	----	0.02	% S		0.03	<0.02	----	----	----
Net Acidity (acidity units)	----	10	mole H+ / t		19	11	----	----	----
Liming Rate	----	1	kg CaCO3/t		1	<1	----	----	----
Net Acidity excluding ANC (sulfur units)	----	0.02	% S		0.03	<0.02	----	----	----
Net Acidity excluding ANC (acidity units)	----	10	mole H+ / t		19	11	----	----	----
Liming Rate excluding ANC	----	1	kg CaCO3/t		1	<1	----	----	----

Inter-Laboratory Testing

Analysis conducted by ALS Brisbane, NATA accreditation no. 825, site no. 818 (Chemistry) 18958 (Biology).

(SOIL) EA033-B: Potential Acidity

(SOIL) EA033-C: Acid Neutralising Capacity

(SOIL) EA033-D: Retained Acidity

(SOIL) EA033-A: Actual Acidity

(SOIL) EA033-E: Acid Base Accounting

QUALITY CONTROL REPORT

Work Order	: ES2144108	Page	: 1 of 3
Client	: ENVIRONMENTAL RESOURCES MANAGEMENT (ERM)	Laboratory	: Environmental Division Sydney
Contact	: MS JESSICA LAWRENCE	Contact	: Monica Wright
Address	: LEVEL 15 309 KENT STREET SYDNEY NSW AUSTRALIA 2000	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: +61 02 8584 8888	Telephone	: +61-2-8784 8555
Project	: 0577577 - The Bays	Date Samples Received	: 03-Dec-2021
Order number	: ----	Date Analysis Commenced	: 09-Dec-2021
C-O-C number	: ----	Issue Date	: 10-Dec-2021
Sampler	: TRISTAN RODRIGUES		
Site	: ----		
Quote number	: EN/114		
No. of samples received	: 39		
No. of samples analysed	: 12		



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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ben Felgendrejeris	Senior Acid Sulfate Soil Chemist	Brisbane Acid Sulphate Soils, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	Brisbane Acid Sulphate Soils, Stafford, QLD



General Comments

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

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

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

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA033-A: Actual Acidity (QC Lot: 4062973)									
ES2143932-020	Anonymous	EA033: sulfidic - Titratable Actual Acidity (s-23F)	----	0.02	% pyrite S	<0.02	<0.02	0.0	No Limit
		EA033: Titratable Actual Acidity (23F)	----	2	mole H+ / t	<2	<2	0.0	No Limit
		EA033: pH KCl (23A)	----	0.1	pH Unit	9.4	9.4	0.0	0% - 20%
ES2144108-015	ERM_BH07_13.5	EA033: sulfidic - Titratable Actual Acidity (s-23F)	----	0.02	% pyrite S	<0.02	<0.02	0.0	No Limit
		EA033: Titratable Actual Acidity (23F)	----	2	mole H+ / t	11	9	19.7	No Limit
		EA033: pH KCl (23A)	----	0.1	pH Unit	5.2	5.2	0.0	0% - 20%
EA033-B: Potential Acidity (QC Lot: 4062973)									
ES2143932-020	Anonymous	EA033: Chromium Reducible Sulfur (22B)	----	0.005	% S	0.021	0.010	73.5	No Limit
		EA033: acidity - Chromium Reducible Sulfur (a-22B)	----	10	mole H+ / t	13	<10	27.1	No Limit
ES2144108-015	ERM_BH07_13.5	EA033: Chromium Reducible Sulfur (22B)	----	0.005	% S	0.032	0.029	10.7	No Limit
		EA033: acidity - Chromium Reducible Sulfur (a-22B)	----	10	mole H+ / t	20	18	10.7	No Limit
EA033-C: Acid Neutralising Capacity (QC Lot: 4062973)									
ES2143932-020	Anonymous	EA033: Acid Neutralising Capacity (19A2)	----	0.01	% CaCO3	0.59	0.51	14.7	0% - 20%
		EA033: sulfidic - Acid Neutralising Capacity (s-19A2)	----	0.01	% pyrite S	0.19	0.16	14.7	0% - 50%
		EA033: acidity - Acid Neutralising Capacity (a-19A2)	----	10	mole H+ / t	118	102	14.7	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**

Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result		LCS	Low	High
EA033-A: Actual Acidity (QCLot: 4062973)								
EA033: pH KCl (23A)	----	----	pH Unit	----	4.4 pH Unit	102	91.0	107
EA033: Titratable Actual Acidity (23F)	----	2	mole H+ / t	<2	19 mole H+ / t	85.4	70.0	124
EA033: sulfidic - Titratable Actual Acidity (s-23F)	----	0.02	% pyrite S	<0.02	----	----	----	----
EA033-B: Potential Acidity (QCLot: 4062973)								
EA033: Chromium Reducible Sulfur (22B)	----	0.005	% S	<0.005	0.246 % S	99.0	77.0	121
EA033: acidity - Chromium Reducible Sulfur (a-22B)	----	10	mole H+ / t	<10	----	----	----	----
EA033-C: Acid Neutralising Capacity (QCLot: 4062973)								
EA033: Acid Neutralising Capacity (19A2)	----	0.01	% CaCO3	<0.01	10 % CaCO3	104	91.0	112
EA033: acidity - Acid Neutralising Capacity (a-19A2)	----	10	mole H+ / t	<10	----	----	----	----
EA033: sulfidic - Acid Neutralising Capacity (s-19A2)	----	0.01	% pyrite S	<0.01	----	----	----	----

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.

- **No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.**

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: ES2144108	Page	: 1 of 5
Client	: ENVIRONMENTAL RESOURCES MANAGEMENT (ERM)	Laboratory	: Environmental Division Sydney
Contact	: MS JESSICA LAWRENCE	Telephone	: +61-2-8784 8555
Project	: 0577577 - The Bays	Date Samples Received	: 03-Dec-2021
Site	: ----	Issue Date	: 10-Dec-2021
Sampler	: TRISTAN RODRIGUES	No. of samples received	: 39
Order number	: ----	No. of samples analysed	: 12

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

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

Outliers : Analysis Holding Time Compliance

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

Outliers : Frequency of Quality Control Samples

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



Analysis Holding Time Compliance

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

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

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

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

Matrix: **SOIL**

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

Method		Sample Date	Extraction / Preparation			Evaluation	Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction			Date analysed	Due for analysis	Evaluation
EA033-A: Actual Acidity									
Snap Lock Bag - frozen (EA033)		01-Dec-2021	09-Dec-2021	01-Dec-2022	✔	09-Dec-2021	09-Mar-2022	✔	
ERM_BH07_6.0,									
ERM_BH07_7.0,									
ERM_BH07_11.0,									
ERM_BH07_12.0,									
ERM_BH07_13.5,									
ERM_BH07_14.5,									
EA033-B: Potential Acidity									
Snap Lock Bag - frozen (EA033)		01-Dec-2021	09-Dec-2021	01-Dec-2022	✔	09-Dec-2021	09-Mar-2022	✔	
ERM_BH07_6.0,									
ERM_BH07_7.0,									
ERM_BH07_11.0,									
ERM_BH07_12.0,									
ERM_BH07_13.5,									
ERM_BH07_14.5,									
EA033-C: Acid Neutralising Capacity									
Snap Lock Bag - frozen (EA033)		01-Dec-2021	09-Dec-2021	01-Dec-2022	✔	09-Dec-2021	09-Mar-2022	✔	
ERM_BH07_6.0,									
ERM_BH07_7.0,									
ERM_BH07_11.0,									
ERM_BH07_12.0,									
ERM_BH07_13.5,									
ERM_BH07_14.5,									
EA033-D: Retained Acidity									
Snap Lock Bag - frozen (EA033)		01-Dec-2021	09-Dec-2021	01-Dec-2022	✔	09-Dec-2021	09-Mar-2022	✔	
ERM_BH07_6.0,									
ERM_BH07_7.0,									
ERM_BH07_11.0,									
ERM_BH07_12.0,									
ERM_BH07_13.5,									
ERM_BH07_14.5,									

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

Method	Sample Date	Extraction / Preparation			Analysis			
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
EA033-E: Acid Base Accounting								
Snap Lock Bag - frozen (EA033)								
ERM_BH07_6.0,	ERM_BH07_6.5,	01-Dec-2021	09-Dec-2021	01-Dec-2022	✓	09-Dec-2021	09-Mar-2022	✓
ERM_BH07_7.0,	ERM_BH07_9.0,							
ERM_BH07_11.0,	ERM_BH07_11.5,							
ERM_BH07_12.0,	ERM_BH07_13.0,							
ERM_BH07_13.5,	ERM_BH07_14.0,							
ERM_BH07_14.5,	ERM_BH07_7.5							



Quality Control Parameter Frequency Compliance

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

Matrix: **SOIL**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
Chromium Suite for Acid Sulphate Soils	EA033	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Chromium Suite for Acid Sulphate Soils	EA033	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Chromium Suite for Acid Sulphate Soils	EA033	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard



Brief Method Summaries

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

Analytical Methods	Method	Matrix	Method Descriptions
Chromium Suite for Acid Sulphate Soils	EA033	SOIL	In house: Referenced to Ahern et al 2004. This method covers the determination of Chromium Reducible Sulfur (SCR); pHKCl; titratable actual acidity (TAA); acid neutralising capacity by back titration (ANC); and net acid soluble sulfur (SNAS) which incorporates peroxide sulfur. It applies to soils and sediments (including sands) derived from coastal regions. Liming Rate is based on results for samples as submitted and incorporates a minimum safety factor of 1.5.

Preparation Methods	Method	Matrix	Method Descriptions
Drying at 85 degrees, bagging and labelling (ASS)	EN020PR	SOIL	In house



CHAIN OF CUSTODY

ALS Laboratory: please tick →

□ Sydney: 277 Woodpark Rd, Smithfield NSW 2164
Ph: 02 8794 5555 E: samples.sydney@alsenviro.com
□ Newcastle: 5 Rosegum Rd, Warabrook NSW 2304
Ph: 02 4968 9433 E: samples.newcastle@alsenviro.com

□ Brisbane: 32 Shend St, Stafford QLD 4053
Ph: 07 3243 7222 E: samples.brisbane@alsenviro.com
□ Townsville: 14-16 Deane Ct, Bahlo QLD 4818
Ph: 07 4796 0600 E: townsville.environmental@alsenviro.com

□ Melbourne: 2-4 Westall
Ph: 03 8649 9600 E: sample
□ Adelaide: 2-4 Byma Rd
Ph: 08 5359 0820 E: edelaide

Environmental Division
Sydney
Work Order Reference
ES2144108



Telephone : + 61-2-8784 8555

CLIENT:	ERM	TURNAROUND REQUIREMENTS :	☐ Standard TAT (List due date):	FOR LABORATORY Quality Seal (if) Free/ice / frozen receipt? Random Sample Other comment
OFFICE:	Sydney	(Standard TAT may be longer for some tests e.g., Ultra Trace Organics)	☐ Non Standard or urgent TAT (List due date):	
PROJECT:	0577577 - The Bays	ALS QUOTE NO.:	COC SEQUENCE NUMBER (Circle)	
ORDER NUMBER:			COC: 1 2 3 4 5 6 7 OF: 1 2 3 4 5 6 7	
PROJECT MANAGER:	Jessica Lawrence	CONTACT PH: 0404935554		
SAMPLER:	Tristan Rodrigues	SAMPLER MOBILE: 0417187687	RELINQUISHED BY:	RECEIVED BY:
COC emailed to ALS? YES		EDD FORMAT (or default):	Tristan Rodrigues	<i>[Signature]</i>
Email Reports to: jessica.lawrence@erm.com, tristan.rodrigues@erm.com			DATE/TIME:	DATE/TIME:
Email Invoice to: jessica.lawrence@erm.com			30/11/21	3/11/21 10:2
COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: Please hold remaining sample.				

ALS USE ONLY		SAMPLE DETAILS MATRIX: Solid(S) Water(W)		CONTAINER INFORMATION		ANALYSIS REQUIRED Including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information	
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE codes below)	(refer to TOTAL BOTTLES	pH	Electrical conductivity	Total Sulfur	ASS Cr Suite					HOLD	Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc. Please use the lower hexavalent chromium LOR.
1	ERM_BH07_2.0	1/12/2021 0:00	Soil						X						please hold remaining sample
2	ERM_BH07_3.0	1/12/2021 0:00	Soil											X	
3	ERM_BH07_4.5	1/12/2021 0:00	Soil											X	
4	ERM_BH07_5.0	1/12/2021 0:00	Soil											X	
5	ERM_BH07_6.0	1/12/2021 0:00	Soil						X						please hold remaining sample
6	ERM_BH07_6.5	1/12/2021 0:00	Soil						X						please hold remaining sample
7	ERM_BH07_7.0	1/12/2021 0:00	Soil						X						please hold remaining sample
8	ERM_BH07_8.0	1/12/2021 0:00	Soil											X	
9	ERM_BH07_9.0	1/12/2021 0:00	Soil						X						please hold remaining sample
10	ERM_BH07_10.0	1/12/2021 0:00	Soil											X	
11	ERM_BH07_11.0	1/12/2021 0:00	Soil						X					X	
12	ERM_BH07_11.5	1/12/2021 0:00	Soil						X					X	
TOTAL															

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic

V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;

Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

CHAIN OF CUSTODY

ALS Laboratory: please tick →

□ Sydney, 277 Woodpark Rd, Smithfield NSW 2164
Ph: 02 8784 8555 E: samples.sydney@arsenviro.com

□ Newcastle: 5 Rosegum Rd, Warabrook NSW 2354
Ph.02 4958 9483 E.samples.newcastle@alsenviro.com

□ Brisbane: 32 Shand St, Stafford QLD 4053
Ph: 07 3243 7222 E: samples.brisbane@ateenviro.com

□ Townsville: 14-15 Deasys Ct, Bohle QLD 4818
Ph 07 4796 0600 E. townsville.environmental@aisenviro.com

— Melbourne: 2-4 Westall Rd., Springvale VIC 3171
Ph.03 8549 2800 E. samples.melbourne@aconviro.com

□ Adelaide: 2-4 Burns Rd, Moolalla SA 5095
Ph. 08 8358 0600 Etadelaide@aisenviro.com

CLIENT: ERM		TURNAROUND REQUIREMENTS :		☐ Standard TAT (List due date):		FOR LABORATORY USE ONLY (Circle)					
OFFICE: Sydney		(Standard TAT may be longer for some tests e.g., Ultra Trace Organics)		☐ Non Standard or urgent TAT (List due date):		Custody Seal Intact? Yes No N/A					
PROJECT: 0577577 - The Bays		ALS QUOTE NO.:				Free ice / frozen ice bricks present upon receipt? Yes No N/A					
ORDER NUMBER:						Random Sample Temperature on Receipt: C					
PROJECT MANAGER: Jessica Lawrence		CONTACT PH: 0404935554				Other comment:					
SAMPLER: Tristan Rodrigues		SAMPLER MOBILE: 0417187687		RELINQUISHED BY:		RECEIVED BY:		RELINQUISHED BY:		RECEIVED BY:	
COC emailed to ALS? YES		EDD FORMAT (or default):		Tristan Rodrigues							
Email Reports to: jessica.lawrence@erm.com, tristan.rodrigues@erm.com				DATE/TIME:		DATE/TIME:		DATE/TIME:		DATE/TIME:	
Email Invoice to: jessica.lawrence@erm.com				2/12/21							

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

[illegible]

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic

Water Content Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; NS = Sodium Hydroxide Preserved; S = Sodium Hydroxide Preserved Glass; NSG = Sodium Hydroxide Preserved Glass; NO = Normal Saline Preserved; NSP = Normal Saline Preserved Plastic; NSPG = Normal Saline Preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;

Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

Samples received without CoC

CLIENT / SENDER:	COC SEQUENCE NUMBER (Circle) COC: 1 2 3 4 5 6 7 OF: 1 2 3 4 5 6 7	Comments ALS WO Label
PROJECT:		
CONTACT NAME:		
CONTACT NUMBER:		
CARRIER:		
CONNOTE REFERENCE:		
SAMPLER:		
NUMBER OF SAMPLES:	SAMPLES RECEIVED BY:	
Client services notified by:	DATE/TIME:	
	ANALYSIS RECEIVED BY:	
	DATE/TIME:	

LAB ID	SAMPLE DETAILS				Additional Information
	SAMPLE ID	DATE	MATRIX	NUMBER OF CONTAINERS	
19	BH07 12.5	1/12	ASS bag		
20	BH08 15	30/11	Grey Orange		
21	BH08 16	}			
22	BH08 17				
23	BH08 18				
24	BH08 19				
25	BH08 20				
26	BH08 21				
27	BH08 22	1/12			
28	BH08 23	}			
29	BH08 24				
30	BH08 25				

Samples received without CoC

CLIENT / SENDER:	COC SEQUENCE NUMBER (Circle) COC: 1 2 3 4 5 6 7 OF: 1 2 3 4 5 6 7	Comments ALS WO Label
PROJECT:		
CONTACT NAME:		
CONTACT NUMBER:		
CARRIER:		
CONNOTE REFERENCE:		
SAMPLER:		
NUMBER OF SAMPLES:	SAMPLES RECEIVED BY:	
Client services notified by:	DATE/TIME:	
	ANALYSIS RECEIVED BY:	
	DATE/TIME:	

LAB ID	SAMPLE DETAILS			NUMBER OF CONTAINERS	Additional Information
	SAMPLE ID	DATE	MATRIX		
31	BH08 26	11/12			
32	BH08 27				
33	BH08 28				
34	BH08 29				
35	BH08 30				
36	20211130 - T01	30/11			
37	20211130 - T03	11/12			
38	20211201 - T04	11/12			
39	20211130 - D02	30/11			
40	20211130 - D03	11/12			
41	20211201 - D04	11/12			

Helen Simpson

From: Tristan Rodrigues <Tristan.Rodrigues@erm.com>
Sent: Monday, 6 December 2021 11:56 AM
To: Helen Simpson
Cc: ALSEnviro Sydney; Jessica Lawrence
Subject: [EXTERNAL] - FW: SRN for ALS Workorder : ES2144108 | Your Reference: 0577577 - The Bays
Attachments: ES2144108_0_SRN_211203145905.pdf; ES2144108_COC.pdf; ES2144108_COC_1.pdf; ES2144108_COC_2.pdf

CAUTION: This email originated from outside of ALS. Do not click links or open attachments unless you recognize the sender and are sure content is relevant to you.

Hey guys,

In regards to this SRN please note the following

- ERM_BH07_2.0 no ASS Cr suite analysis required.
- Samples ERMBH08_13.5, 14.0 and 14.5 should read ERM_BH07_13.5, 14.0 and 14.5 as received, please amend IDs when issuing results
- Samples 20211201_T02 and 20211201_T04 should be sent to Eurofins for PFAS (28 analytes) analysis

- **ASS Cr Suite will not be conducted for sample ERM_BH07_2.0 as no separate frozen sample was received.**
- **Sample ERM_BH08_13.5 was received as ERM_BH07_13.5.**
- **Sample ERM_BH08_14.0 was received as ERM_BH07_14.0.**
- **Sample ERM_BH08_14.5 was received as ERM_BH07_14.5.**
- **Extra samples 19-41 received by ALS, these have been placed on hold.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months $\pm$ 1 week) from receipt of samples.
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Kind Regards

Tristan Rodrigues
Environmental Consultant

ERM

Unit 11, 277 Lane Cove Road | Macquarie Park | NSW | 2113

T +61 2 8586 8750 M +61417187687

E Tristan.Rodrigues@erm.com | W www.erm.com

From: angel-no-reply@alsglobal.com <angel-no-reply@alsglobal.com>
Sent: Friday, December 3, 2021 3:10 PM
To: Tristan Rodrigues <Tristan.Rodrigues@erm.com>
Subject: SRN for ALS Workorder : ES2144108 | Your Reference: 0577577 - The Bays

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Deliverables for ALS Workorder ES2144108

Project: 0577577 - The Bays

Dear TRISTAN RODRIGUES,

Please find enclosed the following deliverables for **ES2144108**:

- ES2144108_0_SRN_211203145905.pdf
- ES2144108_COC.pdf
- ES2144108_COC_1.pdf
- ES2144108_COC_2.pdf

Report Recipients

- TRISTAN RODRIGUES
 - ES2144108_0_SRN_211203145905.pdf (Email)
 - ES2144108_COC.pdf (Email)
 - ES2144108_COC_1.pdf (Email)
 - ES2144108_COC_2.pdf (Email)
- JESSICA LAWRENCE
 - ES2144108_0_SRN_211203145905
 - ES2144108_COC
 - ES2144108_COC_1
 - ES2144108_COC_2

www.alsglobal.com

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CERTIFICATE OF ANALYSIS

Work Order : **ES2144109**
Client : **ENVIRONMENTAL RESOURCES MANAGEMENT (ERM)**
Contact : MS JESSICA LAWRENCE
Address : LEVEL 15 309 KENT STREET
 SYDNEY NSW AUSTRALIA 2000
Telephone : +61 02 8584 8888
Project : 0577577 - The Bays
Order number : ----
C-O-C number : ----
Sampler : TRISTAN RODRIGUES
Site : ----
Quote number : EN/114
No. of samples received : 8
No. of samples analysed : 5

Page : 1 of 9
Laboratory : Environmental Division Sydney
Contact : Monica Wright
Address : 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone : +61-2-8784 8555
Date Samples Received : 03-Dec-2021 10:20
Date Analysis Commenced : 06-Dec-2021
Issue Date : 09-Dec-2021 18:13



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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ben Felgendrejeris	Senior Acid Sulfate Soil Chemist	Brisbane Acid Sulphate Soils, Stafford, QLD
Edwandy Fadjjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Franco Lentini	LCMS Coordinator	Sydney Organics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW



General Comments

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

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

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

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

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

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

- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- ASS: EA033 (CRS Suite): Retained Acidity not required because pH KCl greater than or equal to 4.5
- ASS: EA033 (CRS Suite): Laboratory determinations of ANC needs to be corroborated by effectiveness of the measured ANC in relation to incubation ANC. Unless corroborated, the results of ANC testing should be discounted when determining Net Acidity for comparison with action criteria, or for the determination of the acidity hazard and required liming amounts.
- ASS: EA033 (CRS Suite): Liming rate is calculated and reported on a dry weight basis assuming use of fine agricultural lime (CaCO₃) and using a safety factor of 1.5 to allow for non-homogeneous mixing and poor reactivity of lime. For conversion of Liming Rate from 'kg/t dry weight' to 'kg/m³ in-situ soil', multiply 'reported results' x 'wet bulk density of soil in t/m³'.
- 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, PFTTrDA 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. 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 (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	ERM_BH07_4.0	TB	Trip Blank	----	----
Sampling date / time					01-Dec-2021 00:00	26-Nov-2021 00:00	26-Nov-2021 00:00	----	----
Compound	CAS Number	LOR	Unit		ES2144109-001	ES2144109-003	ES2144109-006	-----	-----
				Result	Result	Result		----	----
EA033-A: Actual Acidity									
pH KCl (23A)	----	0.1	pH Unit	7.1	----	----	----	----	----
Titrateable Actual Acidity (23F)	----	2	mole H+ / t	<2	----	----	----	----	----
sulfidic - Titrateable Actual Acidity (s-23F)	----	0.02	% pyrite S	<0.02	----	----	----	----	----
EA033-B: Potential Acidity									
Chromium Reducible Sulfur (22B)	----	0.005	% S	0.561	----	----	----	----	----
acidity - Chromium Reducible Sulfur (a-22B)	----	10	mole H+ / t	350	----	----	----	----	----
EA033-C: Acid Neutralising Capacity									
Acid Neutralising Capacity (19A2)	----	0.01	% CaCO3	0.58	----	----	----	----	----
acidity - Acid Neutralising Capacity (a-19A2)	----	10	mole H+ / t	117	----	----	----	----	----
sulfidic - Acid Neutralising Capacity (s-19A2)	----	0.01	% pyrite S	0.19	----	----	----	----	----
EA033-E: Acid Base Accounting									
ANC Fineness Factor	----	0.5	-	1.5	----	----	----	----	----
Net Acidity (sulfur units)	----	0.02	% S	0.44	----	----	----	----	----
Net Acidity (acidity units)	----	10	mole H+ / t	272	----	----	----	----	----
Liming Rate	----	1	kg CaCO3/t	20	----	----	----	----	----
Net Acidity excluding ANC (sulfur units)	----	0.02	% S	0.56	----	----	----	----	----
Net Acidity excluding ANC (acidity units)	----	10	mole H+ / t	350	----	----	----	----	----
Liming Rate excluding ANC	----	1	kg CaCO3/t	26	----	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg	----	<10	<10	----	----	----
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	----	----	----
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	----	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	ERM_BH07_4.0	TB	Trip Blank	----	----
Sampling date / time					01-Dec-2021 00:00	26-Nov-2021 00:00	26-Nov-2021 00:00	----	----
Compound	CAS Number	LOR	Unit		ES2144109-001	ES2144109-003	ES2144109-006	-----	-----
					Result	Result	Result	----	----
EP080: BTEXN - Continued									
^ Total Xylenes	----	0.5	mg/kg		----	<0.5	<0.5	----	----
Naphthalene	91-20-3	1	mg/kg		----	<1	<1	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		----	<0.0002	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		----	<0.0002	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		----	<0.0002	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		----	<0.0002	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		----	<0.0002	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		----	<0.0002	----	----	----
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		----	<0.0002	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		----	<0.0002	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		----	<0.0002	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		----	<0.0002	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		----	<0.0002	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		----	<0.0002	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		----	<0.0002	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		----	<0.0002	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		----	<0.0002	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		----	<0.0005	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		----	<0.0002	----	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	ERM_BH07_4.0	TB	Trip Blank	----	----
Sampling date / time					01-Dec-2021 00:00	26-Nov-2021 00:00	26-Nov-2021 00:00	----	----
Compound	CAS Number	LOR	Unit		ES2144109-001	ES2144109-003	ES2144109-006	-----	-----
					Result	Result	Result	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		----	<0.0005	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		----	<0.0005	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		----	<0.0005	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		----	<0.0005	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		----	<0.0002	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	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 PFAS	----	0.0002	mg/kg		----	<0.0002	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		----	<0.0002	----	----	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		----	<0.0002	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.2	%		----	113	108	----	----
Toluene-D8	2037-26-5	0.2	%		----	100	97.9	----	----
4-Bromofluorobenzene	460-00-4	0.2	%		----	84.8	80.5	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		----	107	----	----	----
13C8-PFOA	----	0.0002	%		----	104	----	----	----



Analytical Results

Sub-Matrix: WATER
 (Matrix: WATER)

Sample ID

				2021201_R03	20211130_R02	----	----	----
Sampling date / time				01-Dec-2021 00:00	01-Dec-2021 00:00	----	----	----
Compound	CAS Number	LOR	Unit	ES2144109-007	ES2144109-008	-----	-----	-----
				Result	Result	----	----	----
EG020T: Total Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	----	----	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	----	----	----
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	----	----	----
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	----	----	----
Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	----	----	----
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	----	----	----
Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	----	----	----

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	2021201_R03	20211130_R02	----	----	----
Sampling date / time					01-Dec-2021 00:00	01-Dec-2021 00:00	----	----	----
Compound	CAS Number	LOR	Unit		ES2144109-007	ES2144109-008	-----	-----	-----
				Result	Result		----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	-----	0.01	µg/L		<0.01	<0.01	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	----	----	----
Sum of PFAS (WA DER List)	-----	0.01	µg/L		<0.01	<0.01	----	----	----
EP231S: PFAS Surrogate									



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	2021201_R03	20211130_R02	----	----	----
Sampling date / time					01-Dec-2021 00:00	01-Dec-2021 00:00	----	----	----
Compound	CAS Number	LOR	Unit		ES2144109-007	ES2144109-008	-----	-----	-----
				Result	Result		----	----	----
EP231S: PFAS Surrogate - Continued									
13C4-PFOS	----	0.02	%		101	105	----	----	----
13C8-PFOA	----	0.02	%		95.1	107	----	----	----



Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP080S: TPH(V)/BTEX Surrogates			
1,2-Dichloroethane-D4	17060-07-0	73	133
Toluene-D8	2037-26-5	74	132
4-Bromofluorobenzene	460-00-4	72	130
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Brisbane, NATA accreditation no. 825, site no. 818 (Chemistry) 18958 (Biology).

(SOIL) EA033-B: Potential Acidity

(SOIL) EA033-C: Acid Neutralising Capacity

(SOIL) EA033-D: Retained Acidity

(SOIL) EA033-A: Actual Acidity

(SOIL) EA033-E: Acid Base Accounting

QUALITY CONTROL REPORT

Work Order	: ES2144109	Page	: 1 of 13
Client	: ENVIRONMENTAL RESOURCES MANAGEMENT (ERM)	Laboratory	: Environmental Division Sydney
Contact	: MS JESSICA LAWRENCE	Contact	: Monica Wright
Address	: LEVEL 15 309 KENT STREET SYDNEY NSW AUSTRALIA 2000	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: +61 02 8584 8888	Telephone	: +61-2-8784 8555
Project	: 0577577 - The Bays	Date Samples Received	: 03-Dec-2021
Order number	: ----	Date Analysis Commenced	: 06-Dec-2021
C-O-C number	: ----	Issue Date	: 09-Dec-2021
Sampler	: TRISTAN RODRIGUES		
Site	: ----		
Quote number	: EN/114		
No. of samples received	: 8		
No. of samples analysed	: 5		



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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ben Felgendrejeris	Senior Acid Sulfate Soil Chemist	Brisbane Acid Sulphate Soils, Stafford, QLD
Edwandy Fadjjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Franco Lentini	LCMS Coordinator	Sydney Organics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW



General Comments

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

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

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

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **SOIL**

Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA033-A: Actual Acidity (QC Lot: 4062923)									
ES2144109-001	ERM_BH07_4.0	EA033: sulfidic - Titratable Actual Acidity (s-23F)	----	0.02	% pyrite S	<0.02	<0.02	0.0	No Limit
		EA033: Titratable Actual Acidity (23F)	----	2	mole H+ / t	<2	<2	0.0	No Limit
		EA033: pH KCl (23A)	----	0.1	pH Unit	7.1	7.2	0.0	0% - 20%
EA033-B: Potential Acidity (QC Lot: 4062923)									
ES2144109-001	ERM_BH07_4.0	EA033: Chromium Reducible Sulfur (22B)	----	0.005	% S	0.561	0.554	1.2	0% - 20%
		EA033: acidity - Chromium Reducible Sulfur (a-22B)	----	10	mole H+ / t	350	346	1.2	0% - 20%
EA033-C: Acid Neutralising Capacity (QC Lot: 4062923)									
ES2144109-001	ERM_BH07_4.0	EA033: Acid Neutralising Capacity (19A2)	----	0.01	% CaCO3	0.58	0.55	6.7	0% - 20%
		EA033: sulfidic - Acid Neutralising Capacity (s-19A2)	----	0.01	% pyrite S	0.19	0.18	6.7	0% - 50%
		EA033: acidity - Acid Neutralising Capacity (a-19A2)	----	10	mole H+ / t	117	109	6.7	0% - 50%
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 4058067)									
ES2141799-006	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
ES2143881-001	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 4058067)									
ES2141799-006	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
ES2143881-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
EP080: BTEXN (QC Lot: 4058067)									
ES2141799-006	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



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: 4058067) - continued									
ES2141799-006	Anonymous	EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
ES2143881-001	Anonymous	EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit
		EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
	EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit	
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4059136)									
ES2141618-025	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	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: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0120	0.0101	17.3	0% - 20%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
ES2143790-013	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	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: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0003	0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4059136)									
ES2141618-025	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: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTriDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
ES2143790-013	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



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 (%)
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4059136) - continued									
ES2143790-013	Anonymous	EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4059136)									
ES2141618-025	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
ES2143790-013	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4059136)									
ES2141618-025	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: 4059136) - continued									
ES2141618-025	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
ES2143790-013	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
Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EG020T: Total Metals by ICP-MS (QC Lot: 4055972)									
WN2113980-004	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	0.007	0.008	20.6	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	0.012	0.012	0.0	0% - 50%
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.005	0.004	0.0	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	0.029	0.033	10.6	No Limit
ES2143885-015	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	0.002	0.002	0.0	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	0.002	0.002	0.0	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	0.002	0.002	0.0	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	0.002	0.003	0.0	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.001	<0.001	0.0	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	0.011	0.012	0.0	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 4058935)									
ES2144003-001	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EW2105093-001	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4055665)									
ES2143834-007	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
ES2143834-010	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4055665) - continued									
ES2143834-010	Anonymous	EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4055665)									
ES2143834-007	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
ES2143834-010	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.03	0.02	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.04	0.04	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4055665)									
ES2143834-007	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4055665) - continued									
ES2143834-010	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4055665)									
ES2143834-007	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
ES2143834-010	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4055665)									
ES2143834-007	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
ES2143834-010	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	0.07	0.06	15.4	No Limit



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

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

Sub-Matrix: **SOIL**

Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EA033-A: Actual Acidity (QCLot: 4062923)								
EA033: pH KCl (23A)	----	----	pH Unit	----	4.4 pH Unit	102	91.0	107
EA033: Titratable Actual Acidity (23F)	----	2	mole H+ / t	<2	19 mole H+ / t	86.6	70.0	124
EA033: sulfidic - Titratable Actual Acidity (s-23F)	----	0.02	% pyrite S	<0.02	----	----	----	----
EA033-B: Potential Acidity (QCLot: 4062923)								
EA033: Chromium Reducible Sulfur (22B)	----	0.005	% S	<0.005	0.246 % S	93.3	77.0	121
EA033: acidity - Chromium Reducible Sulfur (a-22B)	----	10	mole H+ / t	<10	----	----	----	----
EA033-C: Acid Neutralising Capacity (QCLot: 4062923)								
EA033: Acid Neutralising Capacity (19A2)	----	0.01	% CaCO3	<0.01	10 % CaCO3	102	91.0	112
EA033: acidity - Acid Neutralising Capacity (a-19A2)	----	10	mole H+ / t	<10	----	----	----	----
EA033: sulfidic - Acid Neutralising Capacity (s-19A2)	----	0.01	% pyrite S	<0.01	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons (QCLot: 4058067)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	92.5	68.4	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 4058067)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	90.9	68.4	128
EP080: BTEXN (QCLot: 4058067)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	104	62.0	116
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	95.9	67.0	121
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	96.2	65.0	117
EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	2 mg/kg	94.8	66.0	118
	106-42-3							
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	95.0	68.0	120
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	97.3	63.0	119
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4059136)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.00125 mg/kg	104	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	95.2	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	95.6	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.4	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	104	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	112	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4059136)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	100	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	121	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	106	70.0	132



Sub-Matrix: **SOIL**

Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4059136) - continued								
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	120	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	106	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	117	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	112	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	114	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	120	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	116	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	124	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4059136)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	115	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	108	71.6	129
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	124	69.8	131
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	128	68.7	130
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	108	65.1	134
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	110	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	112	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4059136)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	101	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00125 mg/kg	109	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	95.6	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.00125 mg/kg	102	69.2	143

Sub-Matrix: **WATER**

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EG020T: Total Metals by ICP-MS (QCLot: 4055972)								
EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	97.8	82.0	114
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	97.9	84.0	112
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	93.4	86.0	116
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	93.1	83.0	118
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	92.5	85.0	115
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	84.5	84.0	116
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	88.8	79.0	117
EG035T: Total Recoverable Mercury by FIMS (QCLot: 4058935)								
EG035T: Mercurv	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	101	77.0	111



Sub-Matrix: **WATER**

Method: Compound				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%)	Acceptable Limits (%)	
						LCS	Low	High
CAS Number	LOR	Unit	Result					
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4055665)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	90.4	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	105	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	99.8	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	105	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	105	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	76.4	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4055665)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	105	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	104	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	104	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	112	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	111	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	101	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	110	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	96.8	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	119	72.0	134
EP231X: Perfluorotridecanoic acid (PFTriDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	73.2	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	119	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4055665)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	102	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	126	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	112	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	124	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	103	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	105	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	91.4	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4055665)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	96.6	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	106	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	115	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	98.4	71.4	144

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**

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: 4058067)							
ES2141799-006	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	94.8	70.0	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 4058067)							
ES2141799-006	Anonymous	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	92.4	70.0	130
EP080: BTEXN (QCLot: 4058067)							
ES2141799-006	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	99.6	70.0	130
		EP080: Toluene	108-88-3	2.5 mg/kg	90.6	70.0	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	92.5	70.0	130
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	89.0	70.0	130
			106-42-3				
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	88.9	70.0	130
		EP080: Naphthalene	91-20-3	2.5 mg/kg	90.6	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4059136)							
ES2141618-025	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00125 mg/kg	107	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00125 mg/kg	104	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00125 mg/kg	95.2	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00125 mg/kg	98.0	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00125 mg/kg	# Not Determined	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.00125 mg/kg	116	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4059136)							
ES2141618-025	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	103	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	126	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	108	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	116	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	106	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	115	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	124	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	123	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	121	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.00125 mg/kg	114	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	127	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4059136)							
ES2141618-025	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	111	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	119	71.6	129
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	119	69.8	131



Sub-Matrix: SOIL				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4059136) - continued							
ES2141618-025	Anonymous	EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	118	68.7	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	108	65.1	134
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	102	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	121	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4059136)							
ES2141618-025	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00125 mg/kg	100	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00125 mg/kg	104	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.00125 mg/kg	104	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00125 mg/kg	120	69.2	143
Sub-Matrix: WATER				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG020T: Total Metals by ICP-MS (QCLot: 4055972)							
ES2143885-016	Anonymous	EG020A-T: Arsenic	7440-38-2	1 mg/L	102	70.0	130
		EG020A-T: Cadmium	7440-43-9	0.25 mg/L	98.7	70.0	130
		EG020A-T: Chromium	7440-47-3	1 mg/L	97.0	70.0	130
		EG020A-T: Copper	7440-50-8	1 mg/L	101	70.0	130
		EG020A-T: Lead	7439-92-1	1 mg/L	94.7	70.0	130
		EG020A-T: Nickel	7440-02-0	1 mg/L	91.8	70.0	130
		EG020A-T: Zinc	7440-66-6	1 mg/L	96.5	70.0	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 4058935)							
ES2144003-002	Anonymous	EG035T: Mercury	7439-97-6	0.01 mg/L	88.6	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4055665)							
ES2143834-008	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	89.2	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	118	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	113	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	91.4	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	96.0	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	92.8	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4055665)							
ES2143834-008	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	107	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	110	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	103	72.0	129



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4055665) - continued							
ES2143834-008	Anonymous	EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	112	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	104	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	98.2	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	117	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	90.6	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	107	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	93.8	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	119	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4055665)							
ES2143834-008	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	116	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	128	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	99.8	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	113	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	100	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	116	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	98.6	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4055665)							
ES2143834-008	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	99.0	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	105	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	114	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	132	71.4	144

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: ES2144109	Page	: 1 of 7
Client	: ENVIRONMENTAL RESOURCES MANAGEMENT (ERM)	Laboratory	: Environmental Division Sydney
Contact	: MS JESSICA LAWRENCE	Telephone	: +61-2-8784 8555
Project	: 0577577 - The Bays	Date Samples Received	: 03-Dec-2021
Site	: ----	Issue Date	: 09-Dec-2021
Sampler	: TRISTAN RODRIGUES	No. of samples received	: 8
Order number	: ----	No. of samples analysed	: 5

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

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

Outliers : Analysis Holding Time Compliance

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

Outliers : Frequency of Quality Control Samples

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



Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
EP231A: Perfluoroalkyl Sulfonic Acids	ES2141618--025	Anonymous	Perfluorooctane sulfonic acid (PFOS)	1763-23-1	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.

Analysis Holding Time Compliance

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

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

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

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

Matrix: **SOIL**

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

Method	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA033-A: Actual Acidity							
Snap Lock Bag - frozen (EA033) ERM_BH07_4.0	01-Dec-2021	09-Dec-2021	01-Dec-2022	✓	09-Dec-2021	09-Mar-2022	✓
EA033-B: Potential Acidity							
Snap Lock Bag - frozen (EA033) ERM_BH07_4.0	01-Dec-2021	09-Dec-2021	01-Dec-2022	✓	09-Dec-2021	09-Mar-2022	✓
EA033-C: Acid Neutralising Capacity							
Snap Lock Bag - frozen (EA033) ERM_BH07_4.0	01-Dec-2021	09-Dec-2021	01-Dec-2022	✓	09-Dec-2021	09-Mar-2022	✓
EA033-D: Retained Acidity							
Snap Lock Bag - frozen (EA033) ERM_BH07_4.0	01-Dec-2021	09-Dec-2021	01-Dec-2022	✓	09-Dec-2021	09-Mar-2022	✓
EA033-E: Acid Base Accounting							
Snap Lock Bag - frozen (EA033) ERM_BH07_4.0	01-Dec-2021	09-Dec-2021	01-Dec-2022	✓	09-Dec-2021	09-Mar-2022	✓
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP080) TB, Trip Blank	26-Nov-2021	06-Dec-2021	10-Dec-2021	✓	08-Dec-2021	10-Dec-2021	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Soil Glass Jar - Unpreserved (EP080) TB, Trip Blank	26-Nov-2021	06-Dec-2021	10-Dec-2021	✓	08-Dec-2021	10-Dec-2021	✓



Matrix: **SOIL**

Evaluation: * = Holding time breach ; ✓ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080: BTEXN							
Soil Glass Jar - Unpreserved (EP080) TB, Trip Blank	26-Nov-2021	06-Dec-2021	10-Dec-2021	✓	08-Dec-2021	10-Dec-2021	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE Soil Jar (EP231X) TB	26-Nov-2021	07-Dec-2021	25-May-2022	✓	07-Dec-2021	16-Jan-2022	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE Soil Jar (EP231X) TB	26-Nov-2021	07-Dec-2021	25-May-2022	✓	07-Dec-2021	16-Jan-2022	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE Soil Jar (EP231X) TB	26-Nov-2021	07-Dec-2021	25-May-2022	✓	07-Dec-2021	16-Jan-2022	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE Soil Jar (EP231X) TB	26-Nov-2021	07-Dec-2021	25-May-2022	✓	07-Dec-2021	16-Jan-2022	✓
EP231P: PFAS Sums							
HDPE Soil Jar (EP231X) TB	26-Nov-2021	07-Dec-2021	25-May-2022	✓	07-Dec-2021	16-Jan-2022	✓

Matrix: **WATER**

Evaluation: * = Holding time breach ; ✓ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG020T: Total Metals by ICP-MS							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG020A-T) 2021201_R03, 20211130_R02	01-Dec-2021	06-Dec-2021	29-May-2022	✓	06-Dec-2021	29-May-2022	✓
EG035T: Total Recoverable Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG035T) 2021201_R03, 20211130_R02	01-Dec-2021	----	----	----	07-Dec-2021	29-Dec-2021	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X) 2021201_R03, 20211130_R02	01-Dec-2021	06-Dec-2021	29-May-2022	✓	07-Dec-2021	29-May-2022	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X) 2021201_R03, 20211130_R02	01-Dec-2021	06-Dec-2021	29-May-2022	✓	07-Dec-2021	29-May-2022	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X) 2021201_R03, 20211130_R02	01-Dec-2021	06-Dec-2021	29-May-2022	✓	07-Dec-2021	29-May-2022	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X) 2021201_R03, 20211130_R02	01-Dec-2021	06-Dec-2021	29-May-2022	✓	07-Dec-2021	29-May-2022	✓



Matrix: **WATER**

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

Method	Sample Date	Extraction / Preparation			Analysis			
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
		EP231P: PFAS Sums						
HDPE (no PTFE) (EP231X) 2021201_R03,	20211130_R02	01-Dec-2021	06-Dec-2021	29-May-2022	✔	07-Dec-2021	29-May-2022	✔



Quality Control Parameter Frequency Compliance

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

Matrix: **SOIL**

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

Quality Control Sample Type		Count		Rate (%)		Quality Control Specification	
Analytical Methods	Method	QC	Regular	Actual	Expected		Evaluation
Laboratory Duplicates (DUP)							
Chromium Suite for Acid Sulphate Soils	EA033	1	1	100.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	19	10.53	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	19	10.53	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Chromium Suite for Acid Sulphate Soils	EA033	1	1	100.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Chromium Suite for Acid Sulphate Soils	EA033	1	1	100.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	19	10.53	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	2	7	28.57	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	7	14.29	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	7	14.29	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	7	14.29	5.00	✓	NEPM 2013 B3 & ALS QC Standard



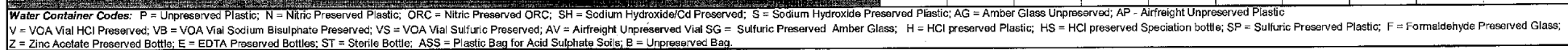
Brief Method Summaries

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

Analytical Methods	Method	Matrix	Method Descriptions
Chromium Suite for Acid Sulphate Soils	EA033	SOIL	In house: Referenced to Ahern et al 2004. This method covers the determination of Chromium Reducible Sulfur (SCR); pHKCl; titratable actual acidity (TAA); acid neutralising capacity by back titration (ANC); and net acid soluble sulfur (SNAS) which incorporates peroxide sulfur. It applies to soils and sediments (including sands) derived from coastal regions. Liming Rate is based on results for samples as submitted and incorporates a minimum safety factor of 1.5.
TRH Volatiles/BTEX	EP080	SOIL	In house: Referenced to USEPA SW 846 - 8260. Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. Compliant with NEPM Schedule B(3) amended.
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.
Total Metals by ICP-MS - Suite A	EG020A-T	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Total Mercury by FIMS	EG035T	WATER	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl ₂)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the unfiltered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl ₂ which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM Schedule B(3).
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.
Preparation Methods	Method	Matrix	Method Descriptions
Drying at 85 degrees, bagging and labelling (ASS)	EN020PR	SOIL	In house
Methanolic Extraction of Soils for Purge and Trap	ORG16	SOIL	In house: Referenced to USEPA SW 846 - 5030A. 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.



<i>Preparation Methods</i>	<i>Method</i>	<i>Matrix</i>	<i>Method Descriptions</i>
QuEChERS Extraction of Solids	ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.
Digestion for Total Recoverable Metals	EN25	WATER	In house: Referenced to USEPA SW846-3005. Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM Schedule B(3)
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.



CERTIFICATE OF ANALYSIS

Work Order	: ES2144294	Page	: 1 of 9
Client	: ENVIRONMENTAL RESOURCES MANAGEMENT (ERM)	Laboratory	: Environmental Division Sydney
Contact	: MS JESSICA LAWRENCE	Contact	: Monica Wright
Address	: LEVEL 15 309 KENT STREET SYDNEY NSW AUSTRALIA 2000	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: +61 02 8584 8888	Telephone	: +61-2-8784 8555
Project	: 0577577 - The Bays	Date Samples Received	: 06-Dec-2021 13:15
Order number	: ----	Date Analysis Commenced	: 07-Dec-2021
C-O-C number	: ----	Issue Date	: 13-Dec-2021 18:33
Sampler	: TRISTAN RODRIGUES		
Site	: ----		
Quote number	: EN/114		
No. of samples received	: 20		
No. of samples analysed	: 8		



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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ankit Joshi	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Franco Lentini	LCMS Coordinator	Sydney Organics, Smithfield, NSW
Wisam Marassa	Inorganics Coordinator	Sydney Inorganics, Smithfield, NSW



General Comments

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

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

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

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

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

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

- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- EP080: The trip spike and its control have been analysed for volatile TPH and BTEXN only. The trip spike and control were prepared in the lab using reagent grade sand spiked with petrol. The spike was dispatched from the lab and the control retained.
- 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. 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 (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	ERM_BH07_18.0	ERM_BH07_19.0	ERM_BH07_20.0	ERM_BH07_25.0	20211202_D05
Sampling date / time					02-Dec-2021 00:00	02-Dec-2021 00:00	02-Dec-2021 00:00	02-Dec-2021 00:00	02-Dec-2021 00:00
Compound	CAS Number	LOR	Unit		ES2144294-001	ES2144294-002	ES2144294-003	ES2144294-008	ES2144294-014
				Result	Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		6.4	6.4	6.6	----	----
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		130	127	53	----	----
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		13.6	15.0	12.7	4.9	5.0
ED040T: Total Sulfur by ICPAES									
Sulfur as S	63705-05-5	100	mg/kg		<100	<100	<100	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		----	----	----	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		----	----	----	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		----	----	----	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		----	----	----	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		----	----	----	<0.0002	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		----	----	----	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		----	----	----	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		----	----	----	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		----	----	----	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		----	----	----	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		----	----	----	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		----	----	----	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		----	----	----	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		----	----	----	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		----	----	----	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		----	----	----	<0.0002	<0.0002



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	ERM_BH07_18.0	ERM_BH07_19.0	ERM_BH07_20.0	ERM_BH07_25.0	20211202_D05
Sampling date / time					02-Dec-2021 00:00	02-Dec-2021 00:00	02-Dec-2021 00:00	02-Dec-2021 00:00	02-Dec-2021 00:00
Compound	CAS Number	LOR	Unit		ES2144294-001	ES2144294-002	ES2144294-003	ES2144294-008	ES2144294-014
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		----	----	----	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		----	----	----	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		----	----	----	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		----	----	----	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		----	----	----	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		----	----	----	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		----	----	----	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		----	----	----	<0.0002	<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	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		----	----	----	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		----	----	----	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		----	----	----	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		----	----	----	<0.0002	<0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		----	----	----	<0.0002	<0.0002
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		----	----	----	<0.0002	<0.0002
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		----	----	----	108	107
13C8-PFOA	----	0.0002	%		----	----	----	114	119

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	ERM_BH07_18.0	ERM_BH07_19.0	ERM_BH07_20.0	ERM_BH07_25.0	20211202_D05
Sampling date / time				02-Dec-2021 00:00	02-Dec-2021 00:00	02-Dec-2021 00:00	02-Dec-2021 00:00	02-Dec-2021 00:00
Compound	CAS Number	LOR	Unit	ES2144294-001	ES2144294-002	ES2144294-003	ES2144294-008	ES2144294-014
				Result	Result	Result	Result	Result
EP231S: PFAS Surrogate - Continued								



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	Trip Spike	Trip Blank	TSC	----	----
Sampling date / time					26-Nov-2021 00:00	26-Nov-2021 00:00	26-Nov-2021 00:00	----	----
Compound	CAS Number	LOR	Unit		ES2144294-015	ES2144294-016	ES2144294-017	-----	-----
					Result	Result	Result	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		----	<10	----	----	----
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	----	----	----
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	----	----
Toluene	108-88-3	0.5	mg/kg		17.6	<0.5	18.8	----	----
Ethylbenzene	100-41-4	0.5	mg/kg		3.0	<0.5	3.1	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		15.7	<0.5	15.8	----	----
ortho-Xylene	95-47-6	0.5	mg/kg		6.6	<0.5	6.9	----	----
^ Total Xylenes	----	0.5	mg/kg		22.3	<0.5	22.7	----	----
^ Sum of BTEX	----	0.2	mg/kg		42.9	<0.2	44.6	----	----
Naphthalene	91-20-3	1	mg/kg		<1	<1	<1	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		----	<0.0002	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		----	<0.0002	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		----	<0.0002	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		----	<0.0002	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		----	<0.0002	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		----	<0.0002	----	----	----
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		----	<0.0002	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		----	<0.0002	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		----	<0.0002	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		----	<0.0002	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		----	<0.0002	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		----	<0.0002	----	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	Trip Spike	Trip Blank	TSC	----	----
Sampling date / time					26-Nov-2021 00:00	26-Nov-2021 00:00	26-Nov-2021 00:00	----	----
Compound	CAS Number	LOR	Unit		ES2144294-015	ES2144294-016	ES2144294-017	-----	-----
					Result	Result	Result	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		----	<0.0002	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		----	<0.0002	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		----	<0.0002	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		----	<0.0005	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		----	<0.0002	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		----	<0.0005	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		----	<0.0005	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		----	<0.0005	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		----	<0.0005	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		----	<0.0002	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	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 PFAS	----	0.0002	mg/kg		----	<0.0002	----	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	Trip Spike	Trip Blank	TSC	----	----
Sampling date / time					26-Nov-2021 00:00	26-Nov-2021 00:00	26-Nov-2021 00:00	----	----
Compound	CAS Number	LOR	Unit		ES2144294-015	ES2144294-016	ES2144294-017	-----	-----
				Result	Result	Result	Result	----	----
EP231P: PFAS Sums - Continued									
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		----	<0.0002	----	----	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		----	<0.0002	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.2	%		95.9	103	99.3	----	----
Toluene-D8	2037-26-5	0.2	%		103	105	103	----	----
4-Bromofluorobenzene	460-00-4	0.2	%		101	96.1	102	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		----	100	----	----	----
13C8-PFOA	----	0.0002	%		----	112	----	----	----



Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP080S: TPH(V)/BTEX Surrogates			
1,2-Dichloroethane-D4	17060-07-0	73	133
Toluene-D8	2037-26-5	74	132
4-Bromofluorobenzene	460-00-4	72	130
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

QUALITY CONTROL REPORT

Work Order	: ES2144294	Page	: 1 of 8
Client	: ENVIRONMENTAL RESOURCES MANAGEMENT (ERM)	Laboratory	: Environmental Division Sydney
Contact	: MS JESSICA LAWRENCE	Contact	: Monica Wright
Address	: LEVEL 15 309 KENT STREET SYDNEY NSW AUSTRALIA 2000	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: +61 02 8584 8888	Telephone	: +61-2-8784 8555
Project	: 0577577 - The Bays	Date Samples Received	: 06-Dec-2021
Order number	: ----	Date Analysis Commenced	: 07-Dec-2021
C-O-C number	: ----	Issue Date	: 13-Dec-2021
Sampler	: TRISTAN RODRIGUES		
Site	: ----		
Quote number	: EN/114		
No. of samples received	: 20		
No. of samples analysed	: 8		



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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ankit Joshi	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Franco Lentini	LCMS Coordinator	Sydney Organics, Smithfield, NSW
Wisam Marassa	Inorganics Coordinator	Sydney Inorganics, Smithfield, NSW



General Comments

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

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

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

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA002: pH 1:5 (Soils) (QC Lot: 4063805)									
ES2144558-002	Anonymous	EA002: pH Value	----	0.1	pH Unit	5.8	5.6	4.2	0% - 20%
ES2144085-001	Anonymous	EA002: pH Value	----	0.1	pH Unit	4.6	4.6	0.0	0% - 20%
EA010: Conductivity (1:5) (QC Lot: 4063804)									
ES2144558-002	Anonymous	EA010: Electrical Conductivity @ 25°C	----	1	µS/cm	38	44	16.6	0% - 20%
ES2144085-001	Anonymous	EA010: Electrical Conductivity @ 25°C	----	1	µS/cm	70	60	15.8	0% - 20%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 4063814)									
ES2144085-002	Anonymous	EA055: Moisture Content	----	0.1	%	13.3	13.0	2.0	0% - 50%
ES2144755-001	Anonymous	EA055: Moisture Content	----	0.1	%	17.4	17.7	1.7	0% - 50%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 4066412)									
ES2144294-008	ERM_BH07_25.0	EA055: Moisture Content	----	0.1	%	4.9	4.9	0.0	0% - 20%
ES2144484-034	Anonymous	EA055: Moisture Content	----	0.1	%	16.6	16.3	1.5	0% - 20%
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 4064885)									
EN2110786-021	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EN2110786-029	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 4064885)									
EN2110786-021	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
EN2110786-029	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
EP080: BTEXN (QC Lot: 4064885)									
EN2110786-021	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: 4064885) - continued									
EN2110786-021	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
EN2110786-029	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit
		EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4064872)							
ES2143751-003	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	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: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	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
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
ES2144358-016	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	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: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	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
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4064872)									
ES2143751-003	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: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
		ES2144358-016	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002
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: Perfluorononanoic acid (PFNA)	375-95-1			0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2			0.0002	mg/kg	<0.0002	<0.0002	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 (%)
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4064872) - continued									
ES2144358-016	Anonymous	EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4064872)									
ES2143751-003	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
ES2144358-016	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4064872)									
ES2143751-003	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

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 Work Order : ES2144294
 Client : ENVIRONMENTAL RESOURCES MANAGEMENT (ERM)
 Project : 0577577 - The Bays



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: 4064872) - continued									
ES2144358-016	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



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

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

Sub-Matrix: **SOIL**

Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EA010: Conductivity (1:5) (QCLot: 4063804)								
EA010: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	1412 µS/cm	102	92.0	108
EP080/071: Total Petroleum Hydrocarbons (QCLot: 4064885)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	98.0	68.4	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 4064885)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	96.7	68.4	128
EP080: BTEXN (QCLot: 4064885)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	94.0	62.0	116
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	96.7	67.0	121
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	91.4	65.0	117
EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	2 mg/kg	90.9	66.0	118
	106-42-3							
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	93.4	68.0	120
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	85.6	63.0	119
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4064872)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.00125 mg/kg	76.8	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	80.8	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	75.6	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	82.4	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	78.8	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	63.6	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4064872)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	82.0	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	79.2	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	77.2	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	79.2	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	86.0	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	72.8	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	81.2	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	75.6	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	86.4	69.0	135
EP231X: Perfluorotridecanoic acid (PFTriDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.8	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	85.9	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4064872)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	84.0	67.0	137



Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4064872) - continued								
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	79.8	71.6	129
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	91.2	69.8	131
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	87.2	68.7	130
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	72.0	65.1	134
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	72.0	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	74.4	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4064872)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	76.4	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00125 mg/kg	73.2	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	77.6	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.00125 mg/kg	76.4	69.2	143

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 Concentration	Spike Recovery (%) MS	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number			Low	High
EP080/071: Total Petroleum Hydrocarbons (QCLot: 4064885)							
EN2110786-021	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	109	70.0	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 4064885)							
EN2110786-021	Anonymous	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	110	70.0	130
EP080: BTEXN (QCLot: 4064885)							
EN2110786-021	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	106	70.0	130
		EP080: Toluene	108-88-3	2.5 mg/kg	115	70.0	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	115	70.0	130
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	111	70.0	130
			106-42-3				
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	117	70.0	130
		EP080: Naphthalene	91-20-3	2.5 mg/kg	116	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4064872)							
ES2143751-003	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00125 mg/kg	90.4	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00125 mg/kg	85.2	73.0	123



Sub-Matrix: **SOIL**

Sub-Matrix: SOIL				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4064872) - continued							
ES2143751-003	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00125 mg/kg	83.6	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00125 mg/kg	90.4	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00125 mg/kg	88.8	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.00125 mg/kg	100	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4064872)							
ES2143751-003	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	72.3	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	74.4	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	85.2	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	88.4	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	95.2	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	86.8	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	92.4	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	98.0	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	91.6	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTeDA)	72629-94-8	0.00125 mg/kg	85.6	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	95.4	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4064872)							
ES2143751-003	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	87.6	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	92.0	71.6	129
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	89.3	69.8	131
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	106	68.7	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	84.8	65.1	134
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	96.0	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	89.2	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4064872)							
ES2143751-003	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00125 mg/kg	86.0	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00125 mg/kg	90.4	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.00125 mg/kg	94.0	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00125 mg/kg	69.2	69.2	143

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: ES2144294	Page	: 1 of 5
Client	: ENVIRONMENTAL RESOURCES MANAGEMENT (ERM)	Laboratory	: Environmental Division Sydney
Contact	: MS JESSICA LAWRENCE	Telephone	: +61-2-8784 8555
Project	: 0577577 - The Bays	Date Samples Received	: 06-Dec-2021
Site	: ----	Issue Date	: 13-Dec-2021
Sampler	: TRISTAN RODRIGUES	No. of samples received	: 20
Order number	: ----	No. of samples analysed	: 8

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

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

Outliers : Analysis Holding Time Compliance

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

Outliers : Frequency of Quality Control Samples

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



Analysis Holding Time Compliance

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

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

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

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

Matrix: **SOIL**

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

Method	Sample Date	Extraction / Preparation			Analysis			
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
EA002: pH 1:5 (Soils)								
Soil Glass Jar - Unpreserved (EA002) ERM_BH07_18.0, ERM_BH07_20.0	ERM_BH07_19.0,	02-Dec-2021	09-Dec-2021	09-Dec-2021	✓	09-Dec-2021	09-Dec-2021	✓
EA010: Conductivity (1:5)								
Soil Glass Jar - Unpreserved (EA010) ERM_BH07_18.0, ERM_BH07_20.0	ERM_BH07_19.0,	02-Dec-2021	09-Dec-2021	09-Dec-2021	✓	09-Dec-2021	06-Jan-2022	✓
EA055: Moisture Content (Dried @ 105-110°C)								
Soil Glass Jar - Unpreserved (EA055) ERM_BH07_18.0, ERM_BH07_20.0	ERM_BH07_19.0,	02-Dec-2021	----	----	----	08-Dec-2021	16-Dec-2021	✓
Soil Glass Jar - Unpreserved (EA055) ERM_BH07_25.0,	20211202_D05	02-Dec-2021	----	----	----	09-Dec-2021	16-Dec-2021	✓
ED040T: Total Sulfur by ICPAES								
Soil Glass Jar - Unpreserved (ED040T) ERM_BH07_18.0, ERM_BH07_20.0	ERM_BH07_19.0,	02-Dec-2021	07-Dec-2021	09-Dec-2021	✓	07-Dec-2021	04-Jan-2022	✓
EP080/071: Total Petroleum Hydrocarbons								
Soil Glass Jar - Unpreserved (EP080) Trip Blank		26-Nov-2021	09-Dec-2021	10-Dec-2021	✓	10-Dec-2021	10-Dec-2021	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
Soil Glass Jar - Unpreserved (EP080) Trip Blank		26-Nov-2021	09-Dec-2021	10-Dec-2021	✓	10-Dec-2021	10-Dec-2021	✓
EP080: BTEXN								
Soil Glass Jar - Unpreserved (EP080) Trip Spike, TSC	Trip Blank,	26-Nov-2021	09-Dec-2021	10-Dec-2021	✓	10-Dec-2021	10-Dec-2021	✓



Matrix: **SOIL**

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

Method	Sample Date	Extraction / Preparation			Analysis			
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE Soil Jar (EP231X) ERM_BH07_25.0,	20211202_D05	02-Dec-2021	09-Dec-2021	31-May-2022	✓	09-Dec-2021	18-Jan-2022	✓
HDPE Soil Jar (EP231X) Trip Blank	26-Nov-2021	09-Dec-2021	25-May-2022	✓	09-Dec-2021	18-Jan-2022	✓	
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE Soil Jar (EP231X) ERM_BH07_25.0,	20211202_D05	02-Dec-2021	09-Dec-2021	31-May-2022	✓	09-Dec-2021	18-Jan-2022	✓
HDPE Soil Jar (EP231X) Trip Blank	26-Nov-2021	09-Dec-2021	25-May-2022	✓	09-Dec-2021	18-Jan-2022	✓	
EP231C: Perfluoroalkyl Sulfonamides								
HDPE Soil Jar (EP231X) ERM_BH07_25.0,	20211202_D05	02-Dec-2021	09-Dec-2021	31-May-2022	✓	09-Dec-2021	18-Jan-2022	✓
HDPE Soil Jar (EP231X) Trip Blank	26-Nov-2021	09-Dec-2021	25-May-2022	✓	09-Dec-2021	18-Jan-2022	✓	
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE Soil Jar (EP231X) ERM_BH07_25.0,	20211202_D05	02-Dec-2021	09-Dec-2021	31-May-2022	✓	09-Dec-2021	18-Jan-2022	✓
HDPE Soil Jar (EP231X) Trip Blank	26-Nov-2021	09-Dec-2021	25-May-2022	✓	09-Dec-2021	18-Jan-2022	✓	
EP231P: PFAS Sums								
HDPE Soil Jar (EP231X) ERM_BH07_25.0,	20211202_D05	02-Dec-2021	09-Dec-2021	31-May-2022	✓	09-Dec-2021	18-Jan-2022	✓
HDPE Soil Jar (EP231X) Trip Blank	26-Nov-2021	09-Dec-2021	25-May-2022	✓	09-Dec-2021	18-Jan-2022	✓	



Quality Control Parameter Frequency Compliance

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

Matrix: **SOIL**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
Electrical Conductivity (1:5)	EA010	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Moisture Content	EA055	4	38	10.53	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
pH (1:5)	EA002	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	19	10.53	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Electrical Conductivity (1:5)	EA010	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Electrical Conductivity (1:5)	EA010	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard



Brief Method Summaries

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

Analytical Methods	Method	Matrix	Method Descriptions
pH (1:5)	EA002	SOIL	In house: Referenced to Rayment and Lyons 4A1 and APHA 4500H+. pH is determined on soil samples after a 1:5 soil/water leach. This method is compliant with NEPM Schedule B(3).
Electrical Conductivity (1:5)	EA010	SOIL	In house: Referenced to Rayment and Lyons 3A1 and APHA 2510. Conductivity is determined on soil samples using a 1:5 soil/water leach. This method is compliant with NEPM Schedule B(3).
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Sulfate as SO ₄ 2- Total	ED040T	SOIL	In house: Total Sulfate is determined off a HCl digestion by ICPAES as S , and reported as SO ₄
TRH Volatiles/BTEX	EP080	SOIL	In house: Referenced to USEPA SW 846 - 8260. Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. Compliant with NEPM Schedule B(3) amended.
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.
Preparation Methods	Method	Matrix	Method Descriptions
HCl Digest	EN24	SOIL	1g of soil is digested in 30 ml of 30% HCl and the resultant digest bulked and filtered for analysis by ICP.
1:5 solid / water leach for soluble analytes	EN34	SOIL	10 g of soil is mixed with 50 mL of reagent grade water and tumbled end over end for 1 hour. Water soluble salts are leached from the soil by the continuous suspension. Samples are settled and the water filtered off for analysis.
Methanolic Extraction of Soils for Purge and Trap	ORG16	SOIL	In house: Referenced to USEPA SW 846 - 5030A. 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
QuEChERS Extraction of Solids	ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : ES2144294

Client : ENVIRONMENTAL RESOURCES MANAGEMENT (ERM) Contact : MS JESSICA LAWRENCE Address : LEVEL 15 309 KENT STREET SYDNEY NSW AUSTRALIA 2000 E-mail : jessica.lawrence@erm.com Telephone : +61 02 8584 8888 Facsimile : +61 02 8584 8800 Project : 0577577 - The Bays Order number : ---- C-O-C number : ---- Site : ---- Sampler : TRISTAN RODRIGUES	Laboratory : Environmental Division Sydney Contact : Monica Wright Address : 277-289 Woodpark Road Smithfield NSW Australia 2164 E-mail : monica.wright@alsglobal.com Telephone : +61-2-8784 8555 Facsimile : +61-2-8784 8500 Page : 1 of 3 Quote number : EP2020ENVRES0018 (EN/114) QC Level : NEPM 2013 B3 & ALS QC Standard
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Dates

Date Samples Received : 06-Dec-2021 13:15 Client Requested Due Date : 08-Dec-2021	Issue Date : 06-Dec-2021 Scheduled Reporting Date : 13-Dec-2021
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Delivery Details

Mode of Delivery : Carrier No. of coolers/boxes : 4 Receipt Detail :	Security Seal : Intact. Temperature : 3.7°C - Ice present No. of samples received / analysed : 20 / 8
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General Comments

- This report contains the following information:
 - Sample Container(s)/Preservation Non-Compliances
 - Summary of Sample(s) and Requested Analysis
 - Proactive Holding Time Report
 - Requested Deliverables
- **Samples #8 (ERM_BH07_25.0) & #14 (20211202_D05) PFAS jar was sent to Lithgow to undergo crushing prior to analysis.**
- **Sample 20211202_T05 was forwarded to Eurofins.**
- **Extra samples BH07_15.0, BH07_16.0, BH07_17.0 received were placed on hold.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.



Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- No sample container / preservation non-compliance exists.

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: SOIL

Laboratory sample ID	Sampling date / time	Sample ID	(On Hold) SOIL No analysis requested	SOIL - EA055-103 Moisture Content	SOIL - ED040T Sulfur Sulfur as S	SOIL - EP080 BTEXN	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)	SOIL - IN-4S pH plus EC (1:5)	SOIL - S-18 (NO MOIST) TRH(C6-C9)/BTEXN with No Moisture for TBs
ES2144294-001	02-Dec-2021 00:00	ERM_BH07_18.0		✓	✓			✓	
ES2144294-002	02-Dec-2021 00:00	ERM_BH07_19.0		✓	✓			✓	
ES2144294-003	02-Dec-2021 00:00	ERM_BH07_20.0		✓	✓			✓	
ES2144294-004	02-Dec-2021 00:00	ERM_BH07_21.0	✓						
ES2144294-005	02-Dec-2021 00:00	ERM_BH07_22.0	✓						
ES2144294-006	02-Dec-2021 00:00	ERM_BH07_23.0	✓						
ES2144294-007	02-Dec-2021 00:00	ERM_BH07_24.0	✓						
ES2144294-008	02-Dec-2021 00:00	ERM_BH07_25.0		✓			✓		
ES2144294-009	02-Dec-2021 00:00	ERM_BH07_26.0	✓						
ES2144294-010	02-Dec-2021 00:00	ERM_BH07_27.0	✓						
ES2144294-011	02-Dec-2021 00:00	ERM_BH07_28.0	✓						
ES2144294-012	02-Dec-2021 00:00	ERM_BH07_29.0	✓						
ES2144294-013	02-Dec-2021 00:00	ERM_BH07_30.0	✓						
ES2144294-014	02-Dec-2021 00:00	20211202_D05		✓			✓		
ES2144294-015	26-Nov-2021 00:00	Trip Spike				✓			
ES2144294-016	26-Nov-2021 00:00	Trip Blank					✓		✓
ES2144294-017	26-Nov-2021 00:00	TSC				✓			
ES2144294-018	01-Dec-2021 00:00	ERM_BH07_15.0	✓						
ES2144294-019	01-Dec-2021 00:00	ERM_BH07_16.0	✓						
ES2144294-020	01-Dec-2021 00:00	ERM_BH07_17.0	✓						

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.



CHAIN OF CUSTODY

ALS Laboratory: please tick →

Sydney: 277 Woodpark Rd, Smithfield NSW 2164
Ph: 02 3784 8555 E: samples.syd@alsenviro.com
Newcastle: 5 Rosegum Rd, Warbrook NSW 2304
Ph: 02 4958 9433 E: samples.newcastle@alsenviro.com

Brisbane: 32 Shand St, Stafford QLD 4053
Ph: 07 3243 7222 E: samples.brisbane@alsenviro.com
Townsville: 14-15 Decma Ct, Bohle QLD 4812
Ph: 07 4785 0500 E: townsville.environmental@alsenviro.com

Melbourne: 2-4 Westgate Rd, Springvale VIC 3171
Ph: 03 8549 0600 E: samples.melbourne@alsenviro.com
Adelaide: 2-1 Burma Rd, Pooraka SA 5095
Ph: 08 5359 0690 E: adelaide@alsenviro.com

CLIENT: ERM	TURNAROUND REQUIREMENTS: ☐ Standard TAT (List due date): ☐ Non Standard or urgent TAT (List due date): 2 day TAT please	FOR LABORATORY USE ONLY (Circle) COC: 1 2 3 4 5 6 7 OF: 1 2 3 4 5 6 7
OFFICE: Sydney	ALS QUOTE NO.:	Freeze / frozen samples present upon receipt? Yes No NA Random Sample Temperature on Receipt: C F Other comment:
PROJECT: 0577577 - The Bays	CONTACT PH: 0404935554	
ORDER NUMBER:		
PROJECT MANAGER: Jessica Lawrence	SAMPLER: Tristan Rodrigues	RECEIVED BY: [Signature]
SAMPLER MOBILE: 0417187687	EDD FORMAT (or default):	DATE/TIME: 6/6/21 1:14
COC emailed to ALS? YES	RELINQUISHED BY: Tristan Rodrigues	RELINQUISHED BY:
Email Reports to: jessica.lawrence@erm.com, tristan.rodrigues@erm.com	DATE/TIME: 3/12/21	DATE/TIME:
Email Invoice to: jessica.lawrence@erm.com		

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

SAMPLE DETAILS		CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB: Suite Codes must be listed to attract suite price)										Additional Information	
MATRIX: Solid(S) Water(W)		Crushing @ 40µm (H2AB#144)		Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (filtered bottle required).										Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc. Please use the lower hexavalent chromium LOR.	
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	PFAS (28 analytes)	ASS Cr suite	Asbestos presence/absence	\$-16	8 metals	BTEX	pH, EC, Total Sulfur	HOLD		
1	ERM_BH07_18.0	2/12/2021 0:00	soil									x			
2	ERM_BH07_19.0	2/12/2021 0:00	soil									x			
3	ERM_BH07_20.0	2/12/2021 0:00	soil									x			
4	ERM_BH07_21.0	2/12/2021 0:00	soil										x		
5	ERM_BH07_22.0	2/12/2021 0:00	soil										x		
6	ERM_BH07_23.0	2/12/2021 0:00	soil										x		
2	ERM_BH07_24.0	2/12/2021 0:00	soil										x		
8	ERM_BH07_25.0	2/12/2021 0:00	soil			x									
9	ERM_BH07_26.0	2/12/2021 0:00	soil										x		
10	ERM_BH07_27.0	2/12/2021 0:00	soil										x		
11	ERM_BH07_28.0	2/12/2021 0:00	soil										x		
12	ERM_BH07_29.0	2/12/2021 0:00	soil										x		
TOTAL															

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl Preserved Plastic; HS = HCl Preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved GL
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag

Environmental Division
Sydney
Work Order Reference
ES2144294



Telephone: + 61-2-6784 8555



CHAIN OF CUSTODY

ALS Laboratory: please tick →

☐ Sydney: 277 Woodpark Rd, Smithfield NSW 2154
Ph: 02 8784 8555 E: samples.sydney@alsenviro.com
☐ Newcastle: 6 Rosegum Rd, Warabrook NSW 2304
Ph: 02 4908 9433 E: samples.newcastle@alsenviro.com

☐ Brisbane: 32 Shand St, Stafford QLD 4053
Ph: 07 3243 7222 E: samples.brisbane@alsenviro.com
☐ Townsville: 14-15 Desma Ct, Bohle QLD 4815
Ph: 07 4798 0000 E: townsville.environmental@alsenviro.com

☐ Melbourne: 2-4 Westall Rd, Springvale VIC 3171
Ph: 03 8646 8600 E: samples.melbourne@alsenviro.com
☐ Adelaide: 2-1 Burma Rd, Pooraka SA 5025
Ph: 08 3339 0890 E: adelaide@alsenviro.com

CLIENT:	ERM	TURNAROUND REQUIREMENTS:	☐ Standard TAT (List due date):	FOR LABORATORY USE ONLY (Circle)	
OFFICE:	Sydney	(Standard TAT may be longer for some tests e.g., Ultra Trace Organics)	☐ Non Standard or urgent TAT (List due date):	Custody Seal intact? Yes No N/A	
PROJECT:	0577577 - The Bays	ALS QUOTE NO.:	2 day TAT please	Freeze / frozen ice bricks present upon receipt? Yes No N/A	
ORDER NUMBER:			COC SEQUENCE NUMBER (Circle)	Random Sample Temperature on Receipt: °C	
PROJECT MANAGER:	Jessica Lawrence	CONTACT PH: 0404935554	COC: 1 2 3 4 5 6 7	Other comment:	
SAMPLER:	Tristan Rodrigues	SAMPLER MOBILE: 0417187687	OF: 1 2 3 4 5 6 7		
COC emailed to ALS? YES		EDD FORMAT (or default):	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Email Reports to: jessica.lawrence@erm.com, tristan.rodrigues@erm.com			Tristan Rodrigues		
Email Invoice to: jessica.lawrence@erm.com			DATE/TIME:	DATE/TIME:	DATE/TIME:
			2/12/21	6/12/21 1:15	

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

SAMPLE DETAILS MATRIX: Solid(S) Water(W)				CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB, Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (filtered bottle required)								Additional Information	
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE codes below)	(refer to)	TOTAL BOTTLES	PFAS (28 analytes)	ASS Cr suite	Asbestos presence/absence	S-16	8 metals	BTEXN	HOLD		
13	ERM_BH07_30.0	2/12/2021 0:00	soil										x		
14	20211202_D05	2/12/2021 0:00	soil				x								
15	20211202_T05	2/12/2021 0:00	soil				x							Please send to Eurofins for Analysis	
15	T9/TB 1216	26/11/21	soil									x			
17	TSC	26/11/21													
18	ERM-BH07-15.0	01/12/21													
19	ERM-BH07-16.0	01/12/21													
20	ERM-BH07-17.0	01/12/21													
			soil												
			soil												
TOTAL															

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Ca Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Solids; B = Unpreserved Bag.

CERTIFICATE OF ANALYSIS

Work Order : **ES2144300**
Client : **ENVIRONMENTAL RESOURCES MANAGEMENT (ERM)**
Contact : MS JESSICA LAWRENCE
Address : LEVEL 15 309 KENT STREET
 SYDNEY NSW AUSTRALIA 2000
Telephone : +61 02 8584 8888
Project : 0577577-The Bays
Order number : ----
C-O-C number : ----
Sampler : tristan rodrigues
Site : ----
Quote number : EN/114
No. of samples received : 51
No. of samples analysed : 17

Page : 1 of 15
Laboratory : Environmental Division Sydney
Contact : Monica Wright
Address : 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone : +61-2-8784 8555
Date Samples Received : 06-Dec-2021 13:15
Date Analysis Commenced : 06-Dec-2021
Issue Date : 10-Dec-2021 17:54



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
- Descriptive 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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ankit Joshi	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Ben Felgendrejeris	Senior Acid Sulfate Soil Chemist	Brisbane Acid Sulphate Soils, Stafford, QLD
Brendan Schrader	Laboratory Technician	Newcastle - Asbestos, Mayfield West, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Franco Lentini	LCMS Coordinator	Sydney Organics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW



General Comments

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

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

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

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

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

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

- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- EG035: Poor matrix spike recovery was obtained for Mercury on sample ES2143765 # 1. Confirmed by re-analysis.
- ASS: EA033 (CRS Suite): Retained Acidity not required because pH KCl greater than or equal to 4.5
- EP080: The trip spike and its control have been analysed for volatile TPH and BTEXN only. The trip spike and control were prepared in the lab using reagent grade sand spiked with petrol. The spike was dispatched from the lab and the control retained.
- ASS: EA033 (CRS Suite): Laboratory determinations of ANC needs to be corroborated by effectiveness of the measured ANC in relation to incubation ANC. Unless corroborated, the results of ANC testing should be discounted when determining Net Acidity for comparison with action criteria, or for the determination of the acidity hazard and required liming amounts.
- ASS: EA033 (CRS Suite): Liming rate is calculated and reported on a dry weight basis assuming use of fine agricultural lime (CaCO₃) and using a safety factor of 1.5 to allow for non-homogeneous mixing and poor reactivity of lime. For conversion of Liming Rate from 'kg/t dry weight' to 'kg/m³ in-situ soil', multiply 'reported results' x 'wet bulk density of soil in t/m³'.
- EA200 'Am' Amosite (brown asbestos)
- EA200 'Cr' Crocidolite (blue asbestos)
- EA200 'Trace' - Asbestos fibres ("Free Fibres") detected by trace analysis per AS4964. The result can be interpreted that the sample contains detectable 'respirable' asbestos fibres
- EA200: Asbestos Identification Samples were analysed by Polarised Light Microscopy including dispersion staining.
- EA200 Legend
- EA200 'Ch' Chrysotile (white asbestos)
- EA200: 'UMF' Unknown Mineral Fibres. "-" indicates fibres detected may or may not be asbestos fibres. Confirmation by alternative techniques is recommended.
- EA200: For samples larger than 30g, the <2mm fraction may be sub-sampled prior to trace analysis as outlined in ISO23909:2008(E) Sect 6.3.2-2
- EA200: 'Yes' - Asbestos detected by polarised light microscopy including dispersion staining.
- EA200: 'No*' - No asbestos found, at the reporting limit of 0.1g/kg, by polarised light microscopy including dispersion staining. Asbestos material was detected and positively identified at concentrations estimated to be below 0.1g/kg.
- EA200: 'No' - No asbestos found at the reporting limit 0.1g/kg, by polarised light microscopy including dispersion staining.
- 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. 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 (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	ERM_BH09A_0.5	ERM_BH09A_2.0	ERM_BH09A_14.5	ERM_BH09A_15.5	ERM_BH09A_16.0
Sampling date / time					02-Dec-2021 00:00	02-Dec-2021 00:00	03-Dec-2021 00:00	03-Dec-2021 00:00	03-Dec-2021 00:00
Compound	CAS Number	LOR	Unit		ES2144300-001	ES2144300-004	ES2144300-022	ES2144300-024	ES2144300-025
				Result	Result	Result	Result	Result	Result
EA033-A: Actual Acidity									
pH KCl (23A)	----	0.1	pH Unit	----	9.4	6.0	5.6	5.1	
Titrateable Actual Acidity (23F)	----	2	mole H+ / t	----	<2	<2	2	6	
sulfidic - Titrateable Actual Acidity (s-23F)	----	0.02	% pyrite S	----	<0.02	<0.02	<0.02	<0.02	<0.02
EA033-B: Potential Acidity									
Chromium Reducible Sulfur (22B)	----	0.005	% S	----	0.056	0.023	0.018	0.018	
acidity - Chromium Reducible Sulfur (a-22B)	----	10	mole H+ / t	----	35	14	11	12	
EA033-C: Acid Neutralising Capacity									
Acid Neutralising Capacity (19A2)	----	0.01	% CaCO3	----	3.89	----	----	----	----
acidity - Acid Neutralising Capacity (a-19A2)	----	10	mole H+ / t	----	777	----	----	----	----
sulfidic - Acid Neutralising Capacity (s-19A2)	----	0.01	% pyrite S	----	1.24	----	----	----	----
EA033-E: Acid Base Accounting									
ANC Fineness Factor	----	0.5	-	----	1.5	1.5	1.5	1.5	
Net Acidity (sulfur units)	----	0.02	% S	----	<0.02	0.02	0.02	0.03	
Net Acidity (acidity units)	----	10	mole H+ / t	----	<10	14	14	18	
Liming Rate	----	1	kg CaCO3/t	----	<1	1	1	1	
Net Acidity excluding ANC (sulfur units)	----	0.02	% S	----	0.06	0.02	0.02	0.03	
Net Acidity excluding ANC (acidity units)	----	10	mole H+ / t	----	35	14	14	18	
Liming Rate excluding ANC	----	1	kg CaCO3/t	----	3	1	1	1	
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%	15.7	----	----	----	----	----
EA200: AS 4964 - 2004 Identification of Asbestos in Soils									
Asbestos Detected	1332-21-4	0.1	g/kg	No	----	----	----	----	----
Asbestos (Trace)	1332-21-4	5	Fibres	No	----	----	----	----	----
Asbestos Type	1332-21-4	-	--	-	----	----	----	----	----
Synthetic Mineral Fibre	----	0.1	g/kg	No	----	----	----	----	----
Organic Fibre	----	0.1	g/kg	Yes	----	----	----	----	----
Sample weight (dry)	----	0.01	g	324	----	----	----	----	----
APPROVED IDENTIFIER:	----	-	--	B.SCHRADER	----	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	----	----	----	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	ERM_BH09A_0.5	ERM_BH09A_2.0	ERM_BH09A_14.5	ERM_BH09A_15.5	ERM_BH09A_16.0
Sampling date / time					02-Dec-2021 00:00	02-Dec-2021 00:00	03-Dec-2021 00:00	03-Dec-2021 00:00	03-Dec-2021 00:00
Compound	CAS Number	LOR	Unit		ES2144300-001	ES2144300-004	ES2144300-022	ES2144300-024	ES2144300-025
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids - Continued									
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		0.0010	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	----	----	----	----
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		<0.0002	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	----	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	----	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	----	----	----	----



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Sample ID

				ERM_BH09A_0.5	ERM_BH09A_2.0	ERM_BH09A_14.5	ERM_BH09A_15.5	ERM_BH09A_16.0
Sampling date / time				02-Dec-2021 00:00	02-Dec-2021 00:00	03-Dec-2021 00:00	03-Dec-2021 00:00	03-Dec-2021 00:00
Compound	CAS Number	LOR	Unit	ES2144300-001	ES2144300-004	ES2144300-022	ES2144300-024	ES2144300-025
				Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued								
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	----	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	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 PFAS	----	0.0002	mg/kg	0.0010	----	----	----	----
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	0.0010	----	----	----	----
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.0002	%	101	----	----	----	----
13C8-PFOA	----	0.0002	%	99.5	----	----	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	ERM_BH09A_17.0	ERM_BH09A_25.0	TS	TB	TSC
Sampling date / time					03-Dec-2021 00:00	03-Dec-2021 00:00	26-Nov-2021 00:00	26-Nov-2021 00:00	26-Nov-2021 00:00
Compound	CAS Number	LOR	Unit		ES2144300-026	ES2144300-034	ES2144300-042	ES2144300-043	ES2144300-046
					Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		6.0	----	----	----	----
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		331	----	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		----	6.4	----	----	----
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		0.02	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		----	----	53	<10	58
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		----	----	66	<10	71
[^] C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		----	----	32	<10	36
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		----	----	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg		----	----	13.5	<0.5	14.4
Ethylbenzene	100-41-4	0.5	mg/kg		----	----	2.4	<0.5	2.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		----	----	12.3	<0.5	12.7
ortho-Xylene	95-47-6	0.5	mg/kg		----	----	5.3	<0.5	5.3
[^] Sum of BTEX	----	0.2	mg/kg		----	----	33.5	<0.2	34.9
[^] Total Xylenes	----	0.5	mg/kg		----	----	17.6	<0.5	18.0
Naphthalene	91-20-3	1	mg/kg		----	----	<1	<1	<1
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		----	<0.0002	----	<0.0002	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		----	<0.0002	----	<0.0002	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		----	<0.0002	----	<0.0002	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		----	<0.0002	----	<0.0002	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		----	<0.0002	----	<0.0002	----

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	ERM_BH09A_17.0	ERM_BH09A_25.0	TS	TB	TSC
Sampling date / time				03-Dec-2021 00:00	03-Dec-2021 00:00	26-Nov-2021 00:00	26-Nov-2021 00:00	26-Nov-2021 00:00	
Compound	CAS Number	LOR	Unit	ES2144300-026	ES2144300-034	ES2144300-042	ES2144300-043	ES2144300-046	
				Result	Result	Result	Result	Result	
EP231A: Perfluoroalkyl Sulfonic Acids - Continued									
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	----	<0.0002	----	<0.0002	----	
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	----	<0.001	----	<0.001	----	
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	----	<0.0002	----	<0.0002	----	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	----	<0.0002	----	<0.0002	----	
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	----	<0.0002	----	<0.0002	----	
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	----	<0.0002	----	<0.0002	----	
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	----	<0.0002	----	<0.0002	----	
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	----	<0.0002	----	<0.0002	----	
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	----	<0.0002	----	<0.0002	----	
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	----	<0.0002	----	<0.0002	----	
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	----	<0.0002	----	<0.0002	----	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	----	<0.0005	----	<0.0005	----	
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	----	<0.0002	----	<0.0002	----	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	----	<0.0005	----	<0.0005	----	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	----	<0.0005	----	<0.0005	----	
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	----	<0.0005	----	<0.0005	----	
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	----	<0.0005	----	<0.0005	----	
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	----	<0.0002	----	<0.0002	----	
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	----	<0.0002	----	<0.0002	----	
EP231D: (n:2) Fluorotelomer Sulfonic Acids									



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	ERM_BH09A_17.0	ERM_BH09A_25.0	TS	TB	TSC
Sampling date / time					03-Dec-2021 00:00	03-Dec-2021 00:00	26-Nov-2021 00:00	26-Nov-2021 00:00	26-Nov-2021 00:00
Compound	CAS Number	LOR	Unit		ES2144300-026	ES2144300-034	ES2144300-042	ES2144300-043	ES2144300-046
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		----	<0.0005	----	<0.0005	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		----	<0.0005	----	<0.0005	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		----	<0.0005	----	<0.0005	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		----	<0.0005	----	<0.0005	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		----	<0.0002	----	<0.0002	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		----	<0.0002	----	<0.0002	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		----	<0.0002	----	<0.0002	----
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.2	%		----	----	92.8	92.7	103
Toluene-D8	2037-26-5	0.2	%		----	----	104	105	117
4-Bromofluorobenzene	460-00-4	0.2	%		----	----	90.8	92.0	103
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		----	99.5	----	102	----
13C8-PFOA	----	0.0002	%		----	104	----	107	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TS6	TS8	TSC6	TSC8	TB
Sampling date / time					26-Nov-2021 00:00	26-Nov-2021 00:00	26-Nov-2021 00:00	26-Nov-2021 00:00	26-Nov-2021 00:00
Compound	CAS Number	LOR	Unit		ES2144300-047	ES2144300-048	ES2144300-049	ES2144300-050	ES2144300-051
					Result	Result	Result	Result	Result
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		52	40	66	67	<10
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		65	50	82	83	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		31	24	42	43	<10
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg		13.4	10.3	16.3	16.6	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg		2.4	1.8	2.8	2.9	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		12.6	9.4	14.6	14.8	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg		5.3	4.1	6.1	6.1	<0.5
^ Sum of BTEX	----	0.2	mg/kg		33.7	25.6	39.8	40.4	<0.2
^ Total Xylenes	----	0.5	mg/kg		17.9	13.5	20.7	20.9	<0.5
Naphthalene	91-20-3	1	mg/kg		<1	<1	<1	<1	<1
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		----	----	----	----	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		----	----	----	----	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		----	----	----	----	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		----	----	----	----	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		----	----	----	----	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		----	----	----	----	<0.0002
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		----	----	----	----	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		----	----	----	----	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		----	----	----	----	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		----	----	----	----	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		----	----	----	----	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		----	----	----	----	<0.0002



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Sample ID

				TS6	TS8	TSC6	TSC8	TB
Sampling date / time				26-Nov-2021 00:00	26-Nov-2021 00:00	26-Nov-2021 00:00	26-Nov-2021 00:00	26-Nov-2021 00:00
Compound	CAS Number	LOR	Unit	ES2144300-047	ES2144300-048	ES2144300-049	ES2144300-050	ES2144300-051
				Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued								
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	----	----	----	----	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	----	----	----	----	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	----	----	----	----	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	----	----	----	----	<0.0005
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	----	----	----	----	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	----	----	----	----	<0.0005
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	----	----	----	----	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	----	----	----	----	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	----	----	----	----	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	----	----	----	----	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	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 PFAS	----	0.0002	mg/kg	----	----	----	----	<0.0002



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TS6	TS8	TSC6	TSC8	TB
Sampling date / time					26-Nov-2021 00:00	26-Nov-2021 00:00	26-Nov-2021 00:00	26-Nov-2021 00:00	26-Nov-2021 00:00
Compound	CAS Number	LOR	Unit		ES2144300-047	ES2144300-048	ES2144300-049	ES2144300-050	ES2144300-051
					Result	Result	Result	Result	Result
EP231P: PFAS Sums - Continued									
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		----	----	----	----	<0.0002
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		----	----	----	----	<0.0002
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.2	%		97.2	81.6	95.4	94.0	100
Toluene-D8	2037-26-5	0.2	%		109	90.4	107	106	112
4-Bromofluorobenzene	460-00-4	0.2	%		95.4	77.2	92.4	91.9	104
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		----	----	----	----	100
13C8-PFOA	----	0.0002	%		----	----	----	----	102



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	20211202_R04	20211203_R05	----	----	----
Sampling date / time					02-Dec-2021 00:00	03-Dec-2021 00:00	----	----	----
Compound	CAS Number	LOR	Unit		ES2144300-044	ES2144300-045	-----	-----	-----
				Result	Result		----	----	----
EG020T: Total Metals by ICP-MS									
Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001		----	----	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001		----	----	----
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001		----	----	----
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001		----	----	----
Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001		----	----	----
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001		----	----	----
Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005		----	----	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001		----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02		----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02		----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01		----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02		----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01		----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02		----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1		----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02		----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02		----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02		----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01		----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02		----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02		----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02		----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02		----	----	----

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	20211202_R04	20211203_R05	----	----	----
Sampling date / time					02-Dec-2021 00:00	03-Dec-2021 00:00	----	----	----
Compound	CAS Number	LOR	Unit		ES2144300-044	ES2144300-045	-----	-----	-----
				Result	Result		----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	----	----	----
EP231S: PFAS Surrogate									



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	20211202_R04	20211203_R05	----	----	----
				Sampling date / time	02-Dec-2021 00:00	03-Dec-2021 00:00	----	----	----
Compound	CAS Number	LOR	Unit		ES2144300-044	ES2144300-045	-----	-----	-----
					Result	Result	----	----	----
EP231S: PFAS Surrogate - Continued									
13C4-PFOS	----	0.02	%		106	102	----	----	----
13C8-PFOA	----	0.02	%		99.4	100	----	----	----

Analytical Results

Descriptive Results

Sub-Matrix: SOIL		
Method: Compound	Sample ID - Sampling date / time	Analytical Results
EA200: AS 4964 - 2004 Identification of Asbestos in Soils		
EA200: Description	ERM_BH09A_0.5 - 02-Dec-2021 00:00	A soil sample.



Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP080S: TPH(V)/BTEX Surrogates			
1,2-Dichloroethane-D4	17060-07-0	73	133
Toluene-D8	2037-26-5	74	132
4-Bromofluorobenzene	460-00-4	72	130
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Brisbane, NATA accreditation no. 825, site no. 818 (Chemistry) 18958 (Biology).

(SOIL) EA033-B: Potential Acidity

(SOIL) EA033-C: Acid Neutralising Capacity

(SOIL) EA033-D: Retained Acidity

(SOIL) EA033-A: Actual Acidity

(SOIL) EA033-E: Acid Base Accounting

(SOIL) ED042T: Total Sulfur by LECO

Analysis conducted by ALS Newcastle, NATA accreditation no. 825, site no. 1656 (Chemistry) 9854 (Biology).

(SOIL) EA200: AS 4964 - 2004 Identification of Asbestos in Soils

QUALITY CONTROL REPORT

Work Order	: ES2144300	Page	: 1 of 17
Client	: ENVIRONMENTAL RESOURCES MANAGEMENT (ERM)	Laboratory	: Environmental Division Sydney
Contact	: MS JESSICA LAWRENCE	Contact	: Monica Wright
Address	: LEVEL 15 309 KENT STREET SYDNEY NSW AUSTRALIA 2000	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: +61 02 8584 8888	Telephone	: +61-2-8784 8555
Project	: 0577577-The Bays	Date Samples Received	: 06-Dec-2021
Order number	: ----	Date Analysis Commenced	: 06-Dec-2021
C-O-C number	: ----	Issue Date	: 10-Dec-2021
Sampler	: tristan rodrigues		
Site	: ----		
Quote number	: EN/114		
No. of samples received	: 51		
No. of samples analysed	: 17		



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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ankit Joshi	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Ben Felgendrejeris	Senior Acid Sulfate Soil Chemist	Brisbane Acid Sulphate Soils, Stafford, QLD
Brendan Schrader	Laboratory Technician	Newcastle - Asbestos, Mayfield West, NSW
Edwandy Fadjjar	Organic Coordinator	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Franco Lentini	LCMS Coordinator	Sydney Organics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW

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 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.

Laboratory Duplicate (DUP) Report

Sub-Matrix: **SOIL**

Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA002: pH 1:5 (Soils) (QC Lot: 4059042)									
ES2143944-007	Anonymous	EA002: pH Value	----	0.1	pH Unit	6.4	6.4	0.0	0% - 20%
EA010: Conductivity (1:5) (QC Lot: 4059041)									
ES2143944-007	Anonymous	EA010: Electrical Conductivity @ 25°C	----	1	µS/cm	79	75	4.2	0% - 20%
EA033-A: Actual Acidity (QC Lot: 4066069)									
EB2135513-008	Anonymous	EA033: sulfidic - Titratable Actual Acidity (s-23F)	----	0.02	% pyrite S	<0.02	<0.02	0.0	No Limit
		EA033: Titratable Actual Acidity (23F)	----	2	mole H+ / t	4	3	0.0	No Limit
		EA033: pH KCl (23A)	----	0.1	pH Unit	5.7	5.7	0.0	0% - 20%
ES2144553-002	Anonymous	EA033: sulfidic - Titratable Actual Acidity (s-23F)	----	0.02	% pyrite S	0.03	0.03	0.0	No Limit
		EA033: Titratable Actual Acidity (23F)	----	2	mole H+ / t	18	18	0.0	No Limit
		EA033: pH KCl (23A)	----	0.1	pH Unit	4.7	4.7	0.0	0% - 20%
EA033-B: Potential Acidity (QC Lot: 4066069)									
EB2135513-008	Anonymous	EA033: Chromium Reducible Sulfur (22B)	----	0.005	% S	0.018	0.020	12.6	No Limit
		EA033: acidity - Chromium Reducible Sulfur (a-22B)	----	10	mole H+ / t	11	12	12.6	No Limit
ES2144553-002	Anonymous	EA033: Chromium Reducible Sulfur (22B)	----	0.005	% S	0.015	0.018	19.8	No Limit
		EA033: acidity - Chromium Reducible Sulfur (a-22B)	----	10	mole H+ / t	<10	11	10.7	No Limit
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 4060461)									
ES2144300-001	ERM_BH09A_0.5	EA055: Moisture Content	----	0.1	%	15.7	15.6	0.0	0% - 20%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 4066558)									
EP2114880-003	Anonymous	EA055: Moisture Content	----	0.1	%	0.4	0.6	21.8	No Limit
ES2144300-034	ERM_BH09A_25.0	EA055: Moisture Content	----	0.1	%	6.4	6.3	2.3	0% - 20%
ED042T: Total Sulfur by LECO (QC Lot: 4065925)									



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 (%)
ED042T: Total Sulfur by LECO (QC Lot: 4065925) - continued									
EM2124144-001	Anonymous	ED042T: Sulfur - Total as S (LECO)	----	0.01	%	0.54	0.55	0.0	0% - 20%
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 4058287)									
ES2143790-010	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
ES2143790-063	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 4058908)									
ES2143928-001	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 4058287)									
ES2143790-010	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
ES2143790-063	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: 4058908)									
ES2143928-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
EP080: BTEXN (QC Lot: 4058287)									
ES2143790-010	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
ES2143790-063	Anonymous	EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit
		EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit
EP080: BTEXN (QC Lot: 4058908)									
ES2143928-001	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4059136)									
ES2141618-025	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	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: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	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 (%)
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4059136) - continued									
ES2141618-025	Anonymous	EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0120	0.0101	17.3	0% - 20%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
ES2143790-013	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	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: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0003	0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4059442)									
ES2144300-034	ERM_BH09A_25.0	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	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: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	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
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit		
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4059136)									
ES2141618-025	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: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
ES2143790-013	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: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4059442)									
ES2144300-034	ERM_BH09A_25.0	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	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 (%)
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4059442) - continued									
ES2144300-034	ERM_BH09A_25.0	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: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit		
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4059136)									
ES2141618-025	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)							
ES2143790-013	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)							
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4059442)									
ES2144300-034	ERM_BH09A_25.0	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	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 (%)
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4059442) - continued									
ES2144300-034	ERM_BH09A_25.0	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4059136)									
ES2141618-025	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
ES2143790-013	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
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4059442)									
ES2144300-034	ERM_BH09A_25.0	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
Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EG020T: Total Metals by ICP-MS (QC Lot: 4058606)									
ES2144306-002	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EG020T: Total Metals by ICP-MS (QC Lot: 4058606) - continued									
ES2144306-002	Anonymous	EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	0.002	0.001	0.0	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.001	<0.001	0.0	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.0	No Limit
ES2143765-001	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	0.0001	<0.0001	0.0	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	0.002	0.002	0.0	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	1.90	1.87	1.6	0% - 20%
		EG020A-T: Copper	7440-50-8	0.001	mg/L	0.195	0.197	1.1	0% - 20%
		EG020A-T: Lead	7439-92-1	0.001	mg/L	0.001	0.002	0.0	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.076	0.077	0.0	0% - 20%
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	0.090	0.087	3.2	0% - 50%
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 4058617)									
ES2142991-067	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
ES2144325-005	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4060104)									
ES2144458-002	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4060104)									
ES2144458-002	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4060104)									
ES2144458-002	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4060104) - continued									
ES2144458-002	Anonymous	EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4060104)									
ES2144458-002	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4060104)									
ES2144458-002	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit



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

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

Sub-Matrix: **SOIL**

Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EA010: Conductivity (1:5) (QCLot: 4059041)								
EA010: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	1412 µS/cm	104	92.0	108
EA033-A: Actual Acidity (QCLot: 4066069)								
EA033: pH KCl (23A)	----	----	pH Unit	----	4.4 pH Unit	102	91.0	107
EA033: Titratable Actual Acidity (23F)	----	2	mole H+ / t	<2	19 mole H+ / t	81.4	70.0	124
EA033: sulfidic - Titratable Actual Acidity (s-23F)	----	0.02	% pyrite S	<0.02	----	----	----	----
EA033-B: Potential Acidity (QCLot: 4066069)								
EA033: Chromium Reducible Sulfur (22B)	----	0.005	% S	<0.005	0.246 % S	88.5	77.0	121
EA033: acidity - Chromium Reducible Sulfur (a-22B)	----	10	mole H+ / t	<10	----	----	----	----
EA033-C: Acid Neutralising Capacity (QCLot: 4066069)								
EA033: Acid Neutralising Capacity (19A2)	----	0.01	% CaCO3	<0.01	10 % CaCO3	106	91.0	112
EA033: acidity - Acid Neutralising Capacity (a-19A2)	----	10	mole H+ / t	<10	----	----	----	----
EA033: sulfidic - Acid Neutralising Capacity (s-19A2)	----	0.01	% pyrite S	<0.01	----	----	----	----
ED042T: Total Sulfur by LECO (QCLot: 4065925)								
ED042T: Sulfur - Total as S (LECO)	----	0.01	%	<0.01	0.16 %	102	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 4058287)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	92.5	68.4	128
EP080/071: Total Petroleum Hydrocarbons (QCLot: 4058908)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	100	68.4	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 4058287)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	92.5	68.4	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 4058908)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	101	68.4	128
EP080: BTEXN (QCLot: 4058287)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	99.7	62.0	116
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	97.0	67.0	121
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	96.0	65.0	117
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	96.1	66.0	118
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	96.3	68.0	120
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	96.6	63.0	119
EP080: BTEXN (QCLot: 4058908)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	103	62.0	116
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	103	67.0	121



Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EP080: BTEXN (QCLot: 4058908) - continued								
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	103	65.0	117
EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	2 mg/kg	104	66.0	118
	106-42-3							
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	103	68.0	120
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	95.6	63.0	119
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4059136)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.00125 mg/kg	104	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	95.2	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	95.6	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.4	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	104	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	112	59.0	134
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4059442)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.00125 mg/kg	88.8	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	84.0	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	74.0	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	84.0	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	82.8	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	78.0	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4059136)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	100	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	121	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	106	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	120	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	106	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	117	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	112	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	114	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	120	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	116	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	124	69.0	133
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4059442)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	78.4	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	88.4	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.0	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	86.8	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	92.0	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	91.2	72.0	129



Sub-Matrix: **SOIL**

Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4059442) - continued								
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	84.4	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.8	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	97.6	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	103	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	92.3	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4059136)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	115	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	108	71.6	129
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	124	69.8	131
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	128	68.7	130
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	108	65.1	134
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	110	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	112	61.0	139
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4059442)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	80.8	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	107	71.6	129
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	90.4	69.8	131
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	94.2	68.7	130
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	89.6	65.1	134
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	78.8	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	83.6	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4059136)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	101	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00125 mg/kg	109	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	95.6	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.00125 mg/kg	102	69.2	143
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4059442)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	81.2	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00125 mg/kg	76.4	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	90.8	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.00125 mg/kg	80.0	69.2	143



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EG020T: Total Metals by ICP-MS (QCLot: 4058606)								
EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	100	82.0	114
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	97.9	84.0	112
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	98.2	86.0	116
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	97.0	83.0	118
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	95.6	85.0	115
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	99.0	84.0	116
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	99.3	79.0	117
EG035T: Total Recoverable Mercury by FIMS (QCLot: 4058617)								
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	98.1	77.0	111
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4060104)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	107	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	101	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	90.2	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	104	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	104	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	101	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4060104)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	89.1	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	100	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	124	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	105	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	112	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	108	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	106	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	109	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	108	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	95.4	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	92.3	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4060104)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	102	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	102	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	90.5	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	89.5	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	88.3	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	101	65.0	136



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4060104) - continued								
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	111	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4060104)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	102	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	124	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	106	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	84.4	71.4	144

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 Concentration	Spike Recovery(%) MS	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number			Low	High
EP080/071: Total Petroleum Hydrocarbons (QCLot: 4058287)							
ES2143790-010	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	99.1	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 4058908)							
ES2143928-001	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	102	70.0	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 4058287)							
ES2143790-010	Anonymous	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	97.0	70.0	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 4058908)							
ES2143928-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	101	70.0	130
EP080: BTEXN (QCLot: 4058287)							
ES2143790-010	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	94.8	70.0	130
		EP080: Toluene	108-88-3	2.5 mg/kg	90.7	70.0	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	92.4	70.0	130
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	88.3	70.0	130
			106-42-3				
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	90.4	70.0	130
ES2143928-001	Anonymous	EP080: Naphthalene	91-20-3	2.5 mg/kg	77.9	70.0	130
		EP080: BTEXN (QCLot: 4058908)					
		EP080: Benzene	71-43-2	2.5 mg/kg	81.0	70.0	130
		EP080: Toluene	108-88-3	2.5 mg/kg	83.1	70.0	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	87.7	70.0	130
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	85.7	70.0	130
			106-42-3				



Sub-Matrix: **SOIL**

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: BTEXN (QCLot: 4058908) - continued							
ES2143928-001	Anonymous	EP080: ortho-Xylene	95-47-6	2.5 mg/kg	89.1	70.0	130
		EP080: Naphthalene	91-20-3	2.5 mg/kg	78.6	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4059136)							
ES2141618-025	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00125 mg/kg	107	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00125 mg/kg	104	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00125 mg/kg	95.2	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00125 mg/kg	98.0	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00125 mg/kg	# Not Determined	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.00125 mg/kg	116	59.0	134
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4059442)							
ES2144300-034	ERM_BH09A_25.0	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00125 mg/kg	88.8	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00125 mg/kg	96.0	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00125 mg/kg	77.2	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00125 mg/kg	84.4	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00125 mg/kg	83.6	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.00125 mg/kg	78.0	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4059136)							
ES2141618-025	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	103	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	126	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	108	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	116	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	106	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	115	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	124	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	123	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	121	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.00125 mg/kg	114	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	127	69.0	133
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4059442)							
ES2144300-034	ERM_BH09A_25.0	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	75.2	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	88.8	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	91.6	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	89.6	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	91.2	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	90.4	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	86.0	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	88.8	64.0	136



Sub-Matrix: **SOIL**

Sub-Matrix: SOIL				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4059442) - continued							
ES2144300-034	ERM_BH09A_25.0	EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	104	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	98.8	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	92.5	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4059136)							
ES2141618-025	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	111	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	119	71.6	129
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	119	69.8	131
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	118	68.7	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	108	65.1	134
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	102	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	121	61.0	139
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4059442)							
ES2144300-034	ERM_BH09A_25.0	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	82.4	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	106	71.6	129
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	92.8	69.8	131
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	91.7	68.7	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	90.9	65.1	134
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	84.4	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	80.8	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4059136)							
ES2141618-025	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00125 mg/kg	100	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00125 mg/kg	104	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.00125 mg/kg	104	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00125 mg/kg	120	69.2	143
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4059442)							
ES2144300-034	ERM_BH09A_25.0	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00125 mg/kg	88.0	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00125 mg/kg	92.8	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.00125 mg/kg	94.4	65.0	137



Sub-Matrix: SOIL				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4059442) - continued							
ES2144300-034	ERM_BH09A_25.0	EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00125 mg/kg	82.4	69.2	143
Sub-Matrix: WATER				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG020T: Total Metals by ICP-MS (QCLot: 4058606)							
ES2143765-002	Anonymous	EG020A-T: Arsenic	7440-38-2	1 mg/L	98.1	70.0	130
		EG020A-T: Cadmium	7440-43-9	0.25 mg/L	99.3	70.0	130
		EG020A-T: Chromium	7440-47-3	1 mg/L	99.3	70.0	130
		EG020A-T: Copper	7440-50-8	1 mg/L	101	70.0	130
		EG020A-T: Lead	7439-92-1	1 mg/L	101	70.0	130
		EG020A-T: Nickel	7440-02-0	1 mg/L	# Not Determined	70.0	130
		EG020A-T: Zinc	7440-66-6	1 mg/L	96.3	70.0	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 4058617)							
ES2143765-001	Anonymous	EG035T: Mercury	7439-97-6	0.01 mg/L	# 54.4	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4060104)							
ES2144459-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	126	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	108	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	90.4	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	101	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	75.6	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	99.8	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4060104)							
ES2144459-001	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	88.4	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	116	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	129	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	116	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	114	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	112	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	109	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	117	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	125	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.25 µg/L	105	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	101	71.0	132
		EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4060104)					
ES2144459-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	108	67.0	137



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4060104) - continued							
ES2144459-001	Anonymous	EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	115	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	96.1	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	99.4	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	102	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	111	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	108	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4060104)							
ES2144459-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	104	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	128	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	108	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	90.2	71.4	144

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: ES2144300	Page	: 1 of 10
Client	: ENVIRONMENTAL RESOURCES MANAGEMENT (ERM)	Laboratory	: Environmental Division Sydney
Contact	: MS JESSICA LAWRENCE	Telephone	: +61-2-8784 8555
Project	: 0577577-The Bays	Date Samples Received	: 06-Dec-2021
Site	: ----	Issue Date	: 10-Dec-2021
Sampler	: tristan rodrigues	No. of samples received	: 51
Order number	: ----	No. of samples analysed	: 17

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

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

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

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



Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
EP231A: Perfluoroalkyl Sulfonic Acids	ES2141618--025	Anonymous	Perfluorooctane sulfonic acid (PFOS)	1763-23-1	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
EG020T: Total Metals by ICP-MS	ES2143765--002	Anonymous	Nickel	7440-02-0	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EG035T: Total Recoverable Mercury by FIMS	ES2143765--001	Anonymous	Mercury	7439-97-6	54.4 %	70.0-130%	Recovery less than lower data quality objective

Outliers : Analysis Holding Time Compliance

Matrix: **SOIL**

Method	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EA002: pH 1:5 (Soils)						
Soil Glass Jar - Unpreserved ERM_BH09A_17.0	----	----	----	08-Dec-2021	07-Dec-2021	1

Analysis Holding Time Compliance

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

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

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

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

Matrix: **SOIL**

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

Method	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA002: pH 1:5 (Soils)							
Soil Glass Jar - Unpreserved (EA002) ERM_BH09A_17.0	03-Dec-2021	07-Dec-2021	10-Dec-2021	✓	08-Dec-2021	07-Dec-2021	✗
EA010: Conductivity (1:5)							
Soil Glass Jar - Unpreserved (EA010) ERM_BH09A_17.0	03-Dec-2021	07-Dec-2021	10-Dec-2021	✓	08-Dec-2021	04-Jan-2022	✓



Matrix: **SOIL**

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

Method	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA033-A: Actual Acidity							
Snap Lock Bag - frozen on receipt at ALS (EA033) ERM_BH09A_2.0	02-Dec-2021	10-Dec-2021	02-Dec-2022	✓	10-Dec-2021	10-Mar-2022	✓
Snap Lock Bag - frozen on receipt at ALS (EA033) ERM_BH09A_14.5, ERM_BH09A_16.0	ERM_BH09A_15.5, 03-Dec-2021	10-Dec-2021	03-Dec-2022	✓	10-Dec-2021	10-Mar-2022	✓
EA033-B: Potential Acidity							
Snap Lock Bag - frozen on receipt at ALS (EA033) ERM_BH09A_2.0	02-Dec-2021	10-Dec-2021	02-Dec-2022	✓	10-Dec-2021	10-Mar-2022	✓
Snap Lock Bag - frozen on receipt at ALS (EA033) ERM_BH09A_14.5, ERM_BH09A_16.0	ERM_BH09A_15.5, 03-Dec-2021	10-Dec-2021	03-Dec-2022	✓	10-Dec-2021	10-Mar-2022	✓
EA033-C: Acid Neutralising Capacity							
Snap Lock Bag - frozen on receipt at ALS (EA033) ERM_BH09A_2.0	02-Dec-2021	10-Dec-2021	02-Dec-2022	✓	10-Dec-2021	10-Mar-2022	✓
Snap Lock Bag - frozen on receipt at ALS (EA033) ERM_BH09A_14.5, ERM_BH09A_16.0	ERM_BH09A_15.5, 03-Dec-2021	10-Dec-2021	03-Dec-2022	✓	10-Dec-2021	10-Mar-2022	✓
EA033-D: Retained Acidity							
Snap Lock Bag - frozen on receipt at ALS (EA033) ERM_BH09A_2.0	02-Dec-2021	10-Dec-2021	02-Dec-2022	✓	10-Dec-2021	10-Mar-2022	✓
Snap Lock Bag - frozen on receipt at ALS (EA033) ERM_BH09A_14.5, ERM_BH09A_16.0	ERM_BH09A_15.5, 03-Dec-2021	10-Dec-2021	03-Dec-2022	✓	10-Dec-2021	10-Mar-2022	✓
EA033-E: Acid Base Accounting							
Snap Lock Bag - frozen on receipt at ALS (EA033) ERM_BH09A_2.0	02-Dec-2021	10-Dec-2021	02-Dec-2022	✓	10-Dec-2021	10-Mar-2022	✓
Snap Lock Bag - frozen on receipt at ALS (EA033) ERM_BH09A_14.5, ERM_BH09A_16.0	ERM_BH09A_15.5, 03-Dec-2021	10-Dec-2021	03-Dec-2022	✓	10-Dec-2021	10-Mar-2022	✓
EA055: Moisture Content (Dried @ 105-110°C)							
Soil Glass Jar - Unpreserved (EA055) ERM_BH09A_0.5	02-Dec-2021	----	----	----	07-Dec-2021	16-Dec-2021	✓
Soil Glass Jar - Unpreserved (EA055) ERM_BH09A_25.0	03-Dec-2021	----	----	----	09-Dec-2021	17-Dec-2021	✓
EA200: AS 4964 - 2004 Identification of Asbestos in Soils							
Snap Lock Bag - Friable Asbestos/PSD Bag (EA200) ERM_BH09A_0.5	02-Dec-2021	----	----	----	08-Dec-2021	31-May-2022	✓
ED042T: Total Sulfur by LECO							
Soil Glass Jar - Unpreserved (ED042T) ERM_BH09A_17.0	03-Dec-2021	09-Dec-2021	10-Dec-2021	✓	09-Dec-2021	07-Jun-2022	✓



Matrix: **SOIL**

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

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080/071: Total Petroleum Hydrocarbons								
HDPE Soil Jar (EP080) TB		26-Nov-2021	07-Dec-2021	10-Dec-2021	✓	08-Dec-2021	10-Dec-2021	✓
Soil Glass Jar - Unpreserved (EP080) TS, TSC, TS8, TSC8	TB, TS6, TSC6,	26-Nov-2021	06-Dec-2021	10-Dec-2021	✓	07-Dec-2021	10-Dec-2021	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
HDPE Soil Jar (EP080) TB		26-Nov-2021	07-Dec-2021	10-Dec-2021	✓	08-Dec-2021	10-Dec-2021	✓
Soil Glass Jar - Unpreserved (EP080) TS, TSC, TS8, TSC8	TB, TS6, TSC6,	26-Nov-2021	06-Dec-2021	10-Dec-2021	✓	07-Dec-2021	10-Dec-2021	✓
EP080: BTEXN								
HDPE Soil Jar (EP080) TB		26-Nov-2021	07-Dec-2021	10-Dec-2021	✓	08-Dec-2021	10-Dec-2021	✓
Soil Glass Jar - Unpreserved (EP080) TS, TSC, TS8, TSC8	TB, TS6, TSC6,	26-Nov-2021	06-Dec-2021	10-Dec-2021	✓	07-Dec-2021	10-Dec-2021	✓
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE Soil Jar (EP231X) ERM_BH09A_0.5		02-Dec-2021	07-Dec-2021	31-May-2022	✓	07-Dec-2021	16-Jan-2022	✓
HDPE Soil Jar (EP231X) ERM_BH09A_25.0		03-Dec-2021	09-Dec-2021	01-Jun-2022	✓	10-Dec-2021	18-Jan-2022	✓
HDPE Soil Jar (EP231X) TB,	TB	26-Nov-2021	07-Dec-2021	25-May-2022	✓	07-Dec-2021	16-Jan-2022	✓
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE Soil Jar (EP231X) ERM_BH09A_0.5		02-Dec-2021	07-Dec-2021	31-May-2022	✓	07-Dec-2021	16-Jan-2022	✓
HDPE Soil Jar (EP231X) ERM_BH09A_25.0		03-Dec-2021	09-Dec-2021	01-Jun-2022	✓	10-Dec-2021	18-Jan-2022	✓
HDPE Soil Jar (EP231X) TB,	TB	26-Nov-2021	07-Dec-2021	25-May-2022	✓	07-Dec-2021	16-Jan-2022	✓



Matrix: **SOIL**

Evaluation: * = Holding time breach ; ✓ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231C: Perfluoroalkyl Sulfonamides							
HDPE Soil Jar (EP231X) ERM_BH09A_0.5	02-Dec-2021	07-Dec-2021	31-May-2022	✓	07-Dec-2021	16-Jan-2022	✓
HDPE Soil Jar (EP231X) ERM_BH09A_25.0	03-Dec-2021	09-Dec-2021	01-Jun-2022	✓	10-Dec-2021	18-Jan-2022	✓
HDPE Soil Jar (EP231X) TB, TB	26-Nov-2021	07-Dec-2021	25-May-2022	✓	07-Dec-2021	16-Jan-2022	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE Soil Jar (EP231X) ERM_BH09A_0.5	02-Dec-2021	07-Dec-2021	31-May-2022	✓	07-Dec-2021	16-Jan-2022	✓
HDPE Soil Jar (EP231X) ERM_BH09A_25.0	03-Dec-2021	09-Dec-2021	01-Jun-2022	✓	10-Dec-2021	18-Jan-2022	✓
HDPE Soil Jar (EP231X) TB, TB	26-Nov-2021	07-Dec-2021	25-May-2022	✓	07-Dec-2021	16-Jan-2022	✓
EP231P: PFAS Sums							
HDPE Soil Jar (EP231X) ERM_BH09A_0.5	02-Dec-2021	07-Dec-2021	31-May-2022	✓	07-Dec-2021	16-Jan-2022	✓
HDPE Soil Jar (EP231X) ERM_BH09A_25.0	03-Dec-2021	09-Dec-2021	01-Jun-2022	✓	10-Dec-2021	18-Jan-2022	✓
HDPE Soil Jar (EP231X) TB, TB	26-Nov-2021	07-Dec-2021	25-May-2022	✓	07-Dec-2021	16-Jan-2022	✓

Matrix: **WATER**

Evaluation: * = Holding time breach ; ✓ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG020T: Total Metals by ICP-MS							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG020A-T) 20211202_R04	02-Dec-2021	07-Dec-2021	31-May-2022	✓	07-Dec-2021	31-May-2022	✓
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG020A-T) 20211203_R05	03-Dec-2021	07-Dec-2021	01-Jun-2022	✓	07-Dec-2021	01-Jun-2022	✓
EG035T: Total Recoverable Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG035T) 20211202_R04	02-Dec-2021	----	----	----	07-Dec-2021	30-Dec-2021	✓
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG035T) 20211203_R05	03-Dec-2021	----	----	----	07-Dec-2021	31-Dec-2021	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X) 20211202_R04	02-Dec-2021	07-Dec-2021	31-May-2022	✓	08-Dec-2021	31-May-2022	✓
HDPE (no PTFE) (EP231X) 20211203_R05	03-Dec-2021	07-Dec-2021	01-Jun-2022	✓	08-Dec-2021	01-Jun-2022	✓



Matrix: **WATER**

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

Method	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X) 20211202_R04	02-Dec-2021	07-Dec-2021	31-May-2022	✓	08-Dec-2021	31-May-2022	✓
HDPE (no PTFE) (EP231X) 20211203_R05	03-Dec-2021	07-Dec-2021	01-Jun-2022	✓	08-Dec-2021	01-Jun-2022	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X) 20211202_R04	02-Dec-2021	07-Dec-2021	31-May-2022	✓	08-Dec-2021	31-May-2022	✓
HDPE (no PTFE) (EP231X) 20211203_R05	03-Dec-2021	07-Dec-2021	01-Jun-2022	✓	08-Dec-2021	01-Jun-2022	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X) 20211202_R04	02-Dec-2021	07-Dec-2021	31-May-2022	✓	08-Dec-2021	31-May-2022	✓
HDPE (no PTFE) (EP231X) 20211203_R05	03-Dec-2021	07-Dec-2021	01-Jun-2022	✓	08-Dec-2021	01-Jun-2022	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X) 20211202_R04	02-Dec-2021	07-Dec-2021	31-May-2022	✓	08-Dec-2021	31-May-2022	✓
HDPE (no PTFE) (EP231X) 20211203_R05	03-Dec-2021	07-Dec-2021	01-Jun-2022	✓	08-Dec-2021	01-Jun-2022	✓



Quality Control Parameter Frequency Compliance

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

Matrix: **SOIL**

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

Quality Control Sample Type		Count		Rate (%)		Quality Control Specification	
Analytical Methods	Method	QC	Regular	Actual	Expected		Evaluation
Laboratory Duplicates (DUP)							
Chromium Suite for Acid Sulphate Soils	EA033	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Electrical Conductivity (1:5)	EA010	1	3	33.33	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Moisture Content	EA055	3	19	15.79	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	20	15.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
pH (1:5)	EA002	1	3	33.33	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Sulfur - Total as S (LECO)	ED042T	1	6	16.67	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	3	23	13.04	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Chromium Suite for Acid Sulphate Soils	EA033	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Electrical Conductivity (1:5)	EA010	1	3	33.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	20	10.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Sulfur - Total as S (LECO)	ED042T	1	6	16.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	23	8.70	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Chromium Suite for Acid Sulphate Soils	EA033	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Electrical Conductivity (1:5)	EA010	1	3	33.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	20	10.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Sulfur - Total as S (LECO)	ED042T	1	6	16.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	23	8.70	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	20	10.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	23	8.70	5.00	✓	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	10	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	2	11	18.18	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	10	10.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	11	9.09	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	10	10.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard

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 Work Order : ES2144300
 Client : ENVIRONMENTAL RESOURCES MANAGEMENT (ERM)
 Project : 0577577-The Bays



Matrix: **WATER**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Method Blanks (MB) - Continued							
Total Mercury by FIMS	EG035T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	11	9.09	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	10	10.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	11	9.09	5.00	✓	NEPM 2013 B3 & ALS QC Standard



Brief Method Summaries

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

Analytical Methods	Method	Matrix	Method Descriptions
pH (1:5)	EA002	SOIL	In house: Referenced to Rayment and Lyons 4A1 and APHA 4500H+. pH is determined on soil samples after a 1:5 soil/water leach. This method is compliant with NEPM Schedule B(3).
Electrical Conductivity (1:5)	EA010	SOIL	In house: Referenced to Rayment and Lyons 3A1 and APHA 2510. Conductivity is determined on soil samples using a 1:5 soil/water leach. This method is compliant with NEPM Schedule B(3).
Chromium Suite for Acid Sulphate Soils	EA033	SOIL	In house: Referenced to Ahern et al 2004. This method covers the determination of Chromium Reducible Sulfur (SCR); pHKCl; titratable actual acidity (TAA); acid neutralising capacity by back titration (ANC); and net acid soluble sulfur (SNAS) which incorporates peroxide sulfur. It applies to soils and sediments (including sands) derived from coastal regions. Liming Rate is based on results for samples as submitted and incorporates a minimum safety factor of 1.5.
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Asbestos Identification in Soils	EA200	SOIL	AS 4964 Method for the qualitative identification of asbestos in bulk samples Analysis by Polarised Light Microscopy including dispersion staining
Sulfur - Total as S (LECO)	ED042T	SOIL	In house: Dried and pulverised sample is combusted in a high temperature furnace in the presence of strong oxidants / catalysts. The evolved S (as SO ₂) is measured by infra-red detector
TRH Volatiles/BTEX	EP080	SOIL	In house: Referenced to USEPA SW 846 - 8260. Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. Compliant with NEPM Schedule B(3) amended.
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.
Total Metals by ICP-MS - Suite A	EG020A-T	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Total Mercury by FIMS	EG035T	WATER	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl ₂)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the unfiltered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl ₂ which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM Schedule B(3).



Analytical Methods	Method	Matrix	Method Descriptions
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.
Preparation Methods	Method	Matrix	Method Descriptions
Drying at 85 degrees, bagging and labelling (ASS)	EN020PR	SOIL	In house
1:5 solid / water leach for soluble analytes	EN34	SOIL	10 g of soil is mixed with 50 mL of reagent grade water and tumbled end over end for 1 hour. Water soluble salts are leached from the soil by the continuous suspension. Samples are settled and the water filtered off for analysis.
Dry and Pulverise (up to 100g)	GEO30	SOIL	#
Methanolic Extraction of Soils for Purge and Trap	ORG16	SOIL	In house: Referenced to USEPA SW 846 - 5030A. 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
QuEChERS Extraction of Solids	ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.
Digestion for Total Recoverable Metals	EN25	WATER	In house: Referenced to USEPA SW846-3005. Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM Schedule B(3)
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.



CHAIN OF CUSTODY

ALS Laboratory: please tick →

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Ph: 02 4988 9433 E: samples.newcastle@alsenviro.com

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□ Townsville: 14-15 Desma Ct, Bohle QLD 4818
Ph: 07 4796 0600 E: townsville.environmental@alsenviro.com

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□ Adelaide: 2-1 Burma Rd
Ph: 08 8359 0860 E: samples@alsenviro.com

Environmental Division
Sydney

Work Order Reference

ES2144300



Telephone: +61-2-8784 8555

CLIENT:	ERM	TURNAROUND REQUIREMENTS:	☐ Standard TAT (List due date):	FOR LABORATORY Custody/Seal/Inta Freeze/Frozen Receipt Random Sample Other comment:
OFFICE:	Sydney	(Standard TAT may be longer for some tests e.g., Ultra Trace Organics)	☐ Non Standard or urgent TAT (List due date):	
PROJECT:	0577577 - The Bays	ALS QUOTE NO.:	COC SEQUENCE NUMBER (Circle)	
ORDER NUMBER:			COC: 1 2 3 4 5 6 7 OF: 1 2 3 4 5 6 7	
PROJECT MANAGER:	Jessica Lawrence	CONTACT PH: 0404935554		
SAMPLER:	Tristan Rodrigues	SAMPLER MOBILE: 0417187687	RELINQUISHED BY:	RECEIVED BY:
COC emailed to ALS? YES		EDD FORMAT (or default):	Tristan Rodrigues	6/11/21
Email Reports to:	jessica.lawrence@erm.com, tristan.rodrigues@erm.com		DATE/TIME:	DATE/TIME:
Email Invoice to:	jessica.lawrence@erm.com		3/12/21	1:15
COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:				

LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).							Additional Information
						PFAS (28 analytes)	ASS Cr suite	Asbestos presence/absence	S-16	8 metals	BTEXN	HOLD	
1	ERM_BH09A_0.5	2/12/2021 0:00	soil			x		x					
2	ERM_BH09A_1.0	2/12/2021 0:00	soil									x	
3	ERM_BH09A_1.5	2/12/2021 0:00	soil									x	
4	ERM_BH09A_2.0	2/12/2021 0:00	soil				x						please hold remaining sample
5	ERM_BH09A_2.5	2/12/2021 0:00	soil									x	
6	ERM_BH09A_3.0	2/12/2021 0:00	soil									x	
7	ERM_BH09A_3.5	2/12/2021 0:00	soil									x	
8	ERM_BH09A_4.0	2/12/2021 0:00	soil									x	
9	ERM_BH09A_5.0	2/12/2021 0:00	soil									x	
10	ERM_BH09A_8.2	2/12/2021 0:00	soil									x	
11	ERM_BH09A_9.0	2/12/2021 0:00	soil									x	
12	ERM_BH09A_9.5	2/12/2021 0:00	soil									x	
TOTAL													

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.



CHAIN OF CUSTODY

ALS Laboratory: please tick →

☐ Sydney: 277 Woodpark Rd. Smithfield NSW 2194
Ph: 02 8184 8556 E: samples.syd@alsenviro.com
☐ Newcastle: 5 Rosegum Rd. Warrobark NSW 2304
Ph: 02 4968 9400 E: samples.newcastle@alsenviro.com

☐ Brisbane: 32 Shand St. Stafford QLD 4063
Ph: 07 3243 7222 E: samples.brisbane@alsenviro.com
☐ Townsville: 14-15 Deasm Ct. Evelyn QLD 4815
Ph: 07 4795 0600 E: townsville.environmental@alsenviro.com

☐ Melbourne: 24 Westall Rd. Springvale VIC 3171
Ph: 03 8540 9600 E: samples.melbourne@alsenviro.com
☐ Adelaide: 2-1 Barossa Rd. Pooraka SA 5095
Ph: 08 8338 0690 E: adelaide@alsenviro.com

CLIENT: ERM	TURNAROUND REQUIREMENTS:	☐ Standard TAT (List due date):	☒ Non Standard or urgent TAT (List due date): 2 day TAT please	FOR LABORATORY USE ONLY: (Circle)	
OFFICE: Sydney	(Standard TAT may be longer for some tests e.g. Ultra Trace Organics)			Custody Seal intact?	Yes No N/A
PROJECT: 0577577 - The Bays	ALS QUOTE NO.:	COC SEQUENCE NUMBER (Circle)		Freeze / frozen ice bricks present upon receipt?	Yes No N/A
ORDER NUMBER:		COC: 1 2 3 4 5 6 7		Random Sample Temperature on Receipt:	°C
PROJECT MANAGER: Jessica Lawrence	CONTACT PH: 0404935554	OF: 1 2 3 4 5 6 7		Other comment:	
SAMPLER: Tristan Rodrigues	SAMPLER MOBILE: 0417187687	RELINQUISHED BY: Tristan Rodrigues	RECEIVED BY: [Signature]	RELINQUISHED BY:	RECEIVED BY:
COC emailed to ALS? YES	EDD FORMAT (or default):	DATE/TIME: 2/12/21	DATE/TIME: 6/12/21 1:14	DATE/TIME:	DATE/TIME:
Email Reports to: jessica.lawrence@erm.com, tristan.rodrigues@erm.com					
Email Invoice to: jessica.lawrence@erm.com					

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE ONLY	SAMPLE DETAILS MATRIX: Solid(S) Water(W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).									Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE <i>codes below</i>	<i>(refer to</i> TOTAL BOTTLES	PFAS (28 analytes)	ASS Cr suite	Asbestos presence/absence	S-16	8 metals	BTEXN			HOLD	Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc. Please use the lower hexavalent chromium LOR.
12	ERM_BH09A_10.0	2/12/2021 0:00	soil											x	
14	ERM_BH09A_10.5	2/12/2021 0:00	soil											x	
15	ERM_BH09A_11.0	2/12/2021 0:00	soil											x	
16	ERM_BH09A_11.5	2/12/2021 0:00	soil											x	
12	ERM_BH09A_12.0	2/12/2021 0:00	soil											x	
18	ERM_BH09A_12.5	2/12/2021 0:00	soil											x	
19	ERM_BH09A_13.0	2/12/2021 0:00	soil											x	
20	ERM_BH09A_13.5	2/12/2021 0:00	soil											x	
21	ERM_BH09A_14.0	2/12/2021 0:00	soil											x	
22	ERM_BH09A_14.5	3/12/2021 0:00	soil				x								please hold remaining sample
23	ERM_BH09A_15.0	3/12/2021 0:00	soil											x	
24	ERM_BH09A_15.5	3/12/2021 0:00	soil				x								please hold remaining sample
TOTAL															

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airtight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airtight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Solids; B = Unpreserved Bag



CHAIN OF CUSTODY

ALS Laboratory, please tick →

☐ Sydney, 277 Woodpark Rd, Smithfield NSW 2104
Ph: 02 8784 8555 E: samples.sydney@alsenviro.com
☐ Newcastle, 5 Rosogum Rd, Warabrook NSW 2304
Ph: 02 4938 9432 E: samples.newcastle@alsenviro.com

☐ Brisbane, 32 Shand St, Stafford QLD 4055
Ph: 07 3243 7222 E: samples.brisbane@alsenviro.com
☐ Townsville, 14-15 Desma Ct, Bohle QLD 4818
Ph: 07 4706 0000 E: townsville.environmental@alsenviro.com

☐ Melbourne, 2-4 Westall Rd, Springvale VIC 3171
Ph: 03 8548 9800 E: samples.melbourne@alsenviro.com
☐ Adelaide, 2-1 Burma Rd, Pooraka SA 5095
Ph: 08 8359 0390 E: adelaide@alsenviro.com

CLIENT:	ERM	TURNAROUND REQUIREMENTS:	☐ Standard TAT (List due date):	FOR LABORATORY USE ONLY (Circle)	
OFFICE:	Sydney	(Standard TAT may be longer for some tests e.g., Ultra Trace Organics)	☐ Non Standard or urgent TAT (List due date):	COC SEQUENCE NUMBER (Circle)	
PROJECT:	0577577 - The Bays	ALS QUOTE NO.:	COC: 1 2 3 4 5 6 7		Client Seal Intact? Yes No NA
ORDER NUMBER:			DF: 1 2 3 4 5 6 7		Free ice/foam can be present upon receipt? Yes No NA
PROJECT MANAGER:	Jessica Lawrence	CONTACT PH: 0404935554	RECEIVED BY: <i>FAZ</i>		Random Sample Temperature on Receipt: C
SAMPLER:	Tristan Rodrigues	SAMPLER MOBILE: 0417187687	DATE/TIME: <i>6/12/21 1:12</i>		Other comment:
COC emailed to ALS? YES	EDD FORMAT (or default):		RELINQUISHED BY:		RECEIVED BY:
Email Reports to: jessica.lawrence@erm.com, tristan.rodrigues@erm.com			Tristan Rodrigues		
Email Invoice to: jessica.lawrence@erm.com			DATE/TIME: 2/12/21		DATE/TIME:
COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:					

ALS USE ONLY	SAMPLE DETAILS MATRIX: Solid(S) Water(W)			CONTAINER INFORMATION			ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered both required) or Dissolved (fold filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE <i>(codes below)</i>	(refer to)	TOTAL BOTTLES	PFAS (28 analytes)	ASS Cr suite	Asbestos presence/absence	S-16	8 metals	BTEXN	pH, EC, Total Sulfur	HOLD	Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc. Please use the lower hexavalent chromium LOR.
15	ERM_BH09A_16.0	3/12/2021 0:00	soil					x							please hold remaining sample
16	ERM_BH09A_17.0	3/12/2021 0:00	soil										x		
17	ERM_BH09A_18.0	3/12/2021 0:00	soil											x	
18	ERM_BH09A_19.0	3/12/2021 0:00	soil											x	
19	ERM_BH09A_20.0	3/12/2021 0:00	soil											x	
20	ERM_BH09A_21.0	3/12/2021 0:00	soil											x	
21	ERM_BH09A_22.0	3/12/2021 0:00	soil											x	
22	ERM_BH09A_23.0	3/12/2021 0:00	soil											x	
23	ERM_BH09A_24.0	3/12/2021 0:00	soil											x	
24	ERM_BH09A_25.0	3/12/2021 0:00	soil				x								
25	ERM_BH09A_26.0	3/12/2021 0:00	soil											x	
26	ERM_BH09A_27.0	3/12/2021 0:00	soil											x	
TOTAL															

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Air-tight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Air-tight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag



CHAIN OF CUSTODY

ALS Laboratory: please tick →

□ Sydney: 277 Woodpark Rd, Smithfield NSW 2104
Ph: 02 8784 6556 E: samples.sydney@alsenviro.com
□ Newcastle: 5 Ransong Rd, Warabrook NSW 2304
Ph: 02 4968 8433 E: samples.newcastle@alsenviro.com

□ Brisbane: 32 Shand St, Stafford QLD 4059
Ph: 07 3243 7222 E: samples.brisbane@alsenviro.com
□ Townsville: 14-15 Desma Ct, Bohle QLD 4818
Ph: 07 4766 0300 E: townsville.environmental@alsenviro.com

□ Melbourne: 2-4 Westall Rd, Springvale VIC 3171
Ph: 03 8549 0000 E: samples.melbourne@alsenviro.com
□ Adelaide: 2-1 Burma Rd, Pooraka SA 5065
Ph: 08 8352 0890 E: adelaide@alsenviro.com

CLIENT: ERM	TURNAROUND REQUIREMENTS:		☐ Standard TAT (List due date): ☒ Non Standard or urgent TAT (List due date): 2 day TAT please		FOR LABORATORY USE ONLY (Circle)	
OFFICE: Sydney	(Standard TAT may be longer for some tests e.g., Ultra Trace Organics)				Custody Seal intact? Yes ☐ No ☐ N/A Bag (ice/frozen) or other present upon receipt? Yes ☐ No ☐ N/A Random Sample Temperature on Receipt: ☐	
PROJECT: 0577577 - The Bays	ALS QUOTE NO.:		COC SEQUENCE NUMBER (Circle)		Other comment:	
ORDER NUMBER:			COC: 1 2 3 4 5 6 7			
PROJECT MANAGER: Jessica Lawrence	CONTACT PH: 0404935554		OF: 1 2 3 4 5 6 7			
SAMPLER: Tristan Rodrigues	SAMPLER MOBILE: 0417187687	RELINQUISHED BY: Tristan Rodrigues	RECEIVED BY: <i>Handwritten signature</i>		RELINQUISHED BY:	RECEIVED BY:
COC emailed to ALS? YES	EDD FORMAT (or default):	DATE/TIME: 2/12/21	DATE/TIME: <i>Handwritten: 6/12/21 1.12</i>		DATE/TIME:	DATE/TIME:
Email Reports to: jessica.lawrence@erm.com, tristan.rodrigues@erm.com	Email Invoice to: jessica.lawrence@erm.com					

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

SAMPLE DETAILS MATRIX: Solid(S) Water(W)				CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (fick filtered bottle required)								Additional Information	
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE <i>codes below</i>	(refer to)	TOTAL BOTTLES	PFAS (28 analytes)	ASS Cr suite	Asbestos presence/absence	S-16	8 metals	BTEXN	HOLD	Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc. Please use the lower hexavalent chromium LOR.	
37	ERM_BH09A_28.0	3/12/2021 0:00	soil										x		
38	ERM_BH09A_29.0	3/12/2021 0:00	soil										x		
39	ERM_BH09A_30.0	3/12/2021 0:00	soil										x		
40	20211203_D06	3/12/2021 0:00	soil										x		
41	20211203_T06	3/12/2021 0:00	soil										x		
42	TS 26/11/21	3/12/2021 0:00	soil									x			
43	TB 26/11/21	3/12/2021 0:00	soil									x			
44	20211202_R04	2/12/2021 0:00	Water				x				x				
45	20211203_R05	3/12/2021 0:00	Water				x				x				
46	TSC 26/11/21		soil												
47	TSC		soil												
48	TSC		soil												
TOTAL															

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

50 TSC
51 TB

CERTIFICATE OF ANALYSIS

Work Order : **ES2145542**
Client : **ENVIRONMENTAL RESOURCES MANAGEMENT (ERM)**
Contact : MS JESSICA LAWRENCE
Address : LEVEL 15 309 KENT STREET
 SYDNEY NSW AUSTRALIA 2000
Telephone : +61 02 8584 8888
Project : 0577577 - The Bays
Order number : ----
C-O-C number : ----
Sampler : TRISTAN RODRIGUES
Site : ----
Quote number : EN/114
No. of samples received : 4
No. of samples analysed : 4

Page : 1 of 5
Laboratory : Environmental Division Sydney
Contact : Monica Wright
Address : 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone : +61-2-8784 8555
Date Samples Received : 13-Dec-2021 09:27
Date Analysis Commenced : 14-Dec-2021
Issue Date : 16-Dec-2021 12:50



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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Evie Sidarta	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Franco Lentini	LCMS Coordinator	Sydney Organics, Smithfield, NSW



General Comments

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

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

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

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

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

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

- 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. 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 (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.



Analytical Results

Sub-Matrix: ROCK
 (Matrix: SOIL)

Sample ID

				ERM_BH08_15.0	ERM_BH08_25.0	ERM_BH08_29.0	20211130_D02	----
Sampling date / time				01-Dec-2021 00:00	01-Dec-2021 00:00	01-Dec-2021 00:00	01-Dec-2021 00:00	----
Compound	CAS Number	LOR	Unit	ES2145542-001	ES2145542-002	ES2145542-003	ES2145542-004	-----
				Result	Result	Result	Result	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	5.2	7.1	3.7	6.3	----
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	----
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	<0.001	<0.001	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	----
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	----



Analytical Results

Sub-Matrix: ROCK
 (Matrix: SOIL)

Sample ID

				ERM_BH08_15.0	ERM_BH08_25.0	ERM_BH08_29.0	20211130_D02	----
Sampling date / time				01-Dec-2021 00:00	01-Dec-2021 00:00	01-Dec-2021 00:00	01-Dec-2021 00:00	----
Compound	CAS Number	LOR	Unit	ES2145542-001	ES2145542-002	ES2145542-003	ES2145542-004	-----
				Result	Result	Result	Result	----
EP231C: Perfluoroalkyl Sulfonamides - Continued								
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<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	<0.0005	<0.0005	<0.0005	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	----
EP231P: PFAS Sums								
Sum of PFAS	----	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	----
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.0002	%	110	108	98.0	108	----
13C8-PFOA	----	0.0002	%	101	100	100	106	----



Surrogate Control Limits

Sub-Matrix: ROCK		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

QUALITY CONTROL REPORT

Work Order	: ES2145542	Page	: 1 of 7
Client	: ENVIRONMENTAL RESOURCES MANAGEMENT (ERM)	Laboratory	: Environmental Division Sydney
Contact	: MS JESSICA LAWRENCE	Contact	: Monica Wright
Address	: LEVEL 15 309 KENT STREET SYDNEY NSW AUSTRALIA 2000	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: +61 02 8584 8888	Telephone	: +61-2-8784 8555
Project	: 0577577 - The Bays	Date Samples Received	: 13-Dec-2021
Order number	: ----	Date Analysis Commenced	: 14-Dec-2021
C-O-C number	: ----	Issue Date	: 16-Dec-2021
Sampler	: TRISTAN RODRIGUES		
Site	: ----		
Quote number	: EN/114		
No. of samples received	: 4		
No. of samples analysed	: 4		



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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Evie Sidarta	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Franco Lentini	LCMS Coordinator	Sydney Organics, Smithfield, NSW



General Comments

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

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

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

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 4076372)									
ES2143984-006	Anonymous	EA055: Moisture Content	----	0.1	%	20.7	19.6	5.5	0% - 20%
ES2145438-020	Anonymous	EA055: Moisture Content	----	0.1	%	6.0	5.6	6.6	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4075267)									
EP2115195-007	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	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: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	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
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
ES2145542-004	20211130_D02	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	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: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	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
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4075267)									
EP2115195-007	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: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	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 (%)
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4075267) - continued									
EP2115195-007	Anonymous	EP231X: Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
ES2145542-004	20211130_D02	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: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4075267)									
EP2115195-007	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
ES2145542-004	20211130_D02	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	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: 4075267)									
EP2115195-007	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
ES2145542-004	20211130_D02	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



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

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

Sub-Matrix: **SOIL**

Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4075267)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.00125 mg/kg	88.8	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	86.8	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	86.4	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	86.4	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	92.8	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	108	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4075267)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	98.4	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.0	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.0	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.8	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	100	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.0	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	95.2	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	90.8	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	95.6	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	111	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	102	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4075267)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	95.2	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	97.1	71.6	129
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	91.3	69.8	131
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	98.1	68.7	130
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	94.1	65.1	134
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.0	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.8	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4075267)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	95.2	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00125 mg/kg	94.4	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	93.2	65.0	137



Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result			Low	High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4075267) - continued								
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.00125 mg/kg	110	69.2	143

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
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4075267)							
EP2115195-007	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00125 mg/kg	88.8	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00125 mg/kg	80.0	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00125 mg/kg	79.2	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00125 mg/kg	73.6	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00125 mg/kg	78.8	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.00125 mg/kg	75.2	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4075267)							
EP2115195-007	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	97.6	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	105	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	97.2	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	94.4	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	92.8	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	100	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	87.6	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	90.0	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	116	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.00125 mg/kg	74.8	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	103	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4075267)							
EP2115195-007	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	98.8	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	113	71.6	129
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	80.9	69.8	131
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	91.0	68.7	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	101	65.1	134
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	75.6	63.0	144



Sub-Matrix: SOIL

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4075267) - continued							
EP2115195-007	Anonymous	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	74.0	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4075267)							
EP2115195-007	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00125 mg/kg	91.6	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00125 mg/kg	88.0	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.00125 mg/kg	118	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00125 mg/kg	78.8	69.2	143

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: ES2145542	Page	: 1 of 4
Client	: ENVIRONMENTAL RESOURCES MANAGEMENT (ERM)	Laboratory	: Environmental Division Sydney
Contact	: MS JESSICA LAWRENCE	Telephone	: +61-2-8784 8555
Project	: 0577577 - The Bays	Date Samples Received	: 13-Dec-2021
Site	: ----	Issue Date	: 16-Dec-2021
Sampler	: TRISTAN RODRIGUES	No. of samples received	: 4
Order number	: ----	No. of samples analysed	: 4

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

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

Outliers : Analysis Holding Time Compliance

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

Outliers : Frequency of Quality Control Samples

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



Analysis Holding Time Compliance

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

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

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

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

Matrix: **SOIL**

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

Method	Sample Date	Extraction / Preparation			Analysis			
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
EA055: Moisture Content (Dried @ 105-110°C)								
HDPE Soil Jar (EA055) ERM_BH08_15.0, ERM_BH08_29.0,	ERM_BH08_25.0, 20211130_D02	01-Dec-2021	----	----	----	14-Dec-2021	15-Dec-2021	✓
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE Soil Jar (EP231X) ERM_BH08_15.0, ERM_BH08_29.0,	ERM_BH08_25.0, 20211130_D02	01-Dec-2021	15-Dec-2021	29-May-2022	✓	15-Dec-2021	24-Jan-2022	✓
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE Soil Jar (EP231X) ERM_BH08_15.0, ERM_BH08_29.0,	ERM_BH08_25.0, 20211130_D02	01-Dec-2021	15-Dec-2021	29-May-2022	✓	15-Dec-2021	24-Jan-2022	✓
EP231C: Perfluoroalkyl Sulfonamides								
HDPE Soil Jar (EP231X) ERM_BH08_15.0, ERM_BH08_29.0,	ERM_BH08_25.0, 20211130_D02	01-Dec-2021	15-Dec-2021	29-May-2022	✓	15-Dec-2021	24-Jan-2022	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE Soil Jar (EP231X) ERM_BH08_15.0, ERM_BH08_29.0,	ERM_BH08_25.0, 20211130_D02	01-Dec-2021	15-Dec-2021	29-May-2022	✓	15-Dec-2021	24-Jan-2022	✓
EP231P: PFAS Sums								
HDPE Soil Jar (EP231X) ERM_BH08_15.0, ERM_BH08_29.0,	ERM_BH08_25.0, 20211130_D02	01-Dec-2021	15-Dec-2021	29-May-2022	✓	15-Dec-2021	24-Jan-2022	✓



Quality Control Parameter Frequency Compliance

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

Matrix: **SOIL**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	11	18.18	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	11	9.09	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	11	9.09	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	11	9.09	5.00	✓	NEPM 2013 B3 & ALS QC Standard



Brief Method Summaries

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

<i>Analytical Methods</i>	<i>Method</i>	<i>Matrix</i>	<i>Method Descriptions</i>
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.
<i>Preparation Methods</i>	<i>Method</i>	<i>Matrix</i>	<i>Method Descriptions</i>
QuEChERS Extraction of Solids	ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.

Vishal Patel

Vishal
13/12/2021
0927 PM

From: Helen Simpson
Sent: Tuesday, 14 December 2021 9:31 AM
To: rebatches.sydney; Franco Lentini; Barbara Hanna
Subject: RE: [EXTERNAL] - FW: SRN for ALS Workorder : ES2144108 | Your Reference: 0577577 - The Bays

Hi Franco/Barbara,

Client has requested fastest TAT for these 4 samples. What can you accommodate (after crushing if needed)?

PS these may need to be crushed first as the client has said they are rock samples.

Kind Regards,

Helen Simpson
Sample Admin, Environmental
Sydney



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F +61 2 8784 8500
helen.simpson@alsglobal.com
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Smithfield NSW 2164 AUSTRALIA

Subscribe    

Environmental Division
Sydney
Work Order Reference
ES2145542



Telephone : +61-2-8784 8555

From: Helen Simpson <helen.simpson@alsglobal.com>
Sent: Tuesday, 14 December 2021 8:09 AM
To: rebatches.sydney <rebatches.sydney@ALSGlobal.com>
Subject: FW: [EXTERNAL] - FW: SRN for ALS Workorder : ES2144108 | Your Reference: 0577577 - The Bays

Hi Vishal,

Can you please arrange the following:

TAT

Additionally please analyse the following samples for PFAS:

20211130_D02

ERM_BH08_15.0

ERM_BH08_25.0

ERM_BH08_29.0

Sample	Sub-Matrix	Status	Date	Highly Impacted	Name
020	SOIL	Logged	1/12/2021 12:00:00 AM	☐	ERM_BH08_15.0
030	SOIL	Logged	1/12/2021 12:00:00 AM	☐	ERM_BH08_25.0
034	SOIL	Logged	1/12/2021 12:00:00 AM	☐	ERM_BH08_29.0
039	SOIL	Logged	1/12/2021 12:00:00 AM	☐	20211130_D02

^ Sydney samples are in trays: S1423-1426

Workorder	Login	☐	ES2144108
-----------	-------	--------------------------	-----------

Kind Regards,

Helen Simpson

Sample Admin, Environmental

Sydney



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From: Jessica Lawrence <Jessica.Lawrence@erm.com>

Sent: Monday, 13 December 2021 9:27 PM

To: Helen Simpson <helen.simpson@alsglobal.com>; Tristan Rodrigues <Tristan.Rodrigues@erm.com>

Cc: ALSEnviro Sydney <ALSEnviro.Sydney@ALSGlobal.com>

Subject: RE: [EXTERNAL] - FW: SRN for ALS Workorder : ES2144108 | Your Reference: 0577577 - The Bays

Hi Helen,

I just wanted to check to see if Tristan's request for the following got logged?

Additionally please analyse the following samples for PFAS:

20211130_D02

ERM_BH08_15.0

ERM_BH08_25.0

ERM_BH08_29.0

Thanks,

Jess

Jessica Lawrence
Senior Environmental Scientist

ERM

Level 15 | 309 Kent Street | Sydney NSW 2000

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E jessica.lawrence@erm.com | W www.erm.com



ERM *The business of sustainability*

From: Helen Simpson <helen.simpson@alsglobal.com>

Sent: Monday, December 6, 2021 5:04 PM

To: Tristan Rodrigues <Tristan.Rodrigues@erm.com>

Cc: ALSEnviro Sydney <ALSEnviro.Sydney@ALSGlobal.com>; Jessica Lawrence <Jessica.Lawrence@erm.com>

Subject: RE: [EXTERNAL] - FW: SRN for ALS Workorder : ES2144108 | Your Reference: 0577577 - The Bays

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Thanks Tristan – I'll have that done.

Kind Regards,

Helen Simpson

Sample Admin, Environmental
Sydney



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Smithfield NSW 2164 AUSTRALIA

Subscribe    

From: Tristan Rodrigues <Tristan.Rodrigues@erm.com>

Sent: Monday, 6 December 2021 4:07 PM

To: Helen Simpson <helen.simpson@alsglobal.com>

Cc: ALSEnviro Sydney <ALSEnviro.Sydney@ALSGlobal.com>; Jessica Lawrence <Jessica.Lawrence@erm.com>

Subject: RE: [EXTERNAL] - FW: SRN for ALS Workorder : ES2144108 | Your Reference: 0577577 - The Bays

Thanks Helen,

Just wanted to clarify in SRN ES2143673 it says

- **Sample 20211130_T01 has been forwarded to Eurofins as per COC requested.**

However in SRN ES2144108 it says that sample 20211130_T01 is placed on Hold, looks like 20211130_T01 from this COC (ES2144108) was mislabelled and should be 20211130_T02. Could you please relabel this sample to read 20211130_T02 and forward to eurofins for PFAS Analysis.

			(On Hold) SOIL No analysis requested	SOIL - EA033 Chromium Suite for Acid Sulphate Soils
ES2144108-036	01-Dec-2021 00:00	20211130_T01	✓	
ES2144108-037	01-Dec-2021 00:00	20211130_T03	✓	
ES2144108-038	01-Dec-2021 00:00	20211201_T04	✓	
ES2144108-039	01-Dec-2021 00:00	20211130_D02	✓	
ES2144108-040	01-Dec-2021 00:00	20211130_D03	✓	
ES2144108-041	01-Dec-2021 00:00	202111201_D04	✓	

Additionally please analyse the following samples for PFAS:

20211130_D02
ERM_BH08_15.0
ERM_BH08_25.0
ERM_BH08_29.0

Kind Regards

Tristan Rodrigues
Environmental Consultant

ERM

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E Tristan.Rodrigues@erm.com | W www.erm.com



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From: Helen Simpson <helen.simpson@alsglobal.com>

Sent: Monday, December 6, 2021 3:05 PM

To: Tristan Rodrigues <Tristan.Rodrigues@erm.com>

Cc: ALSEnviro Sydney <ALSEnviro.Sydney@ALSGlobal.com>; Jessica Lawrence <Jessica.Lawrence@erm.com>

Subject: RE: [EXTERNAL] - FW: SRN for ALS Workorder : ES2144108 | Your Reference: 0577577 - The Bays

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Hi Tristan,

I have made the ID changes and will arrange for T04 to be forwarded, however we did not receive a T02 sample.

Kind Regards,

Helen Simpson

Sample Admin, Environmental

Sydney



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helen.simpson@alsglobal.com

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Smithfield NSW 2164 AUSTRALIA

Subscribe    

From: Tristan Rodrigues <Tristan.Rodrigues@erm.com>

Sent: Monday, 6 December 2021 11:56 AM

To: Helen Simpson <helen.simpson@alsglobal.com>

Cc: ALSEnviro Sydney <ALSEnviro.Sydney@ALSGlobal.com>; Jessica Lawrence <Jessica.Lawrence@erm.com>

Subject: [EXTERNAL] - FW: SRN for ALS Workorder : ES2144108 | Your Reference: 0577577 - The Bays

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Hey guys,

In regards to this SRN please note the following

- ERM_BH07_2.0 no ASS Cr suite analysis required.
- Samples ERMBH08_13.5, 14.0 and 14.5 should read ERM_BH07_13.5, 14.0 and 14.5 as received, please amend IDs when issuing results
- Samples 20211201_T02 and 20211201_T04 should be sent to Eurofins for PFAS (28 analytes) analysis

- **ASS Cr Suite will not be conducted for sample ERM_BH07_2.0 as no separate frozen sample was received.**
- **Sample ERM_BH08_13.5 was received as ERM_BH07_13.5.**
- **Sample ERM_BH08_14.0 was received as ERM_BH07_14.0.**
- **Sample ERM_BH08_14.5 was received as ERM_BH07_14.5.**
- **Extra samples 19-41 received by ALS, these have been placed on hold.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months $\pm$ 1 week) from receipt of samples.
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Kind Regards

Tristan Rodrigues
Environmental Consultant

ERM

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E Tristan.Rodrigues@erm.com | W www.erm.com

From: angel-no-reply@alsglobal.com <angel-no-reply@alsglobal.com>
Sent: Friday, December 3, 2021 3:10 PM
To: Tristan Rodrigues <Tristan.Rodrigues@erm.com>
Subject: SRN for ALS Workorder : ES2144108 | Your Reference: 0577577 - The Bays

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Deliverables for ALS Workorder ES2144108

Project: 0577577 - The Bays

Dear TRISTAN RODRIGUES,

Please find enclosed the following deliverables for **ES2144108**:

- ES2144108_0_SRN_211203145905.pdf
- ES2144108_COC.pdf
- ES2144108_COC_1.pdf
- ES2144108_COC_2.pdf

Report Recipients

- TRISTAN RODRIGUES
 - ES2144108_0_SRN_211203145905.pdf (Email)
 - ES2144108_COC.pdf (Email)
 - ES2144108_COC_1.pdf (Email)
 - ES2144108_COC_2.pdf (Email)
- JESSICA LAWRENCE
 - ES2144108_0_SRN_211203145905
 - ES2144108_COC
 - ES2144108_COC_1
 - ES2144108_COC_2

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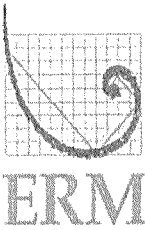
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APPENDIX F FIELD NOTES

ASS FIELD TEST RECORD

DATE	1/12/21	pH Probe Calibration conducted? Y/N	Yes	No			
MATERIAL ID (STP or excavation reference)		pH Probe 2-point Calibration	Desired	Actual			
JOB NUMBER	0406901 0577577	pH 4.0 Buffer Solution	4.0	4.02			
ERM Staff		pH 7.0 Buffer Solution	7.0	7.01			
		pH - DI Water	5.92				
		pH - Hydrogen Peroxide					
Sample ID	Material Source Exc Ref or STP ID	pH FIELD	pH FOX	Reaction Level 1 - 5	Delta pH pH FIELD - pH FOX	Laboratory Analysis Required?*	Comments
ERM BHO7 2.0		7.5804	6.67	4	1.37		
-2.5		8.21	7.04	3	1.17		
-3.0		8.23	7.67	3	0.56		
-3.5		8.34	7.61	3	0.73		
-4.0		7.51	2.35	4	5.16	Y	vigorous bubbling, High heat
-4.5		7.16	3.08	4	4.08	Y	
-5.0		7.59	5.91	3	1.68		
-5.5		7.73	5.96	3	1.77		
-6.0		7.92	2.17	4	5.75	Y	
-6.5		7.95	1.9	3	6.05	Y	
-7.0		6.64	3.46	2	3.18	Y	

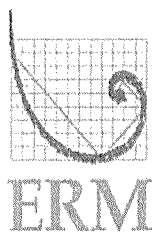
* Confirmatory laboratory analysis may be required if:

- pH F < 4; or
- at least two of the following:
- Effervescence (vigorous reaction such as bubbling/frothing);
- ΔpH > 1;
- pH FOX results < 3;
- Change in colour of the soil from grey tones to brown tones.

-7.5	7.04	3.2462.94	2	4.1	Y	
-8.0	7.0713	2.2944.61	2	2.52		
-8.5	7.14	4.85	2	2.29		

BH07	pH	PFOX	ΔTIT	Acid Reaction	Analysis
		2.08	5.17		
	^{2.5} 7.01	4.54		2	Yes
9.0			1.71		
		5.65		2	N
9.5	7.36	5.65 4.54			
			1.87	2	N
10.0	7.28	5.65 5.41			
			2.57	2	N
10.5	7.11	4.54			
11.0	6.2830	4.45	1.85	2	N
11.5	7.10	2.19	4.91	2	Y
12.0	7.02	2.78	4.24	2	Y
12.5	6.77	2.7	4.07	2	Y
13.0	6.85	1.95	4.9	2	Y
13.5	6.79	2.47	4.32	2	Y
		2.44	4.21	2	Y
14.0	6.65				
14.5	6.54	1.9	4.64	2	Y
15.0	6.55	4.48	2.07	2	N
15.5	6.65	5.11	1.54	2	N
16.0	6.05	4.71	1.34	2	N
16.5	6.31	34.07	3.24	2	N
17.0	6.2841	3.73	2.38	1	N
17.5	6.40	2.42	2.98	2	N
18.0	6.65	3.29		2	N
18.5	6.89	3.47	3.36	2	N
19.0	7.63	3.51	2.42	2	N
19.5	7.85	3.73	4.12	2	N
20.0	7.69	3.64	4.12	2	N
20.5	7.33	3.52	4.05	2	N
			3.81		N

ASS FIELD TEST RECORD

DATE 29/11/21		pH Probe Calibration conducted? Y/N	Yes	No			
MATERIAL ID (STP or excavation reference)		pH Probe 2-point Calibration	Desired	Actual			
JOB NUMBER 0577577	0205904 0577577	pH 4.0 Buffer Solution	4.0	4.07			
ERM Staff	TR	pH 7.0 Buffer Solution	7.0	6.99			
		pH - DI Water					
		pH - Hydrogen Peroxide					
Sample ID	Material Source Exc Ref or STP ID	pH FIELD	pH FOX	Reaction Level 1 - 5	Delta pH pH FIELD - pH FOX	Laboratory Analysis Required?*	Comments
ERM BH8 - 0.5		6.01	6.24	1	0.19	N	
- 1.0		6.21	7.0	4	0.6	N	stells, vigorous bubbling, overflow heat
- 1.5		8.16	7.18	4	0.98	N	heat, stells "
- 2.0		6.6	6.24	2	0.36	N	light bubbling
- 2.5		7.76	6.3	2	1.46	N	" "
- 3.0		9.5	6.1	1	2.4	N	little to no bubbles
- 3.5		7.73	5.52	2	2.21	N	light bubbling
ERM BH9 - 0.5		9.81	7.20	2	2.31	N	
- 1.0		6.6	4.93	3	1.67	N	Bubbling, heat
ERM BH07 - 0.5		6.3	7.79				
- 1.0		7.01	4.3	4	2.71	Y	Bubbling, heat

* Confirmatory laboratory analysis may be required if:

- pH F < 4; or

at least two of the following:

- Effervescence (vigorous reaction such as bubbling/frothing);

- ΔpH > 1;

- pH FOX results < 3;

- Change in colour of the soil from grey tones to brown tones.

ERM - BH07 - 1.5

6.91

3.28

4

3.63

Y

Bubbling, heat

ASS FIELD TEST RECORD							
DATE	30/11/21		pH Probe Calibration conducted? Y/N	☒ Yes	No		
MATERIAL ID (STP or excavation reference)			pH Probe 2-point Calibration	Desired	Actual		
JOB NUMBER	0406901 0577577		pH 4.0 Buffer Solution	4.0	4.09		
ERM Staff			pH 7.0 Buffer Solution	7.0	7.01		
			pH - DI Water	5.92			
			pH - Hydrogen Peroxide				
Sample ID	Material Source Exc Ref or STP ID	pH FIELD	pH FOX	Reaction Level 1 - 5	Delta pH pH FIELD - pH FOX	Laboratory Analysis Required?*	Comments
ERM-BH08-4.0		6.69	6.15	1	0.54	N	
-4.5		6.93	5.90	1	1.03	N	
-5.0		7.21	5.61	2	1.6	N	
-5.5		7.98	6.41	2	1.57	N	
-6.0		7.38	6.27	2	1.11	N	
-6.5		8.31	4.86	2	3.45	N	
-7.0		8.53	6.32	2	2.21	N	
-7.5		8.69	5.85	2	2.84	N	
-8.0		8.21	6.28	2	1.93	N	
-8.5		8.51	6.24	2	2.27	N	
-9.0		8.26	6.03	2	2.23	N	
		7.94	5.70	2	2.24		

* Confirmatory laboratory analysis may be required if:

- pH F < 4; or

at least two of the following:

- Effervescence (vigorous reaction such as bubbling/frothing);
- $\Delta pH > 1$;
- pH FOX results < 3;
- Change in colour of the soil from grey tones to brown tones.

ID	pH Field	pH FOX	Reaction Level	Δ pH	Analysis req	Comments
BH08 - 10.0	6.91	5.76	2			
- 10.5	7.29	5.49	2			
- 11.0	7.54	4.74	2			
- 11.5	7.64	4.59	2			
- 12.0	5.62	4.27	2			
- 12.5*	6.14	3.89	2			
- 13.0	6.33	4.17	2			
- 13.5	6.57	4.47	2			
14.0						

ASS FIELD TEST RECORD							
DATE	2/12/21		pH Probe Calibration conducted? Y/N	Yes	No		
MATERIAL ID (STP or excavation reference)			pH Probe 2-point Calibration	Desired	Actual		
JOB NUMBER	0406981 0577577		pH 4.0 Buffer Solution	4.0	4.01		
ERM Staff	TR		pH 7.0 Buffer Solution	7.0	7.02		
			pH - DI Water	5.95			
			pH - Hydrogen Peroxide	5.4			
Sample ID	Material Source Exc Ref or STP ID	pH FIELD	pH FOX	Reaction Level 1 - 5	Delta pH pH FIELD - pH FOX	Laboratory Analysis Required?*	Comments
ERM-BH09A-0.5		10.82 41	10.07	4	0.34	N	
-1.0		7.34	5.26	3	2.08	N	
-1.5		7.55	4.38	3	3.17	N	
-2.0		7.43	3.5	5	3.93	Y	
-2.5		7.57	6.46	2	1.11	N	
-3.0		7.84	6.41	3	1.43	N	
-3.5		8.22	6.42	2	1.8	N	
-4.0		8.16	6.38	2	1.78	N	
-5.0		8.04	5.97	2	2.07	N	
-8.2		8.46	5.87	2	2.58	N	

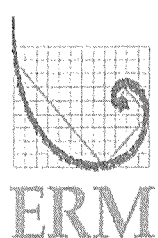
* Confirmatory laboratory analysis may be required if:

- pH F < 4; or
- at least two of the following:
 - Effervescence (vigorous reaction such as bubbling/frothing);
 - ΔpH > 1;
 - pH FOX results < 3;
 - Change in colour of the soil from grey tones to brown tones.

ASS FIELD TEST RECORD							
DATE	2-12-21		pH Probe Calibration conducted? Y/N	Yes	No		
MATERIAL ID (STP or excavation reference)			pH Probe 2-point Calibration	Desired	Actual		
JOB NUMBER	0577572		pH 4.0 Buffer Solution	4.0	4.01		
ERM Staff	NG		pH 7.0 Buffer Solution	7.0	7.02		
			pH - DI Water	5.95			
			pH - Hydrogen Peroxide	5.4			
Sample ID	Material Source Exc Ref or STP ID	pH FIELD	pH FOX	Reaction Level	Delta pH pH FIELD - pH FOX	Laboratory Analysis Required?*	Comments
				1 - 5		Y/N	
ERM - BH09A							
-9.0		8.64	6.42	2	2.22	N	
-9.5		8.72	6.75	2	1.97	N	
-10.0		8.31	6.21	2	2.1	N	
-10.5		7.73	6.01	1	1.72	N	
-11.0		8.21	6.72	1	1.49	N	
-11.5		8.13	6.83	1	1.3	N	
-12.0		7.32	5.52	1	1.8	N	
-12.5		7.86	5.61	1	2.25	N	
-13.0		7.14	5.98	1	1.16	N	
-13.5		7.92	6.25	1	1.67	N	
		8.65	6.14	1	2.51	N	

* Confirmatory laboratory analysis may be required if:

- pH F < 4; or
- Effervescence (vigorous reaction such as bubbling/frothing);
- ΔpH > 1;
- pH FOX results < 3;
- Change in colour of the soil from grey tones to brown tones.

ASS FIELD TEST RECORD							
DATE	3/12/21		pH Probe Calibration conducted? Y/N	Yes	No		
MATERIAL ID (STP or excavation reference)			pH Probe 2-point Calibration	Desired	Actual		
JOB NUMBER	0406901 0597577		pH 4.0 Buffer Solution	4.0	4.02		
ERM Staff			pH 7.0 Buffer Solution	7.0	7.01		
			pH - DI Water	5.95			
			pH - Hydrogen Peroxide	5.4			
Sample ID	Material Source Exc Ref or STP ID	pH FIELD	pH FOX	Reaction Level 1 - 5	Delta pH pH FIELD - pH FOX	Laboratory Analysis Required?*	Comments
BH09A - 14.5		7.19	2.47	2	4.72	Y	
- 15.0		7.34	3.17	2	4.17	N	
- 15.5		7.32	2.86	2	4.46	Y	
- 16		7.28	2.60	2	4.68	Y	
- 16.5		5.1	4.19	2	0.91	N	
- 17		5.31	3.40	2	1.91	N	
- 17.5		5.47	4.30	2	1.17	N	

* Confirmatory laboratory analysis may be required if:

- pH F < 4; or
- at least two of the following:
 - Effervescence (vigorous reaction such as bubbling/frothing);
 - ΔpH > 1;
 - pH FOX results < 3;
 - Change in colour of the soil from grey tones to brown tones.

APPENDIX G QA/QC ASSESSMENT

1. QUALITY ASSURANCE AND QUALITY CONTROL

The objective of this data assessment is to evaluate the quality of data gathered during the assessment detailed in this report. This process has been undertaken to assess whether the sample data is of a suitable standard to be utilised in this report. The data assessment consists of comparing field and laboratory QA/QC results to documented NEPC, ANZECC, USEPA SW-846 guidelines, USEPA CLP National Functional Guidelines for Inorganic and Organic Data Review, and other internationally recognised publications. The data assessment has been prepared in accordance with the ASC NEPM. Particular reference is made to the PARCC parameters (precision, accuracy, representativeness, completeness and comparability) in evaluating the data quality.

Table G1 below discusses the QA/QC measures pertinent to the site investigation sampling. Table G2 presented at the end of this annex identifies laboratory reports relevant to the investigation works.

Table G1 Field QA/QC Assessment

QA/QC Criterion	Comments
QA/QC program includes intra-laboratory duplicates and inter-laboratory duplicates samples	Field duplicate samples, including intra and inter laboratory duplicates were collected at a minimum ratio of one duplicate to ten primary samples (10%). The Relative Percentage Difference (RPDs) of soil duplicate sample pairs were within the acceptance limits (30% RPD (or 50% RPD for organics) where one or both values were greater than 10 x LOR or 50% RPD where one or both values were less than 10 x LOR). RPDs for all soil duplicate pairs are presented in Table G4. Based on the results obtained from the soil RPDs, it is considered that the dataset quality is adequate and acceptable for the purposes of the Detailed Site Investigation.
Appropriate decontamination procedures were adopted	Samples were collected using a fresh pair of nitrile gloves. Soils were either collected from the sonic sleeve. Decontamination of down hole drilling equipment prior to starting each new location was conducted, and collection of rinsate samples was conducted to evaluate the decontamination process. No detections of analytes were reported in rinsate samples, demonstrating effective decontamination was achieved.
All relevant media assessed	The scope involved soil sampling only. Soil samples were collected from various depths within the soil profile and were submitted for laboratory analysis. The additional soil samples are intended to supplement the existing dataset
Appropriateness of Sampling Strategy	Investigation locations were targeted specifically to determine the vertical extent of any PASS, increase PFAS and asbestos sample density, and determine whether PFAS at detectable concentrations is present in the rock. The sampling strategy adopted comprised of targeted investigation locations, to replicate sampling at locations where PFAS was detected in rock previously and thought to have potentially been due to cross contamination. The sampling design was considered appropriate to meet the project objectives.
Trip Blank and Trip Spikes Collected	A total of five laboratory-prepared trip blank samples (all soil), were prepared, stored and transported with soil samples. Summary tables of results for soil trip blanks are presented in Table G5. The concentrations of COPCs in trip blanks were reported below the laboratory LOR for all samples analysed, indicating a low likelihood of cross-contamination having occurred during transport and storage of samples. A total of five laboratory prepared soil trip spike (TS) samples were analysed as part of the investigation. Trip spike recovery percentages reported by the laboratory are presented in Table G6. Trip spikes submitted with soil batches were all reported within the acceptable recovery range (70-130%).

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QA/QC Criterion	Comments
Sample Collection, handling, and transportation procedures	Borelogs describing the media sampled, sampling locations, observations of potential contamination (e.g. odour) and field QA/QC samples were completed. Soil encountered was also photographed. (refer to <i>Appendix C</i>). Soil samples were placed in laboratory supplied sample jars, stored in a chilled cooler on ice, and forwarded to the NATA-accredited laboratory under COC conditions. The methods used to collect the samples, the types of sample containers, preservation techniques and custody protocols were generally documented appropriately. Attempts to chill were recorded as present by the laboratory upon sample receipt.
Sampling is representative of the site conditions	The number and type of samples collected were considered to be appropriate given the extensive sampling previously conducted at the site. The data is intended to be used alongside existing data, with the larger dataset incorporating historical data being representative of the in-situ soils/rock.
Other field QA/QC	Field instruments used as part of the investigation were appropriately calibrated and used according to the manufacturer's instructions. Calibration records are included in <i>Appendix H</i>.

Table G2 below summarises the laboratory's QA/QC measures pertinent to the analytical program.

Table G2 Laboratory QA/QC Assessment

QA/QC criterion	Comments
Appropriate methodologies used for sample analyses	The laboratories used for the investigation works were NATA accredited ALS (NATA Registration No. 825) and Eurofins (NATA Registration No. 1261). All laboratory reports were NATA stamped and signed by a NATA signatory. All methodologies were considered appropriate for the identified contaminants of concern in the matrix.
Appropriate Limit of Reporting	The laboratory LOR for each analyte is presented in the laboratory reports and summary tables. LORs were appropriate to allow screening of results against the nominated criteria.
Laboratory QA/QC Plan	Copies of chain of custody forms were returned by the laboratory. The primary and secondary laboratories were NATA accredited. It is noted that all analytical methods completed were NATA approved as documented on the laboratory reports. Laboratory reports indicate results not covered by NATA accreditation which were limited to calculations of totals (e.g. total BTEX, total PAH). Laboratory quality control samples included laboratory control samples, internal duplicates, matrix spikes and method blanks. The types of QA/QC samples analysed by the laboratory for the documented samples were considered sufficient to assess the precision and accuracy of the laboratory methods used. The statistical data presented in the laboratory QA/QC reports were considered adequate in demonstrating the precision and accuracy of the methods used to analyse field samples. Laboratory duplicate RPDs were within the acceptable ranges. Minimal matrix spike outliers were reported as follows: ■ Matrix spike recovery for mercury was less than the lower data quality objective in sample ES2143435-003 ■ Matrix spike recovery for PFOS was not determined as the background level was greater than 4x the spike level in sample ES2141618-025 ■ Matrix spike recovery for nickel was not determined as the background level was greater than 4x the spike level in sample ES2143765-002

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QA/QC criterion	Comments
	Matrix spike recovery for mercury was less than the lower data quality objective in sample ES2143435-003 One holding time outlier was reported for analysis of pH in one sample. As this holding time non compliance was 1 day, and extraction/preparation of the sample was completed within holding time, this non conformance does not affect the outcomes of this investigation.

Table D3 summarises the QA/QC results in relation to the data quality indicators of precision, accuracy, representativeness, comparability and completeness for the investigation sampling program.

Table G3 Overall Sampling and Analysis Methodology Assessment

Field Considerations	Laboratory Considerations
Precision Requirements	
The soil sampling was conducted following ERM's SOPs and any variations from these procedures were documented.	Analysis of the following were reported: - Laboratory duplicates; and - Field intra- and inter- laboratory duplicates;
Precision Comments	
No significant variations from ERM's SOPs were noted. Field and laboratory duplicates were reported within the acceptance limits.	
Accuracy Requirements	
The soil sampling was conducted following ERM's SOPs and any variations from these procedures were documented.	Analysis of the following were reported: - Trip blanks; - Method blanks; - Matrix spikes; - Surrogate spikes; and - Laboratory control samples.
Accuracy Comments	
Decontamination of the down hole drilling equipment was conducted prior to drilling at each location. Rinsate samples were collected and evaluated to determine the effectiveness of field rinsate procedures. No COPCs were detected in rinsate samples. No significant variations from ERM SOPs were noted. Laboratory QA/QC samples were generally reported within the acceptance limits specified in the laboratory reports.	
Representativeness Requirements	
Appropriate media were identified and sampled.	Samples were analysed according to the Sampling and Analysis Plan.
Representativeness Comments	
The number and type of samples collected as part of investigation works was considered to be representative of the areas where PFAS was detected in rock previously. The number and locations of boreholes was generally in accordance with the SAQP. ERM considers that sufficient data is available to establish a representative dataset across the station box the purposes of site characterisation and in-situ waste classification.	

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Field Considerations	Laboratory Considerations
Comparability Requirements	
■ SOPs were used. ■ All sampling was conducted by an appropriately qualified and experienced sampler. ■ Impacts of climatic conditions on sample integrity were minimised by storing samples in a chilled cooler (with the exception of soil vapour samples). ■ The types of samples collected were consistent.	■ Analytical methods suitable for the target media were used. ■ The laboratory LORs used to report analyte concentrations were less than the adopted investigation criteria. ■ Results of laboratory analysis generally comparable with field screening results where applicable (field observations, PID screening, field pH testing).
Comparability Comments	
The laboratory LOR for each analyte is presented in the laboratory reports and summary tables.	
Completeness Requirements	
■ Relevant locations were sampled. ■ The sampling program was conducted following ERM's SOPs and any variations from these procedures were documented. ■ All sampling was conducted by an appropriately qualified and experienced sampler. ■ Documentation of field works was provided (refer to other Appendices).	■ All critical samples were analysed. ■ All analytes were analysed according to the Sampling and Analysis Plan. ■ Appropriate analysis methods and laboratory LORs were used in the majority of cases. ■ Sample documentation was provided. ■ Sample holding times were generally complied with.
Completeness Comments	
The number and type of samples collected were considered to be representative of the areas where PFAS was previously detected in rock samples. The locations of the samples are also considered appropriate to enable conclusions relating to vertical extents of PASS. Evaluation of soil for asbestos in fill was only able to be done to a limited degree due to boreholes being used to collect samples and inspect soil, however test pits have been completed at the site previously.	

Field Duplicates (SOIL)
Filter: Lab_Report_Nu

Lab Report Number	ES2144294	ES2144294	
Field ID	ERM_BH07_25.0	20211202_D05	RPD
Sampled Date/Time	2/12/2021 15:00	2/12/2021 15:00	

Chem_Gr	ChemNam	Units	EQL			
Fluorotelor	4:2 Fluoro	µg/kg	0.5 (Primary): 5 (Interlab	<0.5	<0.5	0
	6:2 Fluoro	µg/kg	0.5 (Primary): 10 (Interlab	<0.5	<0.5	0
	8:2 Fluoro	µg/kg	0.5 (Primary): 5 (Interlab	<0.5	<0.5	0
	10:2 Fluoro	µg/kg	0.5 (Primary): 5 (Interlab	<0.5	<0.5	0
ner Sulfonic Acids						
Perfluorooa	Perfluoroh	µg/kg	0.2 (Primary): 5 (Interlab	<0.2	<0.2	0
	Perfluorod	µg/kg	0.2 (Primary): 5 (Interlab	<0.2	<0.2	0
	Perfluoron	µg/kg	0.2 (Primary): 5 (Interlab	<0.2	<0.2	0
	Perfluorop	µg/kg	0.2 (Primary): 5 (Interlab	<0.2	<0.2	0
	Perfluorote	µg/kg	0.5 (Primary): 5 (Interlab	<0.5	<0.5	0
	Perfluoroh	µg/kg	0.2 (Primary): 5 (Interlab	<0.2	<0.2	0
	Perfluorob	µg/kg	1 (Primary): 5 (Interlab)	<1.0	<1.0	0
	Perfluorod	µg/kg	0.2 (Primary): 5 (Interlab	<0.2	<0.2	0
	Perfluorotr	µg/kg	0.2 (Primary): 5 (Interlab	<0.2	<0.2	0
	Perfluorou	µg/kg	0.2 (Primary): 5 (Interlab	<0.2	<0.2	0
	Perfluoroo	µg/kg	0.2 (Primary): 5 (Interlab	<0.2	<0.2	0
lkane Carboxylic Aci						
Perfluorooa	Perfluoroo	µg/kg	0.2 (Primary): 5 (Interlab	<0.2	<0.2	0
	Perfluorop	µg/kg	0.2 (Primary): 5 (Interlab	<0.2	<0.2	0
	Perfluoroh	µg/kg	0.2 (Primary): 5 (Interlab	<0.2	<0.2	0
	Perfluoroh	µg/kg	0.2 (Primary): 5 (Interlab	<0.2	<0.2	0
	Perfluorod	µg/kg	0.2 (Primary): 5 (Interlab	<0.2	<0.2	0
	Perfluorob	µg/kg	0.2 (Primary): 5 (Interlab	<0.2	<0.2	0
	Sum of PF	µg/kg	0.2 (Primary): 5 (Interlab	<0.2	<0.2	0
lkane Sulfonic Acids						
Perfluorooa	N-ethyl PF	µg/kg	0.5 (Primary): 5 (Interlab	<0.5	<0.5	0
	N-methyl-P	µg/kg	0.2 (Primary): 10 (Interlab	<0.2	<0.2	0
	N-ethyl-PF	µg/kg	0.2 (Primary): 10 (Interlab	<0.2	<0.2	0
	N-ethyl PF	µg/kg	0.5 (Primary): 5 (Interlab	<0.5	<0.5	0
	N-Methyl p	µg/kg	0.5 (Primary): 5 (Interlab	<0.5	<0.5	0
	N-methyl P	µg/kg	0.5 (Primary): 5 (Interlab	<0.5	<0.5	0
	Perfluoroo	µg/kg	0.2 (Primary): 5 (Interlab	<0.2	<0.2	0
lkyl Sulfonamides						
PFAS Sum	Sum of PF	µg/kg	0.2 (Primary): 50 (Interlab	<0.2	<0.2	0
is						
Physical P	Moisture C	%	0.1	4.9	5.0	2

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

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

***Interlab Duplicates are matched on a per compound basis as methods vary between laboratories

Filter: Lab_Report_Number

in('ES2144300','ES2144294','ES2144109','ES2144108','ES2145542','ES2143674','ES2143673')

Field Duplicates (SOIL)
Filter: Lab_Report_Nu

Lab Report Number	ES2145542	ES2145542	
Field ID	ERM_BH08_15.0	20211130_D02	RPD
Sampled Date/Time	1/12/2021	1/12/2021	

Chem_Gr	ChemNam	Units	EQL			
Fluorotelor	4:2 Fluoro	µg/kg	0.5 (Primary): 5 (Interlab	<0.5	<0.5	0
	6:2 Fluoro	µg/kg	0.5 (Primary): 10 (Interlab	<0.5	<0.5	0
	8:2 Fluoro	µg/kg	0.5 (Primary): 5 (Interlab	<0.5	<0.5	0
	10:2 Fluoro	µg/kg	0.5 (Primary): 5 (Interlab	<0.5	<0.5	0
ner Sulfonic Acids						
Perfluorooa	Perfluoroh	µg/kg	0.2 (Primary): 5 (Interlab	<0.2	<0.2	0
	Perfluorod	µg/kg	0.2 (Primary): 5 (Interlab	<0.2	<0.2	0
	Perfluoron	µg/kg	0.2 (Primary): 5 (Interlab	<0.2	<0.2	0
	Perfluorop	µg/kg	0.2 (Primary): 5 (Interlab	<0.2	<0.2	0
	Perfluorote	µg/kg	0.5 (Primary): 5 (Interlab	<0.5	<0.5	0
	Perfluoroh	µg/kg	0.2 (Primary): 5 (Interlab	<0.2	<0.2	0
	Perfluorob	µg/kg	1 (Primary): 5 (Interlab)	<1.0	<1.0	0
	Perfluorod	µg/kg	0.2 (Primary): 5 (Interlab	<0.2	<0.2	0
	Perfluorotr	µg/kg	0.2 (Primary): 5 (Interlab	<0.2	<0.2	0
	Perfluorou	µg/kg	0.2 (Primary): 5 (Interlab	<0.2	<0.2	0
	Perfluoroo	µg/kg	0.2 (Primary): 5 (Interlab	<0.2	<0.2	0
lkane Carboxylic Aci						
Perfluorooa	Perfluoroo	µg/kg	0.2 (Primary): 5 (Interlab	<0.2	<0.2	0
	Perfluorop	µg/kg	0.2 (Primary): 5 (Interlab	<0.2	<0.2	0
	Perfluoroh	µg/kg	0.2 (Primary): 5 (Interlab	<0.2	<0.2	0
	Perfluoroh	µg/kg	0.2 (Primary): 5 (Interlab	<0.2	<0.2	0
	Perfluorod	µg/kg	0.2 (Primary): 5 (Interlab	<0.2	<0.2	0
	Perfluorob	µg/kg	0.2 (Primary): 5 (Interlab	<0.2	<0.2	0
	Sum of PF	µg/kg	0.2 (Primary): 5 (Interlab	<0.2	<0.2	0
lkane Sulfonic Acids						
Perfluorooa	N-ethyl PF	µg/kg	0.5 (Primary): 5 (Interlab	<0.5	<0.5	0
	N-methyl-P	µg/kg	0.2 (Primary): 10 (Interlab	<0.2	<0.2	0
	N-ethyl-PF	µg/kg	0.2 (Primary): 10 (Interlab	<0.2	<0.2	0
	N-ethyl PF	µg/kg	0.5 (Primary): 5 (Interlab	<0.5	<0.5	0
	N-Methyl p	µg/kg	0.5 (Primary): 5 (Interlab	<0.5	<0.5	0
	N-methyl P	µg/kg	0.5 (Primary): 5 (Interlab	<0.5	<0.5	0
	Perfluoroo	µg/kg	0.2 (Primary): 5 (Interlab	<0.2	<0.2	0
lkyl Sulfonamides						
PFAS Sum	Sum of PF	µg/kg	0.2 (Primary): 50 (Interlab	<0.2	<0.2	0
is						
Physical P	Moisture C	%	0.1	5.2	6.3	19

*RPDs have only been considered where a concentration

**High RPDs are in bold (Acceptable RPDs for each ED (10-30 x EQL); 30 (> 30 x EQL))

***Interlab Duplicates are matched on a per compound basis. Any methods in the row header relate to

Filter: Lab_Report_Number

in('ES2144300','ES2144294','ES2144109','ES2144108','ES2145542','ES2143674','ES2143673')

Field Duplicates (SOIL)
Filter: Lab_Report_Nu

Lab Report Number	ES2144294	847909
Field ID	ERM_BH07_25.0	20211202_T05
Sampled Date/Time	2/12/2021 15:00	2/12/2021 15:00

Chem_Gr	ChemNam	Units	EQL			
Fluorotelom	4:2 Fluoro	µg/kg	0.5 (Primary): 5 (Interlab)	<0.5	<0.1	0
	6:2 Fluoro	µg/kg	0.5 (Primary): 10 (Interlab)	<0.5	<0.5	0
	8:2 Fluoro	µg/kg	0.5 (Primary): 5 (Interlab)	<0.5	<0.1	0
	10:2 Fluoro	µg/kg	0.5 (Primary): 5 (Interlab)	<0.5	<0.1	0
Perfluorinated Sulfonic Acids						
Perfluorooxa	Perfluorohexa	µg/kg	0.2 (Primary): 5 (Interlab)	<0.2	<0.1	0
	Perfluoroocta	µg/kg	0.2 (Primary): 5 (Interlab)	<0.2	<0.1	0
	Perfluoronona	µg/kg	0.2 (Primary): 5 (Interlab)	<0.2	<0.1	0
	Perfluorodeca	µg/kg	0.2 (Primary): 5 (Interlab)	<0.2	<0.1	0
	Perfluorotride	µg/kg	0.5 (Primary): 5 (Interlab)	<0.5	<0.1	0
	Perfluorotetra	µg/kg	0.2 (Primary): 5 (Interlab)	<0.2	<0.1	0
	Perfluoropenta	µg/kg	1 (Primary): 5 (Interlab)	<1.0	<0.5	0
	Perfluorohexa	µg/kg	0.2 (Primary): 5 (Interlab)	<0.2	<0.1	0
	Perfluoroocta	µg/kg	0.2 (Primary): 5 (Interlab)	<0.2	<0.1	0
	Perfluoronona	µg/kg	0.2 (Primary): 5 (Interlab)	<0.2	<0.1	0
	Perfluorodeca	µg/kg	0.2 (Primary): 5 (Interlab)	<0.2	<0.1	0
	Perfluorotride	µg/kg	0.2 (Primary): 5 (Interlab)	<0.2	<0.1	0
Alkane Carboxylic Acids						
Perfluorooxa	Perfluorooxa	µg/kg	0.2 (Primary): 5 (Interlab)	<0.2	<0.1	0
	Perfluoroocta	µg/kg	0.2 (Primary): 5 (Interlab)	<0.2	<0.1	0
	Perfluoronona	µg/kg	0.2 (Primary): 5 (Interlab)	<0.2	<0.1	0
	Perfluorodeca	µg/kg	0.2 (Primary): 5 (Interlab)	<0.2	<0.1	0
	Perfluorotride	µg/kg	0.2 (Primary): 5 (Interlab)	<0.2	<0.1	0
	Perfluorotetra	µg/kg	0.2 (Primary): 5 (Interlab)	<0.2	<0.1	0
	Perfluoropenta	µg/kg	0.2 (Primary): 5 (Interlab)	<0.2	<0.1	0
	Perfluorohexa	µg/kg	0.2 (Primary): 5 (Interlab)	<0.2	<0.1	0
	Sum of PF	µg/kg	0.2 (Primary): 5 (Interlab)	<0.2	<0.1	0
Alkane Sulfonic Acids						
Perfluorooxa	N-ethyl PF	µg/kg	0.5 (Primary): 5 (Interlab)	<0.5	<0.5	0
	N-methyl-PF	µg/kg	0.2 (Primary): 10 (Interlab)	<0.2	<0.5	0
	N-ethyl-PF	µg/kg	0.2 (Primary): 10 (Interlab)	<0.2	<0.5	0
	N-ethyl PF	µg/kg	0.5 (Primary): 5 (Interlab)	<0.5	<0.5	0
	N-Methyl p	µg/kg	0.5 (Primary): 5 (Interlab)	<0.5	<0.5	0
	N-methyl P	µg/kg	0.5 (Primary): 5 (Interlab)	<0.5	<0.5	0
	Perfluorooxa	µg/kg	0.2 (Primary): 5 (Interlab)	<0.2	<0.5	0
Alkyl Sulfonamides						
PFAS Sum	Sum of PF	µg/kg	0.2 (Primary): 50 (Interlab)	<0.2	<0.5	0
IS						
Physical P	Moisture C	%	0.1	4.9		

*RPDs have only been considered where a concentration is present

**High RPDs are in bold (Acceptable RPDs for each EQL)

***Interlab Duplicates are matched on a per compound basis to those used in the primary laboratory

Filter: Lab_Report_Number

in('ES2144300','ES2144294','ES2144109','ES2144108','ES2145542','ES2143674','ES2143673')

Field Duplicates (SOIL)
Filter: Lab_Report_Nu

Lab Report Number	ES2145542	848609
Field ID	ERM_BH08_15.0	20211201_T02
Sampled Date/Time	1/12/2021	1/12/2021

Chem_Gr	ChemNam	Units	EQL			
Fluorotelom	4:2 Fluoro	µg/kg	0.5 (Primary): 5 (Interlab	<0.5	<0.1	0
	6:2 Fluoro	µg/kg	0.5 (Primary): 10 (Interlab	<0.5	<0.5	0
	8:2 Fluoro	µg/kg	0.5 (Primary): 5 (Interlab	<0.5	<0.1	0
	10:2 Fluoro	µg/kg	0.5 (Primary): 5 (Interlab	<0.5	<0.1	0
Perfluorinated Sulfonic Acids						
Perfluorooa	Perfluoroh	µg/kg	0.2 (Primary): 5 (Interlab	<0.2	<0.1	0
	Perfluorod	µg/kg	0.2 (Primary): 5 (Interlab	<0.2	<0.1	0
	Perfluoron	µg/kg	0.2 (Primary): 5 (Interlab	<0.2	<0.1	0
	Perfluorop	µg/kg	0.2 (Primary): 5 (Interlab	<0.2	<0.1	0
	Perfluorote	µg/kg	0.5 (Primary): 5 (Interlab	<0.5	<0.1	0
	Perfluoroh	µg/kg	0.2 (Primary): 5 (Interlab	<0.2	<0.1	0
	Perfluorob	µg/kg	1 (Primary): 5 (Interlab)	<1.0	<0.5	0
	Perfluorod	µg/kg	0.2 (Primary): 5 (Interlab	<0.2	<0.1	0
	Perfluorotr	µg/kg	0.2 (Primary): 5 (Interlab	<0.2	<0.1	0
	Perfluorou	µg/kg	0.2 (Primary): 5 (Interlab	<0.2	<0.1	0
	Perfluoroo	µg/kg	0.2 (Primary): 5 (Interlab	<0.2	<0.1	0
Alkane Carboxylic Acids						
Perfluorooa	Perfluoroo	µg/kg	0.2 (Primary): 5 (Interlab	<0.2	<0.1	0
	Perfluorop	µg/kg	0.2 (Primary): 5 (Interlab	<0.2	<0.1	0
	Perfluoroh	µg/kg	0.2 (Primary): 5 (Interlab	<0.2	<0.1	0
	Perfluoroh	µg/kg	0.2 (Primary): 5 (Interlab	<0.2	<0.1	0
	Perfluorod	µg/kg	0.2 (Primary): 5 (Interlab	<0.2	<0.1	0
	Perfluorob	µg/kg	0.2 (Primary): 5 (Interlab	<0.2	<0.1	0
	Sum of PF	µg/kg	0.2 (Primary): 5 (Interlab	<0.2	<0.1	0
Alkane Sulfonic Acids						
Perfluorooa	N-ethyl PF	µg/kg	0.5 (Primary): 5 (Interlab	<0.5	<0.5	0
	N-methyl-P	µg/kg	0.2 (Primary): 10 (Interlab	<0.2	<0.5	0
	N-ethyl-PF	µg/kg	0.2 (Primary): 10 (Interlab	<0.2	<0.5	0
	N-ethyl PF	µg/kg	0.5 (Primary): 5 (Interlab	<0.5	<0.5	0
	N-Methyl p	µg/kg	0.5 (Primary): 5 (Interlab	<0.5	<0.5	0
	N-methyl P	µg/kg	0.5 (Primary): 5 (Interlab	<0.5	<0.5	0
	Perfluoroo	µg/kg	0.2 (Primary): 5 (Interlab	<0.2	<0.5	0
Alkyl Sulfonamides						
PFAS Sum	Sum of PF	µg/kg	0.2 (Primary): 50 (Interlab	<0.2	<0.5	0
IS						
Physical P	Moisture C	%	0.1	5.2		

*RPDs have only been considered where a concentration is present

**High RPDs are in bold (Acceptable RPDs for each EQL are in normal)

***Interlab Duplicates are matched on a per compound basis

Filter: Lab_Report_Number

in('ES2144300','ES2144294','ES2144109','ES2144108','ES2145542','ES2143674','ES2143673')



Table G5. Trip Blank Recoveries

Station Box DSI

The Bays Construction Site, Sydney Metro West

Lab Report Number	ES2143674	ES2144109	ES2144109	ES2144294	ES2144300	ES2144300
Field ID	TB	TB	Trip Blank	Trip Blank	TB	TB
Sampled_Date	26/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021
Sample Type	Trip_B	Trip_B	Trip_B	Trip_B	Trip_B	Trip_B

Chem_Group	ChemName	Units	EQL						
BTEX	Benzene	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	Toluene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Ethylbenzene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Xylene (m & p)	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Xylene (o)	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Total Xylene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Total BTEX	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Fluorotelomer Sulfonic Acids	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/kg	0.5		<0.5		<0.5	<0.5	<0.5
	6:2 Fluorotelomer Sulfonate (6:2 FtS)	µg/kg	0.5		<0.5		<0.5	<0.5	<0.5
	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/kg	0.5		<0.5		<0.5	<0.5	<0.5
	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/kg	0.5		<0.5		<0.5	<0.5	<0.5
PAHs	Naphthalene	mg/kg	1	<1	<1	<1	<1	<1	<1
Perfluoroalkane Carboxylic Acids	Perfluorohexanoic acid (PFHxA)	µg/kg	0.2		<0.2		<0.2	<0.2	<0.2
	Perfluorododecanoic acid (PFDoDA)	µg/kg	0.2		<0.2		<0.2	<0.2	<0.2
	Perfluorononanoic acid (PFNA)	µg/kg	0.2		<0.2		<0.2	<0.2	<0.2
	Perfluoropentanoic acid (PFPeA)	µg/kg	0.2		<0.2		<0.2	<0.2	<0.2
	Perfluorotetradecanoic acid (PFTeDA)	µg/kg	0.5		<0.5		<0.5	<0.5	<0.5
	Perfluoroheptanoic acid (PFHpA)	µg/kg	0.2		<0.2		<0.2	<0.2	<0.2
	Perfluorobutanoic acid (PFBA)	µg/kg	1		<1		<1	<1	<1
	Perfluorodecanoic acid (PFDA)	µg/kg	0.2		<0.2		<0.2	<0.2	<0.2
	Perfluorotridecanoic acid (PFTrDA)	µg/kg	0.2		<0.2		<0.2	<0.2	<0.2
	Perfluoroundecanoic acid (PFUnDA)	µg/kg	0.2		<0.2		<0.2	<0.2	<0.2
	Perfluorooctanoic acid (PFOA)	µg/kg	0.2		<0.2		<0.2	<0.2	<0.2
Perfluoroalkane Sulfonic Acids	Perfluorooctanesulfonic acid (PFOS)	µg/kg	0.2		<0.2		<0.2	<0.2	<0.2
	Perfluoropentane sulfonic acid (PFPeS)	µg/kg	0.2		<0.2		<0.2	<0.2	<0.2
	Perfluorohexane sulfonic acid (PFHxS)	µg/kg	0.2		<0.2		<0.2	<0.2	<0.2
	Perfluoroheptane sulfonic acid (PFHpS)	µg/kg	0.2		<0.2		<0.2	<0.2	<0.2
	Perfluorodecanesulfonic acid (PFDS)	µg/kg	0.2		<0.2		<0.2	<0.2	<0.2
	Perfluorobutane sulfonic acid (PFBS)	µg/kg	0.2		<0.2		<0.2	<0.2	<0.2
	Sum of PFHxS and PFOS	µg/kg	0.2		<0.2		<0.2	<0.2	<0.2
Perfluoroalkyl Sulfonamides	N-ethyl PFO sulfonamidoethanol (EtFOSE)	µg/kg	0.5		<0.5		<0.5	<0.5	<0.5
	N-methyl-PFO sulfonamidoacetic acid (MeFOSAA)	µg/kg	0.2		<0.2		<0.2	<0.2	<0.2
	N-ethyl-PFO sulfonamidoacetic acid (NEtFOSAA)	µg/kg	0.2		<0.2		<0.2	<0.2	<0.2
	N-ethyl PFO sulfonamide (EtFOSA)	µg/kg	0.5		<0.5		<0.5	<0.5	<0.5
	N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/kg	0.5		<0.5		<0.5	<0.5	<0.5
	N-methyl PFO sulfonamidoethanol (MeFOSE)	µg/kg	0.5		<0.5		<0.5	<0.5	<0.5
	Perfluorooctane sulfonamide (FOSA)	µg/kg	0.2		<0.2		<0.2	<0.2	<0.2
PFAS Sums	Sum of PFAS	µg/kg	0.2		<0.2		<0.2	<0.2	<0.2
Total Petroleum Hydrocarbons	C6-C9 Fraction	mg/kg	10		<10	<10	<10	<10	<10
Total Recoverable Hydrocarbons	C6-C10 Fraction	mg/kg	10		<10	<10	<10	<10	<10
	C6-C10 Fraction minus BTEX (F1)	mg/kg	10		<10	<10	<10	<10	<10

Filter: Lab_Report_Number in('ES2143673','ES2143674','ES2144108','ES2144109','ES2144294','ES2144300','ES2145542')



Trip Spike Recoveries (30% - 150% is acceptable)

Table G6. Trip Spike Recoveries
Station Box Waste Classification W01- Fill
The Bays Construction Site, Sydney Metro West

SDG	Lab_Report	Matrix_Type	SampleCode	Field_ID	Method_Name	Compound	Trip_Spike_Result	Trip_Spike_Control	Result_Units	Spike_Recovery_%	Acceptable
ALSE-Sydney 01-Dec-21	ES2143674	SOIL	ES2143674006	TS 3	EP080: BTEXN	Benzene	<0.2	<0.2	mg/kg	100	Y
ALSE-Sydney 01-Dec-21	ES2143674	SOIL	ES2143674006	TS 3	EP080: BTEXN	Ethylbenzene	1.7	2	mg/kg	85	Y
ALSE-Sydney 01-Dec-21	ES2143674	SOIL	ES2143674006	TS 3	EP080: BTEXN	meta- & para-Xylene	8.6	10.7	mg/kg	80	Y
ALSE-Sydney 01-Dec-21	ES2143674	SOIL	ES2143674006	TS 3	EP080: BTEXN	Naphthalene	<1	<1	mg/kg	100	Y
ALSE-Sydney 01-Dec-21	ES2143674	SOIL	ES2143674006	TS 3	EP080: BTEXN	ortho-Xylene	4	4.8	mg/kg	83	Y
ALSE-Sydney 01-Dec-21	ES2143674	SOIL	ES2143674006	TS 3	EP080: BTEXN	Sum of BTEX	21.8	26.6	mg/kg	82	Y
ALSE-Sydney 01-Dec-21	ES2143674	SOIL	ES2143674006	TS 3	EP080: BTEXN	Toluene	7.5	9.1	mg/kg	82	Y
ALSE-Sydney 01-Dec-21	ES2143674	SOIL	ES2143674006	TS 3	EP080: BTEXN	Total Xylenes	12.6	15.5	mg/kg	81	Y
ALSE-Sydney 06-Dec-21	ES2144294	SOIL	ES2144294015	Trip Spike	EP080: BTEXN	Benzene	<0.2	<0.2	mg/kg	100	Y
ALSE-Sydney 06-Dec-21	ES2144294	SOIL	ES2144294015	Trip Spike	EP080: BTEXN	Ethylbenzene	3	3.1	mg/kg	97	Y
ALSE-Sydney 06-Dec-21	ES2144294	SOIL	ES2144294015	Trip Spike	EP080: BTEXN	meta- & para-Xylene	15.7	15.8	mg/kg	99	Y
ALSE-Sydney 06-Dec-21	ES2144294	SOIL	ES2144294015	Trip Spike	EP080: BTEXN	Naphthalene	<1	<1	mg/kg	100	Y
ALSE-Sydney 06-Dec-21	ES2144294	SOIL	ES2144294015	Trip Spike	EP080: BTEXN	ortho-Xylene	6.6	6.9	mg/kg	96	Y
ALSE-Sydney 06-Dec-21	ES2144294	SOIL	ES2144294015	Trip Spike	EP080: BTEXN	Sum of BTEX	42.9	44.6	mg/kg	96	Y
ALSE-Sydney 06-Dec-21	ES2144294	SOIL	ES2144294015	Trip Spike	EP080: BTEXN	Toluene	17.6	18.8	mg/kg	94	Y
ALSE-Sydney 06-Dec-21	ES2144294	SOIL	ES2144294015	Trip Spike	EP080: BTEXN	Total Xylenes	22.3	22.7	mg/kg	98	Y
ALSE-Sydney 06-Dec-21	ES2144300	SOIL	ES2144300042	TS	EP080/071: Total Pc C6 - C9 Fraction		53	58	mg/kg	91	Y
ALSE-Sydney 06-Dec-21	ES2144300	SOIL	ES2144300042	TS	EP080/071: Total Rc C6 - C10 Fraction		66	71	mg/kg	93	Y
ALSE-Sydney 06-Dec-21	ES2144300	SOIL	ES2144300042	TS	EP080/071: Total Rc C6 - C10 Fraction	mi 32		36	mg/kg	89	Y
ALSE-Sydney 06-Dec-21	ES2144300	SOIL	ES2144300042	TS	EP080: BTEXN	Benzene	<0.2	<0.2	mg/kg	100	Y
ALSE-Sydney 06-Dec-21	ES2144300	SOIL	ES2144300042	TS	EP080: BTEXN	Ethylbenzene	2.4	2.5	mg/kg	96	Y
ALSE-Sydney 06-Dec-21	ES2144300	SOIL	ES2144300042	TS	EP080: BTEXN	meta- & para-Xylene	12.3	12.7	mg/kg	97	Y
ALSE-Sydney 06-Dec-21	ES2144300	SOIL	ES2144300042	TS	EP080: BTEXN	Naphthalene	<1	<1	mg/kg	100	Y
ALSE-Sydney 06-Dec-21	ES2144300	SOIL	ES2144300042	TS	EP080: BTEXN	ortho-Xylene	5.3	5.3	mg/kg	100	Y
ALSE-Sydney 06-Dec-21	ES2144300	SOIL	ES2144300042	TS	EP080: BTEXN	Sum of BTEX	33.5	34.9	mg/kg	96	Y
ALSE-Sydney 06-Dec-21	ES2144300	SOIL	ES2144300042	TS	EP080: BTEXN	Toluene	13.5	14.4	mg/kg	94	Y
ALSE-Sydney 06-Dec-21	ES2144300	SOIL	ES2144300042	TS	EP080: BTEXN	Total Xylenes	17.6	18	mg/kg	98	Y
ALSE-Sydney 06-Dec-21	ES2144300	SOIL	ES2144300047	TS6	EP080/071: Total Pc C6 - C9 Fraction		52	66	mg/kg	79	Y
ALSE-Sydney 06-Dec-21	ES2144300	SOIL	ES2144300047	TS6	EP080/071: Total Rc C6 - C10 Fraction		65	82	mg/kg	79	Y
ALSE-Sydney 06-Dec-21	ES2144300	SOIL	ES2144300047	TS6	EP080/071: Total Rc C6 - C10 Fraction	mi 31		42	mg/kg	74	Y
ALSE-Sydney 06-Dec-21	ES2144300	SOIL	ES2144300047	TS6	EP080: BTEXN	Benzene	<0.2	<0.2	mg/kg	100	Y
ALSE-Sydney 06-Dec-21	ES2144300	SOIL	ES2144300047	TS6	EP080: BTEXN	Ethylbenzene	2.4	2.8	mg/kg	86	Y
ALSE-Sydney 06-Dec-21	ES2144300	SOIL	ES2144300047	TS6	EP080: BTEXN	meta- & para-Xylene	12.6	14.6	mg/kg	86	Y
ALSE-Sydney 06-Dec-21	ES2144300	SOIL	ES2144300047	TS6	EP080: BTEXN	Naphthalene	<1	<1	mg/kg	100	Y
ALSE-Sydney 06-Dec-21	ES2144300	SOIL	ES2144300047	TS6	EP080: BTEXN	ortho-Xylene	5.3	6.1	mg/kg	87	Y
ALSE-Sydney 06-Dec-21	ES2144300	SOIL	ES2144300047	TS6	EP080: BTEXN	Sum of BTEX	33.7	39.8	mg/kg	85	Y
ALSE-Sydney 06-Dec-21	ES2144300	SOIL	ES2144300047	TS6	EP080: BTEXN	Toluene	13.4	16.3	mg/kg	82	Y
ALSE-Sydney 06-Dec-21	ES2144300	SOIL	ES2144300047	TS6	EP080: BTEXN	Total Xylenes	17.9	20.7	mg/kg	86	Y
ALSE-Sydney 06-Dec-21	ES2144300	SOIL	ES2144300048	TS8	EP080/071: Total Pc C6 - C9 Fraction		40	67	mg/kg	60	Y
ALSE-Sydney 06-Dec-21	ES2144300	SOIL	ES2144300048	TS8	EP080/071: Total Rc C6 - C10 Fraction		50	83	mg/kg	60	Y
ALSE-Sydney 06-Dec-21	ES2144300	SOIL	ES2144300048	TS8	EP080/071: Total Rc C6 - C10 Fraction	mi 24		43	mg/kg	56	Y
ALSE-Sydney 06-Dec-21	ES2144300	SOIL	ES2144300048	TS8	EP080: BTEXN	Benzene	<0.2	<0.2	mg/kg	100	Y
ALSE-Sydney 06-Dec-21	ES2144300	SOIL	ES2144300048	TS8	EP080: BTEXN	Ethylbenzene	1.8	2.9	mg/kg	62	Y
ALSE-Sydney 06-Dec-21	ES2144300	SOIL	ES2144300048	TS8	EP080: BTEXN	meta- & para-Xylene	9.4	14.8	mg/kg	64	Y
ALSE-Sydney 06-Dec-21	ES2144300	SOIL	ES2144300048	TS8	EP080: BTEXN	Naphthalene	<1	<1	mg/kg	100	Y
ALSE-Sydney 06-Dec-21	ES2144300	SOIL	ES2144300048	TS8	EP080: BTEXN	ortho-Xylene	4.1	6.1	mg/kg	67	Y
ALSE-Sydney 06-Dec-21	ES2144300	SOIL	ES2144300048	TS8	EP080: BTEXN	Sum of BTEX	25.6	40.4	mg/kg	63	Y
ALSE-Sydney 06-Dec-21	ES2144300	SOIL	ES2144300048	TS8	EP080: BTEXN	Toluene	10.3	16.6	mg/kg	62	Y
ALSE-Sydney 06-Dec-21	ES2144300	SOIL	ES2144300048	TS8	EP080: BTEXN	Total Xylenes	13.5	20.9	mg/kg	65	Y

Table G7. Rinsate Blank Recoveries
Station Box DSI
The Bays Construction Site, Sydney Metro West

Lab Report Number	ES2143674	ES2144109	ES2144109	ES2144300	ES2144300
Field ID	20211129_R01	2021201_R03	20211130_R02	20211202_R04	20211203_R05
Sampled Date	29/11/2021	1/12/2021	1/12/2021	2/12/2021	3/12/2021
Sample Type	Rinsate	Rinsate	Rinsate	Rinsate	Rinsate

Chem_Group	ChemName	Units	EQL					
Fluorotelomer Sulfonic Acids	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	6:2 Fluorotelomer Sulfonate (6:2 FTS)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Metals	Arsenic	µg/l	0.001	<1	<1	<1	<1	<1
	Cadmium	µg/l	0.0001	<0.1	<0.1	<0.1	<0.1	<0.1
	Chromium	µg/l	0.001	<1	<1	<1	<1	<1
	Copper	µg/l	0.001	<1	<1	<1	<1	<1
	Lead	µg/l	0.001	<1	<1	<1	<1	<1
	Mercury	µg/l	0.0001	<0.1	<0.1	<0.1	<0.1	<0.1
	Nickel	µg/l	0.001	<1	<1	<1	<1	<1
	Zinc	µg/l	0.005	<5	<5	<5	<5	<5
Perfluoroalkane Carboxylic Acid	Perfluorohexanoic acid (PFHxA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	Perfluorododecanoic acid (PFDoDA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	Perfluorononanoic acid (PFNA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	Perfluoropentanoic acid (PFPeA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Perfluoroheptanoic acid (PFHpA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	Perfluorobutanoic acid (PFBA)	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Perfluorodecanoic acid (PFDA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	Perfluorotridecanoic acid (PFTTrDA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	Perfluoroundecanoic acid (PFUnDA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	Perfluorooctanoic acid (PFOA)	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroalkane Sulfonic Acids	Perfluorooctanesulfonic acid (PFOS)	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	Perfluorodecanesulfonic acid (PFDS)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	Perfluorobutane sulfonic acid (PFBS)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	Sum of PFHxS and PFOS	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroalkyl Sulfonamides	N-ethyl PFO sulfonamidoethanol (EtFOSE)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	N-methyl-PFO sulfonamidoacetic acid (MeFOSAA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	N-ethyl-PFO sulfonamidoacetic acid (NEtFOSAA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	N-ethyl PFO sulfonamide (EtFOSA)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	N-methyl PFO sulfonamidoethanol (MeFOSE)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Perfluorooctane sulfonamide (FOSA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
PFAS Sums	Sum of PFAS	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01

APPENDIX H CALIBRATION RECORDS



Environmental Resources Management Australia Pty Ltd
PID Calibration Certificate

Project Name :

The Bays

Project Staff :

Tristan Reddy

Project No :

0577577

Date :

29/11/21

Photo-ionisation Detector

Make/Model No:

Tiger - Photocheck
NSW-T-111096

Serial Number:

NSW-T-111096

Calibration Gas

Calibration Gas:

Isobutylene 100ppm

PID Calibration

Zero Calibration

PID Reading:

0.2

Span Calibration

Desired PID Reading:

Actual PID Reading:

<i>29/11/21</i>	<i>30/11/21</i>	<i>1/12/21</i>	<i>2/12/21</i>	<i>3/12/21</i>
<i>100</i>	<i>100</i>	<i>100</i>	<i>100</i>	<i>100</i>
<i>100.1</i>	<i>100.2</i>	<i>100.2</i>	<i>100.2</i>	<i>100.1</i>

Certification

The above detector has been calibrated in accordance with the manufacturers specifications.

Checked By:

TR

Signature:	<i>[Signature]</i>	Date:	<i>29/11/21</i>
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