

Contamination Assessment

Proposed Eraring Battery Energy Storage System, Rocky Point
Road, Eraring, NSW

12-Jul-2021
Eraring Power Station
Commercial-in-Confidence

Contamination Assessment

Proposed Eraring Battery Energy Storage System, Rocky Point Road, Eraring, NSW

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Glossary of Abbreviations

Term	Description
ACM	Asbestos Containing Material
ASC NEPM	National Environment Protection Measure – Assessment of Site Contamination
ASS	Acid sulfate soils
BTEX	Benzene, Toluene, Ethylbenzene and Xylenes
CLM Act 1997	Contaminated Land Management Act 1997
COC	Chain of Custody
CoPC	Contaminants of Potential Concern
CRC CARE	Cooperative Research Centre for Contamination Assessment and Remediation of the Environment
CSM	Conceptual Site Model
DQI	Data Quality Indicator
DQO	Data Quality Objective
EIL	Ecological Investigation Level
ESL	Ecological Screening Level
EPA	Environment Protection Authority
HIL	Health Investigation Level
IMW	Intrusive Maintenance Worker
LOR	Limit of Reporting
LNAPL	Light Non-Aqueous Phase Liquid
mAHD	Metres Australian Height Datum
NATA	National Association of Testing Authority
NEPC	National Environment Protection Council
OC/OP Pesticides	Organochlorine and Organophosphorus Pesticides
PAH	Polycyclic Aromatic Hydrocarbons
PCB	Polychlorinated Biphenyl
PFAS	Per- and Poly-fluoroalkyl Substances
PID	Photo Ionisation Detector
SAC	Soil Assessment Criteria
TPH	Total Petroleum Hydrocarbons
TRH	Total Recoverable Hydrocarbons
QA/QC	Quality Assurance/Quality Control
USCS	Unified Soil Classification System

Executive Summary

AECOM Australia Pty Ltd (AECOM) was engaged by Origin Energy (Origin) to undertake a Contamination Assessment for the proposed Eraring Battery Energy Storage System (BESS) development (herein defined as 'the Project' or 'Project area') within the Origin Eraring Power Station (herein defined as 'the broader site'). The Project is located at Rocky Point Road, Eraring, New South Wales (refer to **Figure 1** in **Appendix A**).

The overarching objectives of the Assessment were to:

- Understand the nature of land contamination in the area of the Project area to address the Secretaries Environmental Assessment Requirements (SEARs) for the Environmental Impact Statement (EIS) submission to the Department of Planning Industry and Environment (DPIE)
- Inform a remedial action plan (RAP) in accordance with State Environmental Planning Policy (SEPP) no 55 *Remediation of Land (Department of Urban Affairs and Planning [DUAP], 1998)*, if required, to make the land suitable for the commercial/industrial development.

Specifically, the Contamination Assessment was designed and conducted to:

- Identify potential soil, groundwater and surface water contamination at locations within the Project area
- Evaluate whether there is a potential unacceptable risk to human health and the environment from identified contamination at the Project area for future commercial/industrial land use
- Provide an indication of the potential for re-use of soils that may potentially be excavated as part of the Project redevelopment and/or the likely waste classification if the soil is surplus to development and needs to be disposed off-site to a licensed landfill in accordance with the *NSW EPA Waste Classification Guidelines (NSW EPA, 2014)*.

The scope of works completed as part of the Contamination Assessment comprised review of available historical investigations for the Project area, intrusive soil investigation and surface water sampling for identified contaminants of potential concern (CoPC) to evaluate the potential risk to human health and/or environment for the future development.

The findings of the Contamination Assessment indicated that the nature of identified land and water contamination at the Project area does not represent a risk to human health that requires remediation as part of the proposed Project. Whilst localised ACM was historically identified in the borrowed pits associated with the construction of the attemperation reservoir, these localised impacts are not widespread and can be managed by implementation of mitigation measures as part of development of a construction environment management plan (CEMP) specific to the Project.

Elevated but low concentrations of perfluorooctane sulfonate (PFOS) were detected in a relatively small volume of stagnant surface water pooled within an intermittent drainage line (dry at the time of sampling) on the Project area. Recent surface water sampling from the December 2020 monitoring event indicated that reported concentrations of PFOS were below the laboratory LOR at the most downgradient surface water location adjacent to Muddy Lake (AECOM, 2021a), which is also downgradient of the Project area. The data generated indicates that migration of PFOS via surface water discharging from the Project area is potentially limited and intermittent. The surface water sampled from the pooled stagnant water also reported a low pH, indicating acidic conditions and presence of potential acid sulphate soils (PASS) at the Project area.

The Head of Environment Protection Authority (HEPA) Per- and poly-fluoroalkyl substances (PFAS) National Environmental Management Plan (NEMP) (2020) includes a decision tree for assessment of re-use of soils on site, which outlines that leachate concentrations need to be protective of receiving water bodies. Given that PFOS concentrations in soil leachate exceed the adopted ecological assessment criteria for protection of nearby ecological receptors, further assessment of risk and implementation of appropriate management measures is required prior to soil reuse at the Project area.

Historically, metals (Cu, Pb, Ni and Zn) and PFAS have been detected in monitoring wells in the vicinity of the Project area at concentrations greater than the adopted ecological screening criteria, however, concentrations of PFAS in groundwater further downgradient of the Project area have reported concentrations below the laboratory limit of reporting (LOR). Concentrations of metals at the

downgradient boundary of the Project area are consistent with metal concentrations detected in groundwater across the broader Origin Eraring Power Station, and with concentrations detected at these locations during previous monitoring events.

Based on the nature of land and water contamination identified from review of historical investigations and this current assessment at the Project area, mitigation measures as part of a CEMP should be implemented to minimise any potential risk to ecological receptors during the redevelopment.

The CEMP would need to give consideration (but not be limited) to:

- An Acid Sulfate Soils Management Plan (ASSMP) in accordance with Acid Sulfate Soil Manual (NSW ASSMAC, 1998), in the event that potential acid sulfate soils (PASS) is encountered
- An unexpected finds protocol, including encountering localised ACM during the construction works
- Management of surface water when present to minimise the mobilisation of any potential residual soil impacts that could migrate to sensitive off-site ecological receptors
- Management of materials in accordance with HEPA (2020) PFAS NEMP, including the completion of a risk assessment so that excavated soils can be reused in less sensitive areas or managed within the Project area to minimise off-site disposal of excavated material to an appropriately licensed landfill.
- Management of materials during construction works by implementation of the Decision Tree for Reuse of Soil in HEPA (2020) PFAS NEMP, so that excavated soils can be reused in less sensitive areas or managed within the Project area to prevent unacceptable risks to any receptor and minimise off-site disposal of excavated materials to a licensed landfill.

By implementation of mitigation measures during the construction works and for the future use of the Project area as a BESS, the potential risk to off-site ecological receptors can be minimised.

1.0 Introduction

1.1 Preamble

AECOM Australia Pty Ltd (AECOM) was engaged by Origin Energy (Origin) to undertake a Contamination Assessment for the proposed Eraring Battery Energy Storage System (BESS) development (herein defined as 'the Project' or 'the Project area') within the Origin Eraring Power Station NSW (herein defined as 'the broader site'). The Project is located at Rocky Point Road, Eraring, New South Wales (refer to **Figure 1 in Appendix A**).

AECOM understands that the findings of the Contamination Assessment will support the Environmental Impact Statement (EIS) submission to the Department of Planning Industry and Environment (DPIE) and allow Origin to make management decisions and/or understand contamination related liabilities and obligations that may impact the Project.

1.2 Background

AECOM understands that Origin is preparing an EIS for the Project which includes:

- The construction and operation of a BESS with an estimated capacity of approximately 700 MW / 2800 MWh
- Associated infrastructure including grid connection to the TransGrid substation switchyard.

The Project area covers an approximate 30 hectare (ha) parcel of land within the Eraring Power Station, with access from Rocky Point Road. The Project area is south west of the operational power station and north west of the Eraring high-level inlet canal and attemperation reservoir. Based on current drawings provided by Origin, the battery footprint in the Project area will be located south of the operational area and cover an approximate area of 12.5 ha. The grid connection will run from the proposed BESS connection point at the TransGrid substation switchyard along the eastern perimeter of the switchyard to the BESS footprint, as shown on **Figure 2 in Appendix A**.

Construction works at the Project area are expected to include placement of a concrete slab across the proposed footprint for installation of the battery infrastructure, with the excavation of soils to a depth of approximately 1 metre below ground surface (bgs). Excavation of soils will also be required from the connection point adjacent to the switchyard along the eastern perimeter of the switchyard to the proposed battery footprint.

The Project area is within a non-operational area of the Eraring Power Station site, located south of the switchyard. The Project area is currently vacant with overgrown vegetation comprising grasses and trees. At the time of the intrusive works, ponded water was observed in low-lying areas in proximity to the Project area's northern boundary.

Historical activities at the Project area are documented in the ERM (2013) Preliminary Site Assessment (ESA) and GHD (2021) Geotechnical Factual report, and comprised:

- Rural land use from the 1980s till the early 2000's
- Playfields for recreational purposes prior to construction of the power station by Eraring Energy (New South Wales Treasury). The playing fields continued to be used for recreational purposes during operation of the power station
- former firefighting training area (FTA) used for training purposes by the power station prior to Origin's occupancy of the power station
- borrow pits associated with the construction of the attemperation reservoir south west of the Eraring high-level inlet canal from 2007 to 2011.

Various contamination investigations have been conducted at the broader site which covers the Project area, and are summarised in **Section 2.2**.

1.3 Objectives

The overarching objectives of the Contamination Assessment are to:

- Understand the nature of land contamination in the area of the Project area to address the Secretaries Environmental Assessment Requirements (SEARs) for the EIS submission to the DPIE
- Inform a remedial action plan (RAP) in accordance with *State Environmental Planning Policy (SEPP) no 55 Remediation of Land*, if required, to make the land suitable for the commercial/industrial development.

Specifically, the Contamination Assessment was designed and conducted to:

- Identify potential soil, surface water and groundwater contamination at locations within the Project area
- Evaluate whether there is a potential unacceptable risk to human health and the environment from identified contamination at the Project area for future commercial/industrial land use
- Provide an indication of the potential for re-use of soils that may potentially be excavated as part of the Project redevelopment and/or the likely waste classification if the soil is surplus to development and needs to be disposed off-site to a licensed landfill in accordance with the *NSW EPA Waste Classification Guidelines (NSW EPA, 2014)*.

1.4 Scope of Work

To achieve the project scope objectives, the following scope of works was undertaken:

- Desktop review of historical contamination investigation reports, a flood study and a recent geotechnical investigation as detailed in Section 2.2
- Preparation of Safety Health Environmental and Wellbeing Management Plan (SHE&WMP) for intrusive field works
- Dial-Before-You-Dig plans obtained and reviewed, locations of underground services by an external contractor under AECOM's supervision
- Hand augering of 40 soil bores across the proposed BESS footprint, along the connection to switchyard and selected areas outside of the footprint within the Project area
- Soil bores were completed to a nominal depth of 1.0m¹ below the ground surface (bgs), with soil samples collected at 0.05m bgs, 0.5m bgs and 1.0m bgs
- Collection of one surface water sample from a small stagnant pooled water body within the Project area in the vicinity of a natural ephemeral stormwater drainage line
- Laboratory analysis of all soil samples for the full per- and polyfluoroalkyl substances (PFAS) analytical suite (28 analyte) and analysis of selected samples for additional suite (metals [As, Cd, Cr, Cu, Hg, Ni, Pb and Zn], total recoverable hydrocarbons [TRH], benzene, toluene, ethylbenzene, xylene and naphthalene [BTEXN], polycyclic aromatic hydrocarbons [PAHs], phenols, asbestos, polychlorinated biphenyls [PCBs], organochlorine pesticides (OCPs) and Toxicity Characteristic Leaching Procedure [TCLP] for PFAS, metals and PAHs (as required) based on data gaps and visual evidence of contamination, as detailed in Section 3.3
- Screening of analytical results against current site assessment criteria appropriate for the proposed Project and future commercial/industrial land use
- Preparation of this Contamination Assessment report.

1.5 Key Guidelines

The investigation was conducted with reference to the following key guidelines:

¹ Depth of hand augers corresponded to the proposed depth of the redevelopment at the Project site

- National Environment Protection Council (NEPC), 1999. *National Environment Protection (Assessment of Site Contamination)*, as amended 2013 (ASC NEPM (2013))
- ANZG (2018) Australian and New Zealand Guidelines for Fresh and Marine Water Quality. Australian and New Zealand Governments and Australian states and territory governments, Canberra, ACT, Australia
- Heads of Environment Protection Authority (HEPA) (2020) PFAS National Environmental Management Plan (NEMP) 2.0.

1.6 Data Quality Objectives

A seven-step Data Quality Objective (DQO) approach was developed to set quality assurance and quality control (QA/QC) parameters for the investigation and laboratory program to ensure data of appropriate reliability would be used for the purposes of the assessment. The design of the DQO approach was undertaken in accordance with Appendix IV of the NSW DEC Guidelines for the NSW Site Auditor Scheme (3rd Edition), 2017.

The process of establishing appropriate DQOs is defined according to the following seven steps in **Table 1**.

Table 1 The Seven steps in defining DQOs

Step	Data Quality Objective Step
1	State the problem – Define the problem that necessitates the study; identify the planning team, examine budget, schedule.
2	Identify the goal of the study – State how environmental data will be used in meeting objectives and solving the problem, identify study questions, define alternative outcomes.
3	Identify information inputs – Identify data and information needed to answer study questions.
4	Define the boundaries of the study – Specify the target population and characteristics of interest, define spatial and temporal limits, scale of inference.
5	Develop the analytic approach – Define the parameter of interest, specify the type of inference, and develop the logic for drawing conclusions from findings.
6	Specify performance or acceptance criteria – Develop performance criteria for new data being collected or acceptable criteria for existing data being considered for use.
7	Develop the plan for obtaining data – Select the resource-effective sampling and analysis plan that meets the performance criteria.

Step 1 - State the Problem

AECOM understands that Origin proposes the development of a BESS at the Project area. A contamination assessment of the Project area is required to understand the nature of land contamination from on-site and off-site sources, in order to inform the SEARs for the EIS submission to the DPIE.

Step 2 - Identify the Decisions

The objectives of the investigations are presented in **Section 1.3** and the inputs to the decisions required to meet the objectives are discussed in Step 3 below.

The key decisions to address the objectives of the investigation include:

- Are the vertical and horizontal extent of Contaminants of Potential Concern (CoPC) in soils at the Project area known?
- Are the nature and extent of CoPCs in soil, groundwater and surface water within the Project area known?
- At what locations and by what discharge mechanisms does surface water from the Project area enter receiving water bodies?

- Does the data set provide sufficient information to evaluate whether complete source-pathway-receptor linkages exist for CoPC?
- Are there any complete or potentially complete exposure pathways to identified human health and/or ecological receptors?

Step 3 - Identify inputs to the Decision

The primary inputs to assessing the contamination status of the Project area were:

- Reviewing available historical information obtained from previous investigations including the early-stage site investigation for the Project (geotechnical investigation and flood study) (see **Section 2.2**)
- Site conditions including, topographical, hydrogeological and geological
- Field results and observations
- Using appropriate sample collection techniques, to obtain samples representative of conditions across the Project area
- Laboratory analytical results of soils and surface water
- Using appropriate analytical methods (i.e. NATA endorsed) with quantitation limits below the adopted assessment criteria
- Appropriate assessment criteria for the media sampled (current data set and historical results)
- Distance to potential human health and environmental receptors
- Assessment of the suitability of the data through the assessment of data quality indicators (DQI), namely precision, accuracy, representativeness, completeness, comparability, and sensitivity
- Assessing for the presence of CoPC in the sampled media at concentrations above adopted assessment criteria.

Step 4 - Define the Study Boundaries

- Lateral: The investigation boundaries will be limited to the north by Rocky Point road, to the west by the access road of Rocky Point road, to the east and south by the high-level inlet canal. In addition, investigation boundaries will include the former recreational field to the north of Rocky Point road and limited by the extent of the field and the area to the west of the high-level inlet canal to the eastern boundary of the TransGrid high voltage substation
- Vertical: Intrusive investigations of soil were undertaken up to a maximum depth of 1.0 m bgs
- Temporal: Data used for the assessment will include the review of data from historical investigations and this current investigation.

Step 5 - Develop the Analytical Approach

- Sampling ratios, quality assurance/ quality control (QAQC) sampling and laboratory analysis were based on Australian Standards and National Environmental Protection Measure (NEPM) guidelines
- AECOM standard sampling methodology was followed for sample collection and preservation
- Laboratories utilised were National Association of Testing Authorities (NATA) approved for the analysis undertaken.

The decision rules for this investigation are as follows:

- If it is determined that the data generated through this investigation are reliable and suitably characterise soil and surface water contamination, the data will be compared against the adopted Soil Assessment Criteria (SAC) and Surface Water Assessment Criteria (SWAC)
- If comparison of the data generated through this investigation (soil and surface water) and the historical investigation (soil, groundwater and surface water) meets the adopted SAC and SWAC,

then the Project area investigated will be considered suitable for the proposed future commercial and industrial land use

- If comparison of the data generated through this investigation does not meet the adopted SAC and SWAC, then further investigations, remediation and/or management will be recommended for the Project area
- If it is determined that the data generated through this investigation are not reliable and/or do not suitably characterise soil, groundwater and surface water contamination as required for determining land use suitability, then further investigations may be recommended.

Step 6 – Specify Limits of Decisions error

The acceptable limits on decision errors applied for the project and the manner of addressing possible decision errors have been developed based on the Data Quality Indicators (DQIs) of precision, accuracy, representativeness, comparability, completeness and sensitivity as described in **Appendix B**

Step 7 – Optimise the design for Obtaining Data

The collection of data was optimised by the development of an appropriate sampling and analytical strategy based on an understanding of the history of the Project area and from the review of previous contamination investigations.

2.0 Site Information

2.1 Project area Description

The Project area description details are provided in **Table 2**.

Table 2 Site Description Details

Item	Description
Project area identification	Non-operational area of the Eraring Power Station, located south of the TransGrid switchyard and west of the Eraring high-level inlet canal
Project area Address	Rocky Point Road, Eraring, NSW
Project area Owner	Origin Energy
Title Identification details	Part of Lot 11, DP 1050120
Current Zoning	The Project area is currently zoned as SP2 (Special infrastructure – Electricity) in accordance with Lake Macquarie Local Environmental Plan (LEP) 2014
Current Land use	The Project area is currently a non-operational area within the Eraring coal fired power station for electricity production
Project area	Approximately 30 hectare (ha)
Project area features	<p>Located in the south western portion of the Eraring power station broader site and comprises the former FTA and area referred to as the borrow pits. The Project area is located north of the attemperation reservoir and south of the TransGrid switchyard. A drainage line captures stormwater runoff from the western side of the high-level inlet canal and low levels of seepage water. Additionally, it captures water from the eastern side of the Project area adjacent to Rocky Point road. Surface water flows to a ponded in the northern portion of the Project area, then flows within drainage culverts underneath Rocky Point road and intercepts water from the Eraring Settling Pond (ERSETPD) at approximately 5m west of the final ERSETPD weir. The surface water naturally mixes with water from ERSETPD, flowing towards Muddy lake to the south west of the Project area.</p> <p>Overgrown vegetation including grasses and a moderate dense covering of trees currently occupies the Project area. Trees at the Project area comprise Prickly-leaved Paperbark, Swamp Oak - Sea Rush – Baumea juncea swamps, Pine Trees and Scribbly Gum - Red Bloodwood (Umwelt, 2021).</p>

2.2 Desktop Review

A desktop review of the following documents has been conducted (historical sample locations are shown in **Figure 4** in **Appendix A**):

- ERM (2013) *Eraring Power Station – Preliminary Site Assessment*, dated June 2013
- ERM (2015) *Eraring Power Station – Stage 2 Environmental Site Assessment*, dated December 2015
- AECOM (2018) *PFAS Targeted On-Site Source Area Investigation*, dated September 2018
- AECOM (2021a) *Eraring Power Station – review of non-PFAS Monitoring Data*, draft version dated March 2021

- GHD (2021a) *Origin Energy Eraring Pty Ltd – Site Investigation for Battery Energy Storage System, Flood Study Report*, dated April 2021
- GHD (2021b) *Origin Energy Eraring Pty Ltd – Site Investigation for Battery Energy Storage System, Geotechnical Interpretative Report*, dated April 2021
- GHD (2021c) *Origin Energy Eraring Pty Ltd – Preliminary Contamination Assessment Proposed Battery Energy Storage System, Eraring Power Station*, dated April 2021
- AECOM (2021b) *Eraring Power Station - review of PFAS Monitoring Data*, dated May 2021.

2.2.1 Preliminary Site Assessment (ERM, 2013)

A preliminary site assessment was undertaken by ERM to provide advice in relation to potential soil and groundwater contamination issues which may be relevant to the sale of certain electricity generation assets owned and operated by Eraring Energy on behalf of NSW Treasury. The Preliminary Site Assessment involved desktop review of historical information and a site visit.

The desktop review indicated that prior to the construction of Eraring Power Station, the site and surrounding area was predominantly occupied by a mixture of small farms and native vegetation. The area south of the switchyard, in the vicinity of the proposed BESS was historically used for recreational purposes including playing fields and pony club grounds.

The Preliminary ESA identified a number of potential contamination sources within the Project area. The contamination sources identified the borrow pits associated with construction of the attemperation reservoir and sediments associated with drainage channels to Lake Eraring.

In the findings of the preliminary ESA, the attemperation reservoir was stated to represent a relatively low risk as a groundwater monitoring well network exists to monitor seepage and off-site migration of saline water. A recommendation was made for the Stage 2 ESA to include surface water sampling in the vicinity of the attemperation reservoir and borrow pits for field parameters (pH and redox potential). The field parameters would indicate if acid sulphate soils are present requiring further assessment. In terms of the sediments associated with drainage channels to Lake Eraring, a recommendation was made to conduct an investigation to assess whether potential material environmental issues exist in sediment as a result of previous incidents involving the loss of contaminants.

2.2.2 Stage 2 Environmental Site Assessment (ESA) (ERM, 2015)

A Stage 2 ESA was undertaken by ERM to develop a baseline assessment of environmental conditions at the Project area and within the surrounding receiving environments at the time of sale of the power station by Eraring Energy. Additionally, the works were undertaken to:

- Assess whether a significant risk to the environment was present
- Assess whether impact at the Project area warranted notification and / or regulation
- Assess whether impact (if present) was considered likely to require material remediation.

A number of soil, groundwater and surface water samples were collected from the Project area, with sampling conducted to target the former FTA. Downgradient of the attemperation reservoir and at the borrow pits.

Sampling as part of the Stage 2 ESA at the Project area comprised:

- Three monitoring wells (EJ_MW40, EJ_MW42 and EJ_MW43) were installed to assess the potential contamination associated with aqueous firefighting foam (AFFF) and accelerants (hydrocarbons) during historical fire training activities at the former FTA
- One monitoring well (EJ_MW54) was installed to target the potential occurrence of low pH and high metals concentrations down gradient of the attemperation reservoir
- Four soil bores (EJ_SB46, EJ_SB47, EJ_SB48 and EJ_SB49) to further assess the perfluorooctane sulfonate (PFOS) detection in shallow soils previously identified at EJ_MW02 during the initial part of the Stage 2 ESA
- Surface water monitoring of field parameters including pH and redox potential at four locations in the vicinity of the attemperation reservoir and borrow pits to assess for acid sulphate soil potential.

The concentrations of targeted contaminants in the soil and groundwater samples at locations in the vicinity of the Project area listed above were below the adopted assessment criteria with the exception of metal concentrations in the groundwater sample collected from EJ_MW54 which exceeded the adopted ecological assessment criteria for copper and zinc. It is also noted that EJ_SB47_0.45 had a low level detect of PFOS (0.0012 mg/kg) which is below the current HEPA NEMP (2020) criteria for human health and ecological receptors adopted for this investigation.

Bonded asbestos containing material (ACM) was observed adjacent to the borrow pits. The laboratory analysis confirmed the fragments contained chrysolite and amosite asbestos fibres.

Field pH readings collected from surface water monitoring locations in the vicinity of the attemperation reservoir ranged from 2.88 to 8.25 with acidic conditions identified in surface water samples collected to the north of the attemperation reservoir. The report states the pH results are consistent with published acid sulphate soil information which indicated that there is a high probability of encountering acid sulphate soils in this area.

2.2.3 PFAS Targeted On-Site Source Area Investigation (AECOM, 2018)

A targeted PFAS assessment was undertaken by AECOM at the current and former FTA. The former FTA is within the Project area. At the former FTA, five soil bores (FFTA_SB01 to FFTA_SB05) were drilled to a maximum depth of 5.8 m bgs and two groundwater monitoring wells were installed to 10 and 13.5 m bgs respectively (MW_B and MW_C). Soil samples were collected from the soil bores and the newly installed monitoring wells. Groundwater samples were collected from the newly installed wells and four existing boundary groundwater monitoring wells. It was noted that the newly installed monitoring wells were dry at the time of sampling.

The geology of the former FTA was logged to comprise topsoil underlain by sandy clay. Weathered sandstone conglomerate was logged to be present across the area at depths ranging from 3.7 to 11 m bgs.

The results of the samples collected from the former FTA indicated that PFAS distribution within soils appear to be limited to small concentrations below the adopted criteria within shallow soils. Soil PFAS concentrations were below the adopted soil assessment criteria for human health and ecological receptors and below the updated HEPA NEMP (2020) criteria for human health and ecological receptors. Detectable PFAS concentrations were reported at FFTA_SB03 at depths of 0.5 and 2.0 m bgs, with concentrations decreasing with depth demonstrating typical surface down impacts associated with firefighting training activities. Down gradient sample locations (MW_B and MW_C) returned soil results less than the level of reporting (LOR). Groundwater concentrations in the four existing boundary wells were all less than the laboratory LOR for PFAS.

A revised conceptual site model (CSM) for PFAS only was presented for the former FTA which indicated that there are no potentially complete source-pathway-receptor linkages identified at the former FTA. A recommendation was made to continue to monitor groundwater locations within the vicinity of the former FTA to account for any seasonal fluctuations and to revise the CSM as required.

2.2.4 Review of non-PFAS Monitoring Data: December 2020 (AECOM, 2021a)

A review of the groundwater, surface water, sediment and pore water monitoring for non-PFAS data from the most recent December 2020 monitoring event was undertaken by AECOM. AECOM has been reviewing monitoring data (PFAS and non-PFAS data) for Origin since June 2018.

The purpose was to review the monitoring data and make recommendations on adjustments to the monitoring program and, identify if any perimeter bore exceedances were significant or inconsistent with historical data, and identify if any locations should be reported to the NSW Environment Protection Agency under the *Contaminated Land Management Act 1997*.

The December 2020 monitoring event included the sampling of three groundwater monitoring wells down gradient of the Project area (EJ_MW01, EJ_MW02 and EJ_MW39) and one monitoring well upgradient of the Project area in the vicinity of the attemperation reservoir (ERGW1). Concentrations of TRH, BTEXN, PAH and volatile organic compounds (VOCs) at these locations were less than the LOR or adopted human health and ecological assessment criteria. Concentrations of metals at these locations were below the adopted assessment criteria with the exception of ERGW1 (upgradient of the BESS footprint) where manganese concentrations were reported above the adopted human health

assessment criteria and concentrations of copper, lead, nickel and zinc were reported above the adopted ecological assessment criteria. It was noted that the concentrations of copper, lead, nickel and zinc at ERGW1 were higher than previous monitoring events.

Three co-located surface water and sediment samples were collected at the Eraring Settling Pond (ERSETPD) down gradient of the Project area (SW10/SED10, SW11/SED11 and SW12/SED12). Concentrations of dissolved zinc exceeded the ecological assessment criteria at SW11. Concentrations of antimony and copper exceeded the ecological assessment criteria at SED12.

2.2.5 Site Investigation for Battery Energy Storage System, Flood Study Report (GHD, 2021a)

A flood study was undertaken by GHD to assist with early-stage site investigation for the proposed BESS Project. The flood study was prepared to present results of flood modelling to calculate peak flood elevations, velocity and shear stress of surface water runoff within the Project area. The report presents the flood mapping for peak 1 in 100, 1 in 20 and 1 in 500 annual exceedance probability rainfall events. The results indicate that the extent of flooding and generally shallow depth of flows indicate that the flooding is the result of local overland flows only and that the detailed design of the facility should incorporate adequate drainage measures to manage run off and direct flow away from the BESS and supporting infrastructure of the Project area.

2.2.6 Site Investigation for Battery Energy Storage System, Geotechnical Interpretative Report (GHD, 2021b)

A geotechnical investigation was undertaken by GHD across the proposed BESS footprint of the Project area to assess subsurface conditions and provide geotechnical recommendations for the design of electrical equipment and cabling, foundations/footings, earthworks, cut and fill batter slopes, hardstand areas, access roads and drainage. The scope of the geotechnical investigation included six boreholes, five test pits and two hand augers and the collection of soil samples for geotechnical parameters. The following information was presented in relation to consideration for the BESS construction at the Project area:

- Design of drainage and erosion control measures would need to take into consideration the dispersive nature of the soils at the Project area
- Appropriate stormwater drainage will be incorporated into the design of the facility such that ponding or waterlogging of the Project area soil is unlikely post-construction
- Some of the materials would be geotechnically suitable for re-use as general fill, subject to approval
- Soil aggressivity results indicate that any structures that will be in direct contact with saline creek water, should be designed for severe exposure classifications.

2.2.7 Preliminary Contamination Assessment Proposed Battery Energy Storage System, Eraring Power Station (GHD, 2021c)

A preliminary contamination assessment was undertaken by GHD to assist with early-stage Site investigation for the proposed BESS. The preliminary contamination assessment was undertaken concurrent with the geotechnical investigation (see **Section 2.2.6** above). Soil samples were collected at the geotechnical sample locations (four boreholes, one hand auger and six test pits) and analysed for heavy metals, TRH, BTEXN, PAHs, organochlorine pesticides (OCPs) and PCBs. Soil concentrations were below the laboratory LOR and/or adopted human health and ecological assessment criteria for all soil samples collected at the Project area.

Groundwater inflows were noted during the drilling of the boreholes and stabilised between 0.3 m below ground level (m bgl) and 10 m bgl. It is noted that groundwater depths may vary depending on factors such as material permeability and seasonal and environmental effects. Perched groundwater may be expected to be encountered in some locations during earthworks/construction following rainfall events, particularly in close vicinity to drainage lines. GHD concluded that based on the preliminary sampling conducted and taking into account the proposed future land use, the preliminary results indicated that there is a low potential risk to human health and the environment as a result of past and current activities at the Project area.

2.2.8 Review of PFAS Monitoring Data: December 2020 (AECOM, 2021b)

A review of the groundwater, surface water, sediment and pore water monitoring PFAS data from the December 2020 monitoring event was undertaken by AECOM. AECOM has been reviewing PFAS data for Origin since monitoring events conducted in June 2018. The purpose was to review the monitoring data and inform Origin of any exceedances with current endorsed criteria, assess temporal trends and identify any findings that are inconsistent with previous PFAS data, so as to present findings to the NSW EPA.

The December 2020 monitoring event included the sampling of three groundwater monitoring wells down gradient of the Project area (EJ_MW01, EJ_MW02 and EJ_MW39) and one monitoring well upgradient of the Project area in the vicinity of the attemperation reservoir (ERGW1). Concentrations of PFAS in groundwater at these locations were below the adopted assessment criteria with the exception of PFOS concentrations at EJ_MW39 which exceeded the adopted ecological assessment criteria.

Four co-located surface water and sediment samples were collected down gradient of the Project area (SW10/SED10, SW11/SED11, SW12/SED12 and SW22/SED22). Co-located samples SW10/SED10, SW11/SED11, SW12/SED12 were collected from within the ERSETPD, while SW22/SED22 was collected from the downgradient boundary, adjacent to Muddy Lake. Concentrations of PFOS in surface water exceeded the ecological assessment criteria at SW10, SW11 and SW12. Concentrations of PFAS at the most downgradient surface water sampling location was below the laboratory LOR. Detectable concentrations of PFOS in sediments was reported in SED10 and SED12, however there is no current criteria for PFAS in sediments.

2.3 Surrounding Land Use

Current land use surrounding the Project area is summarised below:

- North – TransGrid high voltage switchyard associated with the Eraring Power Station.
- South – The high-level inlet canal and attemperation reservoir associated with Eraring Power Station.
- East – The high-level inlet canal, recreational facilities, and marine worm farm.
- West – Bushland immediately west of the Project area, Rail corridor, and Muddy Lake beyond.

2.4 Topography and Drainage

The Project area is located approximately 320m from the eastern edge of Muddy Lake with an elevation ranging from 20 m relative to the Australian Height Datum (AHD) on the south eastern boundary to 12 m AHD on the north western boundary. The Project area is gently undulating with a ridge running down the eastern side of the site sloping down to a large drainage line between the Project area and the high-level inlet canal causing water on the far eastern side to flow in a north easterly direction and water from the middle of the Project area to flow in a westerly direction towards Muddy's Lake.

Minor seepage from the high-level inlet canal flows through the eastern perimeter drainage line, and during periods of rain it also captures storm water flows from across the Project area. Site surface water flows to a pooled area to the north, then underneath Rocky Point road within a drainage culvert. The surface water flows to the north and intercepts water from ERSETPD at approximately 5m west of the final weir. The surface water naturally mixes with water from ERSETPD, and flows towards Muddy lake to the south west.

Surface water from the southern portion of the Project area flows in a westerly direction towards Muddy Lake on the western side of Rocky Point road and Wangi road.

The drainage lines across the Project area were observed to be dry to intermittent during the intrusive works, with little to no surface water observed along the drainage lines. A surface water sample (SW001) was collected from a location where the surface water was pooled and stagnant in the northern part of the Project area (refer to **Figure 3 in Appendix A**).

2.5 Geology and Soils

The Gosford-Lake Macquarie 1:100,000 Geological Sheet (9131 and part sheet 9231) identifies the subsurface geology at the Project area to be predominantly Munmorah Conglomerates, part of the Narrabeen Mesozoic, early Triassic period. The Gosford- Lake Macquarie Geological sheet recognises a potential unidentified fault running through the centre of the Project area.

The A-B cross section within the Gosford Lake Macquarie Geological sheet identifies the Project area is underlain by Dooralong Formation, comprised of medium-grained Quartz-lithic sandstone, siltstone, claystone, laminate and coals derived from the Palaeozoic, late Permian period. This is further underlain by Moon Island Beach sandstones, which are all formations in the Newcastle Coals.

The geology identified during previous investigation works at Project area (ERM, 2015) was predominately sandy clays overlying weathered sandstone bedrock.

2.6 Hydrogeology

Previous investigations (ERM, 2015) at the Eraring Power Station site, indicated groundwater is present in two broadly defined aquifer systems which are considered to be:

- Shallow groundwater, present within 7 m below top of casing (btoc), present within unconsolidated fill/reworked materials, residual materials and in alluvial sediments. Shallow aquifers are considered to be discontinuous across the site, being present primarily in low lying areas. Groundwater yield are expected to be low due to the high silt and clay content; and
- Deeper groundwater present within 10 to 15m bgl in sedimentary bedrock, hosted within weathered and /or fractured conglomerates, sandstone and coal seams. In the absence of significant fracturing to system would be expected to have relatively low hydraulic conductivity.

Shallow groundwater intercepted during the PFAS Targeted on-site source area investigation (AECOM, 2018) identified groundwater at 0.518 m btoc at EJ_MW02, west of the Project area. Groundwater flow across the Project area are inferred to the west/southwest.

In addition, groundwater flow across the broader Eraring Power Station site is complex due to a large amount of cut and fill works undertaken historically and due to mine workings within the vicinity.

Registered groundwater bore information was obtained from NSW Department of Primary Industries – Office of Water/ Water administration Ministerial Corporation, and Eraring Power Station figures (AECOM, 2020). A total of 11 groundwater wells were identified within 0.5km radius. The closest bores are monitoring bores EJ_MW40, EJ_MW42, EJ_MW43 within the Project area. The registered and non-registered bore details are summarised in **Table 3** below.

Table 3 Summary of Registered Bore Information within 0.5 km of the Project area

Bore ID	Depth of Bore (m bgs)	Monitoring Bore	Distance/Location from Project Area (m)
EJ_MW40	7.28	Monitoring Bore	0
EJ_MW42	6.06	Monitoring Bore	0
EJ_MW43	6.59	Monitoring Bore	0
MW_B	11.53	Monitoring Bore	5
EJ_MW02	9.0625	Monitoring Bore	250
MW_C	13.98	Monitoring Bore	216
GW202943	8.00	Monitoring Bore	335
GW202945	9.00	Monitoring Bore	390
GW202944	8.50	Monitoring Bore	430
GW202951	8.88	Monitoring Bore	500
EJ_MW01	11.90	Monitoring Bore	500

Source: Water NSW bore search

2.7 Proximity to Sensitive Environments

The nearest local down gradient sensitive receptor is Muddy Lake, located approximately 320m to the West. Muddy Lake flows into Lake Eraring and onto Lake Macquarie.

3.0 Investigation Methodology

3.1 Soil Sampling Methodology

The soil assessment program was undertaken between 18-19 May 2021. The methodology is described in **Table 4**.

Table 4 Soil and Sediment Assessment Methodology

Activity	Details
Hand Augers	A stainless-steel hand auger was used to advance soil bores for sample collection to a nominal depth of 1.0m below ground surface (bgs). Of the 40 hand auger locations, the target depth of 1.0 m bgs was reached at 17 locations. At the remaining 23 locations, refusal was encountered.
Soil Sampling	Soil samples obtained from the soil bores were collected by a gloved hand from the hand auger. Soil was placed into laboratory prepared jars and a new pair of disposable nitrile sampling gloves were used to collect each sample. Soil samples were collected throughout the profile at approximately 0.05 m bgs and 0.5 m bgs.
Soil Logging	Soil logging was undertaken in general accordance with the Unified Soil Classification System and the AECOM documented standard field procedures. Samples were logged and information recorded in the field. The borelogs are presented in Appendix D.
Quality Control (QC) samples	Intra-laboratory and inter-laboratory duplicate samples were collected at an approximate rate of 1 per 10 primary samples in accordance with the Data Quality Indicators (DQIs) provided in Appendix B. Rinsate blank samples were collected to assess the effectiveness of field decontamination procedures. A rinsate sample was collected at the end of the day's sampling (i.e. three rinsate samples in total). One trip blank was utilised and analysed per sample batch (i.e. three trip blanks in total).
Sample Transport	Sample containers were immediately placed into ice-filled coolers for storage following sample collection and during transport to the laboratory.
Field Screening	Soil sub-samples were placed in snap-lock plastic bags and the vapour headspace screened in the field for volatile organic compounds (VOCs) using a calibrated photoionisation detector (PID) equipped with a 10.6 eV lamp. Calibration details are provided in Appendix E.
Decontamination	Decontamination of re-usable equipment was undertaken between sampling locations and involved the scrubbing of reusable equipment in a solution of Liquinox and potable water, followed by a double rinse with potable water. Soil samples were collected by hand, using single use, disposable nitrile gloves.
Reinstatement	Soil bores were reinstated with excess hand auger cuttings.

3.2 Surface Water Sampling Methodology

Surface water sample was collected on 21st May 2021. The surface water assessment sampling methodology is described in **Table 5**.

Table 5 Surface Water Assessment Methodology

Activity	Details
Surface Water Sampling	Surface water sample was collected from ponded stagnant water directly into unpreserved laboratory supplied sample bottles. Water quality parameters including temperature, dissolved oxygen, electrical conductivity, pH and redox, were collected prior to collection of the samples. Water quality parameters are provided in Table 13 in Section 6.4.1. The sampling location is identified on Figure 3 in Appendix A.
Sample Transport	Sample containers were immediately placed into ice-filled coolers for storage following sample collection and during transport to the laboratory.
QA/QC samples	Intra-laboratory and inter-laboratory duplicate samples were collected at a rate of 1 per 10 primary samples on soil matrix for the batch. No rinsate sample was collected at the end of the day specifically for water sampling as no re-usable equipment was utilised.
Decontamination	No re-useable equipment was used for the surface water sample therefore, no decontamination was required.

3.3 Analytical Plan

Australian Laboratory Services Environmental (ALS) was used as the primary laboratory. Eurofins Environmental Testing were used as the secondary (or check) laboratory. All laboratories are NATA accredited for the analyses undertaken.

An assessment of the reliability and adequacy of the analytical data is provided in **Appendix B**.

3.3.1 Soil Analytical Plan

The soil analytical program comprised the following:

- 49 primary soil samples were analysed for PFAS full suite (28 analytes)
- Five primary samples were analysed for PFAS following the toxicity characteristic leaching potential (TCLP)
- Ten soil samples were analysed for TRH, BTEXN, PAHs, Phenols, PCBs, OCPs and a suite of eight metals (As, Cd, Cr, Cu, Hg, Pb, Ni and Zn)
- Six primary samples were analysed for asbestos.

Six intra-laboratory and two inter-laboratory duplicate soil samples were analysed in accordance with the DQIs provided in Appendix B.

3.3.2 Surface Water Analytical Plan

One surface water sample was collected and analysed for PFAS full suite (28 analytes) only.

4.0 Site Assessment Criteria

4.1 Soil Assessment Criteria

The following guidelines were adopted for the evaluation of the soil analytical results:

- Cooperative Research Centre for Contamination Assessment and Remediation of the Environment (CRC CARE) Technical Report No.10 - Health Screening Levels for Petroleum Hydrocarbons in Soil and Groundwater. September 2011. (Friebel, E. and Nadebaum, P., 2011) – Soil Health Screening Levels (HSLs) (for TRH and BTEXN)
- CRC CARE Technical Report No. 10, Part 2 - Intrusive Maintenance Worker (Shallow Trench) Health Screening Levels, 2011
- National Environment Protection Measure (Assessment of Site Contamination) (NEPM, 2013) – Soil Health Investigation Levels (HILs) (for metals and PAH), Health Screening Levels (for volatile hydrocarbons), Ecological Screening Levels (ESLs) and Ecological Investigation Levels (EILs)
- NSW Environment Protection Authority (NSW EPA, 2014) – Waste Classification Guidelines
- Heads of EPA (HEPA) PFAS National Environmental Management Plan (NEMP) version 2.0 (HEPA, 2020) - Human Health Industrial/ Commercial and Ecological exposure through direct and indirect soil contact
- Western Australian Department of Health (DoH, 2009) Guidelines for the Assessment, Remediation and Management of Asbestos Contaminated Sites in Western Australia.

Application of these guidelines is summarised in the following sections.

4.1.1 Human Health Soil Assessment

4.1.1.1 ASC NEPM (2013) Health Investigation Levels

The HILs described in the ASC NEPM (2013) are scientifically based generic assessment criteria designed to be used in the first stage of an assessment of potential risks to human health from chronic exposure to contaminants. They are intentionally conservative and are based on a reasonable worst-case scenario for four generic land use settings, as summarised in **Table 6** below.

Table 6 Health Investigation Level Summary

HIL	Land Use
HIL A	Residential with garden/accessible soil (home grown produce <10% fruit and vegetable intake, (no poultry), also includes children's day care centres, preschools and primary schools
HIL B	Residential with minimal opportunities for soil access includes dwellings with fully and permanently paved yard space such as high-rise buildings and flats
HIL C	Public open space such as parks, playgrounds, playing fields (e.g. ovals), secondary schools and footpaths
HIL D	Commercial/industrial such as shops, offices, factories and industrial sites

4.1.1.2 ASC NEPM (2013) Health Screening Levels

The HSLs (presented in the ASC NEPM and CRC CARE) for petroleum hydrocarbons in soil and groundwater were developed to be protective of human health by determining the reasonable maximum concentration from on-site sources for a range of situations commonly encountered on contaminated sites. The HSLs apply to the same land-use settings as for the HILs, although the values for residential A and B are combined. The HSLs also include consideration of soil texture and depth to source to determine the appropriate soil, groundwater and soil vapour criteria for the exposure scenario as summarised in **Table 6**.

Selection of appropriate HSLs require identification of the soil type affected by contamination. Identifying the appropriate soil texture is important for volatile chemicals as saturation porosity (a factor of soil particulate size) will directly influence the rate of vapour transport and consequently determine the HSL value for vapour inhalation. The adopted soil description is based on the Unified Soil Classification System (USCS), which is determined by the ratio of sand, silt and clay particles in the soil. HSLs for vapour intrusion are summarised in **Table 7**.

Table 7 Soil Health Screening Level (HSL) for Vapour Intrusion

HSL	Land Use	Soil Depths	Soil Types (all land users)
HSL A	Refer to Table 6	0 m to <1 m	Clay
HSL B		1 m to <2 m	Sand (including sand, sandy clay, sandy clay loam, sandy loam, loamy sand, loam, sandy silt and silty sand)
HSL C		2 m to <4 m	
HSL D		>4 m	Silt (including silt, silty clay and silty clay loam)

Friebel and Nadebaum (2011) included two key assumptions in the derivation of the HSLs that limit their use to assessing impacts from petroleum sources:

- An aliphatic: aromatic ratio of 80:20 within each Total Petroleum Hydrocarbon (TPH) fraction was adopted based on representative data for fresh petrol and diesel fuels typical of those available in Australia. CRC CARE states that the HSLs may be applied to other fuel types (e.g. kerosene, aviation fuel and fuel oil); however, it should be confirmed that the aliphatic/aromatic speciation is similar to that assumed in the derivation of the HSLs (80:20) (Friebel and Nadebaum, 2011)
- The soil saturation and water solubility limits used in the derivation of the HSLs were based on an assumed mixture composition. The HSLs are therefore not applicable to pure compound solvents, as solubility limits incorporated into the HSLs were derived based on typical petrol and diesel fuel mixtures.

Where the HSL value is non-limiting (NL), the Friebel and Nadebaum (2011), direct contact values have been adopted. Direct contact HSLs have been developed for the incidental soil ingestion, dermal and inhalation exposure pathways. The direct contact HSLs are generally not the risk drivers for further site assessment for the same contamination source as the HSLs for vapour intrusion.

Additionally, HSLs have been derived for utility workers, i.e. intrusive maintenance workers (IMW) who may be exposed to contamination in the subsurface while undertaking work in shallow trenches. The HSLs for direct contact via the above scenarios are summarised in **Table 8**.

Table 8 Soil Health Screening Level (HSL) for Direct Contact

HSL	Land Use
HSL A	Refer to Table 6
HSL B	
HSL C	
HSL D	
Shallow Trench Worker	Utility / intrusive maintenance workers involved in shallow trenches (to a maximum depth of 2 m)

Note: Loam soils are not usually considered in Australian assessments.

4.1.1.3 Asbestos Assessment Criteria

The ASC NEPM (2013) provides specific guidance for the assessment of asbestos in soils based on the Western Australian Department of Health (DoH) Guidelines for the Assessment, Remediation and Management of Asbestos Contaminated Sites in Western Australia (DoH, 2009). The DoH guidelines include three groups of asbestos contamination:

- **Asbestos Containing Material (ACM):** asbestos is bound in a matrix, in sound condition, although possibly broken or fragmented (e.g. asbestos sheeting, vinyl floor tiles), and is restricted to material that cannot pass through a 7 mm x 7 mm sieve. The sieve size is selected on the basis that it approximates the thickness of common asbestos cement sheeting and for fragments to be smaller than this would involve extreme mechanical action probably associated with asbestos fibre release. The smaller fragments are considered to be Asbestos Fines. ACM usually represents a low human health risk
- **Fibrous Asbestos (FA):** friable asbestos material, such as severely weathered ACM and loose fibrous material such as insulation products. FA is defined as asbestos material that is in a degraded condition such that it can be broken or crumbled by hand pressure. Both ACM and FA can often be detected visually
- **Asbestos Fines (AF):** includes free fibres of asbestos, small fibre bundles and ACM fragments that pass through a 7 mm x 7 mm sieve. Both FA and AF have the potential to generate or be associated with free asbestos fibres.

The DoH guidelines nominate the soil asbestos investigation and clean-up criteria, as presented in **Table 9**.

Table 9 Asbestos Guidelines

Land Use	Asbestos Group	Health Screening Level
All land uses	All forms of Asbestos	No visible asbestos for surface soil
All land uses	FA and AF	0.001 % (w/w)
Residential, day care centres, preschools etc.	ACM	0.01 % (w/w)
Residential, minimal soil access	ACM	0.04 % (w/w)
Parks, public open space, playing fields etc.	ACM	0.02 % (w/w)
Commercial/Industrial	ACM	0.05 % (w/w)

Note: w/w = weight for weight of asbestos in soil.

Due to the limited asbestos sampling conducted as part of this targeted investigation, the assessment criteria will be limited to the absence/presence of asbestos only.

4.1.1.4 PFAS Assessment Criteria

HEPA National Environmental Management Plan (NEMP) (2020) guidelines provide human-health investigation levels for PFOS+PFHxS, and PFOA in residential with garden/accessible soil (HIL A), residential with minimal opportunities for soil access (HIL B), public open space (HIL C) and industrial /commercial (HIL D). As the Project area will be used for ongoing commercial / industrial purposes all onsite soil samples will be screened against the commercial / industrial criteria.

4.1.1.5 Adopted Human Health Assessment Criteria

A summary of the adopted human health-based soil assessment criteria is presented in **Table 10** below. All soil analytical results will be compared to these criteria.

Table 10 Adopted Human Health based Soil Assessment Criteria - Commercial/Industrial Land Use

Guideline	Level Adopted	CoPC
ASC NEPM	- HIL D	Metals, PAHs, Phenols, PCBs
	- Absence/Presence	Asbestos
CRC Care	- *Vapour Intrusion: HSL D petroleum/non-petroleum sites (Sand 0-<1m)	TRH, BTEXN
	- Direct Contact: HSL D - Intrusive Maintenance Worker	
NEMP 2.0	- Human Health Industrial/Commercial	PFOS, PFOA
	- Ecological indirect exposure, all land uses	
NSW EPA Waste Classification Guidelines	- CT 1 (General Solid Waste)	PFAS, Metals, TPH, TRH, BTEXN, PAH, Phenols, PCB, OCP
	- CT 2 (Restricted Solid Waste)	

4.1.2 Ecological Soil Assessment

4.1.2.1 Ecological Investigation Levels

The ASC NEPM (2013) provides EILs for the protection of terrestrial ecosystems. EILs have been derived for arsenic (As), copper (Cu), chromium (Cr) (III), dichloro-diphenyl-trichloroethane (DDT), naphthalene, nickel, lead and zinc and have been developed for three generic land use settings:

Areas of ecological significance (where the land use is primarily for nature conservation) – 99% species protection:

- Urban residential areas and public open space – 80% species protection
- Commercial and industrial land uses – 60% species protection.

EILs apply principally to contaminants in the top 2m of soil at the finished surface/ground level which corresponds to the root zone and habitation zone of many terrestrial species.

The EILs have been derived to protect soil, soil processes and terrestrial species using a risk-based approach. Toxicity data for each chemical was compiled and used to calculate an added contaminant limit (ACL) either using a species sensitivity distribution (SSD) or assessment factor (AF) approach depending upon the level of available toxicological data.

4.1.2.2 Ecological Screening Levels

ESLs are provided in the ASC NEPM (2013) and are based on the review of Canadian guidance (derived by the Canadian Council for Ministers of the Environment (CCME)) for petroleum hydrocarbons in soils and comparison of the derivation methodology with Australian methodology. It was determined that the derivation of ecological screening values by the CCME was in accordance with Australian methodology and thus the CCME values for BTEX, benzo(a)pyrene and F1 (carbon chain fractions C₆-C₁₀) and F2 (>C₁₀-C₁₆) were adopted in the ASC NEPM (2013).

ESLs are provided for four TPH fractions (F1 to F4, [F3 >C₁₆-C₃₄ and F4 >C₃₄-C₄₀]) and for coarse and fine-grained soil types. The adopted values for F3 and F4 fractions are considered low reliability due to the limited Australian ecotoxicity data. As per the EILs, the ESLs apply from the surface to 2m depth below finished surface/ground level and apply to fresh petroleum contamination. The ESLs have been adopted for screening purposes in this assessment.

4.1.2.3 PFAS Assessment Criteria

The HEPA NEMP (2020) presents ecological guidelines for soil for direct exposure and indirect exposure which apply to all land uses.

Based on the findings of the ERA (AECOM, 2017) the broader site is likely to support ecological food webs that support high trophic organisms (e.g. insectivorous birds), both aquatic and terrestrial. Therefore, ecological criteria for both direct and indirect exposure are considered relevant for the Project area.

4.1.2.4 Adopted Soil Ecological Assessment Criteria

The adopted ecological soil assessment criteria are summarised in **Table 11** below.

Table 11 Adopted Soil Ecological Assessment Criteria

Land Use	Level	Contaminant
Commercial/ Industrial	EIL - Commercial and industrial land uses	Naphthalene, Metals (Zinc, Copper, Chromium III, Nickel, Lead and Arsenic).
	ESL - Commercial and industrial land uses	TRH (F1 to F4), BTEX, Naphthalene and Benzo(a)pyrene.
All land uses	NEMP 2.0 -Ecological direct exposure	PFOS, PFOA
	NEMP 2.0 - Ecological indirect exposure	PFOS, PFOA

4.1.2.5 Adopted Aesthetic Assessment Criteria

In accordance with the ASC NEPM (2013), the following are the type of findings that would trigger the requirement for assessment of aesthetic considerations where further assessment hasn't already been triggered by an exceedance of an investigation or screening criteria:

- Highly odorous soil or groundwater
- Hydrocarbon sheens on groundwater
- Discoloured soil or chemical deposits
- Large monolithic deposits of otherwise low risk material
- Soils containing residue from animal or abattoir waste burial.

The above aesthetic conditions have been considered in the assessment of the Project area.

4.2 Soil Leachate Criteria

The following guidelines were adopted for the evaluation of the soil leachate analytical results.

- NSW EPA Waste Classification Guidelines (2014) and Addendum (2016)
- HEPA NEMP (2020) – Recreational and 99% Interim Marine Guideline values.

4.3 Surface Water Assessment Criteria

The following guidelines were adopted for the evaluation of the surface water analytical results.

- HEPA PFAS NEMP (2020) – Recreational health based guidelines
- Interim Marine Guideline values – 99% species protection.

AS stated in the HEPA PFAS NEMP (2020), for bioaccumulative contaminants, which includes many PFAS, the Water Quality Guideline framework specifies that the 99% species protection default guideline value (DGV) should be used for:

- assessing toxicity and bioaccumulation in high conservation value ecosystems

- assessing bioaccumulation in slightly to moderately disturbed ecosystems.

The adopted surface water assessment criteria will be the 99% Marine Water Trigger Levels, noting the ultimate receiving waterbody is Muddy Lake, a saline waterbody and many of the PFAS are bioaccumulative. The adopted surface water criteria are presented within the surface water analytical results in **Table T2** in **Appendix C**.

4.4 Summary of Criteria for Site Assessment

The criteria selected above for the screening of soil and surface water have been selected to provide assessment of potential contamination risks to human health and ecological receptors at the Project area, including potential future construction workers and future Project area users.

4.5 Waste Classification Criteria

The NSW EPA Waste Classification Guidelines (2014) were used to classify waste into groups that pose similar risks to the environment and human health. The guidelines divide waste into the following categories:

- Special waste
- Liquid waste
- Pre-classified waste (such as garden waste)
- Hazardous waste (such as explosives)
- General solid waste (putrescibles and non- putrescible)
- Restricted solid waste (following chemical assessment).

In 2016, an addendum to the NSW EPA Waste Classification Guidelines was released to include toxicity characteristics leaching procedure (TCLP) and specific contaminant concentration values for PFOS, perfluorohexane sulfonate (PFHxS) and perfluorooctanoic acid (PFOA).

The analytical suite used to provide an indication of waste classification was based on the CoPC associated with coal fire power generation and those identified in the ERM (2015) Stage 2 ESA. Collected samples from the Project area were analysed for the following analytes:

- TRH
- BTEXN
- PAH
- Phenols
- OCPs
- PCB
- Heavy Metals (As, Ca, Cr, Cu, Pb, Hg, Ni, Zn)
- PFAS.

As the material could not be pre-classified into one of the above waste categories, the samples were subjected to classification using chemical assessment. In order to determine the likely waste classification if soils are considered surplus and require off-site disposal to a licenced landfill, the results were screened against the contaminant thresholds (CTs) for general solid waste (GSW) and restricted solid waste (RSW).

5.0 Quality Assurance and Quality Control

Soil and surface water QAQC tables are presented in **Table T1** and **Table T4** in **Appendix C**. The data validation summary reports are location in **Appendix B**. The data validation program comprised of an assessment of the field and laboratory QA/QC data.

The assessment indicated that the reported analytical results are representative of the soil and surface water conditions at the sample locations within the Project area, and that the overall quality of the analytical data produced is acceptable for the purpose of the assessment.

6.0 Investigation Results

6.1 Project area Stratigraphic Conditions

Gravelly sand, or sandy gravel, transitioning to sandy clays after 0.3 to 0.4 metres (m) were generally logged in all soil bores around the main area within the footprint of the BESS. Grass topsoil transitioning to chitter after 0.2 to 0.3m were generally logged in soil bores within the proposed laydown area. Grass topsoil transitioning to sandy clays after 0.2 to 0.3m were generally logged within the proposed cable connection area logged in soil bores and gravel fill material was logged at one location. There was no evidence of contamination (odour or visual) or suspected ACM observed in the soil samples collected from across the Project area.

6.2 Soil Analytical Results

Soil analytical results for soil sampling during this contamination assessment are provided in **Table T1** of **Appendix C** and PFAS leachable analytical results are provided in **Table T2** of **Appendix C**. Laboratory certificates are provided in **Appendix F**.

- Reported soil concentrations for the CoPC were less than the adopted Human Health SAC for commercial/industrial land use in the soil samples analysed
- Report soil concentrations for the CoPC were less than the adopted Ecological SAC for commercial/industrial land use and for ecological direct/indirect exposure in the soil samples analysed
- Detectable concentrations of PFAS, below the adopted assessment criteria were reported in 15 soil samples from ten hand auger locations (HA018, HA019, HA021, HA025, HA028, HA030, HA031, HA032, HA033 and HA035). PFAS concentrations decreased with depth and were not detected in samples greater than a depth of 0.5 m bgs.

6.3 Waste Classification

Soil analytical results assessed against the NSW EPA Waste Classification guidelines (2014) are provided in **Table 3** of **Appendix C**. Laboratory certificates are provided in **Appendix F**.

All samples analysed reported concentrations below general solid waste CT1 criteria indicating that the material would be classified as general solid waste (GSW), if it were considered surplus and required off-site disposal to a licensed landfill.

Selected soil samples were analysed for PFAS TCLP. The soil leachate testing reported concentrations below the waste classification guidelines for GSW.

6.4 Surface Water

6.4.1 Surface Water Conditions

The surface water sample (SW001) was collected from ponded stagnant surface water within an intermittent drainage line to the north of the BESS footprint within the Project area, as shown in **Figure 3** in **Appendix A**.

Measured geochemical parameters are presented in **Table 12**.

Table 12 Surface Water Parameters

Sample Point	Dissolved Oxygen (mg/L)	Electrical Conductivity (µS/cm)	pH	Redox (Eh) (mV)	Temp (°C)
SW001	5.87	34,700	3.01	478	21.1

The geochemical parameters measured indicate that the surface water is marine to saline, acidic and oxidising. No sheen or odours was observed at SW001.

6.4.2 Surface Water Analytical Results

PFAS Analytical results for surface water sample SW001 is presented in **Table T4** of **Appendix C**. Laboratory certificates are provided in **Appendix F**.

PFAS concentrations were reported below the laboratory LOR with the exception of:

- Sum (PFHxS + PFOS) - 0.02 µg/L
- PFBS - 0.03 µg/L
- PFOS - 0.02 µg/L
- Sum of PFAS - 0.05 µg/L.

All PFAS concentrations were below the adopted surface water criteria with the exception of PFOS which exceeded the adopted surface water criteria (0.00023 µg/L) with a result of 0.02 µg/L.

7.0 Conceptual Site Model

The purpose of a Conceptual Site Model (CSM) is to present information regarding contamination sources, receptors and exposure pathways between the sources and receptors, and to assess the risks potentially present at the Project area. The CSM is based on the available data.

The transport and ecological and human health exposure pathways for the Project area are summarised below.

- Potential transport mechanisms of contamination at the Project area are:
 - Transport of particulates via wind, vehicular movements or earthworks
 - Leaching from soils and rock to underlying groundwater
 - Groundwater migration and potential downstream (off-site) discharge into lakes and creeks
 - Surface water in ephemeral drainage lines within the Project area. Surface water is intermittent across the Project area, and may flow following a rainfall event of sufficient intensity.
- Potential human health exposure pathways:
 - Exposure via direct dermal contact, inhalation or ingestion for commercial worker or future construction worker (if appropriate controls and PPE are not implemented)
 - Direct contact with shallow groundwater or with surface water.
- Ecological exposure pathways:
 - Uptake of contaminants by aquatic plant species from surface water and ingestion or uptake of contaminants by fauna
 - Uptake of contaminants in soil by plants and ingestion of soil by fauna
 - Bioaccumulation of contaminants in fauna that ingest plants which have been exposed to contaminants.

The CSM for the Project area including the completion of the pathways between sources and receptors is presented in **Table 13** and is based on the data from the historical investigations and current contamination assessment.

The Source-Pathway-Receptor linkages presented in **Table 13** below have been assessed against a Commercial/Industrial land use scenario to reflect anticipated activities at the Project area. Typical anticipated activities include earthworks and construction as part of the Project.

Table 13 Conceptual Site Model

Potential Sources of Contamination	CoPC	Surface Water Conditions and Impacts	Soil Impacts	Groundwater Impacts	Receptors	Pathway Completion
Former FTA within the Project area, where AFFF containing PFAS chemicals were historically used during firefighting training prior to Origin's occupation of the power station.	<ul style="list-style-type: none"> PFAS 	<ul style="list-style-type: none"> One surface water sample was collected and analysed for PFAS only. The water body sampled was pooled and stagnant. No exceedance of adopted human health assessment criteria for PFAS contaminants. Exceedance of Interim Marine 99% for PFOS was reported. Historically, surface water samples collected further down gradient of the broader site and Project area had concentrations of PFOS below the ecological assessment criteria. 	<ul style="list-style-type: none"> Localised low concentrations of PFAS were reported in 15 shallow soil samples within the top 0.5 m. Historically, PFAS concentrations in soil samples within the former FTA appear to be limited to low concentrations below the adopted criteria within shallow soils. 	<ul style="list-style-type: none"> Historically, groundwater samples collected downgradient of the Project area had concentrations of PFOS above the adopted ecological assessment criteria. Concentrations of PFAS further downgradient of the Project area have historically been non-detect. 	<p>Human Health:</p> <ul style="list-style-type: none"> Future site workers and intrusive maintenance workers. Concentrations of PFAS at the sampled locations were less than human health SAC. <p>Ecological:</p> <ul style="list-style-type: none"> Concentrations of PFAS in the pooled surface water sampled were less than recreational criteria however, were above Interim Marine 99% criteria. Concentrations of PFAS in surface water and groundwater further downgradient of the Project area were below the LOR in the recent December 2020 monitoring event. 	<ul style="list-style-type: none"> Human receptor Commercial Workers and Intrusive Maintenance Workers exposure pathway (direct contact) from soil contamination is considered incomplete. The ecological pathway is incomplete for soil uptake. Potentially intermittently complete pathway. The ecological pathway is potentially complete under circumstances where there is sufficient surface water run-off / flow to mobilise PFAS.
Metals in groundwater as a result of historical activities associated with the Eraring Power station broader site	<ul style="list-style-type: none"> Zinc Copper Manganese Lead Nickel 	<ul style="list-style-type: none"> Ponded surface water sampled reported high salinity and acidic pH. Historically, surface water samples collected at the ERSETPD down gradient of the Project area had concentrations of zinc exceeding the ecological assessment criteria in select samples. 	<ul style="list-style-type: none"> NA 	<ul style="list-style-type: none"> Historically, groundwater samples collected in the vicinity of the Project area had concentrations of copper, lead, nickel and zinc above the adopted ecological assessment criteria and concentrations of manganese above the adopted human health assessment criteria. 	<p>Human Health:</p> <ul style="list-style-type: none"> Future site workers and intrusive maintenance workers. Concentrations of Manganese in groundwater upgradient of the Project area exceeded the human health SAC. <p>Ecological:</p> <ul style="list-style-type: none"> Concentrations of metals (Cu, Pb, Ni and Zn) in the surface waters were less than recreational criteria however, were above Interim Marine 99% criteria. 	<ul style="list-style-type: none"> Human receptor Commercial Workers and Intrusive Maintenance Workers exposure pathway (direct contact) from soil contamination is considered incomplete. The ecological pathway is incomplete for soil uptake. The ecological pathway is potentially complete for metals (Cu, Pb, Ni and Zn) in surface water which flows intermittently towards the ecological receptor, Muddy Lake.
Borrowed pits associated with the construction of the attemperation reservoir	<ul style="list-style-type: none"> Asbestos 	<ul style="list-style-type: none"> NA 	<ul style="list-style-type: none"> Historically, two fragments of ACM containing chrysotile and amosite asbestos fibres were observed and confirmed to contain chrysotile and amosite asbestos fibres (ERM, 2015) in vicinity of the borrowed pits 	<ul style="list-style-type: none"> NA 	<p>Human Health:</p> <ul style="list-style-type: none"> Future site workers and intrusive maintenance workers. 	<ul style="list-style-type: none"> Potentially complete. However, based on limited and localised detection of asbestos, risk to Commercial Workers and Intrusive Maintenance Workers on-site are considered low.

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8.0 Discussion

8.1 Nature and Extent of Contamination

8.1.1 Soil

Relatively low concentrations of PFAS were detected at a number of locations (HA021_0.05, HA019_0.05, HA018_0.05, HA028_0.05 and HA025_0.05) in the sub-surface soils in the vicinity of the former FTA and at the proposed lay down area of the Project area. The detects of PFAS in soils from this investigation and historical investigations were limited to the sub-surface soils and concentrations were below the adopted site assessment criteria for protection of human health and ecological receptors. Soil PFAS concentrations decreased with depth demonstrating typical surface down impacts associated with firefighting training activities. Soil leachate concentrations of PFAS exceeded the Interim Marine 99% protection level at a localised surface soil sample location (HA025_0.05). This localised soil leachate result associated with re-use of soils on-site and as potentially surplus soils (assessed against waste classification guidelines) from the construction works are discussed further in **Section 8.1.4**.

Historically, two fragments of ACM were observed and confirmed to contain chrysotile and amosite asbestos fibres from the borrowed pits within the Project area, indicating localised ACM impact.

Soil sampling from this Contamination Assessment and historical investigations across the Project area has not identified any further impacts from CoPCs.

8.1.2 Surface Water

SW001 was collected from pooled stagnant water from an intermittent ephemeral drainage line in the northern part of the Project area. The current assessment indicated a PFOS concentration that exceeded the adopted ecological criteria (Interim Marine 99% protection level) for this surface water sample.

Recent surface water sampling from the December 2020 monitoring event indicated that reported concentrations of PFOS were below the laboratory LOR at the most downgradient surface water location adjacent to Muddy Lake (AECOM, 2021a), which is also down-gradient of the Project area.

At present, there is insufficient evidence to confirm that the concentration detected at SW001 is either representative of typical surface water conditions across the Project area and that the reported PFOS concentration, discharges across the Project area boundary. In summary, surface water at the Project area appears to be discontinuous and an ongoing enduring hydraulic connection has not been conclusively established between this location and the receiving environment of Muddy Lake, although the drainage pathway heads towards Muddy Lake.

The pH of the surface water sampled was acidic and may indicate the presence of potential acid sulphate soils at the Project area.

Review of the historical surface water data from previous investigations, discussed in **Section 2.2**, indicated surface water collected at the ERSETPD down gradient of the Project area reported concentrations of dissolved zinc exceeding the ecological assessment criteria in SW11 (AECOM, 2021a).

8.1.3 Groundwater

A review of the historical groundwater data from previous investigations, discussed in **Section 2.2** indicated groundwater samples collected in the vicinity of the Project area reported impacts as follows:

- Concentrations of copper and zinc were above the adopted ecological assessment criteria at EJ_MW54, located potentially upgradient of the Project area (ERM, 2015)
- Concentrations of manganese was reported above the adopted human health assessment criteria and concentrations of copper, lead, nickel and zinc were reported above the adopted ecological assessment criteria at ERGW1, located potentially upgradient of the Project area (AECOM, 2021a)

- Concentrations of PFOS were reported above adopted ecological assessment criteria at EJ_MW39 located downgradient of the Project area (AECOM, 2021b) and concentrations of regulated PFAS further downgradient of the Project area have historically been reported as non-detects (AECOM, 2021a).

8.1.4 Assessment for re-use of soil on-Site

The HEPA PFAS NEMP (2020) includes a decision tree for assessment of re-use of soils on site, which outlines that leachate concentrations need to be protective of receiving water bodies. Given that PFOS concentrations in soil leachate exceed the adopted ecological assessment criteria for protection of nearby ecological receptors at a localised location, further assessment of risk and implementation of appropriate management measures is required before soils can be reused at the Project area. The guidance in the HEPA PFAS NEMP (2020) should be observed.

Should surplus soils be generated during the planned Project construction works that require off-site disposal, then the soil sampling completed to date indicates that material would be classified as general solid waste (GSW) in accordance with the NSW EPA waste classification guidelines. However, it is noted that the sampling density and locations may not be sufficient / appropriate for waste classification given that the volumes of material to be excavated and considered surplus, is not known.

9.0 Conclusions and Recommendations

9.1 Conclusions

The nature of land and water contamination across the Project area does not identify a risk to human health that requires remediation as part of the proposed Project. Whilst localised ACM was historically identified in the borrowed pits associated with the construction of the attemperation reservoir, these impacts can be managed by implementation of mitigation measures as part of a construction environment management plan (CEMP) specific to the Project.

There are low level PFOS impacts (exceed the adopted ecological criteria [Interim Marine 99% protection level]) in pooled stagnant surface water from an intermittent drainage line (mostly dry at the time of sampling) in the northern part of the Project area. Recent surface water sampling from the December 2020 monitoring event indicated that reported concentrations of PFOS were below the laboratory LOR at the most downgradient surface water location adjacent to Muddy Lake (AECOM, 2021a), which is also down-gradient of the Project area.

The HEPA PFAS NEMP (2020) includes a decision tree for assessment of re-use of soils on site, which outlines that leachate concentrations need to be protective of receiving water bodies. Given that PFOS concentrations in soil leachate PFOS exceed the adopted ecological assessment criteria for protection of nearby ecological receptors at a localised location, further assessment of risk and implementation of appropriate management measures is required before soils can be reused at the Project area.

The surface water sampled from the pooled stagnant water reported a low pH, indicating acidic conditions and presence of potential acid sulphate soils at the Project area.

Historically, metals (Cu, Pb, Ni and Zn) and PFAS have been detected in monitoring wells in the vicinity of the Project area at concentrations greater than the adopted ecological assessment criteria, however concentrations of PFAS in groundwater further downgradient of the Project area have reported concentrations below the LOR. Concentrations of metals at the downgradient boundary are however consistent with metal concentrations across the broader Eraring Power Station, and with concentrations from previous monitoring events.

9.2 Recommendations

Based on the nature of land and water contamination identified from review of historical investigations and this current assessment, mitigation measures as part of a CEMP should be implemented to minimise any potential risk to ecological receptors during the redevelopment of the Project area.

The CEMP would need to give consideration (but not be limited) to:

- An acid sulfate soils management plan in accordance with Acid Sulfate Soil Manual (NSW ASSMAC, 1998), in the event that PASS is encountered
- An unexpected finds protocol, including encountering ACM during the extent of the construction works
- Management of surface water when present to minimise the mobilisation of any potential residual soil impacts that could migrate to sensitive off-site ecological receptors
- Management of materials during construction works by implementation of the Decision Tree for Reuse of Soil in HEPA (2020) PFAS NEMP, so that excavated soils can be reused in less sensitive areas or managed within the Project area to prevent unacceptable risks to any receptor and minimise off-site disposal of excavated materials to a licensed landfill.

By implementation of the above mitigation measures during the construction works and for the future use of the Project area as a BESS, the potential risk to off-site ecological receptors can be minimised.

10.0 Key References

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- AECOM, 2021a. Eraring Power Station – review of non-PFAS Monitoring Data, draft version dated March 2021.
- AECOM, 2021b. Eraring Power Station - review of PFAS Monitoring Data, dated May 2021.
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- Friebel, E and Nadebaum, P (2011) *Health screening levels for petroleum hydrocarbons in soil and groundwater*. CRC CARE Technical Report no. 10, CRC for Contamination Assessment and Remediation of the Environment, Adelaide, Australia
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- GHD, 2021c. Origin Energy Eraring Pty Ltd –Preliminary Contamination Assessment Proposed Battery Energy Storage System, Eraring Power Station, dated April 2021.
- Heads of EPAs Australia and New Zealand (HEPA) and the Australian Government Department of the Environment and Energy (DoEE) 2020, PFAS National Environmental Plan (NEMP), version 2.0.
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- National Environment Protection Council (NEPC), 1999. National Environment Protection (Assessment of Site Contamination), as amended 2013 (ASC NEPM (2013)).
- NSW ASSMAC, 1998. *Acid Sulfate Soil Manual*.
- NSW EPA, 2017. *Guidelines for the NSW Site Auditor Scheme, 3rd Edition*.
- NSW EPA, 1995. *Sampling Design Guidelines*.
- NSW Office of Environment & Heritage (OEH) 2011. Guidelines for Consultants Reporting on Contaminated Sites.
- Western Australia Department of Health, May 2009. Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia

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Appendix A

Figures

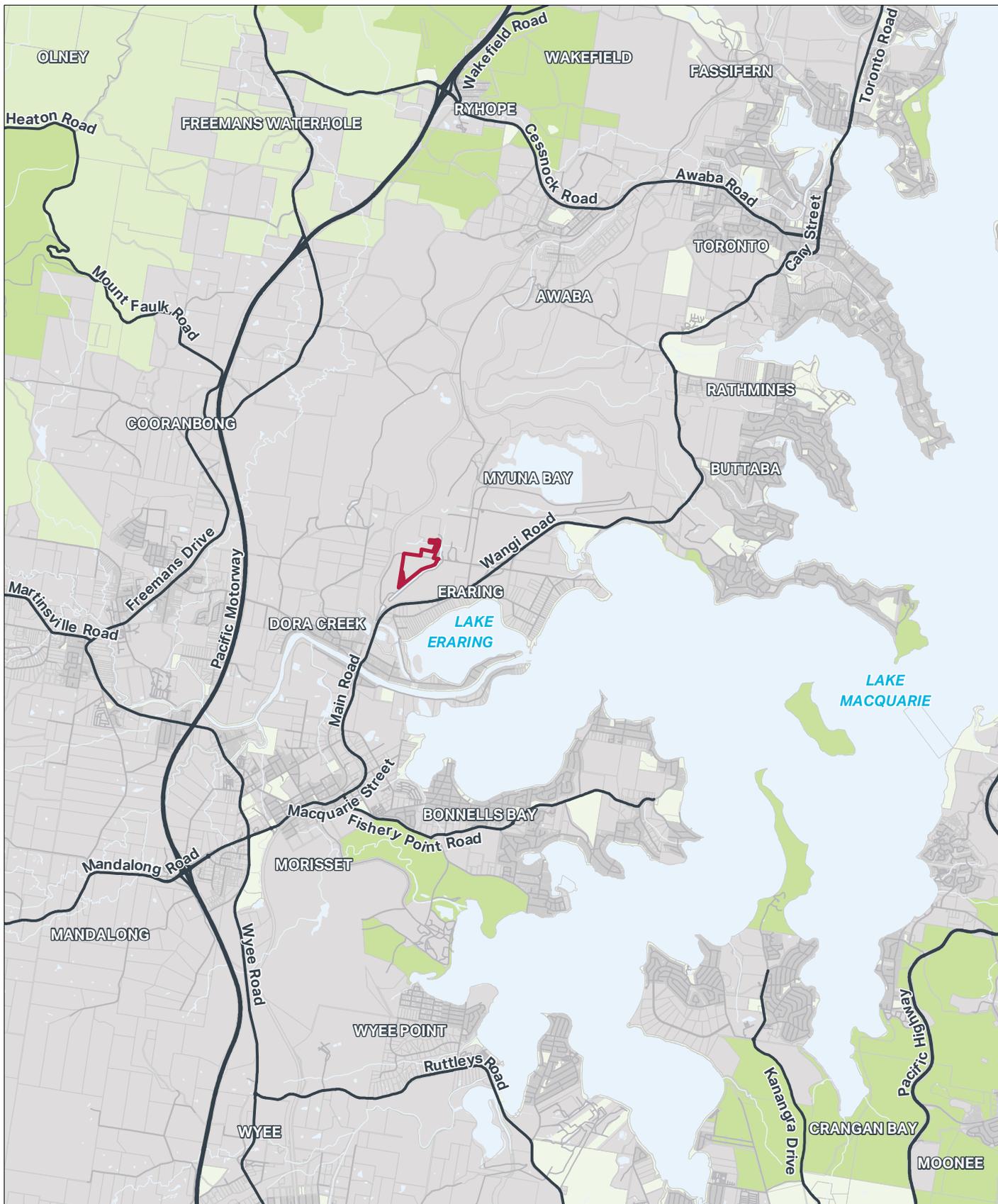


FIGURE 1: SITE LOCATION

Origin Energy - Eraring Power Station
 Rocky Point Road, Eraring NSW



Legend

- Project Area
- National Parks Estate
- Primary road
- State forest
- Local road
- Local park
- Watercourse
- Waterbody

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Via aecom.com.au | 154PAC | Sydney | AU | 511 | Secure | Project | 605A | 60522823 | 900 | CAD | GIS | 9/20 | GIS | 02 | Maps | G003 | 02 | AEP | Site Location | 20210701 | mxd Date Saved: 11/07/2021

**FIGURE 2:
SITE LAYOUT**

Origin Energy - Eraring Power Station
Rocky Point Road, Eraring NSW



Legend

- Project Area
- Battery Energy Storage System
- Proposed 330kV transmission connection
- Substation

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**FIGURE 3:
SAMPLING LOCATIONS**

Origin Energy - Eraring Power Station
Rocky Point Road, Eraring NSW



Legend

- Project Area
- High-level Inlet Canal seepage and storm water drainage
- ➔ Inferred surface water flow
- ◆ Sampling location

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**FIGURE 4:
HISTORICAL SAMPLING
LOCATIONS**

Origin Energy - Eraring Power Station
Rocky Point Road, Eraring NSW



Legend

- Project
- ◆ Historical sampling location
- Battery Energy Storage System
- proposed 330kV transmission connection
- Substation

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Appendix B

Data Validation

1.0 LABORATORY DATA VALIDATION REPORT					
Project number:	60622873	Validation by:	P. Waddingham	Date:	02/06/2021
Client:	Origin Energy				
Site:	Eraring Power Station				
Matrix type:	Soil and Surface water	Data verified by:	J. Byrne	Date:	03/06/2021
Primary Samples:	50 soil and 1 surface water				
Laboratory:	ALS (Primary) and Eurofins (Secondary)				
Lab reference:	ES211814, ES2119057, ES2120685, 797546, 802500	Project Manager:	O. Ferguson	Date:	17/06/2021
Key Issues:	No issues were identified that have the potential to impact upon the reliability of the Data. AECOM considers that the field procedures and laboratory QA/QC processes employed were appropriate for the purposes of the investigation.				
Field Quality Assurance and Quality Controls					
Field DQOs and DQIs	The data quality objectives (DQOs) and data quality indicators (DQIs) adopted for these works are presented in the BESS Contaminated Assessment (AECOM,2021).				
Sampling personnel	Sampling was conducted by Peter Waddingham and Sidnee Harris between the 18/05/2021 and 18/05/2021. Field personnel were all suitably qualified and experienced AECOM Environmental Scientists				
Sampling Methodology	<p>Soil samples were collected from directly beneath surface in general at 0.05m bgl, 0.5m bgl, and 1.0m bgl using a de-contaminated stainless-steel hand auger. Soil samples were collected directly from the auger using a nitrile gloved hand and placed directly into laboratory supplied and stored on ice.</p> <p>One surface water sample was collected from directly beneath the surface. Smaller vials were filled from larger sampling containers, to ensure preservative acids did not spill. The bottles were filled to the top, following laboratory instructions, caps immediately applied and stored on ice for preservation.</p> <p>After each sampling location, re-usable equipment was decontaminated using Liquinox and nitrile gloves disposed of, with a new pair used for sampling location.</p>				
Chain of Custody	All samples taken were reported on the Chain of Custody documents (COC) and analysed for requested analytes.				
Frequency of field QC	Field duplicate and triplicates (inter-laboratory duplicates) were to be collected at a frequency of one in ten primary samples. In total, six field duplicates were collected for Soil, meeting the DQO.				

Handling and preservation	<p>Primary and duplicate samples for Soil, surface and water were placed in a chilled cooler between sampling and analysis. Samples were received preserved and chilled at the laboratory, with all containers received within the recommended temperature range ($4 \pm 2^{\circ}\text{C}$).</p> <p>The inter-laboratory duplicate samples were received at the secondary laboratory (Eurofins) within the recommended temperature range ($4 \pm 2^{\circ}\text{C}$). All samples were received at the laboratory in appropriate sample containers.</p>
Calibration of equipment	<p>Measurement of surface water geochemical parameters was undertaken using YSI Pro Plus (WQM), which was calibrated by the supplier prior to use, in accordance with manufacturer's instructions. The water quality meter was also calibrated in the field prior to use.</p> <p>All calibration and service certificates are presented in Appendix D of the report.</p>
<p>Laboratory Quality Assurance and Quality Controls</p>	
Laboratory DQOs and DQIs	<p>All primary 0.05m bgl soil samples were analysed for the PFAS extended suite with additional at depth samples analysed as required, with approximately ten samples analysed for heavy metals (as, Cd, Cr, Cu, Hg, Ni, Pb and Zn), TRH, BTEXN, PAHs, Phenols, PCBs and OCP. In addition, asbestos analysis was undertaken on six samples. TCLP analysis is reported in ES2120685.</p>
Tests requested/reported	<p>All sample request of analysis was reported on the Chain Of Custody (COC).</p>
Holding time compliance	<p>Samples were extracted and analysed within recommended holding times.</p>
Laboratory	<p>The primary laboratory analysis was conducted by ALS Environmental Pty Ltd (Sydney) a National Association of Testing Authorities (NATA) accredited laboratory (Accreditation No. 825). The secondary sample analysis was conducted at the Eurofins Environmental Testing (Eurofins, Sydney), also a NATA accredited laboratory (accreditation number 1261).</p>
Frequency of laboratory QC	<p>The laboratory reported a sufficient frequency of quality control samples to assess whether the results have been reported to an acceptable accuracy and precision with the exception of the following laboratory certificates which reported quality control frequency outliers for:</p> <p>Laboratory Duplicates (DUP) Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS for Water matrices:</p> <ul style="list-style-type: none"> • ES2118814 – 0.0% below the expected 10.0% due to insufficient samples • ES2119057 – 0.0% below the expected 10.0% due to insufficient samples <p>Given that the laboratory RPDs were within control limits, it is unlikely that these outliers will affect the integrity of data for reporting purposes.</p>
Method Blank (MB)	<p>All method blank concentrations were reported <LOR for the analytes tested from the primary laboratory, ALS. This is presented in the laboratory Quality Control Report.</p>

Laboratory Duplicate (LD) Relative Percent Difference (RPD)	The reported laboratory RPDs were within laboratories control limits. The laboratory duplicate RPDs are presented in the laboratory Quality Control Report.
Laboratory Control Spike (LCS) recovery	The reported laboratory Control Spikes (LCS) recoveries were within the laboratories control limits. This is presented in the laboratory Quality Control Report
Matrix Spike (MS) recovery	Matrix spike (MS) recoveries met the DQI, with the exception of: <ul style="list-style-type: none"> - Rate of Matrix Spike for PFAS by LCMSMS in batch ES2119057, where the number of matrix spikes were 0.0% below the expected 5.0%. Given that the laboratory MS recoveries were within control limits for all other media sampled, it is unlikely that this outlier will affect the integrity of data for reporting purposes. - MS recoveries not determined for a number of PFAS substances as conducted on an anonymous sample and background concentrations level was greater than 4 x the spike level.
Surrogate spike (SS) recovery	The reported laboratory Surrogate Spikes (SS) recoveries were within the laboratories control limits. This is presented in the laboratory Quality Control Report.
Quality Assurance and Quality Controls Data Evaluation	
Comparison of Esdat data and Laboratory Results	No anomalous results between Esdat output data and laboratory analysis results were noted.
Data transcription	A check of the laboratory results identified no anomalies within the electronic data, the laboratory reports, and tables generated by AECOM.
Limits of reporting	Limits of Reporting (LORs) were sufficiently low to enable assessment against adopted human health ecological screening levels.
Field duplicate and RPDs	Field duplicate RPDs were reported within control limits for all primary and duplicate samples.
Comments	
Data validation procedure employed in the assessment of the field and laboratory QA/QC data indicated that the reported analytical results are representative of the sample locations and that the overall quality of the analytical data produced is acceptably reliable for the purpose of this report.	

Appendix C

Tables

		Per- and Polyfluoroalkyl Substances (PFAS) by LCMS																																		
		Sum (PFAS + PFOS)	Perfluorobutane sulfonic acid (PFBS)	Sum of PFAS (WA DER List)	Perfluoropentane sulfonic acid (PFHxS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPA)	Perfluorohexanoic acid (PFHA)	Perfluorooctanoic acid (PFHpA)	Perfluorodecanoic acid (PFDA)	Perfluorododecanoic acid (PFNA)	Perfluorotetradecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTrDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	N-Methyl perfluorooctane sulfonamideacetic acid (MeFOSAA)	N-Ethyl perfluorooctane sulfonamideacetic acid (EFOSAA)	Perfluorooctane sulfonamide (FOSA)	N-Ethyl perfluorooctane sulfonamide (EFOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Ethyl perfluorooctane sulfonamide (EFOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Ethyl perfluorooctane sulfonamide (EFOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	Sum of PFAS			
EQCL		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			
PFAS NEMP 2020 Interim Marine 99%		0.01	0.02	0.01	0.02	0.02	0.02	0.01	0.02	0.1	0.02	0.02	0.02	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.05	0.05	0.05	0.05	0.02	0.02	0.02	0.02	0.05	0.05	0.05	0.05	0.05	0.01		
PFAS NEMP 2020 Recreational Water																																				
NSW Waste Classification (2014) TCLP 1 (General Solid Waste)	2																																			
NSW Waste Classification (2014) TCLP 2 (Restricted Solid Waste)	200																																			
Field ID	Sampled Date Time	Lab Report Number																																		
HA018	0.05	19/05/2021	ES2120685	<0.01	<0.02	<0.01	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	
HA019	0.05	19/05/2021	ES2120685	<0.01	<0.02	<0.01	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01
HA025	0.05	20/05/2021	ES2120685	0.02	<0.02	0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.02
HA038	0.05	20/05/2021	ES2120685	<0.01	<0.02	<0.01	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01
HA032	0.05	20/05/2021	ES2120685	<0.01	<0.02	0.08	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.03	0.05	0.12	0.06	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.26

		Per- and Polyfluoroalkyl Substances (PFAS) by LCMS																															
		Sum (PFAS + PFOS)	Perfluorobutane sulfonic acid (PFBS)	Sum of PFAS (NA DER List)	Perfluoropentane sulfonic acid (PFHxS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPrA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDDA)	Perfluorotridecanoic acid (PFTriDA)	Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Ethyl perfluorooctane sulfonamide (EFOSA)	Perfluorooctane sulfonamide (FOSA)	N-Ethyl perfluorooctane sulfonamide (EFOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Ethyl perfluorooctane sulfonamide (EFOSE)	N-Methyl perfluorooctane sulfonamide (MeFOSE)	Sum of PFAS	
ECI		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	
PFAS NEMP 2020 Interim Marine 99%		0.01	0.02	0.01	0.02	0.02	0.01	0.02	0.02	0.1	0.02	0.02	0.02	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.05	0.05	0.05	0.05	0.05	0.02	0.02	0.02	0.05	0.05	0.05	0.05	0.01
PFAS NEMP 2020 Recreational Water		2						0.0023							19																		
Field ID	Sampled Date Time	Lab Report Number																															
SW01_210520	20/05/2021	ES2119057																															
Notes		0.02	0.03	0.05	<0.02	<0.02	<0.01	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.05
Exceeds PFAS NEMP 2020 Interim Marine 99%																																	
Exceeds PFAS NEMP 2020 Recreational Water																																	

Field or Interlab Duplicates

Lab Report Number	Field ID	Matrix Type	Date	Sum of Unhealth PFAC (PHH ₆ + PFOS + PFOA)		Physico- Chemical Parameters
				UG/KG	UG/KG	
EQL				5	5	0.1
ES2118814	HA011_0.05_210519	soil	19/05/2021	NR	NR	13.5
ES2118814	QC102_210519	soil	19/05/2021	NR	NR	13.0
RPD				NR	NR	4
ES2118814	HA011_0.05_210519	soil	19/05/2021	NR	NR	13.5
797054	QC202_210519	soil	18/05/2021	NR	NR	NR
RPD				NR	NR	NR
ES2118814	HA011_0.05_210519	soil	19/05/2021	NR	NR	13.5
802500	QC202_210519	SOIL	18/05/2021	<5	<5	NR
RPD				NR	NR	NR
ES2118814	HA014_0.05_210519	soil	19/05/2021	NR	NR	11.1
ES2118814	QC101_210519	soil	19/05/2021	NR	NR	11.1
RPD				NR	NR	0
ES2118814	HA014_0.05_210519	soil	19/05/2021	NR	NR	11.1
797054	QC201_210519	soil	18/05/2021	NR	NR	NR
RPD				NR	NR	NR
ES2118814	HA014_0.05_210519	soil	19/05/2021	NR	NR	11.1
802500	QC201_210519	SOIL	18/05/2021	<5	<5	NR
RPD				NR	NR	NR
ES2118814	HA015_0.05_210519	soil	19/05/2021	NR	NR	9.9
ES2118814	QC100_210519	soil	19/05/2021	NR	NR	9.9
RPD				NR	NR	10
ES2118814	HA015_0.05_210519	soil	19/05/2021	NR	NR	9.9
797054	QC200_210519	soil	18/05/2021	NR	NR	NR
RPD				NR	NR	NR
ES2118814	HA015_0.05_210519	soil	19/05/2021	NR	NR	9.9
802500	QC200_210519	SOIL	18/05/2021	<5	<5	NR
RPD				NR	NR	NR
ES2119057	HA027_0.05_210520	soil	20/05/2021	NR	NR	7.5
ES2119057	QC103_210520	soil	20/05/2021	NR	NR	7.8
RPD				NR	NR	4
ES2119057	HA027_0.05_210520	soil	20/05/2021	NR	NR	7.5
797546	QC203_210520	soil	20/05/2021	<5	<5	NR
RPD				NR	NR	NR
ES2119057	HA028_0.05_210520	soil	20/05/2021	NR	NR	24.9
ES2120685	QC104	soil	20/05/2021	NR	NR	23.9
RPD				NR	NR	4
ES2119057	HA028_0.05_210520	soil	20/05/2021	NR	NR	24.9
800143	QC204_210520	soil	20/05/2021	<5	<5	NR
RPD				NR	NR	NR
ES2119057	HA029_0.05_210520	soil	20/05/2021	NR	NR	6.4
ES2120685	QC105	soil	20/05/2021	NR	NR	28.2
RPD				NR	NR	126
ES2119057	HA029_0.05_210520	soil	20/05/2021	NR	NR	6.4
800143	QC205_210520	soil	20/05/2021	<5	<5	NR
RPD				NR	NR	NR

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

**Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RPDs for each EQL multiplier range ar

***Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any met

Table 6 - Rinstate Analytical Results
 Analytical Results
 Origin Eraring
 Origin Energy - Eraring BESS

		PFAS																															
		Sum (PFHxS + PFOS)	Perfluorobutane sulfonic acid (PFBS)	Sum of PFAS (WA DER List)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (POA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	N-Methyl perfluorooctane sulfonamideacetic acid (MeFOSAA)	N-Ethyl perfluorooctane sulfonamideacetic acid (EFOSAA)	Perfluorooctane sulfonamide (FOSA)	N-Ethyl perfluorooctane sulfonamide (EFOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Ethyl perfluorooctane sulfonamide (EFOSE)	N-Methyl perfluorooctane sulfonamideethanol (MeFOSE)	Sum of PFAS	
Field ID	Sampled Date Time	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	
EOI		0.01	0.02	0.01	0.02	0.02	0.02	0.01	0.02	0.1	0.02	0.02	0.02	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.01
GC300	210518 18/05/2021	<0.01	<0.02	<0.01	<0.02	<0.01	<0.01	<0.01	<0.02	<0.01	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.01
GC301	210519 19/05/2021	<0.01	<0.02	<0.01	<0.02	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.01
GC302	210520 20/05/2021	<0.01	<0.02	<0.01	<0.02	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.01

Moisture Content		Per- and Polyfluoroalkyl Substances (PFAS) by LCMS																												
	%	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		
EOL	0.1	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.001	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	
Field ID	Sampled Date Time	Lab Report Number																												
QC502 210520	14/05/2021	ES2119057	7.8	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
QC602 210520	13/05/2021	ES2119057	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Trip Spike Control	13/05/2021	ES2119057	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

Table 7 QAQC Trip Blanks and Spikes
 Analytical Results
 Origin Earning
 Origin Energy - Earning BESS

				TRH Volatiles/BTEX															
Field ID	Sampled Date Time	Lab Report Number	mg/kg	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Ethyl perfluorooctane sulfonamideethanol (EtFOSE)	N-Methyl perfluorooctane sulfonamideethanol (MeFOSE)	Sum of PFAS	C6-C9 fraction	C6-C10 fraction	C6-C10 fraction (minus BTEX)(F1)	Benzene	Toluene	Ethylbenzene	m,p-Xylene	o-Xylene	Total Xylenes	Total BTEX	Naphthalene	
				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
EQ1			0.0005	0.0005	0.0005	0.0002	10	10	10	0.2	0.5	0.5	0.5	0.5	0.5	0.5	0.2	1	
QC502 210520	14/05/2021	ES2119057	<0.0005	<0.0005	<0.0005	<0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-
QC602 210520	13/05/2021	ES2119057	-	-	-	-	25	36	20	<0.2	5.5	1.2	6.4	2.9	9.3	16	<1		
Trip Spike Control	13/05/2021	ES2119057	-	-	-	-	44	58	31	<0.2	11.1	2	9.9	4.1	14	27.1	<1		

Appendix D

Borelogs



AECOM Australia Pty Ltd
Level 21, 420 George Street
Sydney, NSW 2000

HAND AUGER LOG HA001

PROJECT NUMBER 60622873 DATE 18 May 21
 PROJECT NAME Orgin BESS Contamination Assessment
 LOCATION Eraring
 DRILLING METHOD Hand Auger
 SAMPLING METHOD Grab

LOGGED BY Sidnee Harris NORTHING -33.069979
 COMMENTS EASTING 151.509692

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
						SPG	SAND with trace gravel. Black to brown colour, trace orange. Dry. Medium grain, coarse gravel, loose. No odour, no ACM.	
2.1		HA001_210518	*	0.10		CLG	CLAY with trace gravel and sand. Dark orange to light brown colour. Moist. Medium grain, coarse gravel, loose, rounded. Firm, medium plasticity. No odour, no ACM.	0.10
		HA001_210518		0.20				
		HA001_210518		0.40				
		HA001_210518		0.60		CH	As above, but white mottling and clay has higher plasticity.	0.60
		HA001_210518		0.80		CH	As above, but black with colour and trace brown.	0.80
		HA001_210518		1.00		CH	Target depth reached at 1.0m	1.00

ORIGIN BESS BORELOGS.GPJ 17/6/21

Total Depth: 1.20 m



AECOM Australia Pty Ltd
Level 21, 420 George Street
Sydney, NSW 2000

HAND AUGER LOG HA002

PROJECT NUMBER 60622873 DATE 18 May 21
 PROJECT NAME Origin BESS Contamination Assessment
 LOCATION Eraring
 DRILLING METHOD Hand Auger
 SAMPLING METHOD Grab

LOGGED BY Sidnee Harris NORTHING -33.069647
 COMMENTS EASTING 151.50989

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
2.6		HA002_0.1_210518		0.0		CLG	Gravelly CLAY with trace sand. Brown colour with trace orange/red, and trace black/white mottling. Moist. Very coarse gravels, medium grain. No odour, no ACM.	0.10
				0.1		CLG	As above.	0.20
				0.2		CLG	Unable to reach target depth due to large rock. Depth reached, 0.2m	
				0.4				
				0.6				
				0.8				
				1.0				

ORIGIN BESS BORELOGS.GPJ 17/6/21

Total Depth: 1.20 m



AECOM Australia Pty Ltd
Level 21, 420 George Street
Sydney, NSW 2000

HAND AUGER LOG HA003

PROJECT NUMBER 60622873 DATE 18 May 21
 PROJECT NAME Origin BESS Contamination Assessment
 LOCATION Eraring
 DRILLING METHOD Hand Auger
 SAMPLING METHOD Grab

LOGGED BY Sidnee Harris NORTHING -33.069708
 COMMENTS EASTING 151.510274

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
						GS	Sandy GRAVEL. Light brown colour. Dry. Very coarse grain and loose. Moderate sorting, sub-rounded. No odour, no ACM.	
0.1		HA003_0.1_210518		0.1		CL	CLAY. Light brown colour with trace orange. Moist. Fine grain. Stiff clay, no-plasticity. No odour, no ACM.	0.10
				0.2		CL	As above, but light brown/orange colour with trace red. Medium stiffness, low-plasticity.	0.20
				0.4				
0.0		HA003_0.5_210518		0.5		CL	As above, but red colouring with white mottling. Stiff clay, no-plasticity.	0.50
				0.6		CL	As above, but trace orange/black. Hard to friable clay.	0.60
				0.7		CL	As above.	0.70
				0.8				
				1.0		CL	Target depth reached at 1.0m	1.00
0.0		HA003_1.0_210518						

ORIGIN BESS BORELOGS.GPJ 17/6/21

Total Depth: 1.20 m



AECOM Australia Pty Ltd
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Sydney, NSW 2000

HAND AUGER LOG HA004

PROJECT NUMBER 60622873 DATE 18 May 21
 PROJECT NAME Origin BESS Contamination Assessment
 LOCATION Eraring
 DRILLING METHOD Hand Auger
 SAMPLING METHOD Grab

LOGGED BY Sidnee Harris NORTHING -33.0695
 COMMENTS EASTING 151.510767

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0.7		HA004_0.1_210518		0.10		CLS	Sandy CLAY with trace gravel. Light brown colour with white gravels. Damp. Coarse to fine grains. Medium stiffness, low plasticity. No odour, no ACM.	0.10
				0.20		CLS	As above, but trace rootlets.	0.20
				0.30		CLS	As above, but more white colouring and no rootlets.	0.30
				0.40		CLS	As above, but red staining.	0.40
0.0		HA004_0.5_210518		0.60		CLS	As above, but light orange colours.	0.60
				0.70		CLS	As above, but light brown colour with trace orange, and white and red staining.	0.70
				0.80				0.80
				0.90				0.90
0.0		HA004_1.0_210518		1.00		CLS	Target depth reached at 1.0m	1.00

ORIGIN BESS BORELOGS.GPJ 17/6/21

Total Depth: 1.20 m

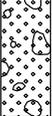


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Sydney, NSW 2000

HAND AUGER LOG HA005

PROJECT NUMBER 60622873 DATE 18 May 21
 PROJECT NAME Origin BESS Contamination Assessment
 LOCATION Eraring
 DRILLING METHOD Hand Auger
 SAMPLING METHOD Grab

LOGGED BY Sidnee Harris NORTHING -33.069122
 COMMENTS EASTING 151.510321

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
3.7		HA005_0.1_210518		0.0		SWG	Gravelly SAND, with trace gravels. Light brown colour with trace white/grey. Dry. Coarse to fine gravels/sand. Well sorted, sub-rounded. No odour, no ACM.	0.10
				0.1		SWG	As above.	0.20
				0.2		SWG	Unable to reach target depth due to large rock. Depth reached, 0.25m	
				0.4				
				0.6				
				0.8				
				1.0				

ORIGIN BESS BORELOGS.GPJ 17/6/21

Total Depth: 1.20 m



AECOM Australia Pty Ltd
Level 21, 420 George Street
Sydney, NSW 2000

HAND AUGER LOG HA006

PROJECT NUMBER 60622873 DATE 19 May 21
 PROJECT NAME Orgin BESS Contamination Assessment
 LOCATION Eraring
 DRILLING METHOD Hand Auger
 SAMPLING METHOD Grab

LOGGED BY Sidnee Harris NORTHING -33.068776
 COMMENTS EASTING 151.509742

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
		HA006_0.05_210519		0.05		SPG	Gravelly SAND. Brown colour. Dry. Loose, fine to medium grain. Few rootlets. No odour, no ACM.	0.10
		HA006_0.5_210519		0.5		CLS	Sandy CLAY with trace gravels/cobbles. Dark brown. Moist. Loose, fine to medium grain. Few rootlets. No odour, no ACM.	
		HA006_1.0_210519		1.0		CLS	Target depth reached at 1.0m	1.00

ORIGIN BESS BORELOGS.GPJ 17/6/21

Total Depth: 1.20 m



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HAND AUGER LOG HA007

PROJECT NUMBER 60622873 DATE 19 May 21
 PROJECT NAME Origin BESS Contamination Assessment
 LOCATION Eraring
 DRILLING METHOD Hand Auger
 SAMPLING METHOD Grab

LOGGED BY Sidnee Harris NORTHING -33.06838
 COMMENTS EASTING 151.509893

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0.0		HA007_0.05_210518		0.05		SM	SAND with trace grass, gravels. Brown colour. Dry. No odour, no ACM.	0.10
0.0		HA007_0.5_210519		0.50		CLS	Sandy CLAY, with trace gravels. Orange/brown colour. Moist. Loose, low-plasticity. No odour, no ACM.	0.50
0.0		HA007_0.5_210519		0.50		CLS	Sandy CLAY, with few gravels. Light brown colour. Moist. Medium-plasticity, soft. No odour, no ACM.	0.50
0.0		HA007_1.0_210519		1.00		CLG	CLAY with few gravels. Light brown colour. Moist. High-plasticity, soft. No odour, no ACM. Target depth reached at 1.0m	1.00

ORIGIN BESS BORELOGS.GPJ 17/6/21

Total Depth: 1.20 m



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HAND AUGER LOG HA008

PROJECT NUMBER 60622873 DATE 19 May 21
 PROJECT NAME Origin BESS Contamination Assessment
 LOCATION Eraring
 DRILLING METHOD Hand Auger
 SAMPLING METHOD Grab

LOGGED BY Sidnee Harris NORTHING -33.068663
 COMMENTS EASTING 151.510963

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0.0		HA008_0.05_210519	*	0.05		CLG	CLAY with trace gravels. Light brown colour. Firm, medium-plasticity. No odour, no ACM.	0.05
0.0		HA008_0.5_210519		0.5		CLS	Sandy CLAY. Light brown colour with orange. Soft, low-plasticity. No odour, no ACM.	
0.0		HA008_0.8_210519		0.8		CLS	Unable to reach target depth due to rock. Depth reached, 0.8m	0.80

ORIGIN BESS BORELOGS.GPJ 17/6/21

Total Depth: 1.20 m



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HAND AUGER LOG HA009

PROJECT NUMBER 60622873 DATE 19 May 21
 PROJECT NAME Origin BESS Contamination Assessment
 LOCATION Eraring
 DRILLING METHOD Hand Auger
 SAMPLING METHOD Grab

LOGGED BY Sidnee Harris NORTHING -33.068827
 COMMENTS EASTING 151.511955

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0.0		HA009_0.05_210518		0.05		SW-SC	Sandy CLAY, with trace gravels. Light brown colour with flecks of orange/black. Firm, low-plasticity. No odour, no ACM.	
				0.2				
				0.4				
0.0		HA009_0.5_210519		0.5		SC-SM	CLAY with sand. Light brown colour with white mottles. Soft, high-plasticity. Damp. No odour, no ACM.	0.50
				0.6				
				0.8				
				0.8		SWG	CLAY with trace gravels. Light brown colour with white/orange mottles. Soft, high-plasticity. No odour, no ACM.	0.80
				0.9				
0.0		HA009_1.0_210519		1.0		SWG	Target depth reached at 1.0m	1.00

ORIGIN BESS BORELOGS.GPJ 17/6/21

Total Depth: 1.20 m



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HAND AUGER LOG HA010

PROJECT NUMBER 60622873 DATE 19 May 21
 PROJECT NAME Origin BESS Contamination Assessment
 LOCATION Eraring
 DRILLING METHOD Hand Auger
 SAMPLING METHOD Grab

LOGGED BY Sidnee Harris NORTHING -33.068022
 COMMENTS Asbestos sample taken at 0.05m EASTING 151.512858

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0.0		HA010_0.05_210518	*	0.05		SWG	Gravelly SAND. Light brown colour with trace orange. Dry. Fine to medium grain. No odour, no ACM.	
				0.2		SWG	As above, with cobbles.	0.20
0.0		HA010_0.3_210519		0.30		SWG	Target depth not reached due to hard sub-surface. Depth reached, 0.3m	0.30
				0.4				
				0.6				
				0.8				
				1.0				

ORIGIN BESS BORELOGS.GPJ 17/6/21

Total Depth: 1.20 m



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HAND AUGER LOG HA011

PROJECT NUMBER 60622873 DATE 19 May 21
 PROJECT NAME Origin BESS Contamination Assessment
 LOCATION Eraring
 DRILLING METHOD Hand Auger
 SAMPLING METHOD Grab

LOGGED BY Sidnee Harris NORTHING -33.06784
 COMMENTS EASTING 151.513142

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0.0		HA011_0.05_210518		0.05		SWG	Gravelly SAND. Brown colour. Wet. Fine to medium grain. Rootlets present. No odour, no ACM.	
				0.2				
				0.3				0.30
				0.4			As above, but brown and grey colours.	
				0.5				0.50
0.0		HA011_0.5_210519		0.5		CH	Sandy CLAY with trace gravels. Grey with red mottles. Moist. Soft, high-plasticity. No odour, no ACM.	
				0.6				
				0.8				
				1.0				1.00
0.0		HA011_1.0_210519		1.0		CH	Target depth reached at 1.0m	

ORIGIN BESS BORELOGS.GPJ 17/6/21

Total Depth: 1.20 m



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HAND AUGER LOG HA012

PROJECT NUMBER 60622873 DATE 20 May 21
 PROJECT NAME Origin BESS Contamination Assessment
 LOCATION Eraring
 DRILLING METHOD Hand Auger
 SAMPLING METHOD Grab

LOGGED BY Sidnee Harris NORTHING -33.067137
 COMMENTS EASTING 151.513407

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0.0		HA012_0.05_210520		0.05		CLS	Sandy CLAY with trace gravels. Brown. Damp. No odour, no ACM.	0.10
0.0		HA012_0.5_210520		0.5		CLS	As above, but CLAY is firm, no-plasticity, and had red/white mottles.	0.70
0.0		HA012_1.0_210520		1.0		CH	Sandy CLAY. Light brown colours with white mottles. Moist. Soft, high-plasticity. No odour, no ACM.	1.00
0.0				1.0		CH	Target depth reached at 1.0m	

ORIGIN BESS BORELOGS.GPJ 17/6/21

Total Depth: 1.20 m



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HAND AUGER LOG HA013

PROJECT NUMBER 60622873 DATE 20 May 21
 PROJECT NAME Origin BESS Contamination Assessment
 LOCATION Eraring
 DRILLING METHOD Hand Auger
 SAMPLING METHOD Grab

LOGGED BY Sidnee Harris NORTHING -33.067315
 COMMENTS EASTING 151.511549

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0.0		HA013_0.05_210520		0.0		TOPSOIL	Sandy TOPSOIL/Fine MULCH with trace gravels. Brown colour. Dry. Rootlets. No odour, no ACM.	
				0.2				
				0.4				
				0.5				0.50
0.0		HA013_0.5_210520		0.5		TOPSOIL	Unable to reach target depth due to rock. Depth reached, 0.5m	
				0.6				
				0.8				
				1.0				

ORIGIN BESS BORELOGS.GPJ 17/6/21

Total Depth: 1.20 m



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HAND AUGER LOG HA014

PROJECT NUMBER 60622873 DATE 19 May 21
 PROJECT NAME Origin BESS Contamination Assessment
 LOCATION Eraring
 DRILLING METHOD Hand Auger
 SAMPLING METHOD Grab

LOGGED BY Sidnee Harris NORTHING -33.067449
 COMMENTS Asbestos sample taken at 0.05m EASTING 151.512365

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0.4		HA014_0.05_210518		0.05		SPG	SAND with trace gravels. Brown colour, dry. Sand is fine. Rootlets. No odour, no ACM.	0.05
				0.2		SPG	As above, except dark brown colour.	
				0.3		SW-SC	Sandy CLAY. Brown and grey colour. Clay is hard, no-plasticity. No odour, no ACM.	0.30
		HA014_0.5_210519		0.6				
				0.8				
				1.0		SW-SC	Target depth reached at 1.0m	1.00
		HA014_1.0_210519						

ORIGIN BESS BORELOGS.GPJ 17/6/21

Total Depth: 1.20 m



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HAND AUGER LOG HA015

PROJECT NUMBER 60622873 DATE 19 May 21
 PROJECT NAME Origin BESS Contamination Assessment
 LOCATION Eraring
 DRILLING METHOD Hand Auger
 SAMPLING METHOD Grab

LOGGED BY Sidnee Harris NORTHING -33.090402
 COMMENTS Asbestos sample taken at 0.05m EASTING 151.514607

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0.0		HA015_0.05_210518		0.05		SPG	SAND with trace gravels. Light brown colour, soft. Rootlets. No odour, no ACM.	
		HA015_0.3_210519		0.30		SPG	Unable to reach target depth due to rock. Depth reached, 0.3m	0.30

ORIGIN BESS BORELOGS.GPJ 17/6/21

Total Depth: 1.20 m



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HAND AUGER LOG HA016

PROJECT NUMBER 60622873 DATE 20 May 21
 PROJECT NAME Orgin BESS Contamination Assessment
 LOCATION Eraring
 DRILLING METHOD Hand Auger
 SAMPLING METHOD Grab

LOGGED BY Sidnee Harris NORTHING -33.067398
 COMMENTS Asbestos sample taken at 0.05m EASTING 151.510498

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0.0		HA016_0.05_210521		0.05		SWG	Gravelly SAND with few cobbles. Light brown colour, fine to medium grain. Dry, loose. No odour, no ACM.	0.10
				0.10		SWG	Unable to reach target depth due to rock. Depth reached, 0.1m	
				0.2				
				0.4				
				0.6				
				0.8				
				1.0				

ORIGIN BESS BORELOGS.GPJ 17/6/21

Total Depth: 1.20 m



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HAND AUGER LOG HA017

PROJECT NUMBER 60622873 DATE 20 May 21
 PROJECT NAME Origin BESS Contamination Assessment
 LOCATION Eraring
 DRILLING METHOD Hand Auger
 SAMPLING METHOD Grab

LOGGED BY Sidnee Harris NORTHING -33.066718
 COMMENTS EASTING 151.510666

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0.0		HA017_0.05_210520		0.0		SW-SC	Sandy CLAY. Light brown colour, with red/white mottles. Fine to medium grain. Firm, no plasticity. No odour, no ACM.	
				0.2		SW-SC	As above, except gravels present, light brown colour with orange flecks, medium plasticity.	0.20
		HA017_0.5_210520		0.6				
				0.8				
		HA017_1.0_210520		1.0		SW-SC	Target depth reached at 1.0m	1.00

ORIGIN BESS BORELOGS.GPJ 17/6/21

Total Depth: 1.20 m



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HAND AUGER LOG HA018

PROJECT NUMBER 60622873 DATE 19 May 21
 PROJECT NAME Origin BESS Contamination Assessment
 LOCATION Eraring
 DRILLING METHOD Hand Auger
 SAMPLING METHOD Grab

LOGGED BY Sidnee Harris NORTHING -33.067073
 COMMENTS EASTING 151.512926

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0.0		HA018_0.05_210518		0.0		SW	SAND. Black colour, loose, fine to medium grain. Damp. Rootlets. No odour, no ACM.	
				0.2		SW-SC	Sandy CLAY. Black sand with orange clay, white mottles. Firm, high plasticity. No odour, no ACM.	0.20
				0.4		CH	CLAY. Orange and white colour. stiff, high plasticity. No odour, no ACM.	0.40
0.0		HA018_0.5_210519		0.5		CH	As above, except with light brown mottles. Unable to reach target depth due to stiff clay. Depth reached, 0.5m	0.50
				0.6				
				0.8				
				1.0				

ORIGIN BESS BORELOGS.GPJ 17/6/21

Total Depth: 1.20 m



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HAND AUGER LOG HA019

PROJECT NUMBER 60622873 DATE 19 May 21
 PROJECT NAME Origin BESS Contamination Assessment
 LOCATION Eraring
 DRILLING METHOD Hand Auger
 SAMPLING METHOD Grab

LOGGED BY Sidnee Harris NORTHING -33.067023
 COMMENTS Abestos sample taken at 0.05m EASTING 151.512216

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0.0		HA019_0.05_210519	*	0.05		TOPSOIL	Sandy TOPSOIL. Dark brown colour. Damp, firm. Organic matter, rootlets. No odour, no ACM.	
				0.2				
				0.4		SP-SC	Sandy CLAY. Dark brown sand, grey clay. Firm, no plasticity. No odour, no ACM.	0.40
		HA019_0.5_210519		0.5		CL	CLAY. Grey colour with orange. Firm, no plasticity. Bark present. No odour, no ACM.	0.50
				0.6		SP-SC	Sandy CLAY with trace gravels. Dark and light brown colours, with orange. Grey, coarse gravels, rounded. No odour, no ACM.	0.60
		HA019_0.7_210519		0.7		SP-SC	Unable to reach target depth due to gravel. Depth reached, 0.7m	0.70
				0.8				
				1.0				

ORIGIN BESS BORELOGS.GPJ 17/6/21

Total Depth: 1.20 m



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HAND AUGER LOG HA020

PROJECT NUMBER 60622873 DATE 19 May 21
 PROJECT NAME Origin BESS Contamination Assessment
 LOCATION Eraring
 DRILLING METHOD Hand Auger
 SAMPLING METHOD Grab

LOGGED BY Sidnee Harris NORTHING -33.067952
 COMMENTS EASTING 151.511998

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0.0		HA020_0.05_210518		0.0		SWG	Gravelly SAND, light brown colour, medium to coarse grain. Dry, loose. Rootlets. No odour, no visual ACM.	
0.0		HA020_0.5_210519		0.5		SWG	Unable to reach target depth due to rock. Depth reached, 0.5m	0.50

ORIGIN BESS BORELOGS.GPJ 17/6/21

Total Depth: 1.20 m



AECOM Australia Pty Ltd
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HAND AUGER LOG HA021

PROJECT NUMBER 60622873 DATE 19 May 21
 PROJECT NAME Origin BESS Contamination Assessment
 LOCATION Eraring
 DRILLING METHOD Hand Auger
 SAMPLING METHOD Grab

LOGGED BY Sidnee Harris NORTHING -33.066874
 COMMENTS EASTING 151.511703

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0.0		HA021_0.05_210518		0.05		GPS	Sandy GRAVEL, light brown colour, rootlets. No odour, no visual ACM.	
0.0		HA021_0.3_210519		0.30		GPS	Unable to reach target depth due to rock. Depth reached, 0.3m	0.30

ORIGIN BESS BORELOGS.GPJ 17/6/21

Total Depth: 1.20 m



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HAND AUGER LOG HA022

PROJECT NUMBER 60622873 DATE 20 May 21
 PROJECT NAME Origin BESS Contamination Assessment
 LOCATION Eraring
 DRILLING METHOD Hand Auger
 SAMPLING METHOD Grab

LOGGED BY Sidnee Harris NORTHING -33.094994
 COMMENTS EASTING 151.517353

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0.0		HA022_0.05_210520		0.0		SWG	Sandy GRAVEL, light brown colour, fine grain. Dry. No odour, no visual ACM.	
				0.2				
				0.4		SC-SM	Sandy CLAY, light brown colour, soft, low plasticity. Dry. No odour, no visual ACM.	0.40
		HA022_0.5_210520		0.6		SC-SM	Sandy CLAY with trace gravels. Orange colour with yellow/white mottles. Soft, low plasticity. No odour, no visual ACM.	0.60
				0.8		SC-SM	As above, except orange/red colour.	0.80
		HA022_1.0_210520		1.0		SC-SM	As above, except with trace orange/red clay with white mottles. Target depth reached at 1.0m	1.00

ORIGIN BESS BORELOGS.GPJ 17/6/21

Total Depth: 1.20 m



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HAND AUGER LOG HA023

PROJECT NUMBER 60622873 DATE 20 May 21
 PROJECT NAME Origin BESS Contamination Assessment
 LOCATION Eraring
 DRILLING METHOD Hand Auger
 SAMPLING METHOD Grab

LOGGED BY Sidnee Harris NORTHING -33.066041
 COMMENTS EASTING 151.511144

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0.0		HA023_0.05_210520		0.0		CLS	Sandy CLAY with gravels. Light brown colour. Dry. Soft, crumbly clay, no plasticity. Rootlets. No odour, no visual ACM.	
		HA023_0.5_210520		0.6		CLS	Sandy CLAY, light brown colour with orange/white mottles. Dry. Firm, no plasticity. No odour, no visual ACM.	0.60
		HA023_1.0_210520		1.0		CLS	Target depth reached at 1.0m	1.00

ORIGIN BESS BORELOGS.GPJ 17/6/21

Total Depth: 1.20 m



AECOM Australia Pty Ltd
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HAND AUGER LOG HA024

PROJECT NUMBER 60622873 DATE 20 May 21
 PROJECT NAME Origin BESS Contamination Assessment
 LOCATION Eraring
 DRILLING METHOD Hand Auger
 SAMPLING METHOD Grab

LOGGED BY Sidnee Harris NORTHING -33.065973
 COMMENTS EASTING 151.512177

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
		HA024_0.05_210520		0.0		GWS	Gravelly SAND. Light brown colour, dry. Small gravels, fine to medium grain. Rootlets. No odour, no visual ACM.	
				0.2				
				0.4		GWS	As above, except slightly darker colour brown, no rootlets.	0.40
		HA024_0.5_210520		0.6				
				0.8		GWS	As above, except rootlets/stringy bark present. Unable to reach target depth due to hard surface. Depth reached, 0.8m	0.80
		HA024_0.8_210520		1.0				

ORIGIN BESS BORELOGS.GPJ 17/6/21

Total Depth: 1.20 m



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HAND AUGER LOG HA025

PROJECT NUMBER 60622873 DATE 20 May 21
 PROJECT NAME Orgin BESS Contamination Assessment
 LOCATION Eraring
 DRILLING METHOD Hand Auger
 SAMPLING METHOD Grab

LOGGED BY Sidnee Harris NORTHING -33.066196
 COMMENTS EASTING 151.5132

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
						GPS	Sandy GRAVEL. Sand brown, fine to medium grain, gravels grey and coarse. Wet, rootlets. Litter. Organic odour, no visual ACM.	0.05
		HA025_0.05_210520				GPS	Sandy GRAVEL. Grey colour soil. Saturated, rootlets, bark approximately 10-20mm. No odour, no visual ACM.	0.10
						GPS	As above, excpet brown colour soil, much more mulch (rootlets/bark). Encountered water at 0.2m	
						GPS	Unable to reach target depth due to rootlets and water. Depth reached, 0.5m	0.50
		HA025_0.5_210520						

ORIGIN BESS BORELOGS.GPJ 17/6/21

Total Depth: 1.20 m



AECOM Australia Pty Ltd
Level 21, 420 George Street
Sydney, NSW 2000

HAND AUGER LOG HA026

PROJECT NUMBER 60622873 DATE 20 May 21
 PROJECT NAME Origin BESS Contamination Assessment
 LOCATION Eraring
 DRILLING METHOD Hand Auger
 SAMPLING METHOD Grab

LOGGED BY Sidnee Harris NORTHING -33.066508
 COMMENTS EASTING 151.514508

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0.0		HA026_0.05_210520		0.05		GS	Gravelly SAND. Light brown colour. Dry. Loose, fine grain. No odour, no ACM.	
				0.2				
				0.30		CL	CLAY, grey colour with red/orange mottles. Stiff, medium plasticity. No odour, no ACM.	0.30
0.0		HA026_0.5_210520		0.5				
				0.6				
				0.70		CL	Unable to reach target depth due to very stiff clay.	0.70
		HA026_0.7_210520		0.7			Depth reached, 0.7m	
				0.8				
				1.0				

ORIGIN BESS BORELOGS.GPJ 17/6/21

Total Depth: 1.20 m



AECOM Australia Pty Ltd
Level 21, 420 George Street
Sydney, NSW 2000

HAND AUGER LOG HA027

PROJECT NUMBER 60622873 DATE 20 May 21
 PROJECT NAME Origin BESS Contamination Assessment
 LOCATION Eraring
 DRILLING METHOD Hand Auger
 SAMPLING METHOD Grab

LOGGED BY Sidnee Harris NORTHING -33.066925
 COMMENTS EASTING 151.514496

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
		HA027_0.05_210520		0.05		GPS	Gravelly SAND. Grey colour, dry. Loose, fine to medium grain. Rootlets. No odour, no ACM.	
		HA027_0.5_210520		0.5		SM	SAND. Grey with orange mottles, dry. Loose, fine to medium grain. No odour, no ACM.	0.20
		HA027_1.0_210520		1.0		SM	Target depth reached at 1.0m	1.00

ORIGIN BESS BORELOGS.GPJ 17/6/21

Total Depth: 1.20 m



AECOM Australia Pty Ltd
Level 21, 420 George Street
Sydney, NSW 2000

HAND AUGER LOG HA028

PROJECT NUMBER 60622873 DATE 20 May 21
 PROJECT NAME Orgin BESS Contamination Assessment
 LOCATION Eraring
 DRILLING METHOD Hand Auger
 SAMPLING METHOD Grab

LOGGED BY Sidnee Harris

COMMENTS _____

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0.0		HA028_0.05_210520		0.05		TOPSOIL	Sandy TOPSOIL. Dark brown colour. Dry. Loose, fine to medium grain. No odour, no ACM.	0.10
				0.2		SM	SAND with pebbles, grey colour. Moist. Medium to coarse grain. No odour, no ACM.	
				0.4				
				0.5		SM	As above.	0.50
		HA028_0.5_210520		0.6				
				0.8				
				1.0		SM	Target depth reached at 1.0m	1.00
		HA028_1.0_210520		1.0				

ORIGIN BESS BORELOGS.GPJ 17/6/21

Total Depth: 1.20 m



AECOM Australia Pty Ltd
Level 21, 420 George Street
Sydney, NSW 2000

HAND AUGER LOG HA029

PROJECT NUMBER 60622873 DATE 20 May 21
 PROJECT NAME Origin BESS Contamination Assessment
 LOCATION Eraring
 DRILLING METHOD Hand Auger
 SAMPLING METHOD Grab

LOGGED BY Sidnee Harris NORTHING -33.066717
 COMMENTS EASTING 151.515694

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0.0		HA029_0.05_210520		0.05		SPG	Sandy GRAVEL. Light brown colour, sand fine to medium grain, gravels coarse. Dry. Rootlets. No odour, no ACM.	0.05
				0.2				
				0.4				
				0.5				
		HA029_0.5_210520		0.50		SPG	Unable to reach target depth due to hard surface/rock (most likely cobble). Depth reached, 0.5m	0.50
				0.6				
				0.8				
				1.0				

ORIGIN BESS BORELOGS.GPJ 17/6/21

Total Depth: 1.20 m



AECOM Australia Pty Ltd
Level 21, 420 George Street
Sydney, NSW 2000

HAND AUGER LOG HA030

PROJECT NUMBER 60622873 DATE 20 May 21
 PROJECT NAME Origin BESS Contamination Assessment
 LOCATION Eraring
 DRILLING METHOD Hand Auger
 SAMPLING METHOD Grab

LOGGED BY Sidnee Harris NORTHING -33.066171
 COMMENTS EASTING 151.514585

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
						TOPSOIL	Gravelly TOPSOIL, dark brown, moist. Rootlets. No odour, no ACM.	0.05
0.0		HA030_0.05_210520				SPG	Gravelly SAND with pebbles. Dark brown colour, moist. Rootlets. No odour, no ACM.	
		HA030_0.2_210520		0.2		GWS	Sandy GRAVEL, dark brown colour, damp. Large cobbles approximately 15mm. No odour, no ACM. Unable to reach target depth due to hard surface (presumably larger cobble). Depth reached, 0.2m	0.20
				0.4				
				0.6				
				0.8				
				1.0				

ORIGIN BESS BORELOGS.GPJ 17/6/21

Total Depth: 1.20 m



AECOM Australia Pty Ltd
Level 21, 420 George Street
Sydney, NSW 2000

HAND AUGER LOG HA031

PROJECT NUMBER 60622873 DATE 20 May 21
 PROJECT NAME Origin BESS Contamination Assessment
 LOCATION Eraring
 DRILLING METHOD Hand Auger
 SAMPLING METHOD Grab

LOGGED BY Sidnee Harris NORTHING -33.065341
 COMMENTS EASTING 151.5148

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
						TOPSOIL	Sandy TOPSOIL with trace gravels/chitter. Dark brown colour. Moist. Rootlets. No odour, no ACM.	0.05
0.0		HA031_0.05_210520		0.05		CLS	Sandy CLAY. Dark brown colour. Sand fine to medium grain, clay firm, no plasticity, red/white mottles. No odour, no ACM.	
				0.2				
				0.3		CLS	As above, except dark brown clay, no mottles and cream/light brown sand. Trace gravels.	0.30
				0.4				
		HA031_0.5_210520		0.5		SWG	Sandy GRAVEL. Light brown colour. Sand fine to medium grain. Gravels sub-angular, coarse. No odour, no ACM.	0.50
				0.6				
				0.8				
		HA031_0.5_210520		1.0		SWG	As above, except white chips of gravel, possibly shale. Target depth reached at 1.0m	1.00

ORIGIN BESS BORELOGS.GPJ 17/6/21

Total Depth: 1.20 m



AECOM Australia Pty Ltd
Level 21, 420 George Street
Sydney, NSW 2000

HAND AUGER LOG HA032

PROJECT NUMBER 60622873 DATE 20 May 21
 PROJECT NAME Origin BESS Contamination Assessment
 LOCATION Eraring
 DRILLING METHOD Hand Auger
 SAMPLING METHOD Grab

LOGGED BY Sidnee Harris NORTHING -33.0605095
 COMMENTS EASTING 151.514314

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
						TOPSOIL	Sandy TOPSOIL, dark brown colour, moist. Rootlets. No odour, no ACM.	
0.0		HA032_0.05_210520		0.05		CLS	Sandy CLAY, dark brown colour, firm, moist, no plasticity. No odour, no ACM.	0.05
				0.20		COAL	COAL. Black colour, approximately 15-20mm. No odour, no ACM.	0.20
				0.30		CLS	Sandy CLAY with trace gravels. Light brown clay with red/white mottling. Coarse gravels. Damp. No odour, no ACM.	0.30
0.0		HA032_0.5_210520		0.50		CLS	As above, except large cobbles.	0.50
				0.60			Unable to reach target depth due to hard surface (presumably cobbles). Depth reached, 0.5m	
				0.80				
				1.00				

ORIGIN BESS BORELOGS.GPJ 17/6/21

Total Depth: 1.20 m



AECOM Australia Pty Ltd
Level 21, 420 George Street
Sydney, NSW 2000

HAND AUGER LOG HA033

PROJECT NUMBER 60622873 DATE 20 May 21
 PROJECT NAME Origin BESS Contamination Assessment
 LOCATION Eraring
 DRILLING METHOD Hand Auger
 SAMPLING METHOD Grab

LOGGED BY Sidnee Harris NORTHING -33.065032
 COMMENTS EASTING 151.513778

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0.0		HA033_0.05_210520		0.05		TOPSOIL	Sandy TOPSOIL, trace gravels. Brown colour, damp. Rootlets. No odour, no ACM.	0.05
				0.20		COAL	COAL/chitter. Black colour, approximately 5-15mm. No odour, no ACM.	0.20
		HA033_0.2_210520		0.20		COAL	Unable to reach target depth due to coal. Depth reached, 0.2m	
				0.4				
				0.6				
				0.8				
				1.0				

ORIGIN BESS BORELOGS.GPJ 17/6/21

Total Depth: 1.20 m



AECOM Australia Pty Ltd
Level 21, 420 George Street
Sydney, NSW 2000

HAND AUGER LOG HA034

PROJECT NUMBER 60622873 DATE 20 May 21
 PROJECT NAME Origin BESS Contamination Assessment
 LOCATION Eraring
 DRILLING METHOD Hand Auger
 SAMPLING METHOD Grab

LOGGED BY Sidnee Harris NORTHING -33.065963
 COMMENTS EASTING 151.51348

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
						TOPSOIL	Sandy TOPSOIL with gravels. Brown colour, moist, gravels coarse. No odour, no ACM.	
0.0		HA034_0.05_210520		0.05		SWG	Gravelly SAND with cobbles present throughout 5-15mm. Brown colour, moist. Rootlets. No odour, no ACM.	0.05
0.0		HA034_0.2_210520		0.2		COAL	Sandy COAL trace gravels. Black to brown chitter approximately 2-25mm. No odour, no ACM. Unable to reach target depth due to coal. Depth reached, 0.2m	0.20
				0.4				
				0.6				
				0.8				
				1.0				

ORIGIN BESS BORELOGS.GPJ 17/6/21

Total Depth: 1.20 m



AECOM Australia Pty Ltd
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Sydney, NSW 2000

HAND AUGER LOG HA035

PROJECT NUMBER 60622873 DATE 20 May 21
 PROJECT NAME Origin BESS Contamination Assessment
 LOCATION Eraring
 DRILLING METHOD Hand Auger
 SAMPLING METHOD Grab

LOGGED BY Sidnee Harris NORTHING -33.066014
 COMMENTS EASTING 151.514105

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
						TOPSOIL	Sandy TOPSOIL, light brown colour, dry. Rootlets. No odour, no ACM.	
0.0		HA035_0.05_210520		0.05		SPG	As above, except gravels (cobbles) present. No odour, no ACM.	0.05
		HA035_0.2_210520		0.2		SPG	Unable to reach target depth due to rock/hard surface. Depth reached, 0.2m	0.20
				0.4				
				0.6				
				0.8				
				1.0				

ORIGIN BESS BORELOGS.GPJ 17/6/21

Total Depth: 1.20 m



AECOM Australia Pty Ltd
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Sydney, NSW 2000

HAND AUGER LOG HA036

PROJECT NUMBER 60622873 DATE 20 May 21
 PROJECT NAME Origin BESS Contamination Assessment
 LOCATION Eraring
 DRILLING METHOD Hand Auger
 SAMPLING METHOD Grab

LOGGED BY Sidnee Harris NORTHING -33.066135
 COMMENTS EASTING 151.516112

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
						TOPSOIL	GRASS.	
0.0		HA036_0.05_210520		0.05		CLS	Gravelly, sandy CLAY. Brown colour, moist, loose. Few cobbles present. No odour, no ACM.	0.05
				0.2				
				0.4				
				0.5				
		HA036_0.5_210520		0.50		CLS	Sandy CLAY with few gravels. Brown clay with orange mottles. Moist, firm, high plasticity. No odour, no ACM.	0.50
				0.6				
				0.8				
				1.0				
		HA036_1.0_210520		1.00		CLS	Target depth reached at 1.0m	1.00

ORIGIN BESS BORELOGS.GPJ 17/6/21

Total Depth: 1.20 m



AECOM Australia Pty Ltd
Level 21, 420 George Street
Sydney, NSW 2000

HAND AUGER LOG HA037

PROJECT NUMBER 60622873 DATE 20 May 21
 PROJECT NAME Origin BESS Contamination Assessment
 LOCATION Eraring
 DRILLING METHOD Hand Auger
 SAMPLING METHOD Grab

LOGGED BY Sidnee Harris NORTHING -33.065341
 COMMENTS EASTING 151.516615

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
						TOPSOIL	GRASS.	
0.0		HA037_0.05_210520		0.05		SM	SAND with trace gravels. Brown colour, dry, loose, fine to medium grain. No odour, no ACM.	0.05
				0.20		CL-CH	CLAY, white colour, with orange/brown mottling. Moist, firm, medium plasticity. No odour, no ACM.	0.20
				0.40		CL-CH		
0.0		HA037_0.5_210520		0.50		CL-CH	CLAY, grey colour, with dark red mottling. Moist, firm, medium plasticity. No odour.	0.50
				0.60		CL-CH		
				0.80		CL-CH		
				1.00		CL-CH	Target depth reached at 1.0m	1.00

ORIGIN BESS BORELOGS.GPJ 17/6/21

Total Depth: 1.20 m



AECOM Australia Pty Ltd
Level 21, 420 George Street
Sydney, NSW 2000

HAND AUGER LOG HA038

PROJECT NUMBER 60622873 DATE 20 May 21
 PROJECT NAME Origin BESS Contamination Assessment
 LOCATION Eraring
 DRILLING METHOD Hand Auger
 SAMPLING METHOD Grab

LOGGED BY Sidnee Harris NORTHING -33.06438
 COMMENTS EASTING 151.516568

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
						TOPSOIL	GRASS.	
		HA038_0.05_210520		0.05		SPG	Gravelly SAND. Brown colour, loose, fine to medium grain. Dry. No odour, no ACM.	0.05
				0.2		CLG	Sandy, gravelly CLAY with few cobbles. Brown colour with orange mottling, loose. Dry. No odour, no ACM.	0.20
				0.4		CLG		
		HA038_0.5_210520		0.50		CLG	Unable to reach target depth due to hard surface (presumably cobbles). Depth reached, 0.5m	0.50
				0.6				
				0.8				
				1.0				

ORIGIN BESS BORELOGS.GPJ 17/6/21

Total Depth: 1.20 m



AECOM Australia Pty Ltd
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Sydney, NSW 2000

HAND AUGER LOG HA039

PROJECT NUMBER 60622873 DATE 20 May 21
 PROJECT NAME Origin BESS Contamination Assessment
 LOCATION Eraring
 DRILLING METHOD Hand Auger
 SAMPLING METHOD Grab

LOGGED BY Sidnee Harris

COMMENTS Abestos sample taken at 0.05m

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0.0		HA039_0.05_210520		0.05		GPS	Pine needles, gravelly SAND, fill material. Brown colour, dry, loose, fine to medium grain. No odour, no ACM.	
0.0		HA039_0.5_210520		0.5		GPS	Unable to reach target depth due to gravels/cobbles. Depth reached, 0.5m	0.50

ORIGIN BESS BORELOGS.GPJ 17/6/21

Total Depth: 1.20 m



AECOM Australia Pty Ltd
Level 21, 420 George Street
Sydney, NSW 2000

HAND AUGER LOG HA040

PROJECT NUMBER 60622873 DATE 20 May 21
 PROJECT NAME Orgin BESS Contamination Assessment
 LOCATION Eraring
 DRILLING METHOD Hand Auger
 SAMPLING METHOD Grab

LOGGED BY Sidnee Harris

COMMENTS _____

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
						GM	Moss, GRAVEL.	
						GWS	Gravelly SAND. Brown colour, loose, fine to medium grain. Dry. Cobbles present. No odour, no ACM.	0.05
		HA040_0.05_210521				GWS	Unable to reach target depth due to cobbles/gravels. Depth reached, 0.1m	0.10
				0.2				
				0.4				
				0.6				
				0.8				
				1.0				

ORIGIN BESS BORELOGS.GPJ 17/6/21

Total Depth: 1.20 m

Appendix E

Calibration Certificates

ANZ

FQM - Gas Monitoring Calibration Record

Q4AN(EV)-003-FM1

Project Name:	Origin BESS Cont.	Project Number:	60622873
Project Location:	Eraring	Client:	Origin
PM Name:	Orla Ferguson	Fieldwork Staff Name:	J. Hughes, S. Havens
This calibration record is intended to prompt fieldwork staff to calibrate various gas instruments (PID, LEL, Landfill gas meters) daily before the start of fieldworks.			
INSTRUMENT DETAILS			
Supplier:	WAM scientific		
Make and Model:	MiniRAE 3000+		
Serial Number:	592-930519		
For PID - Lamp Photon Energy (eV):			
CALIBRATION			
Calibration (Span) Gas:	iso-Butylene		
Batch Number:	W0249314-15		
Expiry Date:	21/04/2025		
Concentration (ppm or % v/v):	100ppm		
CALIBRATE WITH SPAN GAS			
Calibration Date:	18/05/21	19/05/21	20/05/21
Calibration Time:	0725	0720	0635
Fresh Air Calibration Reading (ppm or % v/v):	0ppm	0ppm	0ppm
Calibration Reading (ppm or % v/v):	100ppm	100ppm	100ppm
CORRECTION FACTOR			
The project HSEP provides the target compound/s of interest and should include the appropriate correction factor to be used for the PID.			
Target Compound/s:			
Correction Factor:			
BUMP TEST WITH SPAN GAS			
Time:			
Bump Test Reading (ppm):			
ALARM LEVELS			
The project HSEP provides actions levels for the target compound/s of interest and the instrument should be set up with high and low level alarms based on the action level concentrations where required.			
High Level Alarm (ppm or % v/v):			
Low Level Alarm (ppm or % v/v):			
TEST ALARMS BY BUMP TEST			
Time:			
Alarms Activated at Low Level (Y/N):			
COMMENTS			
Detail any equipment faults, minor maintenance performed, change of batteries or technical support provided.			
Approval and Distribution			
 _____ Fieldwork Staff Signature		20/5/2021 _____ Date	
Distribution: Project Central File			

Appendix F

Laboratory Certificates

Fadi Soro

Fadi
2/6/21
10-

From: Angus Harding
Sent: Wednesday, 2 June 2021 9:27 AM
To: Fadi Soro
Cc: Juliana Gonzalez
Subject: RE: [EXTERNAL] - ES2118814 and ES2119057 - additional analysis request

Hey Fadi,

Can you organise the below re-batch:

Work Order	Samples to analyse
1 ES2118814	: HA018_0.05 1
	PFAS:HA018_0.5 2
	: HA019_0.05 3
	PFAS analysis: HA019_0.5 and HA019_0.7 4 5 PFAS analysis: HA021_0.3 6
2 ES2119057	: HA025_0.05 7
	PFAS analysis: HA025_0.5 8
	: HA028_0.05 9
	PFAS analysis: HA028_0.5 and HA028_1.0 10 11
	* PFAS analysis: HA030_0.2 12
	PFAS analysis: HA031_0.5 and HA031_1.0 13 14
	: HA032_0.05 15

ES2118814 → S130-136

#34, 35, 36, 38, 42, 37

ES2119057 → S194-200, 229

#19, 20, 27, 28, 29, 33, 35, 36, 37, 38,

40, 44, 58, 59

Environmental Division
Sydney
Work Order Reference
ES2120685



Telephone : + 61-2-8784 8555

PFAS analysis:HA032_0.5 16
PFAS analysis:HA033_0.2 17
PFAS analysis:HA035_0.2 18
PFAS analysis: QC104_210520 and QC105_210520 19 20

ES2119057 is in trays S222, S194 – 200 ES2118814 is in trays S130-136

Please let me know if you need more details.

Kind Regards,

Angus Harding

Client Services Officer, Environmental
Sydney



T +61 2 8784 8555
 F +61 2 8784 8500
 D +61 2 8784 8503
angus.harding@alsglobal.com
 277-289 Woodpark Road
 Smithfield NSW 2164 AUSTRALIA

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EnviroMail™ 128 – Revised PFAS Bottle Requirements

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From: Angus Harding

Sent: Tuesday, 1 June 2021 2:56 PM

To: Vishal Patel <vishal.patel@ALSGlobal.com>

Subject: FW: [EXTERNAL] - ES2118814 and ES2119057 - additional analysis request

Hi Vishal

Can you please organise the below samples?

Work Order	Samples to analyse	
ES2118814	[REDACTED]: HA018_0.05 PFAS:HA018_0.5	
	[REDACTED]: HA019_0.05 PFAS analysis: HA019_0.5 and HA019_0.7 PFAS analysis: HA021_0.3	
	[REDACTED]: HA025_0.05 PFAS analysis: HA025_0.5	
	[REDACTED]: HA028_0.05 PFAS analysis: HA028_0.5 and HA028_1.0	
ES2119057	[REDACTED]: HA030_0.2 PFAS analysis: HA030_0.2	
	[REDACTED]: HA031_0.5 and HA031_1.0 PFAS analysis: HA031_0.5 and HA031_1.0	
	[REDACTED]: HA032_0.05 PFAS analysis:HA032_0.5	
	[REDACTED]: HA033_0.2 PFAS analysis:HA033_0.2	
	[REDACTED]: HA035_0.2 PFAS analysis:HA035_0.2	
	[REDACTED]: QC104_210520 and QC105_210520 PFAS analysis: QC104_210520 and QC105_210520	

ES2119057 is in trays S222, S194 – 200 ES2118814 is in trays S130-136

Please let me know if you need more details.

Kind Regards,

Angus Harding

Client Services Officer, Environmental
Sydney



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D +61 2 8784 8503
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From: Byrne, Jessica [<mailto:Jessica.Byrne@aecom.com>]

Sent: Tuesday, 1 June 2021 12:53 PM

To: ALSEnviro Sydney <ALSEnviro.Sydney@ALSGlobal.com>

Cc: Ferguson, Orla <Orla.Ferguson@aecom.com>; Waddingham, Peter <Peter.Waddingham@aecom.com>

Subject: [EXTERNAL] - ES2118814 and ES2119057 - additional analysis request

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.

Hello ALS,

Can I please request the following additional analysis:

Work Order	Samples to analyse
ES2118814	[REDACTED]: HA018_0.05
	PFAS:HA018_0.5
	[REDACTED]: HA019_0.05
	PFAS analysis: HA019_0.5 and HA019_0.7 PFAS analysis: HA021_0.3
ES2119057	[REDACTED]: HA025_0.05
	PFAS analysis: HA025_0.5
	[REDACTED]: HA028_0.05
	PFAS analysis: HA028_0.5 and HA028_1.0
	PFAS analysis: HA030_0.2
	PFAS analysis: HA031_0.5 and HA031_1.0
	[REDACTED]: HA032_0.05
	PFAS analysis:HA032_0.5
	PFAS analysis:HA033_0.2
	PFAS analysis:HA035_0.2

Thanks

Jess

Jessica Byrne

Principal Environmental Engineer
M +61 416 156 268
Jessica.Byrne@aecom.com

AECOM
17 Warabrook Boulevard, Warabrook, NSW 2304
PO Box 73 Hunter Region MC NSW 2310
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Please consider the environment before printing this email.

ANZ FQM - Chain of Custody Form

Q4AN(EV)-007-FM1

CONSULTANT: AECOM Maree Welch		ADDRESS 17 Warahook Boulevard, NSW 2304		SAMPLER: Peter Waddingham, James Hughes, Sidnee Harris		Destination Laboratory ALS Newcatsbe	
PROJECT MANAGER (PM): Orla Ferguson		SITE: Eraring Origin Power Station		MOBILE: 0447 724 681		PHONE:	
PROJECT NUMBER & TASK CCI 00622873		P.O. NO.:		EMAIL REPORT TO: Maree Welch@aecom.com			
RESULTS REQUIRED (Date):		QUOTE NO.:		ANALYSIS REQUIRED including SUITES (note - suite codes must be listed to attract suite prices)			
FOR LABORATORY USE ONLY COOLER SEAL (circle appropriate) Intact: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> SAMPLE TEMPERATURE CHILLED: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:		PFAS (full suite - 28 analytes)		Notes: e.g. Highly contaminated sample e.g. "High PAHs expected". Extra volume for QC or trace LORs etc.	
03 No (icy)				HOLD Asbestos (present / absent)		Subcon / Forward Lab / Split Lab / Analysis: <u>WO</u> <u>Organised By / Date:</u> <u>Relinquished By / Date:</u> <u>Connote Courier:</u> <u>WO No:</u> <u>Attached By PO / Internal Sheet:</u>	
SAMPLE INFORMATION (note: S = Soil, W = Water)				CONTAINER INFORMATION			
ALS ID	SAMPLE ID	MATRIX	DATE	Time	Type / Code	Total bottles	
1	HA012_0.05_210520	Soil	20/05/21				X
2	HA012_0.5_210520	Soil	20/05/21				X
3	HA012_1.0_210520	Soil	20/05/21				X
4	HA013_0.05_210520	Soil	20/05/21				X
5	HA013_0.5_210520	Soil	20/05/21				X
6	HA016_0.05_210520	Soil	20/05/21				X X
7	HA017_0.05_210520	Soil	20/05/21				X
8	HA017_0.5_210520	Soil	20/05/21				X
9	HA017_1.0_210520	Soil	20/05/21				X
10	HA022_0.05_210520	Soil	20/05/21				X
11	HA022_0.5_210520	Soil	20/05/21				X
12	HA022_1.0_210520	Soil	20/05/21				X
13	HA023_0.05_210520	Soil	20/05/21				X
14	HA023_0.5_210520	Soil	20/05/21				X
15	HA023_1.0_210520	Soil	20/05/21				X
16	HA024_0.05_210520	Soil	20/05/21				X
17	HA024_0.5_210520	Soil	20/05/21				X
18	HA024_0.8_210520	Soil	20/05/21				X
19	HA025_0.05_210520	Soil	20/05/21				X

Environmental Division Sydney Work Order Reference ES2119057



Telephone: 61-2-8794 8557

LAB O...
NE...

Asbestos analysis on HOLD

RELINQUISHED BY:		RECEIVED BY:		RECEIVED BY:		METHOD OF SHIPMENT	
Name: Sidnee Harris	Date: 20/5/21	Name: [Signature]	Date: 20/5/21	Name: [Signature]	Date: 20/5/21	Con' Note No:	
OF: AECOM	Time: 18:50	OF: [Signature]	Time: 4:50 PM	OF: [Signature]	Time: 3:05 PM	Transport Co:	

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

#797546

rel: L&S 20/5-21

ASD& ER



COC Page 2 of 3
 Chilled: 4.8
 Temp: 0.2
 Final Temp: 5.0
 Page 1 of 1

AN2
FQM - Chain of Custody Form

CLIENT: AECOM Maree Welch		ADDRESS 17 Warabrook Boulevard, NSW 2304		SAMPLER: Peter Waddingham, James Hughes, Sidnee Harris		Destination Laboratory ALS Newcastle	
PROJECT MANAGER (PM) Orla Ferguson		SITE: Eraring Origin Power Station		MOBILE: 0447 724 581		PHONE:	
PROJECT NUMBER & TASK CODE 60622873		P.O. NO.:		EMAIL REPORT TO: Maree.Welch@aecom.com			
RESULTS REQUIRED (Date):		QUOTE NO.:		ANALYSIS REQUIRED including BUTES (note - suite codes must be listed to attract auto prices)			
FOR LABORATORY USE ONLY COOLER SEAL (circle appropriate) Intact: Yes <input type="checkbox"/> No <input type="checkbox"/> N/A SAMPLE TEMPERATURE CHILLED: Yes <input type="checkbox"/> No <input type="checkbox"/>		COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:		ANALYSIS REQUIRED including BUTES (note - suite codes must be listed to attract auto prices) Notes: e.g. Highly contaminated sample e.g. "High PAHs expected". Extra volume for QC or trace LORs etc.			
SAMPLE INFORMATION (note: S = Soil, W = Water)				CONTAINER INFORMATION			
ALS ID	SAMPLE ID	MATRIX	DATE	Time	Type / Code	Total bottles	
20	HA025_0.5_210520	Soil	20/05/21				X
21	HA026_0.05_210520	Soil	20/05/21			X	
22	HA025_0.5_210520	Soil	20/05/21				X
23	HA025_0.7_210520	Soil	20/05/21				X
24	HA027_0.05_210520	Soil	20/05/21			X	
25	HA027_0.5_210520	Soil	20/05/21				X
26	HA027_1.0_210520	Soil	20/05/21				X
27	HA028_0.05_210520	Soil	20/05/21			X	
28	HA028_0.5_210520	Soil	20/05/21				X
29	HA028_1.0_210520	Soil	20/05/21				X
30	HA029_0.05_210520	Soil	20/05/21			X	
31	HA029_0.5_210520	Soil	20/05/21				X
32	HA030_0.05_210520	Soil	20/05/21			X	
33	HA030_0.2_210520	Soil	20/05/21				X
34	HA031_0.05_210520	Soil	20/05/21			X	
35	HA031_0.5_210520	Soil	20/05/21				X
36	HA031_1.0_210520	Soil	20/05/21				X
37	HA032_0.05_210520	Soil	20/05/21			X	
38	HA032_0.2_210520	Soil	20/05/21				X
RELINQUISHED BY:		RECEIVED BY:		RECEIVED BY:		METHOD OF SHIPMENT	
Name: Sidnee Harris		Name: KS		Name: KS		Con' Note No:	
Date: 20/5/21		Date: 20/5/21		Date: 20/5/21		Transport Co:	
Time: 1:50		Time: 4:50		Time: 4:50			
Of: ALS		Of: ALS		Of: ALS			

LAB OF ORIGIN
 NEWCASTLE

Vol: **KS 20-5-21**

ANZ FQM Chain of Custody Form

CONSULTANT: AECOM Maree Welch		ADDRESS 17 Waratook Boulevard, NSW 2304		SAMPLER: Peter Waddingham, James Hughes, Sidnee Harris		Destination Laboratory ALS Newcastle			
PROJECT MANAGER (PM): Orla Ferguson		SITE: Eraring Origin Power Station		MOBILE: 0447 724 581		PHONE:			
PROJECT NUMBER & TASK COI 60622873		P.O. NO.:		EMAIL REPORT TO: Maree.Welch@aecom.com					
RESULTS REQUIRED (Date):		QUOTE NO.:		ANALYSIS REQUIRED including SUITES (note - suite codes must be listed to attract suite prices)					
FOR LABORATORY USE ONLY COOLER SEAL (circle appropriate) Seal: Yes No N/A		COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:		PFAS (full suite - 28 analyses) Asbestos (present / absent) HOLD				Notes: e.g. Highly contaminated sample e.g. "High PAHs expected". Extra volume for QC or trace LORs etc.	
SAMPLE TEMPERATURE CHILLED: Yes No									
SAMPLE INFORMATION (note: S = Soil, W = Water)				CONTAINER INFORMATION					
ALS ID	SAMPLE ID	MATRIX	DATE	Time	Type / Code	Total bottles			
39	HA033 0.05 210520	Soil	20/05/21				X		
40	HA033 0.2 210520	Soil	20/05/21					X	
41	HA034 0.05 210520	Soil	20/05/21				X		
42	HA034 0.2 210520	Soil	20/05/21					X	
43	HA036 0.05 210520	Soil	20/05/21				X		
44	HA035 0.2 210520	Soil	20/05/21					X	
45	HA036 0.05 210520	Soil	20/05/21				X		
46	HA036 0.5 210520	Soil	20/05/21					X	
47	HA036 1.0 210520	Soil	20/05/21					X	
48	HA037 0.05 210520	Soil	20/05/21				X		
49	HA037 0.5 210520	Soil	20/05/21					X	
50	HA037 1.0 210520	Soil	20/05/21					X	
51	HA039 0.05 210520	Soil	20/05/21				X		
52	HA036 0.5 210520	Soil	20/05/21					X	
53	HA039 0.05 210520	Soil	20/05/21				X		Abestos analysis on HOLD
54	HA039 0.5 210520	Soil	20/05/21					X	
55	HA040 0.05 210520	Soil	20/05/21				X		
56	SW01 210520	Water	20/05/21				X		



LAB OF ORIGIN: NEWCASTLE

RELEASUED BY:		RECEIVED BY:		RECEIVED BY:		METHOD OF SHIPMENT	
Name: <i>Sidnee Harris</i>	Date: <i>20/5/21</i>	Name: <i>KG</i>	Date: <i>20/5/21</i>	Name: <i>Sidnee Harris</i>	Date: <i>20/5/21</i>	Con' Note No:	
Of: <i>AECOM</i>	Time: <i>1650</i>	Of: <i>AC</i>	Time: <i>1650</i>	Of: <i>AC</i>	Time: <i>20/5</i>	Transport Co:	

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
Soil Container Codes: Jar = Unpreserved glass jar

ul. 15 20/5/21 5/2

COC Page 2 of 3
3 of 4

ANZ
FQM - Chain of Custody Form

CONSULTANT: AECOM Maree Welch		ADDRESS 17 Warabrook Boulevard, NSW 2304		SAMPLER: Peter Waddingham, James-Hughes, Sidnee Harris		Destination Laboratory ALS Newcastle	
PROJECT MANAGER (PM): Orla Ferguson		SITE: Eraring Origin Power Station		MOBILE: 0447 724 561		PHONE:	
PROJECT NUMBER & TASK COI 60622873		P.O. NO.:		EMAIL REPORT TO: Maree.Welch@aecom.com			
RESULTS REQUIRED (Date):		QUOTE NO.:		ANALYSIS REQUIRED including SUITES (note - suite codes must be listed to attract suite prices)			
FOR LABORATORY USE ONLY: COOLER SEAL (circle appropriate) Intact: Yes No N/A SAMPLE TEMPERATURE CHILLED: Yes No		COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:		PPAS (full suite - 28 analyses) Absence (present / absent) HOLD		Notes: e.g. Highly contaminated samples e.g. "High PAHs expected". Extra volume for OC or trace LOFs etc.	
SAMPLE INFORMATION (note: S = Soils, W=Water)		CONTAINER INFORMATION					
ALS ID	SAMPLE ID	MATRIX	DATE	Time	Type / Code	Total bottles	
57	QC103_210520	Soil	20/05/21				X
58	QC104_210520	Soil	20/05/21				X
59	QC105_210520	Soil	20/05/21				X
-	QC203_210520	Soil	20/05/21				X
-	QC204_210520	Soil	20/05/21				X
-	QC205_210520	Soil	20/05/21				X
60	QC302_210520 IN	Soil	20/05/21				X
61	QC802_210520	Soil	20/05/21				X
62	QC802_210520	Soil	20/05/21				X
RELINQUISHED BY:		RECEIVED BY:		RECEIVED BY:		METHOD OF SHIPMENT	
Name: Sidnee Harris		Name: V/S		Name: V/S		Con' Note No.:	
Date: 20/5/21		Date: 20/5/21		Date: 20/5/21		Transport Co.:	
Of: AECOM		Of: ALS		Of: ALS			
Time: 16:50		Time: 16:50		Time: 16:50			

RECEIVED
ALS
NEWCASTLE

rel: 68 20-5-21

COC Page 2 of 3
4 of 4

Australia
Melbourne
 6 Monterey Road
 Dandenong South VIC 3175
 Phone : +61 3 8564 5000
 NATA # 1261
 Site # 1254 & 14271

Sydney
 Unit F3, Building F
 16 Mars Road
 Lane Cove West NSW 2066
 Phone : +61 2 9900 8400
 NATA # 1261 Site # 18217

Brisbane
 1/21 Smallwood Place
 Murarie QLD 4172
 Phone : +61 7 3902 4600
 NATA # 1261 Site # 20794

Perth
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 NATA # 1261
 Site # 23736

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 Mayfield East NSW 2304
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 Phone : +61 2 4968 8448
 NATA # 1261 Site # 25079

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Auckland
 35 O'Rorke Road
 Penrose, Auckland 1061
 Phone : +64 9 526 45 51
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Christchurch
 43 Detroit Drive
 Rolleston, Christchurch 7675
 Phone : 0800 856 450
 IANZ # 1290

ABN: 50 005 085 521 web: www.eurofins.com.au email: EnviroSales@eurofins.com

Company Name:	AECOM Aust Pty Ltd Newcastle	Order No.:		Received:	May 24, 2021 12:25 PM
Address:	18 Warabrook Blvd, PO Box 73 HRMC NSW 2310	Report #:	797546	Due:	May 31, 2021
Project Name:	ERARING ORIGIN POWER STATION	Phone:	02 4911 4900	Priority:	5 Day
Project ID:	60622873 6.0	Fax:	02 4968 0005	Contact Name:	Maree Welch

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						HOLD	Moisture Set	Per- and Polyfluoralkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
Mayfield Laboratory - NATA Site # 25079								
External Laboratory								
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID			
1	QC203_210520	May 20, 2021		Soil	B21-My46022		X	X
2	QC204_210520	May 20, 2021		Soil	B21-My46023	X		
3	QC205_210520	May 20, 2021		Soil	B21-My46024	X		
Test Counts						2	1	1

AECOM Aust Pty Ltd Newcastle
18 Warabrook Blvd, PO Box 73
HRMC
NSW 2310



NATA Accredited
Accreditation Number 1261
Site Number 20794

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

Attention: Maree Welch

Report 797546-S
 Project name ERARING ORIGIN POWER STATION
 Project ID 60622873 6.0
 Received Date May 24, 2021

Client Sample ID			QC203_210520
Sample Matrix			Soil
Eurofins Sample No.			B21-My46022
Date Sampled			May 20, 2021
Test/Reference	LOR	Unit	
% Moisture	1	%	8.7
Perfluoroalkyl carboxylic acids (PFCAs)			
Perfluorobutanoic acid (PFBA) ^{N11}	5	ug/kg	< 5
Perfluoropentanoic acid (PFPeA) ^{N11}	5	ug/kg	< 5
Perfluorohexanoic acid (PFHxA) ^{N11}	5	ug/kg	< 5
Perfluoroheptanoic acid (PFHpA) ^{N11}	5	ug/kg	< 5
Perfluorooctanoic acid (PFOA) ^{N11}	5	ug/kg	< 5
Perfluorononanoic acid (PFNA) ^{N11}	5	ug/kg	< 5
Perfluorodecanoic acid (PFDA) ^{N11}	5	ug/kg	< 5
Perfluoroundecanoic acid (PFUnDA) ^{N11}	5	ug/kg	< 5
Perfluorododecanoic acid (PFDoDA) ^{N11}	5	ug/kg	< 5
Perfluorotridecanoic acid (PFTTrDA) ^{N15}	5	ug/kg	< 5
Perfluorotetradecanoic acid (PFTeDA) ^{N11}	5	ug/kg	< 5
13C4-PFBA (surr.)	1	%	110
13C5-PFPeA (surr.)	1	%	133
13C5-PFHxA (surr.)	1	%	118
13C4-PFHpA (surr.)	1	%	112
13C8-PFOA (surr.)	1	%	148
13C5-PFNA (surr.)	1	%	138
13C6-PFDA (surr.)	1	%	143
13C2-PFUnDA (surr.)	1	%	88
13C2-PFDoDA (surr.)	1	%	61
13C2-PFTeDA (surr.)	1	%	74
Perfluoroalkyl sulfonamido substances			
Perfluorooctane sulfonamide (FOSA) ^{N11}	5	ug/kg	< 5
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA) ^{N11}	5	ug/kg	< 5
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA) ^{N11}	5	ug/kg	< 5
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE) ^{N11}	5	ug/kg	< 5
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE) ^{N11}	5	ug/kg	< 5
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA) ^{N11}	10	ug/kg	< 10
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA) ^{N11}	10	ug/kg	< 10
13C8-FOSA (surr.)	1	%	42

Client Sample ID			QC203_210520
Sample Matrix			Soil
Eurofins Sample No.			B21-My46022
Date Sampled			May 20, 2021
Test/Reference	LOR	Unit	
Perfluoroalkyl sulfonamido substances			
D3-N-MeFOSA (surr.)	1	%	42
D5-N-EtFOSA (surr.)	1	%	59
D7-N-MeFOSE (surr.)	1	%	43
D9-N-EtFOSE (surr.)	1	%	31
D5-N-EtFOSAA (surr.)	1	%	100
D3-N-MeFOSAA (surr.)	1	%	117
Perfluoroalkyl sulfonic acids (PFASs)			
Perfluorobutanesulfonic acid (PFBS) ^{N11}	5	ug/kg	< 5
Perfluorononanesulfonic acid (PFNS) ^{N15}	5	ug/kg	< 5
Perfluoropropanesulfonic acid (PFPrS) ^{N15}	5	ug/kg	< 5
Perfluoropentanesulfonic acid (PFPeS) ^{N15}	5	ug/kg	< 5
Perfluorohexanesulfonic acid (PFHxS) ^{N11}	5	ug/kg	< 5
Perfluoroheptanesulfonic acid (PFHpS) ^{N15}	5	ug/kg	< 5
Perfluorooctanesulfonic acid (PFOS) ^{N11}	5	ug/kg	< 5
Perfluorodecanesulfonic acid (PFDS) ^{N15}	5	ug/kg	< 5
13C3-PFBS (surr.)	1	%	123
18O2-PFHxS (surr.)	1	%	130
13C8-PFOS (surr.)	1	%	131
n:2 Fluorotelomer sulfonic acids (n:2 FTSA)			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA) ^{N11}	5	ug/kg	< 5
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA) ^{N11}	10	ug/kg	< 10
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA) ^{N11}	5	ug/kg	< 5
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA) ^{N11}	5	ug/kg	< 5
13C2-4:2 FTS (surr.)	1	%	INT
13C2-6:2 FTSA (surr.)	1	%	157
13C2-8:2 FTSA (surr.)	1	%	INT
13C2-10:2 FTSA (surr.)	1	%	137
PFASs Summations			
Sum (PFHxS + PFOS)*	5	ug/kg	< 5
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	< 5
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	< 5
Sum of WA DWER PFAS (n=10)*	10	ug/kg	< 10
Sum of PFASs (n=30)*	50	ug/kg	< 50

Sample History

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

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

Description	Testing Site	Extracted	Holding Time
% Moisture - Method: LTM-GEN-7080 Moisture	Brisbane	May 27, 2021	14 Days
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs) - Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)	Brisbane	May 26, 2021	14 Days
Perfluoroalkyl sulfonamido substances - Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)	Brisbane	May 26, 2021	14 Days
Perfluoroalkyl sulfonic acids (PFASs) - Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)	Brisbane	May 26, 2021	14 Days
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs) - Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)	Brisbane	May 26, 2021	28 Days

Australia
Melbourne
 6 Monterey Road
 Dandenong South VIC 3175
 Phone : +61 3 8564 5000
 NATA # 1261
 Site # 1254 & 14271

Sydney
 Unit F3, Building F
 16 Mars Road
 Lane Cove West NSW 2066
 Phone : +61 2 9900 8400
 NATA # 1261 Site # 18217

Brisbane
 1/21 Smallwood Place
 Murarie QLD 4172
 Phone : +61 7 3902 4600
 NATA # 1261 Site # 20794

Perth
 46-48 Banksia Road
 Welshpool WA 6106
 Phone : +61 8 9251 9600
 NATA # 1261
 Site # 23736

Newcastle
 4/52 Industrial Drive
 Mayfield East NSW 2304
 PO Box 60 Wickham 2293
 Phone : +61 2 4968 8448
 NATA # 1261 Site # 25079

New Zealand
Auckland
 35 O'Rorke Road
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 IANZ # 1327

Christchurch
 43 Detroit Drive
 Rolleston, Christchurch 7675
 Phone : 0800 856 450
 IANZ # 1290

ABN: 50 005 085 521 web: www.eurofins.com.au email: EnviroSales@eurofins.com

Company Name:	AECOM Aust Pty Ltd Newcastle	Order No.:		Received:	May 24, 2021 12:25 PM
Address:	18 Warabrook Blvd, PO Box 73 HRMC NSW 2310	Report #:	797546	Due:	May 31, 2021
Project Name:	ERARING ORIGIN POWER STATION	Phone:	02 4911 4900	Priority:	5 Day
Project ID:	60622873 6.0	Fax:	02 4968 0005	Contact Name:	Maree Welch

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						HOLD	Moisture Set	Per- and Polyfluoralkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
Mayfield Laboratory - NATA Site # 25079								
External Laboratory								
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID			
1	QC203_210520	May 20, 2021		Soil	B21-My46022		X	X
2	QC204_210520	May 20, 2021		Soil	B21-My46023	X		
3	QC205_210520	May 20, 2021		Soil	B21-My46024	X		
Test Counts						2	1	1

Internal Quality Control Review and Glossary

General

- Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
- All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
- All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
- Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
- Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
- SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
- Samples were analysed on an 'as received' basis.
- Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
- This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

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

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

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.3
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 20-130% Phenols & 50-150% PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.3 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPaA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

- Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
- Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
- Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
- Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
- Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
- pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
- Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
- Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
- For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
- Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
Method Blank						
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)	ug/kg	< 5		5	Pass	
Perfluoropentanoic acid (PFPeA)	ug/kg	< 5		5	Pass	
Perfluorohexanoic acid (PFHxA)	ug/kg	< 5		5	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/kg	< 5		5	Pass	
Perfluorooctanoic acid (PFOA)	ug/kg	< 5		5	Pass	
Perfluorononanoic acid (PFNA)	ug/kg	< 5		5	Pass	
Perfluorodecanoic acid (PFDA)	ug/kg	< 5		5	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/kg	< 5		5	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/kg	< 5		5	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/kg	< 5		5	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/kg	< 5		5	Pass	
Method Blank						
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)	ug/kg	< 5		5	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/kg	< 5		5	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/kg	< 5		5	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	ug/kg	< 5		5	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	ug/kg	< 5		5	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/kg	< 10		10	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/kg	< 10		10	Pass	
Method Blank						
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)	ug/kg	< 5		5	Pass	
Perfluoronanesulfonic acid (PFNS)	ug/kg	< 5		5	Pass	
Perfluoropropanesulfonic acid (PFPrS)	ug/kg	< 5		5	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/kg	< 5		5	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/kg	< 5		5	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/kg	< 5		5	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/kg	< 5		5	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/kg	< 5		5	Pass	
Method Blank						
n:2 Fluorotelomer sulfonic acids (n:2 FTSA)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/kg	< 5		5	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	ug/kg	< 10		10	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/kg	< 5		5	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/kg	< 5		5	Pass	
LCS - % Recovery						
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)	%	91		50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	106		50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	102		50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	100		50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	94		50-150	Pass	
Perfluorononanoic acid (PFNA)	%	102		50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	100		50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	97		50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	95		50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	108		50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	101		50-150	Pass	

Test			Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery								
Perfluoroalkyl sulfonamido substances								
Perfluorooctane sulfonamide (FOSA)			%	120		50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)			%	102		50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)			%	115		50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)			%	85		50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)			%	100		50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)			%	107		50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)			%	90		50-150	Pass	
LCS - % Recovery								
Perfluoroalkyl sulfonic acids (PFSAs)								
Perfluorobutanesulfonic acid (PFBS)			%	83		50-150	Pass	
Perfluorononanesulfonic acid (PFNS)			%	122		50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)			%	97		50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)			%	88		50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)			%	88		50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)			%	110		50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)			%	97		50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)			%	97		50-150	Pass	
LCS - % Recovery								
n:2 Fluorotelomer sulfonic acids (n:2 FTSA)								
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)			%	73		50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)			%	141		50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)			%	121		50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)			%	95		50-150	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery								
Perfluoroalkyl carboxylic acids (PFCAs)								
				Result 1				
Perfluorobutanoic acid (PFBA)	S21-My44229	NCP	%	90		50-150	Pass	
Perfluoropentanoic acid (PFPeA)	S21-My44229	NCP	%	97		50-150	Pass	
Perfluorohexanoic acid (PFHxA)	S21-My44229	NCP	%	109		50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	S21-My44229	NCP	%	95		50-150	Pass	
Perfluorooctanoic acid (PFOA)	S21-My44229	NCP	%	96		50-150	Pass	
Perfluorononanoic acid (PFNA)	S21-My44229	NCP	%	112		50-150	Pass	
Perfluorodecanoic acid (PFDA)	S21-My44229	NCP	%	93		50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	S21-My44229	NCP	%	90		50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	S21-My44229	NCP	%	108		50-150	Pass	
Perfluorotridecanoic acid (PFTTrDA)	S21-My44229	NCP	%	97		50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	S21-My44229	NCP	%	111		50-150	Pass	
Spike - % Recovery								
Perfluoroalkyl sulfonamido substances								
				Result 1				
Perfluorooctane sulfonamide (FOSA)	S21-My44229	NCP	%	115		50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	S21-My44229	NCP	%	97		50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	S21-My44229	NCP	%	104		50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	S21-My44229	NCP	%	90		50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	S21-My44229	NCP	%	113		50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	S21-My44229	NCP	%	102			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	S21-My44229	NCP	%	96			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSA's)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	S21-My44229	NCP	%	84			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	S21-My44229	NCP	%	124			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	S21-My44229	NCP	%	119			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	S21-My44229	NCP	%	94			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	S21-My44229	NCP	%	88			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	S21-My44229	NCP	%	107			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	S21-My44229	NCP	%	100			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	S21-My44229	NCP	%	107			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids (n:2 FTSA's)				Result 1					
1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2 FTSA)	S21-My44229	NCP	%	104			50-150	Pass	
1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2 FTSA)	S21-My44229	NCP	%	98			50-150	Pass	
1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2 FTSA)	S21-My44229	NCP	%	97			50-150	Pass	
1H,1H,2H,2H-perfluorododecanesulfonic acid (10:2 FTSA)	S21-My44229	NCP	%	95			50-150	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S21-My44402	NCP	%	15	15	2.0	30%	Pass	
Duplicate									
Perfluoroalkyl carboxylic acids (PFCA's)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	S21-My44415	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	S21-My44415	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	S21-My44415	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	S21-My44415	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	S21-My44415	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	S21-My44415	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	S21-My44415	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	S21-My44415	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	S21-My44415	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	S21-My44415	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	S21-My44415	NCP	ug/kg	< 5	< 5	<1	30%	Pass	

Duplicate								
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD		
Perfluorooctane sulfonamide (FOSA)	S21-My44415	NCP	ug/kg	< 5	< 5	<1	30%	Pass
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	S21-My44415	NCP	ug/kg	< 5	< 5	<1	30%	Pass
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	S21-My44415	NCP	ug/kg	< 5	< 5	<1	30%	Pass
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	S21-My44415	NCP	ug/kg	< 5	< 5	<1	30%	Pass
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	S21-My44415	NCP	ug/kg	< 5	< 5	<1	30%	Pass
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	S21-My44415	NCP	ug/kg	< 10	< 10	<1	30%	Pass
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	S21-My44415	NCP	ug/kg	< 10	< 10	<1	30%	Pass
Duplicate								
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD		
Perfluorobutanesulfonic acid (PFBS)	S21-My44415	NCP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluorononanesulfonic acid (PFNS)	S21-My44415	NCP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluoropropanesulfonic acid (PFPrS)	S21-My44415	NCP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluoropentanesulfonic acid (PFPeS)	S21-My44415	NCP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluorohexanesulfonic acid (PFHxS)	S21-My44415	NCP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluoroheptanesulfonic acid (PFHpS)	S21-My44415	NCP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluorooctanesulfonic acid (PFOS)	S21-My44415	NCP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluorodecanesulfonic acid (PFDS)	S21-My44415	NCP	ug/kg	< 5	< 5	<1	30%	Pass
Duplicate								
n:2 Fluorotelomer sulfonic acids (n:2 FTSA)				Result 1	Result 2	RPD		
1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2 FTSA)	S21-My44415	NCP	ug/kg	< 5	< 5	<1	30%	Pass
1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2 FTSA)	S21-My44415	NCP	ug/kg	< 10	< 10	<1	30%	Pass
1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2 FTSA)	S21-My44415	NCP	ug/kg	< 5	< 5	<1	30%	Pass
1H,1H,2H,2H-perfluorododecanesulfonic acid (10:2 FTSA)	S21-My44415	NCP	ug/kg	< 5	< 5	<1	30%	Pass

Comments
Sample Integrity

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

Qualifier Codes/Comments

Code	Description
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).

Authorised by:

Andrew Black	Analytical Services Manager
Sarah McCallion	Senior Analyst-PFAS (QLD)



Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please [click here](#).

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IANZ # 1290

Sample Receipt Advice

Company name: AECOM Aust Pty Ltd Sydney
Contact name: Orla Ferguson
Project name: ERARING ORIGIN POWER STATION
Project ID: 60622873_4
Turnaround time: 1 Day
Date/Time received: Jun 11, 2021 12:29 PM
Eurofins reference: 802500

Sample Information

- ✓ A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- ✓ Sample Temperature of a random sample selected from the batch as recorded by Eurofins Sample Receipt : 10 degrees Celsius.
- ✓ All samples have been received as described on the above COC.
- ✓ COC has been completed correctly.
- ✓ Attempt to chill was evident.
- ✓ Appropriately preserved sample containers have been used.
- ✓ All samples were received in good condition.
- ✓ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- ✓ Appropriate sample containers have been used.
- ✓ Sample containers for volatile analysis received with zero headspace.
- ✗ Split sample sent to requested external lab.
- ✗ Some samples have been subcontracted.
- N/A Custody Seals intact (if used).

Notes

Contact

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

Ursula Long on phone : or by email: UrsulaLong@eurofins.com

Results will be delivered electronically via email to Orla Ferguson - orla.ferguson@aecom.com.

Note: A copy of these results will also be delivered to the general AECOM Aust Pty Ltd Sydney email address.

AECOM Aust Pty Ltd Sydney
Level 21, 420 George St
Sydney
NSW 2000



NATA Accredited
Accreditation Number 1261
Site Number 20794

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

Attention: Orla Ferguson

Report **802500-S**
Project name **ERARING ORIGIN POWER STATION**
Project ID **60622873_4**
Received Date **Jun 11, 2021**

Client Sample ID			QC200_210519	QC201_210519	QC202_210519
Sample Matrix			Soil	Soil	Soil
Eurofins Sample No.			B21-Jn24750	B21-Jn24751	B21-Jn24752
Date Sampled			May 18, 2021	May 18, 2021	May 18, 2021
Test/Reference	LOR	Unit			
% Moisture	1	%	8.0	17	13
Perfluoroalkyl carboxylic acids (PFCAs)					
Perfluorobutanoic acid (PFBA) ^{N11}	5	ug/kg	< 5	< 5	< 5
Perfluoropentanoic acid (PFPeA) ^{N11}	5	ug/kg	< 5	< 5	< 5
Perfluorohexanoic acid (PFHxA) ^{N11}	5	ug/kg	< 5	< 5	< 5
Perfluoroheptanoic acid (PFHpA) ^{N11}	5	ug/kg	< 5	< 5	< 5
Perfluorooctanoic acid (PFOA) ^{N11}	5	ug/kg	< 5	< 5	< 5
Perfluorononanoic acid (PFNA) ^{N11}	5	ug/kg	< 5	< 5	< 5
Perfluorodecanoic acid (PFDA) ^{N11}	5	ug/kg	< 5	< 5	< 5
Perfluoroundecanoic acid (PFUnDA) ^{N11}	5	ug/kg	< 5	< 5	< 5
Perfluorododecanoic acid (PFDoDA) ^{N11}	5	ug/kg	< 5	< 5	< 5
Perfluorotridecanoic acid (PFTTrDA) ^{N15}	5	ug/kg	< 5	< 5	< 5
Perfluorotetradecanoic acid (PFTeDA) ^{N11}	5	ug/kg	< 5	< 5	< 5
13C4-PFBA (surr.)	1	%	116	95	109
13C5-PFPeA (surr.)	1	%	110	84	103
13C5-PFHxA (surr.)	1	%	95	78	87
13C4-PFHpA (surr.)	1	%	112	97	99
13C8-PFOA (surr.)	1	%	120	107	93
13C5-PFNA (surr.)	1	%	111	106	96
13C6-PFDA (surr.)	1	%	118	113	98
13C2-PFUnDA (surr.)	1	%	115	109	116
13C2-PFDoDA (surr.)	1	%	100	99	119
13C2-PFTeDA (surr.)	1	%	65	55	95
Perfluoroalkyl sulfonamido substances					
Perfluorooctane sulfonamide (FOSA) ^{N11}	5	ug/kg	< 5	< 5	< 5
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA) ^{N11}	5	ug/kg	< 5	< 5	< 5
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA) ^{N11}	5	ug/kg	< 5	< 5	< 5
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE) ^{N11}	5	ug/kg	< 5	< 5	< 5
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE) ^{N11}	5	ug/kg	< 5	< 5	< 5
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA) ^{N11}	10	ug/kg	< 10	< 10	< 10
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA) ^{N11}	10	ug/kg	< 10	< 10	< 10
13C8-FOSA (surr.)	1	%	66	52	79

Client Sample ID			QC200_210519	QC201_210519	QC202_210519
Sample Matrix			Soil	Soil	Soil
Eurofins Sample No.			B21-Jn24750	B21-Jn24751	B21-Jn24752
Date Sampled			May 18, 2021	May 18, 2021	May 18, 2021
Test/Reference	LOR	Unit			
Perfluoroalkyl sulfonamido substances					
D3-N-MeFOSA (surr.)	1	%	62	56	94
D5-N-EtFOSA (surr.)	1	%	61	42	59
D7-N-MeFOSE (surr.)	1	%	49	27	84
D9-N-EtFOSE (surr.)	1	%	37	22	63
D5-N-EtFOSAA (surr.)	1	%	49	50	88
D3-N-MeFOSAA (surr.)	1	%	84	80	98
Perfluoroalkyl sulfonic acids (PFASs)					
Perfluorobutanesulfonic acid (PFBS) ^{N11}	5	ug/kg	< 5	< 5	< 5
Perfluorononanesulfonic acid (PFNS) ^{N15}	5	ug/kg	< 5	< 5	< 5
Perfluoropropanesulfonic acid (PFPrS) ^{N15}	5	ug/kg	< 5	< 5	< 5
Perfluoropentanesulfonic acid (PFPeS) ^{N15}	5	ug/kg	< 5	< 5	< 5
Perfluorohexanesulfonic acid (PFHxS) ^{N11}	5	ug/kg	< 5	< 5	< 5
Perfluoroheptanesulfonic acid (PFHpS) ^{N15}	5	ug/kg	< 5	< 5	< 5
Perfluorooctanesulfonic acid (PFOS) ^{N11}	5	ug/kg	< 5	< 5	< 5
Perfluorodecanesulfonic acid (PFDS) ^{N15}	5	ug/kg	< 5	< 5	< 5
13C3-PFBS (surr.)	1	%	122	121	107
18O2-PFHxS (surr.)	1	%	119	111	111
13C8-PFOS (surr.)	1	%	122	128	112
n:2 Fluorotelomer sulfonic acids (n:2 FTSA)					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA) ^{N11}	5	ug/kg	< 5	< 5	< 5
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA) ^{N11}	10	ug/kg	< 10	< 10	< 10
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA) ^{N11}	5	ug/kg	< 5	< 5	< 5
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA) ^{N11}	5	ug/kg	< 5	< 5	< 5
13C2-4:2 FTS (surr.)	1	%	INT	INT	147
13C2-6:2 FTSA (surr.)	1	%	INT	INT	82
13C2-8:2 FTSA (surr.)	1	%	INT	INT	191
13C2-10:2 FTSA (surr.)	1	%	101	86	91
PFASs Summations					
Sum (PFHxS + PFOS)*	5	ug/kg	< 5	< 5	< 5
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	< 5	< 5	< 5
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	< 5	< 5	< 5
Sum of WA DWER PFAS (n=10)*	10	ug/kg	< 10	< 10	< 10
Sum of PFASs (n=30)*	50	ug/kg	< 50	< 50	< 50

Sample History

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

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

Description	Testing Site	Extracted	Holding Time
% Moisture - Method: LTM-GEN-7080 Moisture	Brisbane	Jun 14, 2021	14 Days
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs) - Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)	Brisbane	Jun 11, 2021	28 Days
Perfluoroalkyl sulfonamido substances - Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)	Brisbane	Jun 11, 2021	28 Days
Perfluoroalkyl sulfonic acids (PFSAs) - Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)	Brisbane	Jun 11, 2021	28 Days
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs) - Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)	Brisbane	Jun 11, 2021	28 Days

Australia
Melbourne
 6 Monterey Road
 Dandenong South VIC 3175
 Phone : +61 3 8564 5000
 NATA # 1261
 Site # 1254 & 14271

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 Lane Cove West NSW 2066
 Phone : +61 2 9900 8400
 NATA # 1261 Site # 18217

Brisbane
 1/21 Smallwood Place
 Murarie QLD 4172
 Phone : +61 7 3902 4600
 NATA # 1261 Site # 20794

Perth
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 NATA # 1261
 Site # 23736

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 Mayfield East NSW 2304
 PO Box 60 Wickham 2293
 Phone : +61 2 4968 8448
 NATA # 1261 Site # 25079

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Auckland
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 Rolleston, Christchurch 7675
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Company Name:	AECOM Aust Pty Ltd Sydney	Order No.:	60622873_4	Received:	Jun 11, 2021 12:29 PM
Address:	Level 21, 420 George St Sydney NSW 2000	Report #:	802500	Due:	Jun 15, 2021
Project Name:	ERARING ORIGIN POWER STATION	Phone:	02 8934 0000	Priority:	1 Day
Project ID:	60622873_4	Fax:	02 8934 0001	Contact Name:	Orla Ferguson

Eurofins Analytical Services Manager : Ursula Long

Sample Detail						Moisture Set	Per- and Polyfluoralkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271							
Sydney Laboratory - NATA Site # 18217							
Brisbane Laboratory - NATA Site # 20794						X	X
Perth Laboratory - NATA Site # 23736							
Mayfield Laboratory - NATA Site # 25079							
External Laboratory							
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID		
1	QC200_210519	May 18, 2021		Soil	B21-Jn24750	X	X
2	QC201_210519	May 18, 2021		Soil	B21-Jn24751	X	X
3	QC202_210519	May 18, 2021		Soil	B21-Jn24752	X	X
Test Counts						3	3

Internal Quality Control Review and Glossary

General

- Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
- All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
- All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
- Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
- Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
- SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
- Samples were analysed on an 'as received' basis.
- Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
- This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

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

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

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.3
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 20-130% Phenols & 50-150% PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.3 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPaA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

- Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
- Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
- Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
- Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
- Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
- pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
- Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
- Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
- For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
- Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
Method Blank						
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)	ug/kg	< 5		5	Pass	
Perfluoropentanoic acid (PFPeA)	ug/kg	< 5		5	Pass	
Perfluorohexanoic acid (PFHxA)	ug/kg	< 5		5	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/kg	< 5		5	Pass	
Perfluorooctanoic acid (PFOA)	ug/kg	< 5		5	Pass	
Perfluorononanoic acid (PFNA)	ug/kg	< 5		5	Pass	
Perfluorodecanoic acid (PFDA)	ug/kg	< 5		5	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/kg	< 5		5	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/kg	< 5		5	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/kg	< 5		5	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/kg	< 5		5	Pass	
Method Blank						
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)	ug/kg	< 5		5	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/kg	< 5		5	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/kg	< 5		5	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	ug/kg	< 5		5	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	ug/kg	< 5		5	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/kg	< 10		10	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/kg	< 10		10	Pass	
Method Blank						
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)	ug/kg	< 5		5	Pass	
Perfluorononanesulfonic acid (PFNS)	ug/kg	< 5		5	Pass	
Perfluoropropanesulfonic acid (PFPrS)	ug/kg	< 5		5	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/kg	< 5		5	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/kg	< 5		5	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/kg	< 5		5	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/kg	< 5		5	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/kg	< 5		5	Pass	
Method Blank						
n:2 Fluorotelomer sulfonic acids (n:2 FTSA)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/kg	< 5		5	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	ug/kg	< 10		10	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/kg	< 5		5	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/kg	< 5		5	Pass	
LCS - % Recovery						
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)	%	97		50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	98		50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	107		50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	102		50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	99		50-150	Pass	
Perfluorononanoic acid (PFNA)	%	103		50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	98		50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	91		50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	109		50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	116		50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	115		50-150	Pass	

Test			Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery								
Perfluoroalkyl sulfonamido substances								
Perfluorooctane sulfonamide (FOSA)			%	113		50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)			%	87		50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)			%	114		50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)			%	111		50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)			%	108		50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)			%	97		50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)			%	106		50-150	Pass	
LCS - % Recovery								
Perfluoroalkyl sulfonic acids (PFSAs)								
Perfluorobutanesulfonic acid (PFBS)			%	85		50-150	Pass	
Perfluorononanesulfonic acid (PFNS)			%	126		50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)			%	110		50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)			%	91		50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)			%	98		50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)			%	85		50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)			%	95		50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)			%	98		50-150	Pass	
LCS - % Recovery								
n:2 Fluorotelomer sulfonic acids (n:2 FTSA)								
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)			%	82		50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)			%	102		50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)			%	104		50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)			%	113		50-150	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery								
Perfluoroalkyl carboxylic acids (PFCAs)								
Perfluorobutanoic acid (PFBA)				Result 1				
Perfluorobutanoic acid (PFBA)	B21-Jn24751	CP	%	98		50-150	Pass	
Perfluoropentanoic acid (PFPeA)	B21-Jn24751	CP	%	94		50-150	Pass	
Perfluoroheptanoic acid (PFHxA)	B21-Jn24751	CP	%	97		50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	B21-Jn24751	CP	%	101		50-150	Pass	
Perfluorooctanoic acid (PFOA)	B21-Jn24751	CP	%	97		50-150	Pass	
Perfluorononanoic acid (PFNA)	B21-Jn24751	CP	%	102		50-150	Pass	
Perfluorodecanoic acid (PFDA)	B21-Jn24751	CP	%	122		50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	B21-Jn24751	CP	%	92		50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	B21-Jn24751	CP	%	100		50-150	Pass	
Perfluorotridecanoic acid (PFTTrDA)	B21-Jn24751	CP	%	110		50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	B21-Jn24751	CP	%	136		50-150	Pass	
Spike - % Recovery								
Perfluoroalkyl sulfonamido substances								
Perfluorooctane sulfonamide (FOSA)				Result 1				
Perfluorooctane sulfonamide (FOSA)	B21-Jn24751	CP	%	136		50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	B21-Jn24751	CP	%	79		50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	B21-Jn24751	CP	%	89		50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	B21-Jn24751	CP	%	89		50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	B21-Jn24751	CP	%	127		50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	B21-Jn24751	CP	%	110			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	B21-Jn24751	CP	%	100			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSA's)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	B21-Jn24751	CP	%	86			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	B21-Jn24751	CP	%	126			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	B21-Jn24751	CP	%	117			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	B21-Jn24751	CP	%	87			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	B21-Jn24751	CP	%	111			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	B21-Jn24751	CP	%	87			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	B21-Jn24751	CP	%	89			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	B21-Jn24751	CP	%	99			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids (n:2 FTSA's)				Result 1					
1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2 FTSA)	B21-Jn24751	CP	%	97			50-150	Pass	
1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2 FTSA)	B21-Jn24751	CP	%	108			50-150	Pass	
1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2 FTSA)	B21-Jn24751	CP	%	101			50-150	Pass	
1H,1H,2H,2H-perfluorododecanesulfonic acid (10:2 FTSA)	B21-Jn24751	CP	%	110			50-150	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	B21-Jn24295	NCP	%	73	60	19	30%	Pass	
Duplicate									
Perfluoroalkyl carboxylic acids (PFCA's)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	B21-Jn24750	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	B21-Jn24750	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	B21-Jn24750	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	B21-Jn24750	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	B21-Jn24750	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	B21-Jn24750	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	B21-Jn24750	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	B21-Jn24750	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	B21-Jn24750	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	B21-Jn24750	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	B21-Jn24750	CP	ug/kg	< 5	< 5	<1	30%	Pass	

Duplicate								
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD		
Perfluorooctane sulfonamide (FOSA)	B21-Jn24750	CP	ug/kg	< 5	< 5	<1	30%	Pass
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	B21-Jn24750	CP	ug/kg	< 5	< 5	<1	30%	Pass
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	B21-Jn24750	CP	ug/kg	< 5	< 5	<1	30%	Pass
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	B21-Jn24750	CP	ug/kg	< 5	< 5	<1	30%	Pass
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	B21-Jn24750	CP	ug/kg	< 5	< 5	<1	30%	Pass
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	B21-Jn24750	CP	ug/kg	< 10	< 10	<1	30%	Pass
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	B21-Jn24750	CP	ug/kg	< 10	< 10	<1	30%	Pass
Duplicate								
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD		
Perfluorobutanesulfonic acid (PFBS)	B21-Jn24750	CP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluorononanesulfonic acid (PFNS)	B21-Jn24750	CP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluoropropanesulfonic acid (PFPrS)	B21-Jn24750	CP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluoropentanesulfonic acid (PFPeS)	B21-Jn24750	CP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluorohexanesulfonic acid (PFHxS)	B21-Jn24750	CP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluoroheptanesulfonic acid (PFHpS)	B21-Jn24750	CP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluorooctanesulfonic acid (PFOS)	B21-Jn24750	CP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluorodecanesulfonic acid (PFDS)	B21-Jn24750	CP	ug/kg	< 5	< 5	<1	30%	Pass
Duplicate								
n:2 Fluorotelomer sulfonic acids (n:2 FTSA)				Result 1	Result 2	RPD		
1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2 FTSA)	B21-Jn24750	CP	ug/kg	< 5	< 5	<1	30%	Pass
1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2 FTSA)	B21-Jn24750	CP	ug/kg	< 10	< 10	<1	30%	Pass
1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2 FTSA)	B21-Jn24750	CP	ug/kg	< 5	< 5	<1	30%	Pass
1H,1H,2H,2H-perfluorododecanesulfonic acid (10:2 FTSA)	B21-Jn24750	CP	ug/kg	< 5	< 5	<1	30%	Pass

Comments
Sample Integrity

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

Qualifier Codes/Comments

Code	Description
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).

Authorised by:

Ursula Long	Analytical Services Manager
Sarah McCallion	Senior Analyst-PFAS (QLD)



Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please [click here](#).

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CERTIFICATE OF ANALYSIS

Work Order : ES2118814
 Client : AECOM Australia Pty Ltd
 Contact : MS ORLA FERGUSON
 Address : 17 WARABROOK BOULEVARDE
 WARABROOK NSW, AUSTRALIA 2304
 Telephone : 02 8295 3600
 Project : 60622873 1.0
 Order number : 60622873 1.0
 C-O-C number : —
 Sampler : James Hughes, Peter Waddingham, Sidnee Harris
 Site : Eraring Origin Power Station
 Quote number : EN/004/20
 No. of samples received : 53
 No. of samples analysed : 22

Page : 1 of 23
 Laboratory : Environmental Division Sydney
 Contact : Brenda Hong
 Address : 277-289 Woodpark Road Smithfield NSW Australia 2164
 Telephone : +61 2 8784 8555
 Date Samples Received : 19-May-2021 16:08
 Date Analysis Commenced : 24-May-2021
 Issue Date : 28-May-2021 17:49



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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- 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.

Signatories	Position	Accreditation Category
Alana Smylie	Asbestos Identifier	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 Inorganics, 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.

- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) per the NEPM (2013) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1,2,3-cd)pyrene (0.1), Dibenz(a,h)anthracene (1.0), Benzo(g,h,i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero, for 'TEQ 1/2LOR' are treated as half the reported LOR, and for 'TEQ LOR' are treated as being equal to the reported LOR. Note: TEQ 1/2LOR and TEQ LOR will calculate as 0.6mg/Kg and 1.2mg/Kg respectively for samples with non-detects for all of the eight TEQ PAHs.
- 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.
- EP068: Where reported, Total Chlordane (sum) is the sum of the reported concentrations of cis-Chlordane and trans-Chlordane at or above the LOR.
- EP068: Where reported, Total OCP is the sum of the reported concentrations of all Organochlorine Pesticides at or above LOR.
- EP075(SIM): Where reported, Total Cresol is the sum of the reported concentrations of 2-Methylphenol and 3- & 4-Methylphenol at or above the LOR.
- 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	HA001_0_1_210518	HA002_0_1_210518	HA003_0_1_210518	HA004_0_1_210518	HA005_0_1_210518
Sampling date / time				18-May-2021 00:00	19-May-2021 00:00				
Compound	CAS Number	LOR	Unit	ES2118814-001	ES2118814-004	ES2118814-005	ES2118814-008	ES2118814-011	
				Result	Result	Result	Result	Result	
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	---	0.1	%	6.8	6.6	7.0	9.6	9.5	
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<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	<0.0002	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<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	<0.0002	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<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	<0.0002	
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<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	<0.0002	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<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	<0.0002	
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<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	<0.0002	
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<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	<0.0002	
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<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	<0.0002	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<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	<0.0002	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	HA001_0.1_210518	HA002_0.1_210518	HA003_0.1_210518	HA004_0.1_210518	HA005_0.1_210518
Sampling date / time				18-May-2021 00:00	18-May-2021 00:00	18-May-2021 00:00	18-May-2021 00:00	19-May-2021 00:00	
Compound	CAS Number	LOR	Unit	ES2118814-001	ES2118814-004	ES2118814-005	ES2118814-008	ES2118814-011	
				Result	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	<0.0005	
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<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	<0.0005	
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<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	<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	<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	<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	<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	<0.0005	
EP231P: PFAS Sums									
Sum of PFAS	---	0.0002	mg/kg	<0.0002	<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	<0.0002	
Sum of PFAS (WA DER List)	---	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	
EP231S: PFAS Surrogate									
13C4-PFOS	---	0.0002	%	101	109	104	106	99.5	
13C8-PFOA	---	0.0002	%	102	101	98.0	104	102	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	HA006_0.05_210519	HA007_0.05_210519	HA008_0.05_210519	HA009_0.05_210519	HA010_0.05_210519
Sampling date / time				19-May-2021 00:00					
Compound	CAS Number	LOR	Unit	ES2118814-012	ES2118814-015	ES2118814-018	ES2118814-021	ES2118814-024	
				Result	Result	Result	Result	Result	
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	---	0.1	%	8.6	7.0	25.8	9.4	6.8	
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	---	---	---	---	No	
Sample weight (dry)	---	0.01	g	---	---	---	---	268	
APPROVED IDENTIFIER:	---	-	--	---	---	---	---	A. SMYLIE	
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<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	<0.0002	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<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	<0.0002	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<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	<0.0002	
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<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	<0.0002	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<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	<0.0002	
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<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	<0.0002	
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<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	<0.0002	
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	HA006_0.05_210519	HA007_0.05_210519	HA008_0.05_210519	HA009_0.05_210519	HA010_0.05_210519
Sampling date / time				19-May-2021 00:00					
Compound	CAS Number	LOR	Unit	ES2118814-012	ES2118814-015	ES2118814-018	ES2118814-021	ES2118814-024	
				Result	Result	Result	Result	Result	
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	<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	<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	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	<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	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	<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	<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	<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	<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	<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	<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	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	---	0.0002	mg/kg	<0.0002	<0.0002	<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	<0.0002	<0.0002
Sum of PFAS (WA DER List)	---	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231S: PFAS Surrogate									



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	HA006_0.05_210519	HA007_0.05_210519	HA008_0.05_210519	HA009_0.05_210519	HA010_0.05_210519
Sampling date / time				19-May-2021 00:00					
Compound	CAS Number	LOR	Unit	ES2118814-012	ES2118814-015	ES2118814-018	ES2118814-021	ES2118814-024	
				Result	Result	Result	Result	Result	Result
EP231S: PFAS Surrogate - Continued									
13C4-PFOS	---	0.0002	%	97.0	110	105	104	104	104
13C8-PFOA	---	0.0002	%	106	104	104	102	101	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	HA011_0.05_210519	HA014_0.05_210519	HA015_0.05_210519	HA018_0.05_210519	HA019_0.05_210519
Sampling date / time				19-May-2021 00:00					
Compound	CAS Number	LOR	Unit	ES2118814-026	ES2118814-029	ES2118814-032	ES2118814-034	ES2118814-036	
				Result	Result	Result	Result	Result	
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	---	0.1	%	13.5	11.1	9.9	32.0	56.2	
EA200: AS 4964 - 2004 Identification of Asbestos in Soils									
Asbestos Detected	1332-21-4	0.1	g/kg	---	No	No	---	No	
Asbestos (Trace)	1332-21-4	5	Fibres	---	No	No	---	No	
Asbestos Type	1332-21-4	-	--	---	-	-	---	-	
Synthetic Mineral Fibre	---	0.1	g/kg	---	No	No	---	No	
Organic Fibre	---	0.1	g/kg	---	No	No	---	No	
Sample weight (dry)	---	0.01	g	---	160	212	---	31.5	
APPROVED IDENTIFIER:	---	-	--	---	A. SMYLLIE	A. SMYLLIE	---	A. SMYLLIE	
EG005(ED093)T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg	---	---	---	7	---	
Cadmium	7440-43-9	1	mg/kg	---	---	---	<1	---	
Chromium	7440-47-3	2	mg/kg	---	---	---	9	---	
Copper	7440-50-8	5	mg/kg	---	---	---	26	---	
Lead	7439-92-1	5	mg/kg	---	---	---	12	---	
Nickel	7440-02-0	2	mg/kg	---	---	---	8	---	
Zinc	7440-66-6	5	mg/kg	---	---	---	93	---	
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg	---	---	---	<0.1	---	
EP066: Polychlorinated Biphenyls (PCB)									
Total Polychlorinated biphenyls	---	0.1	mg/kg	---	---	---	<0.1	---	
EP068A: Organochlorine Pesticides (OC)									
alpha-BHC	319-84-6	0.05	mg/kg	---	---	---	<0.05	---	
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	---	---	---	<0.05	---	
beta-BHC	319-85-7	0.05	mg/kg	---	---	---	<0.05	---	
gamma-BHC	58-89-9	0.05	mg/kg	---	---	---	<0.05	---	
delta-BHC	319-86-8	0.05	mg/kg	---	---	---	<0.05	---	
Heptachlor	76-44-8	0.05	mg/kg	---	---	---	<0.05	---	
Aldrin	309-00-2	0.05	mg/kg	---	---	---	<0.05	---	
Heptachlor epoxide	1024-57-3	0.05	mg/kg	---	---	---	<0.05	---	
^A Total Chlordane (sum)	---	0.05	mg/kg	---	---	---	<0.05	---	
trans-Chlordane	5103-74-2	0.05	mg/kg	---	---	---	<0.05	---	
alpha-Endosulfan	959-98-8	0.05	mg/kg	---	---	---	<0.05	---	
cis-Chlordane	5103-71-9	0.05	mg/kg	---	---	---	<0.05	---	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	HA011_0.05_210519	HA014_0.05_210519	HA015_0.05_210519	HA018_0.05_210519	HA019_0.05_210519
Sampling date / time				19-May-2021 00:00					
Compound	CAS Number	LOR	Unit	ES2118814-026	ES2118814-029	ES2118814-032	ES2118814-034	ES2118814-036	
				Result	Result	Result	Result	Result	
EP068A: Organochlorine Pesticides (OC) - Continued									
Dieldrin	60-57-1	0.05	mg/kg	---	---	---	<0.05	---	
4,4'-DDE	72-55-9	0.05	mg/kg	---	---	---	<0.05	---	
Endrin	72-20-8	0.05	mg/kg	---	---	---	<0.05	---	
beta-Endosulfan	33213-65-9	0.05	mg/kg	---	---	---	<0.05	---	
^ Endosulfan (sum)	115-29-7	0.05	mg/kg	---	---	---	<0.05	---	
4,4'-DDD	72-54-8	0.05	mg/kg	---	---	---	<0.05	---	
Endrin aldehyde	7421-93-4	0.05	mg/kg	---	---	---	<0.05	---	
Endosulfan sulfate	1031-07-8	0.05	mg/kg	---	---	---	<0.05	---	
4,4'-DDT	50-29-3	0.2	mg/kg	---	---	---	<0.2	---	
Endrin ketone	53494-70-5	0.05	mg/kg	---	---	---	<0.05	---	
Methoxychlor	72-43-5	0.2	mg/kg	---	---	---	<0.2	---	
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg	---	---	---	<0.05	---	
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-29-3	0.05	mg/kg	---	---	---	<0.05	---	
EP075(SIM)A: Phenolic Compounds									
Phenol	108-95-2	0.5	mg/kg	---	---	---	<0.5	---	
2-Chlorophenol	95-57-8	0.5	mg/kg	---	---	---	<0.5	---	
2-Methylphenol	95-48-7	0.5	mg/kg	---	---	---	<0.5	---	
3- & 4-Methylphenol	1319-77-3	1	mg/kg	---	---	---	<1	---	
2-Nitrophenol	88-75-5	0.5	mg/kg	---	---	---	<0.5	---	
2,4-Dimethylphenol	105-67-9	0.5	mg/kg	---	---	---	<0.5	---	
2,4-Dichlorophenol	120-83-2	0.5	mg/kg	---	---	---	<0.5	---	
2,6-Dichlorophenol	87-65-0	0.5	mg/kg	---	---	---	<0.5	---	
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	---	---	---	<0.5	---	
2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	---	---	---	<0.5	---	
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	---	---	---	<0.5	---	
Pentachlorophenol	87-86-5	2	mg/kg	---	---	---	<2	---	
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg	---	---	---	<0.5	---	
Acenaphthylene	208-96-8	0.5	mg/kg	---	---	---	<0.5	---	
Acenaphthene	83-32-9	0.5	mg/kg	---	---	---	<0.5	---	
Fluorene	86-73-7	0.5	mg/kg	---	---	---	<0.5	---	
Phenanthrene	85-01-8	0.5	mg/kg	---	---	---	<0.5	---	
Anthracene	120-12-7	0.5	mg/kg	---	---	---	<0.5	---	
Fluoranthene	206-44-0	0.5	mg/kg	---	---	---	<0.5	---	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	HA011_0.05_210519	HA014_0.05_210519	HA015_0.05_210519	HA018_0.05_210519	HA019_0.05_210519
Sampling date / time				19-May-2021 00:00					
Compound	CAS Number	LOR	Unit	ES2118814-026	ES2118814-029	ES2118814-032	ES2118814-034	ES2118814-036	
				Result	Result	Result	Result	Result	
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Pyrene	129-00-0	0.5	mg/kg	---	---	---	<0.5	---	
Benzo(a)anthracene	56-55-3	0.5	mg/kg	---	---	---	<0.5	---	
Chrysene	218-01-9	0.5	mg/kg	---	---	---	<0.5	---	
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	---	---	---	<0.5	---	
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	---	---	---	<0.5	---	
Benzo(a)pyrene	50-32-8	0.5	mg/kg	---	---	---	<0.5	---	
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	---	---	---	<0.5	---	
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	---	---	---	<0.5	---	
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	---	---	---	<0.5	---	
^ Sum of polycyclic aromatic hydrocarbons	---	0.5	mg/kg	---	---	---	<0.5	---	
^ Benzo(a)pyrene TEQ (zero)	---	0.5	mg/kg	---	---	---	<0.5	---	
^ Benzo(a)pyrene TEQ (half LOR)	---	0.5	mg/kg	---	---	---	0.6	---	
^ Benzo(a)pyrene TEQ (LOR)	---	0.5	mg/kg	---	---	---	1.2	---	
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	---	10	mg/kg	---	---	---	<10	---	
C10 - C14 Fraction	---	50	mg/kg	---	---	---	<50	---	
C15 - C28 Fraction	---	100	mg/kg	---	---	---	<100	---	
C29 - C36 Fraction	---	100	mg/kg	---	---	---	<100	---	
^ C10 - C36 Fraction (sum)	---	50	mg/kg	---	---	---	<50	---	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg	---	---	---	<10	---	
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	---	---	---	<10	---	
>C10 - C16 Fraction	---	50	mg/kg	---	---	---	<50	---	
>C16 - C34 Fraction	---	100	mg/kg	---	---	---	<100	---	
>C34 - C40 Fraction	---	100	mg/kg	---	---	---	<100	---	
^ >C10 - C40 Fraction (sum)	---	50	mg/kg	---	---	---	<50	---	
^ >C10 - C16 Fraction minus Naphthalene (F2)	---	50	mg/kg	---	---	---	<50	---	
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg	---	---	---	<0.2	---	
Toluene	108-88-3	0.5	mg/kg	---	---	---	<0.5	---	
Ethylbenzene	100-41-4	0.5	mg/kg	---	---	---	<0.5	---	
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	---	---	---	<0.5	---	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	HA011_0.05_210519	HA014_0.05_210519	HA015_0.05_210519	HA018_0.05_210519	HA019_0.05_210519
Sampling date / time				19-May-2021 00:00					
Compound	CAS Number	LOR	Unit	ES2118814-026	ES2118814-029	ES2118814-032	ES2118814-034	ES2118814-036	
				Result	Result	Result	Result	Result	
EP080: BTEXN - Continued									
ortho-Xylene	95-47-6	0.5	mg/kg	--	---	---	<0.5	--	
^ Sum of BTEX	---	0.2	mg/kg	--	---	---	<0.2	--	
^ Total Xylenes	---	0.5	mg/kg	--	---	---	<0.5	--	
Naphthalene	91-20-3	1	mg/kg	--	---	---	<1	--	
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<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	<0.0002	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<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	<0.0002	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	0.0013	0.0006	
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<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	<0.001	
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<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	<0.0002	
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<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	<0.0002	
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<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	<0.0002	
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<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	<0.0002	
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<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	<0.0005	
EP231C: Perfluoroalkyl Sulfonamides									



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	HA011_0.05_210519	HA014_0.05_210519	HA015_0.05_210519	HA018_0.05_210519	HA019_0.05_210519
Sampling date / time				19-May-2021 00:00					
Compound	CAS Number	LOR	Unit	ES2118814-026	ES2118814-029	ES2118814-032	ES2118814-034	ES2118814-036	
				Result	Result	Result	Result	Result	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<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	<0.0005	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<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	<0.0005	
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<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	<0.0002	
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<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	<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	<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	<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	<0.0005	
EP231P: PFAS Sums									
Sum of PFAS	---	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	0.0013	0.0006	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	0.0013	0.0006	
Sum of PFAS (WA DER List)	---	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	0.0013	0.0006	
EP066S: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	0.1	%	--	---	---	70.5	--	
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%	--	---	---	75.6	--	
EP068T: Organophosphorus Pesticide Surrogate									



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	HA011_0.05_210519	HA014_0.05_210519	HA015_0.05_210519	HA018_0.05_210519	HA019_0.05_210519
Sampling date / time				19-May-2021 00:00					
Compound	CAS Number	LOR	Unit	ES2118814-026	ES2118814-029	ES2118814-032	ES2118814-034	ES2118814-036	
				Result	Result	Result	Result	Result	
EP068T: Organophosphorus Pesticide Surrogate - Continued									
DEF	78-48-8	0.05	%	--	---	---	90.3	--	
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%	--	---	---	86.0	--	
2-Chlorophenol-D4	93951-73-6	0.5	%	---	---	---	87.9	---	
2,4,6-Tribromophenol	118-79-6	0.5	%	--	---	---	81.7	--	
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%	--	---	---	92.4	--	
Anthracene-d10	1719-06-8	0.5	%	---	---	---	97.6	---	
4-Terphenyl-d14	1718-51-0	0.5	%	--	---	---	91.5	--	
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.2	%	--	---	---	89.9	--	
Toluene-D8	2037-26-5	0.2	%	--	---	---	95.8	--	
4-Bromofluorobenzene	460-00-4	0.2	%	--	---	---	96.8	--	
EP231S: PFAS Surrogate									
13C4-PFOS	---	0.0002	%	100	99.5	95.5	106	83.0	
13C8-PFOA	---	0.0002	%	101	101	98.5	107	106	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	HA020_0.05_210519	HA021_0.05_210519	QC100_210519	QC101_210519	QC102_210519
Sampling date / time				19-May-2021 00:00					
Compound	CAS Number	LOR	Unit	ES2118814-039	ES2118814-041	ES2118814-043	ES2118814-044	ES2118814-045	
				Result	Result	Result	Result	Result	
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	---	0.1	%	6.3	11.1	9.0	11.1	13.0	
EG005(ED093)T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg	--	6	---	---	---	
Cadmium	7440-43-9	1	mg/kg	---	<1	---	---	---	
Chromium	7440-47-3	2	mg/kg	--	10	---	---	---	
Copper	7440-50-8	5	mg/kg	---	18	---	---	---	
Lead	7439-92-1	5	mg/kg	---	11	---	---	---	
Nickel	7440-02-0	2	mg/kg	--	13	---	---	---	
Zinc	7440-66-6	5	mg/kg	---	102	---	---	---	
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg	---	<0.1	---	---	---	
EP066: Polychlorinated Biphenyls (PCB)									
Total Polychlorinated biphenyls	---	0.1	mg/kg	---	<0.1	---	---	---	
EP068A: Organochlorine Pesticides (OC)									
alpha-BHC	319-84-6	0.05	mg/kg	---	<0.05	---	---	---	
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	---	<0.05	---	---	---	
beta-BHC	319-85-7	0.05	mg/kg	---	<0.05	---	---	---	
gamma-BHC	58-89-9	0.05	mg/kg	---	<0.05	---	---	---	
delta-BHC	319-86-8	0.05	mg/kg	---	<0.05	---	---	---	
Heptachlor	76-44-8	0.05	mg/kg	---	<0.05	---	---	---	
Aldrin	309-00-2	0.05	mg/kg	---	<0.05	---	---	---	
Heptachlor epoxide	1024-57-3	0.05	mg/kg	---	<0.05	---	---	---	
^ Total Chlordane (sum)	---	0.05	mg/kg	---	<0.05	---	---	---	
trans-Chlordane	5103-74-2	0.05	mg/kg	---	<0.05	---	---	---	
alpha-Endosulfan	959-98-8	0.05	mg/kg	---	<0.05	---	---	---	
cis-Chlordane	5103-71-9	0.05	mg/kg	---	<0.05	---	---	---	
Dieldrin	60-57-1	0.05	mg/kg	---	<0.05	---	---	---	
4,4'-DDE	72-55-9	0.05	mg/kg	---	<0.05	---	---	---	
Endrin	72-20-8	0.05	mg/kg	---	<0.05	---	---	---	
beta-Endosulfan	33213-65-9	0.05	mg/kg	---	<0.05	---	---	---	
^ Endosulfan (sum)	115-29-7	0.05	mg/kg	---	<0.05	---	---	---	
4,4'-DDD	72-54-8	0.05	mg/kg	---	<0.05	---	---	---	
Endrin aldehyde	7421-93-4	0.05	mg/kg	---	<0.05	---	---	---	
Endosulfan sulfate	1031-07-8	0.05	mg/kg	---	<0.05	---	---	---	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	HA020_0.05_210519	HA021_0.05_210519	QC100_210519	QC101_210519	QC102_210519
Sampling date / time				19-May-2021 00:00					
Compound	CAS Number	LOR	Unit	ES2118814-039	ES2118814-041	ES2118814-043	ES2118814-044	ES2118814-045	
				Result	Result	Result	Result	Result	
EP068A: Organochlorine Pesticides (OC) - Continued									
4,4'-DDT	50-29-3	0.2	mg/kg	--	<0.2	---	---	---	
Endrin ketone	53494-70-5	0.05	mg/kg	--	<0.05	---	---	---	
Methoxychlor	72-43-5	0.2	mg/kg	--	<0.2	---	---	---	
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg	--	<0.05	---	---	---	
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/5 0-2	0.05	mg/kg	--	<0.05	---	---	---	
EP075(SIM)A: Phenolic Compounds									
Phenol	108-95-2	0.5	mg/kg	--	<0.5	---	---	---	
2-Chlorophenol	95-57-8	0.5	mg/kg	--	<0.5	---	---	---	
2-Methylphenol	95-48-7	0.5	mg/kg	--	<0.5	---	---	---	
3- & 4-Methylphenol	1319-77-3	1	mg/kg	--	<1	---	---	---	
2-Nitrophenol	88-75-5	0.5	mg/kg	--	<0.5	---	---	---	
2,4-Dimethylphenol	105-67-9	0.5	mg/kg	--	<0.5	---	---	---	
2,4-Dichlorophenol	120-83-2	0.5	mg/kg	--	<0.5	---	---	---	
2,6-Dichlorophenol	87-65-0	0.5	mg/kg	--	<0.5	---	---	---	
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	--	<0.5	---	---	---	
2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	--	<0.5	---	---	---	
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	--	<0.5	---	---	---	
Pentachlorophenol	87-86-5	2	mg/kg	--	<2	---	---	---	
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg	--	<0.5	---	---	---	
Acenaphthylene	208-96-8	0.5	mg/kg	--	<0.5	---	---	---	
Acenaphthene	83-32-9	0.5	mg/kg	--	<0.5	---	---	---	
Fluorene	86-73-7	0.5	mg/kg	--	<0.5	---	---	---	
Phenanthrene	85-01-8	0.5	mg/kg	--	<0.5	---	---	---	
Anthracene	120-12-7	0.5	mg/kg	--	<0.5	---	---	---	
Fluoranthene	206-44-0	0.5	mg/kg	--	<0.5	---	---	---	
Pyrene	129-00-0	0.5	mg/kg	--	<0.5	---	---	---	
Benz(a)anthracene	56-55-3	0.5	mg/kg	--	<0.5	---	---	---	
Chrysene	218-01-9	0.5	mg/kg	--	<0.5	---	---	---	
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	--	<0.5	---	---	---	
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	--	<0.5	---	---	---	
Benzo(a)pyrene	50-32-8	0.5	mg/kg	--	<0.5	---	---	---	
Indeno(1,2,3.cd)pyrene	193-39-5	0.5	mg/kg	--	<0.5	---	---	---	
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	--	<0.5	---	---	---	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	HA020_0.05_210519	HA021_0.05_210519	QC100_210519	QC101_210519	QC102_210519
Sampling date / time				19-May-2021 00:00					
Compound	CAS Number	LOR	Unit	ES2118814-039	ES2118814-041	ES2118814-043	ES2118814-044	ES2118814-045	
				Result	Result	Result	Result	Result	
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	---	<0.5	---	---	---	
^ Sum of polycyclic aromatic hydrocarbons	---	0.5	mg/kg	---	<0.5	---	---	---	
^ Benzo(a)pyrene TEQ (zero)	---	0.5	mg/kg	---	<0.5	---	---	---	
^ Benzo(a)pyrene TEQ (half LOR)	---	0.5	mg/kg	---	0.6	---	---	---	
^ Benzo(a)pyrene TEQ (LOR)	---	0.5	mg/kg	---	1.2	---	---	---	
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	---	10	mg/kg	---	<10	---	---	---	
C10 - C14 Fraction	---	50	mg/kg	---	<50	---	---	---	
C15 - C28 Fraction	---	100	mg/kg	---	<100	---	---	---	
C29 - C36 Fraction	---	100	mg/kg	---	<100	---	---	---	
^ C10 - C36 Fraction (sum)	---	50	mg/kg	---	<50	---	---	---	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg	---	<10	---	---	---	
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	---	<10	---	---	---	
>C10 - C16 Fraction	---	50	mg/kg	---	<50	---	---	---	
>C16 - C34 Fraction	---	100	mg/kg	---	<100	---	---	---	
>C34 - C40 Fraction	---	100	mg/kg	---	<100	---	---	---	
^ >C10 - C40 Fraction (sum)	---	50	mg/kg	---	<50	---	---	---	
^ >C10 - C16 Fraction minus Naphthalene (F2)	---	50	mg/kg	---	<50	---	---	---	
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg	---	<0.2	---	---	---	
Toluene	108-88-3	0.5	mg/kg	---	<0.5	---	---	---	
Ethylbenzene	100-41-4	0.5	mg/kg	---	<0.5	---	---	---	
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	---	<0.5	---	---	---	
ortho-Xylene	95-47-6	0.5	mg/kg	---	<0.5	---	---	---	
^ Sum of BTEX	---	0.2	mg/kg	---	<0.2	---	---	---	
^ Total Xylenes	---	0.5	mg/kg	---	<0.5	---	---	---	
Naphthalene	91-20-3	1	mg/kg	---	<1	---	---	---	
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<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	<0.0002	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	HA020_0.05_210519	HA021_0.05_210519	QC100_210519	QC101_210519	QC102_210519
Sampling date / time				19-May-2021 00:00					
Compound	CAS Number	LOR	Unit	ES2118814-039	ES2118814-041	ES2118814-043	ES2118814-044	ES2118814-045	
				Result	Result	Result	Result	Result	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<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	<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	<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	<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	<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	<0.0005	
EP231P: PFAS Sums									
Sum of PFAS	---	0.0002	mg/kg	<0.0002	0.0004	<0.0002	<0.0002	<0.0002	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	0.0004	<0.0002	<0.0002	<0.0002	
Sum of PFAS (WA DER List)	---	0.0002	mg/kg	<0.0002	0.0004	<0.0002	<0.0002	<0.0002	
EP066S: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	0.1	%	---	70.6	---	---	---	
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%	---	84.4	---	---	---	
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%	---	64.7	---	---	---	
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%	---	80.8	---	---	---	
2-Chlorophenol-D4	93951-73-6	0.5	%	---	85.7	---	---	---	
2,4,6-Tribromophenol	118-79-6	0.5	%	---	84.4	---	---	---	
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%	---	92.1	---	---	---	
Anthracene-d10	1719-06-8	0.5	%	---	101	---	---	---	
4-Terphenyl-d14	1718-51-0	0.5	%	---	94.1	---	---	---	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	HA020_0.05_210519	HA021_0.05_210519	QC100_210519	QC101_210519	QC102_210519
Sampling date / time				19-May-2021 00:00					
Compound	CAS Number	LOR	Unit	ES2118814-039	ES2118814-041	ES2118814-043	ES2118814-044	ES2118814-045	
				Result	Result	Result	Result	Result	
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.2	%	--	97.8	---	---	---	
Toluene-D8	2037-26-5	0.2	%	--	108	---	---	---	
4-Bromofluorobenzene	460-00-4	0.2	%	--	115	---	---	---	
EP231S: PFAS Surrogate									
13C4-PFOS	---	0.0002	%	99.5	107	93.5	112	95.5	
13C8-PFOA	---	0.0002	%	109	106	99.5	106	100	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)		Sample ID		QC300_210518	QC301_210519	---	---	---
		Sampling date / time		18-May-2021 00:00	19-May-2021 00:00	---	---	---
Compound	CAS Number	LOR	Unit	ES2118814-046	ES2118814-047	-----	-----	-----
				Result	Result	---	---	---
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	0.02	µg/L	<0.02	<0.02	---	---	---
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	---	---	---
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	---	---	---



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	QC300_210518	QC301_210519	---	---	---
Sampling date / time				18-May-2021 00:00	19-May-2021 00:00	---	---	---	
Compound	CAS Number	LOR	Unit	ES2118814-046	ES2118814-047	-----	-----	-----	
				Result	Result	---	---	---	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
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									
13C4-PFOS	---	0.02	%	92.0	88.5	---	---	---	
13C8-PFOA	---	0.02	%	115	118	---	---	---	



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	HA010_0.05_210519 - 19-May-2021 00:00	Mid brown soil.
EA200: Description	HA014_0.05_210519 - 19-May-2021 00:00	Mid brown soil.
EA200: Description	HA015_0.05_210519 - 19-May-2021 00:00	Mid brown soil.
EA200: Description	HA019_0.05_210519 - 19-May-2021 00:00	Mid brown soil.



Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP066S: PCB Surrogate			
Decachlorobiphenyl	2051-24-3	39	149
EP068S: Organochlorine Pesticide Surrogate			
Dibromo-DDE	21655-73-2	49	147
EP068T: Organophosphorus Pesticide Surrogate			
DEF	78-48-8	35	143
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	63	123
2-Chlorophenol-D4	93951-73-6	66	122
2,4,6-Tribromophenol	118-79-6	40	138
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	70	122
Anthracene-d10	1719-06-8	66	128
4-Terphenyl-d14	1718-51-0	65	129
EP080S: TPH(V)/BTEX Surrogates			
1,2-Dichloroethane-D4	17060-07-0	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 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	: ES2118814	Page	: 1 of 15
Client	: AECOM Australia Pty Ltd	Laboratory	: Environmental Division Sydney
Contact	: MS ORLA FERGUSON	Contact	: Brenda Hong
Address	: 17 WARABROOK BOULEVARDE WARABROOK NSW, AUSTRALIA 2304	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: 02 8295 3600	Telephone	: +61 2 8784 8555
Project	: 60622873 1.0	Date Samples Received	: 19-May-2021
Order number	: 60622873 1.0	Date Analysis Commenced	: 24-May-2021
C-O-C number	: —	Issue Date	: 28-May-2021
Sampler	: James Hughes, Peter Waddingham, Sidnee Harris		
Site	: Eraring Origin Power Station		
Quote number	: EN/004/20		
No. of samples received	: 53		
No. of samples analysed	: 22		



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

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

This Quality Control Report contains the following information:

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

Signatories

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

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
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Edwandy Fadjar	Organic Coordinator	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Franco Lentini	LCMS Coordinator	Sydney Inorganics, 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

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%.

Laboratory sample ID		Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EG005(ED093): Total Metals by ICP-AES (QC Lot: 3699585)										
EM2108857-039	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit	
		EG005T: Chromium	7440-47-3	2	mg/kg	<2	<2	0.0	No Limit	
		EG005T: Nickel	7440-02-0	2	mg/kg	<2	<2	0.0	No Limit	
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit	
		EG005T: Copper	7440-50-8	5	mg/kg	14	15	0.0	No Limit	
		EG005T: Lead	7439-92-1	5	mg/kg	<5	<5	0.0	No Limit	
		EG005T: Zinc	7440-66-6	5	mg/kg	14	16	13.0	No Limit	
ES2118930-012	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit	
		EG005T: Chromium	7440-47-3	2	mg/kg	11	17	46.4	No Limit	
		EG005T: Nickel	7440-02-0	2	mg/kg	13	20	43.8	0% - 50%	
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit	
		EG005T: Copper	7440-50-8	5	mg/kg	22	34	42.8	No Limit	
		EG005T: Lead	7439-92-1	5	mg/kg	32	39	20.2	No Limit	
		EG005T: Zinc	7440-66-6	5	mg/kg	37	54	38.5	0% - 50%	
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 3699285)										
ES2119057-006	Anonymous	EA055: Moisture Content	---	0.1	%	5.4	5.0	8.1	0% - 20%	
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 3699564)										
ES2118814-004	HA002_0.1_210518	EA055: Moisture Content	---	0.1	%	6.6	6.4	4.0	0% - 20%	
ES2118814-032	HA015_0.05_210519	EA055: Moisture Content	---	0.1	%	9.9	9.2	7.2	0% - 20%	
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 3699588)										
ES2118814-041	HA021_0.05_210519	EA055: Moisture Content	---	0.1	%	11.1	11.8	6.2	0% - 20%	
ES2119020-001	Anonymous	EA055: Moisture Content	---	0.1	%	17.8	16.6	7.1	0% - 50%	
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3699584)										
EM2108857-039	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit	



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3699584) - continued									
ES2118930-012	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EP066: Polychlorinated Biphenyls (PCB) (QC Lot: 3694994)									
ES2119057-053	Anonymous	EP066: Total Polychlorinated biphenyls	---	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
ES2118814-034	HA018_0.05_210519	EP066: Total Polychlorinated biphenyls	---	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EP068A: Organochlorine Pesticides (OC) (QC Lot: 3694993)									
ES2119057-053	Anonymous	EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4'-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4'-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4'-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
ES2118814-034	HA018_0.05_210519	EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4'-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit



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 (%)		
EP068A: Organochlorine Pesticides (QC Lot: 3694993) - continued											
ES2118814-034	HA018_0.05_210519	EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit		
		EP068: 4,4'-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit		
		EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.0	No Limit		
		EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit		
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit		
		EP068: 4,4'-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.0	No Limit		
		EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.0	No Limit		
EP075(SIM)A: Phenolic Compounds (QC Lot: 3694992)											
ES2119057-053	Anonymous	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): 2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): 2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): 2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.0	No Limit		
		EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.0	No Limit		
		ES2118814-034	HA018_0.05_210519	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
				EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075(SIM): 2-Methylphenol	95-48-7			0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
EP075(SIM): 2-Nitrophenol	88-75-5			0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
EP075(SIM): 2,4-Dimethylphenol	105-67-9			0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
EP075(SIM): 2,4-Dichlorophenol	120-83-2			0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
EP075(SIM): 2,6-Dichlorophenol	87-65-0			0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
EP075(SIM): 4-Chloro-3-methylphenol	59-50-7			0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
EP075(SIM): 2,4,6-Trichlorophenol	88-06-2			0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
EP075(SIM): 2,4,5-Trichlorophenol	95-95-4			0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
EP075(SIM): 3- & 4-Methylphenol	1319-77-3			1	mg/kg	<1	<1	0.0	No Limit		
EP075(SIM): Pentachlorophenol	87-86-5			2	mg/kg	<2	<2	0.0	No Limit		
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3694992)											
ES2119057-053	Anonymous			EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report							
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)		
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3694992) - continued											
ES2119057-053	Anonymous	EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
			205-82-3								
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): Indeno(1,2,3,cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	---	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	---	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		ES2118814-034	HA018_0.05_210519	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
				EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075(SIM): Acenaphthene	83-32-9			0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
EP075(SIM): Fluorene	86-73-7			0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
EP075(SIM): Phenanthrene	85-01-8			0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
EP075(SIM): Anthracene	120-12-7			0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
EP075(SIM): Fluoranthene	206-44-0			0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
EP075(SIM): Pyrene	129-00-0			0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
EP075(SIM): Benz(a)anthracene	56-55-3			0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
EP075(SIM): Chrysene	218-01-9			0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2			0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
	205-82-3										
EP075(SIM): Benzo(k)fluoranthene	207-08-9			0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
EP075(SIM): Benzo(a)pyrene	50-32-8			0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
EP075(SIM): Indeno(1,2,3,cd)pyrene	193-39-5			0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
EP075(SIM): Dibenz(a,h)anthracene	53-70-3			0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
EP075(SIM): Benzo(g,h,i)perylene	191-24-2			0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
EP075(SIM): Sum of polycyclic aromatic hydrocarbons	---			0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
EP075(SIM): Benzo(a)pyrene TEQ (zero)	---			0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3694991)											
ES2118814-034	HA018_0.05_210519	EP071: C15 - C28 Fraction	---	100	mg/kg	<100	<100	0.0	No Limit		
		EP071: C29 - C36 Fraction	---	100	mg/kg	<100	<100	0.0	No Limit		
		EP071: C10 - C14 Fraction	---	50	mg/kg	<50	<50	0.0	No Limit		
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3696051)											
ES2118814-034	HA018_0.05_210519	EP080: C6 - C9 Fraction	---	10	mg/kg	<10	<10	0.0	No Limit		
ES2119057-007	Anonymous	EP080: C6 - C9 Fraction	---	10	mg/kg	<10	<10	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 (%)
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 3694991)									
ES2118814-034	HA018_0.05_210519	EP071: >C16 - C34 Fraction	---	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	---	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	---	50	mg/kg	<50	<50	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 3696051)									
ES2118814-034	HA018_0.05_210519	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
ES2119057-007	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
EP080: BTEXN (QC Lot: 3696051)									
ES2118814-034	HA018_0.05_210519	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
ES2119057-007	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: 3692975)									
ES2118814-001	HA001_0.1_210518	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
ES2118814-026	HA011_0.05_210519	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: 3692975)									
ES2118814-001	HA001_0.1_210518	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



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: 3692975) - continued									
ES2118814-001	HA001_0.1_210518	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
ES2118814-026	HA011_0.05_210519	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: 3692975)							
ES2118814-001	HA001_0.1_210518	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
ES2118814-026	HA011_0.05_210519	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



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: 3692975) - continued									
ES2118814-026	HA011_0.05_210519	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 (EiFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n-2) Fluorotelomer Sulfonic Acids (QC Lot: 3692975)									
ES2118814-001	HA001_0.1_210518	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
ES2118814-026	HA011_0.05_210519	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

Method/Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low High		
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 3699585)									
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	121.1 mg/kg	103	88.0	113	
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	0.74 mg/kg	121	70.0	130	
EG005T: Chromium	7440-47-3	2	mg/kg	<2	19.6 mg/kg	116	68.0	132	
EG005T: Copper	7440-50-8	5	mg/kg	<5	52.9 mg/kg	110	89.0	111	
EG005T: Lead	7439-92-1	5	mg/kg	<5	60.8 mg/kg	106	82.0	119	
EG005T: Nickel	7440-02-0	2	mg/kg	<2	15.3 mg/kg	106	80.0	120	
EG005T: Zinc	7440-66-6	5	mg/kg	<5	139.3 mg/kg	99.2	66.0	133	
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3699584)									
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	0.087 mg/kg	91.4	70.0	125	
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 3694994)									
EP066: Total Polychlorinated biphenyls	---	0.1	mg/kg	<0.1	1 mg/kg	89.3	62.0	126	
EP068A: Organochlorine Pesticides (OC) (QCLot: 3694993)									
EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	0.5 mg/kg	100	69.0	113	
EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	0.5 mg/kg	102	65.0	117	
EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	0.5 mg/kg	94.4	67.0	119	
EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	0.5 mg/kg	103	68.0	116	
EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	92.7	65.0	117	
EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	0.5 mg/kg	96.6	67.0	115	
EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	0.5 mg/kg	101	69.0	115	
EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	0.5 mg/kg	103	62.0	118	
EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	0.5 mg/kg	101	63.0	117	
EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	0.5 mg/kg	103	66.0	116	
EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	0.5 mg/kg	102	64.0	116	
EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	0.5 mg/kg	99.1	66.0	116	
EP068: 4,4'-DDE	72-55-9	0.05	mg/kg	<0.05	0.5 mg/kg	97.9	67.0	115	
EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	0.5 mg/kg	99.4	67.0	123	
EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	0.5 mg/kg	108	69.0	115	
EP068: 4,4'-DDD	72-54-8	0.05	mg/kg	<0.05	0.5 mg/kg	103	69.0	121	
EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	0.5 mg/kg	105	56.0	120	
EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	0.5 mg/kg	103	62.0	124	
EP068: 4,4'-DDT	50-29-3	0.2	mg/kg	<0.2	0.5 mg/kg	103	66.0	120	
EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	0.5 mg/kg	101	64.0	122	
EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	0.5 mg/kg	94.4	54.0	130	
EP075(SIM)A: Phenolic Compounds (QCLot: 3694992)									



Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB)	Laboratory Control Spike (LCS) Report				
				Report	Spike	Spike Recovery (%)		Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High	
EP075(SIM)A: Phenolic Compounds (QCLot: 3694992) - continued									
EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	6 mg/kg	89.8	71.0	125	
EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	6 mg/kg	98.6	72.0	124	
EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	6 mg/kg	91.4	71.0	123	
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	12 mg/kg	91.3	67.0	127	
EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	6 mg/kg	79.4	54.0	114	
EP075(SIM): 2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	6 mg/kg	89.4	68.0	126	
EP075(SIM): 2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	6 mg/kg	90.3	66.0	120	
EP075(SIM): 2,6-Dichlorophenol	87-85-0	0.5	mg/kg	<0.5	6 mg/kg	90.8	70.0	120	
EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	6 mg/kg	93.7	70.0	116	
EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	6 mg/kg	75.5	54.0	114	
EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	6 mg/kg	74.2	60.0	114	
EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	12 mg/kg	23.8	10.0	57.0	
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3694992)									
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	6 mg/kg	91.2	77.0	125	
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	6 mg/kg	88.9	72.0	124	
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	6 mg/kg	91.5	73.0	127	
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	6 mg/kg	92.6	72.0	126	
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	6 mg/kg	93.6	75.0	127	
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	6 mg/kg	94.2	77.0	127	
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	6 mg/kg	93.5	73.0	127	
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	6 mg/kg	96.6	74.0	128	
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	6 mg/kg	89.4	69.0	123	
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	6 mg/kg	93.1	75.0	127	
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	6 mg/kg	95.8	68.0	116	
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	6 mg/kg	95.0	74.0	126	
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	6 mg/kg	92.2	70.0	126	
EP075(SIM): Indeno(1,2,3,cd)pyrene	193-39-5	0.5	mg/kg	<0.5	6 mg/kg	86.4	61.0	121	
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	6 mg/kg	83.3	62.0	118	
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	6 mg/kg	87.2	63.0	121	
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3694991)									
EP071: C10 - C14 Fraction	---	50	mg/kg	<50	300 mg/kg	90.2	75.0	129	
EP071: C15 - C28 Fraction	---	100	mg/kg	<100	450 mg/kg	87.6	77.0	131	
EP071: C29 - C36 Fraction	---	100	mg/kg	<100	300 mg/kg	88.7	71.0	129	
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3696051)									
EP080: C6 - C9 Fraction	---	10	mg/kg	<10	26 mg/kg	109	68.4	128	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3694991)									
EP071: >C10 - C16 Fraction	---	50	mg/kg	<50	375 mg/kg	88.4	77.0	125	



Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB)	Laboratory Control Spike (LCS) Report			
				Report	Spike Concentration	Spike Recovery (%)	Acceptable Limits (%)	
				Result			LCS	Low
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3694991) - continued								
EP071: >C16 - C34 Fraction	---	100	mg/kg	<100	525 mg/kg	87.8	74.0	138
EP071: >C34 - C40 Fraction	---	100	mg/kg	<100	225 mg/kg	94.9	63.0	131
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3696051)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	109	68.4	128
EP080: BTEXN (QCLot: 3696051)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	110	62.0	116
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	104	67.0	121
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	105	65.0	117
EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	2 mg/kg	102	66.0	118
	106-42-3							
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	110	68.0	120
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	101	63.0	119
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3692975)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.00125 mg/kg	86.4	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	92.0	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	91.6	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	92.8	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	92.4	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.8	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3692975)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	97.8	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.4	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	101	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.0	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	93.2	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	105	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	104	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	102	69.0	135
EP231X: Perfluorotridecanoic acid (PFTriDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	101	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	100	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3692975)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.8	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	95.8	69.8	131
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	99.7	68.7	130



Sub-Matrix: SOIL				Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report			
Method: Compound	CAS Number	LOR	Unit		Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low High	
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3692975) - continued								
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EiFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	96.5	65.1	134
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	95.2	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EiFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	95.2	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3692975)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	108	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	98.0	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	107	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	107	69.2	143
Sub-Matrix: WATER				Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report			
Method: Compound	CAS Number	LOR	Unit		Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low High	
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3692933)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	124	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	125	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	<0.02	0.25 µg/L	118	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	124	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	109	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	128	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3692933)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	120	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	122	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	119	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	122	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	121	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	125	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	130	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	107	72.0	134
EP231X: Perfluorotridecanoic acid (PFTriDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	84.2	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	116	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3692933)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	125	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 (EiFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	101	62.6	147



Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB)	Laboratory Control Spike (LCS) Report			
				Report	Spike Concentration	Spike Recovery (%)	Acceptable Limits (%)	
				Result			Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3692933) - continued								
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	123	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	116	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	128	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	122	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3692933)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	118	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	114	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	121	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	117	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**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report			
				Spike Concentration	Spike Recovery (%)	Acceptable Limits (%)	
						MS	Low
EG005(ED093): Total Metals by ICP-AES (QCLot: 3699585)							
EM2108857-039	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	102	70.0	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	102	70.0	130
		EG005T: Chromium	7440-47-3	50 mg/kg	101	68.0	132
		EG005T: Copper	7440-50-8	250 mg/kg	93.8	70.0	130
		EG005T: Lead	7439-92-1	250 mg/kg	102	70.0	130
		EG005T: Nickel	7440-02-0	50 mg/kg	99.0	70.0	130
		EG005T: Zinc	7440-66-6	250 mg/kg	106	66.0	133
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3699584)							
EM2108857-039	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	81.2	70.0	130
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 3694994)							
ES2118814-034	HA018_0_05_210519	EP066: Total Polychlorinated biphenyls	---	1 mg/kg	81.3	70.0	130
EP068A: Organochlorine Pesticides (OC) (QCLot: 3694993)							
ES2118814-034	HA018_0_05_210519	EP068: gamma-BHC	58-89-9	0.5 mg/kg	84.4	70.0	130
		EP068: Heptachlor	76-44-8	0.5 mg/kg	77.3	70.0	130
		EP068: Aldrin	309-00-2	0.5 mg/kg	86.0	70.0	130
		EP068: Dieldrin	60-57-1	0.5 mg/kg	92.0	70.0	130



Sub-Matrix: SOIL				Matrix Spike (MS) Report			
				Spike Concentration	Spike Recovery (%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP068A: Organochlorine Pesticides (OC) (QCLot: 3694993) - continued							
ES2118814-034	HA018_0.05_210519	EP068: Endrin	72-20-8	2 mg/kg	77.4	70.0	130
		EP068: 4,4'-DDT	50-29-3	2 mg/kg	77.8	70.0	130
EP075(SIM)A: Phenolic Compounds (QCLot: 3694992)							
ES2118814-034	HA018_0.05_210519	EP075(SIM): Phenol	108-95-2	10 mg/kg	90.7	70.0	130
		EP075(SIM): 2-Chlorophenol	95-57-8	10 mg/kg	88.2	70.0	130
		EP075(SIM): 2-Nitrophenol	88-75-5	10 mg/kg	83.3	60.0	130
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	10 mg/kg	89.6	70.0	130
		EP075(SIM): Pentachlorophenol	87-86-5	10 mg/kg	40.7	20.0	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3694992)							
ES2118814-034	HA018_0.05_210519	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	103	70.0	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	100	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3694991)							
ES2118814-034	HA018_0.05_210519	EP071: C10 - C14 Fraction	---	523 mg/kg	76.2	73.0	137
		EP071: C15 - C28 Fraction	---	2319 mg/kg	114	53.0	131
		EP071: C29 - C36 Fraction	---	1714 mg/kg	109	52.0	132
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3696051)							
ES2118814-034	HA018_0.05_210519	EP080: C6 - C9 Fraction	---	32.5 mg/kg	93.1	70.0	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3694991)							
ES2118814-034	HA018_0.05_210519	EP071: >C10 - C16 Fraction	---	860 mg/kg	93.4	73.0	137
		EP071: >C16 - C34 Fraction	---	3223 mg/kg	121	53.0	131
		EP071: >C34 - C40 Fraction	---	1058 mg/kg	67.5	52.0	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3696051)							
ES2118814-034	HA018_0.05_210519	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	93.2	70.0	130
EP080: BTEXN (QCLot: 3696051)							
ES2118814-034	HA018_0.05_210519	EP080: Benzene	71-43-2	2.5 mg/kg	82.6	70.0	130
		EP080: Toluene	108-88-3	2.5 mg/kg	85.1	70.0	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	90.3	70.0	130
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	87.8	70.0	130
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	88.8	70.0	130
		EP080: Naphthalene	91-20-3	2.5 mg/kg	83.2	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3692975)							
ES2118814-001	HA001_0.1_210518	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00125 mg/kg	82.4	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00125 mg/kg	86.8	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00125 mg/kg	95.6	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00125 mg/kg	99.6	70.0	132



Sub-Matrix: SOIL

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report			
				Spike Concentration	Spike Recovery (%)	Acceptable Limits (%)	
						MS	Low
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3692975) - continued							
ES2118814-001	HA001_0.1_210518	EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00125 mg/kg	97.6	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.00125 mg/kg	105	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3692975)							
ES2118814-001	HA001_0.1_210518	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	102	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	95.2	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	104	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	97.2	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	102	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	101	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	106	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	100	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	106	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	92.4	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	104	69.0	133
		EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3692975)					
ES2118814-001	HA001_0.1_210518	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	93.2	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	109	71.6	129
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	94.4	69.8	131
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	99.0	68.7	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	96.0	65.1	134
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	97.6	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	95.2	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3692975)							
ES2118814-001	HA001_0.1_210518	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00125 mg/kg	80.4	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00125 mg/kg	97.2	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.00125 mg/kg	95.2	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00125 mg/kg	87.6	69.2	143



QA/QC Compliance Assessment to assist with Quality Review

Work Order	: ES2118814	Page	: 1 of 9
Client	: AECOM Australia Pty Ltd	Laboratory	: Environmental Division Sydney
Contact	: MS ORLA FERGUSON	Telephone	: +61 2 8784 8555
Project	: 60622873 1.0	Date Samples Received	: 19-May-2021
Site	: Eraring Origin Power Station	Issue Date	: 28-May-2021
Sampler	: James Hughes, Peter Waddingham, Sidnee Harris	No. of samples received	: 53
Order number	: 60622873 1.0	No. of samples analysed	: 22

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

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



Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	0	20	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	0	20	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results. This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein. Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters. Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

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

Method	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
EA055: Moisture Content (Dried @ 105-110°C)								
HDPE Soil Jar (EA055)								
HA001_0.1_210518, HA003_0.1_210518,	HA002_0.1_210518, HA004_0.1_210518	18-May-2021	---	---	---	26-May-2021	01-Jun-2021	✓
HDPE Soil Jar (EA055)								
HA005_0.1_210518, HA007_0.05_210519, HA009_0.05_210519, HA011_0.05_210519, HA015_0.05_210519, HA019_0.05_210519, HA021_0.05_210519, QC101_210519,	HA006_0.05_210519, HA008_0.05_210519, HA010_0.05_210519, HA014_0.05_210519, HA018_0.05_210519, HA020_0.05_210519, QC100_210519, QC102_210519	19-May-2021	---	---	---	26-May-2021	02-Jun-2021	✓
EA200: AS 4964 - 2004 Identification of Asbestos in Soils								
Soil Glass Jar - Unpreserved (EA200)								
HA010_0.05_210519, HA015_0.05_210519,	HA014_0.05_210519, HA019_0.05_210519	19-May-2021	---	---	---	25-May-2021	15-Nov-2021	✓
EG005(ED093)T: Total Metals by ICP-AES								
Soil Glass Jar - Unpreserved (EG005T)								
HA018_0.05_210519,	HA021_0.05_210519	19-May-2021	26-May-2021	15-Nov-2021	✓	27-May-2021	15-Nov-2021	✓
EG035T: Total Recoverable Mercury by FIMS								
Soil Glass Jar - Unpreserved (EG035T)								
HA018_0.05_210519,	HA021_0.05_210519	19-May-2021	26-May-2021	16-Jun-2021	✓	28-May-2021	16-Jun-2021	✓



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

Method	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP066: Polychlorinated Biphenyls (PCB)							
Soil Glass Jar - Unpreserved (EP066)							
HA018_0.05_210519, HA021_0.05_210519	19-May-2021	25-May-2021	02-Jun-2021	✓	27-May-2021	04-Jul-2021	✓
EP068A: Organochlorine Pesticides (OC)							
Soil Glass Jar - Unpreserved (EP068)							
HA018_0.05_210519, HA021_0.05_210519	19-May-2021	25-May-2021	02-Jun-2021	✓	27-May-2021	04-Jul-2021	✓
EP075(SIM)A: Phenolic Compounds							
Soil Glass Jar - Unpreserved (EP075(SIM))							
HA018_0.05_210519, HA021_0.05_210519	19-May-2021	25-May-2021	02-Jun-2021	✓	26-May-2021	04-Jul-2021	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved (EP075(SIM))							
HA018_0.05_210519, HA021_0.05_210519	19-May-2021	25-May-2021	02-Jun-2021	✓	26-May-2021	04-Jul-2021	✓
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP071)							
HA018_0.05_210519, HA021_0.05_210519	19-May-2021	25-May-2021	02-Jun-2021	✓	26-May-2021	04-Jul-2021	✓
Soil Glass Jar - Unpreserved (EP080)							
HA018_0.05_210519, HA021_0.05_210519	19-May-2021	25-May-2021	02-Jun-2021	✓	27-May-2021	02-Jun-2021	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Soil Glass Jar - Unpreserved (EP071)							
HA018_0.05_210519, HA021_0.05_210519	19-May-2021	25-May-2021	02-Jun-2021	✓	26-May-2021	04-Jul-2021	✓
Soil Glass Jar - Unpreserved (EP080)							
HA018_0.05_210519, HA021_0.05_210519	19-May-2021	25-May-2021	02-Jun-2021	✓	27-May-2021	02-Jun-2021	✓
EP080: BTEXN							
Soil Glass Jar - Unpreserved (EP080)							
HA018_0.05_210519, HA021_0.05_210519	19-May-2021	25-May-2021	02-Jun-2021	✓	27-May-2021	02-Jun-2021	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE Soil Jar (EP231X)							
HA001_0.1_210518, HA003_0.1_210518, HA004_0.1_210518	18-May-2021	24-May-2021	14-Nov-2021	✓	25-May-2021	03-Jul-2021	✓
HDPE Soil Jar (EP231X)							
HA005_0.1_210518, HA007_0.05_210519, HA009_0.05_210519, HA011_0.05_210519, HA015_0.05_210519, HA019_0.05_210519, HA021_0.05_210519, QC101_210519	19-May-2021	24-May-2021	15-Nov-2021	✓	25-May-2021	03-Jul-2021	✓
HA006_0.05_210519, HA008_0.05_210519, HA010_0.05_210519, HA014_0.05_210519, HA018_0.05_210519, HA020_0.05_210519, QC100_210519, QC102_210519							



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

Method	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE Soil Jar (EP231X) HA001_0.1_210518, HA003_0.1_210518,	HA002_0.1_210518, HA004_0.1_210518	18-May-2021	24-May-2021	14-Nov-2021	✓	25-May-2021	03-Jul-2021	✓
HDPE Soil Jar (EP231X) HA005_0.1_210518, HA007_0.05_210519, HA009_0.05_210519, HA011_0.05_210519, HA015_0.05_210519, HA019_0.05_210519, HA021_0.05_210519, QC101_210519,	HA006_0.05_210519, HA008_0.05_210519, HA010_0.05_210519, HA014_0.05_210519, HA018_0.05_210519, HA020_0.05_210519, QC100_210519, QC102_210519	19-May-2021	24-May-2021	15-Nov-2021	✓	25-May-2021	03-Jul-2021	✓
EP231C: Perfluoroalkyl Sulfonamides								
HDPE Soil Jar (EP231X) HA001_0.1_210518, HA003_0.1_210518,	HA002_0.1_210518, HA004_0.1_210518	18-May-2021	24-May-2021	14-Nov-2021	✓	25-May-2021	03-Jul-2021	✓
HDPE Soil Jar (EP231X) HA005_0.1_210518, HA007_0.05_210519, HA009_0.05_210519, HA011_0.05_210519, HA015_0.05_210519, HA019_0.05_210519, HA021_0.05_210519, QC101_210519,	HA006_0.05_210519, HA008_0.05_210519, HA010_0.05_210519, HA014_0.05_210519, HA018_0.05_210519, HA020_0.05_210519, QC100_210519, QC102_210519	19-May-2021	24-May-2021	15-Nov-2021	✓	25-May-2021	03-Jul-2021	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE Soil Jar (EP231X) HA001_0.1_210518, HA003_0.1_210518,	HA002_0.1_210518, HA004_0.1_210518	18-May-2021	24-May-2021	14-Nov-2021	✓	25-May-2021	03-Jul-2021	✓
HDPE Soil Jar (EP231X) HA005_0.1_210518, HA007_0.05_210519, HA009_0.05_210519, HA011_0.05_210519, HA015_0.05_210519, HA019_0.05_210519, HA021_0.05_210519, QC101_210519,	HA006_0.05_210519, HA008_0.05_210519, HA010_0.05_210519, HA014_0.05_210519, HA018_0.05_210519, HA020_0.05_210519, QC100_210519, QC102_210519	19-May-2021	24-May-2021	15-Nov-2021	✓	25-May-2021	03-Jul-2021	✓



Matrix: **SOIL** 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	
EP231P: PFAS Sums								
HDPE Soil Jar (EP231X) HA001_0.1_210518, HA003_0.1_210518,	HA002_0.1_210518, HA004_0.1_210518	18-May-2021	24-May-2021	14-Nov-2021	✓	25-May-2021	03-Jul-2021	✓
HDPE Soil Jar (EP231X) HA005_0.1_210518, HA007_0.05_210519, HA009_0.05_210519, HA011_0.05_210519, HA015_0.05_210519, HA019_0.05_210519, HA021_0.05_210519, QC101_210519,	HA006_0.05_210519, HA008_0.05_210519, HA010_0.05_210519, HA014_0.05_210519, HA018_0.05_210519, HA020_0.05_210519, QC100_210519, QC102_210519	19-May-2021	24-May-2021	15-Nov-2021	✓	25-May-2021	03-Jul-2021	✓

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	
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE (no PTFE) (EP231X) QC300_210518		18-May-2021	24-May-2021	14-Nov-2021	✓	24-May-2021	14-Nov-2021	✓
HDPE (no PTFE) (EP231X) QC301_210519		19-May-2021	24-May-2021	15-Nov-2021	✓	24-May-2021	15-Nov-2021	✓
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE (no PTFE) (EP231X) QC300_210518		18-May-2021	24-May-2021	14-Nov-2021	✓	24-May-2021	14-Nov-2021	✓
HDPE (no PTFE) (EP231X) QC301_210519		19-May-2021	24-May-2021	15-Nov-2021	✓	24-May-2021	15-Nov-2021	✓
EP231C: Perfluoroalkyl Sulfonamides								
HDPE (no PTFE) (EP231X) QC300_210518		18-May-2021	24-May-2021	14-Nov-2021	✓	24-May-2021	14-Nov-2021	✓
HDPE (no PTFE) (EP231X) QC301_210519		19-May-2021	24-May-2021	15-Nov-2021	✓	24-May-2021	15-Nov-2021	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE (no PTFE) (EP231X) QC300_210518		18-May-2021	24-May-2021	14-Nov-2021	✓	24-May-2021	14-Nov-2021	✓
HDPE (no PTFE) (EP231X) QC301_210519		19-May-2021	24-May-2021	15-Nov-2021	✓	24-May-2021	15-Nov-2021	✓
EP231P: PFAS Sums								
HDPE (no PTFE) (EP231X) QC300_210518		18-May-2021	24-May-2021	14-Nov-2021	✓	24-May-2021	14-Nov-2021	✓
HDPE (no PTFE) (EP231X) QC301_210519		19-May-2021	24-May-2021	15-Nov-2021	✓	24-May-2021	15-Nov-2021	✓



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	Method	Count		Rate (%)			Quality Control Specification
		QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	5	43	11.63	10.00	✔	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	2	18	11.11	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
Pesticides by GCMS	EP068	2	12	16.67	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	2	12	16.67	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-AES	EG005T	2	20	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	10	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	20	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)	EP075(SIM)	1	18	5.56	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
Pesticides by GCMS	EP068	1	12	8.33	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	12	8.33	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-AES	EG005T	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	10	10.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
PAH/Phenols (SIM)	EP075(SIM)	1	18	5.56	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
Pesticides by GCMS	EP068	1	12	8.33	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	12	8.33	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-AES	EG005T	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	10	10.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	1	18	5.56	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
Pesticides by GCMS	EP068	1	12	8.33	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	12	8.33	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-AES	EG005T	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	10	10.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard



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

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	0	20	0.00	10.00	✖	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	0	20	0.00	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
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
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl ₂) (Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl ₂ which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM Schedule B(3)
Polychlorinated Biphenyls (PCB)	EP066	SOIL	In house: Referenced to USEPA SW 846 - 8270 Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM Schedule B(3).
Pesticides by GCMS	EP068	SOIL	In house: Referenced to USEPA SW 846 - 8270 Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This technique is compliant with NEPM Schedule B(3).
TRH - Semivolatile Fraction	EP071	SOIL	In house: Referenced to USEPA SW 846 - 8015 Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C40. Compliant with NEPM Schedule B(3).
PAH/Phenols (SIM)	EP075(SIM)	SOIL	In house: Referenced to USEPA SW 846 - 8270. Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM Schedule B(3)
TRH Volatiles/BTEX	EP080	SOIL	In house: Referenced to USEPA SW 846 - 8260. Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. Compliant with NEPM Schedule B(3) amended.
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.



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
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	In house: Referenced to USEPA 200.2. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM Schedule B(3).
Methanolic Extraction of Soils for Purge and Trap	ORG16	SOIL	In house: Referenced to USEPA SW 846 - 5030A. 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids	ORG17	SOIL	In house: Mechanical agitation (tumbler). 10g of sample, Na ₂ SO ₄ and surrogate are extracted with 30mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.
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.
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.

ANZ
FGM - Chain of Custody Form

AECOM

04AN(EV)-007-FM1

CONSULTANT: AECOM Marsd Walsh		ADDRESS: 17 Washbrook Boulevard, NSW 2204	
PROJECT MANAGER (PM): Ora Ferguson		SITE: Ealing Origin Pump Station	
PROJECT NUMBER & TASK COI: 60622873		P.O. NO.:	
RESULTS REQUIRED (date):		QUOTE NO.:	
COMMENTS / SPECIAL HANDLING, STORAGE OR DISPOSAL:			
			
SAMPLE INFORMATION (Orig. S = Soil, W=Water)			
ALS ID	SAMPLE ID	MATRIX	DATE
1	HA001_0.1_210518	Soil	18/05/21
2	HA001_0.5_210518	Soil	18/05/21
3	HA001_1.0_210518	Soil	18/05/21
4	HA002_0.1_210518	Soil	18/05/21
5	HA003_0.1_210518	Soil	18/05/21
6	HA003_0.5_210518	Soil	18/05/21
7	HA003_1.0_210518	Soil	18/05/21
8	HA004_0.1_210518	Soil	18/05/21
9	HA004_0.5_210518	Soil	18/05/21
10	HA004_1.0_210518	Soil	18/05/21
11	HA005_0.1_210518	Soil	18/05/21
12	HA006_0.05_210519	Soil	19/05/21
13	HA006_0.5_210519	Soil	19/05/21
14	HA006_1.0_210519	Soil	19/05/21
15	HA007_0.05_210519	Soil	19/05/21
16	HA007_0.5_210519	Soil	19/05/21
17	HA007_1.0_210519	Soil	19/05/21
18	HA008_0.05_210519	Soil	19/05/21
19	HA008_0.5_210519	Soil	19/05/21

SAMPLER: Peter Waddingham, James Hughes, Sknee Harris
 MOBILE: 0447 724 581
 EMAIL REPORT TO: Maria.Walsh@aecom.com

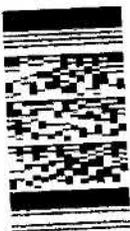
Destination Laboratory
ALS Newcastles

PFAS (Full suite - 28 analytes)
 TLCP
 Abestos (present / absent)
 HOLD

0200 - 210518
 0201 - 210518
 0202 - 210518
 Subcon / Forward Lab / Spill W.O.

Organised By / Date
 Requisitioned By / Date
 Contain / Count
 WO No
 Attached By PO / Internal Check

Environmental Division
 Sydney
 Work Order Reference
ES2118814



RELINQUISHED BY: Name: **Stephane Harms** Date: **19/05/21** Time: **16:10**

RECEIVED BY: Name: **AR3** Date: **19/05/21** Time: **16:28**

METHOD OF SHIPMENT: Name: **SOFF** Date: **19/05/21** Time: **15:30**

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/acid Preserved; S = Sodium Hydroxide Preserved Plastic; AS = Amber Glass Unpreserved AP - Airfreight Unpreserved Plastic
 V = VOA Via HCl Preserved; VA = VOA Via Sodium Bisphinate Preserved; VS = VOA Via Sulfuric Preserved; AV = Airfreight Unpreserved Vial SQ = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic
 F = Formic/acid Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottle; ST = Silante Bottle; ASS = Plastic Bag for Acid Sulphate Solids; B = Unpreserved Bag
 Soil Container Codes: Jar = Unpreserved glass jar

ANZ
FQM - Chain of Custody Form

AECOM

QCAN(EV)-007-FM1

CONTRACT: AECOM Maresa Wealth		ADDRESS: 17 Warburton Boulevard, NSW 2304		SAMPLER: Peter Waddingham, James Hughes, Sidnee Harris		Destination Laboratory	
PROJECT MANAGER (PM): Orta Ferguson		SITE: Eraring Origin Power Station		MOBILE: 0447 724 581		ALS Newcastles	
PROJECT NUMBER & TASK CO: 60622873		P.O. NO.:		EMAIL REPORT TO: Maresa.Weicht@aecom.com			
RESULTS REQUIRED (Date):		QUOTE NO.:		ANALYSIS REQUIRED including SURRES (name - suite codes must be listed to attract suite prices)			
SAMPLE INFORMATION (Code: S = Soil, W=Water)				CONTAINER INFORMATION			
ALS ID	SAMPLE ID	MATRIX	DATE	Time	Type / Code	Total bottles	
20	HA008_1.0_210519	Soil	1905/21				
21	HA009_0.05_210519	Soil	1905/21				
22	HA009_0.5_210519	Soil	1905/21				
23	HA009_1.0_210519	Soil	1905/21				
24	HA010_0.05_210519	Soil	1905/21				
25	HA010_0.3_210519	Soil	1905/21				
26	HA011_0.05_210519	Soil	1905/21				
27	HA011_0.5_210519	Soil	1905/21				
28	HA011_1.0_210519	Soil	1905/21				
29	HA014_0.05_210519	Soil	1905/21				
30	HA014_0.5_210519	Soil	1905/21				
31	HA014_1.0_210519	Soil	1905/21				
32	HA015_0.05_210519	Soil	1905/21				
33	HA015_0.3_210519	Soil	1905/21				
34	HA018_0.05_210519	Soil	1905/21				
35	HA018_0.5_210519	Soil	1905/21				
36	HA019_0.05_210519	Soil	1905/21				
37	HA019_0.5_210519	Soil	1905/21				
38	HA019_0.7_210519	Soil	1905/21				
RELINQUISHED BY: Name: Sidnee Harris		RECEIVED BY: Name: ACS		Date: 16/05/14		Date: 17/5/14	
Time: 16/0		Time: 16:08		Time: 16:08		Time: 16:08	
METHOD OF SHIPMENT		METHOD OF SHIPMENT		METHOD OF SHIPMENT		METHOD OF SHIPMENT	
Cont Note No.:		Cont Note No.:		Cont Note No.:		Cont Note No.:	
Transport Co.:		Transport Co.:		Transport Co.:		Transport Co.:	

QCAN(EV)-007-FM1 (2)
Form - Chain of Custody Form (QCAN(EV)-007-FM1)
Revision 1 Date: 10/28/0

ANZ
QAM - Chain of Custody Form

AECOM
 QAMNEY-007-FM1

CONSULTANT: AECOM, Marne Weich
 PROJECT MANAGER (PM): Ota Ferguson
 PROJECT NUMBER & TASK CODE: 60622873
 ADDRESS: 17 Westbrook Boulevard, NSW 2304
 SITE: Eraring Origin Power Station
 P.O. NO.:
 QUOTE NO.:

SAMPLER: Peter Waddingham, James Hughes, Sidnee Harms
 MOBILE: 0447 724 581
 EMAIL REPORT TO: Marne Weich@aecom.com
 PHONE:
 ANALYSIS REQUIRED INCLUDING SUITES (note - suite codes must be listed to attract suite prices)
 PFAS (full suite - 28 analytes) TLCP
 Abestos (present / absent) HOLD

ALS ID	SAMPLE ID	MATRIX	DATE	Time	CONTAINER INFORMATION		Total bottles	PFAS (full suite - 28 analytes) TLCP	Abestos (present / absent) HOLD	Notes: e.g. Highly contaminated sample e.g. "High PAHs expected" Extra volume for OC or trace LORs etc.
					Type / Code					
39	HA020_0.05_210519	Soil	19/05/21				X			
40	HA020_0.5_210519	Soil	19/05/21				X			
41	HA021_0.05_210519	Soil	19/05/21				X			
42	HA021_0.3_210519	Soil	19/05/21				X			
43	OC100_210519	Soil	19/05/21				X			
44	OC101_210519	Soil	19/05/21				X			
45	OC102_210519	Soil	19/05/21				X			
46	OC200_210519	Soil	19/05/21				X			Please forward to Eurofins for analysis
47	OC201_210519	Soil	19/05/21				X			Please forward to Eurofins for analysis
48	OC202_210519	Soil	19/05/21				X			Please forward to Eurofins for analysis
49	OC300_210519	Soil	19/05/21				X			
50	OC501_210519	Soil	19/05/21				X			
51	TS2	Soil								
52	TS4	Soil								
53	TS2	Soil								

RELINQUISHED BY: Name: Sidnee Harms Date: 19/05/24
 RECEIVED BY: Name: ACS Date: 19/5/21
 METHOD OF SHIPMENT: Transport Co:
 Master Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Hydroxide 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 SC = 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 = Sample Roller; ASS = Plastic Bag for Acid Sulfate Solids; B = Unpreserved Bag; Soil Container Codes: UR = Unpreserved glass jar



CERTIFICATE OF ANALYSIS

Work Order : ES2119057
Client : AECOM Australia Pty Ltd
Contact : MS ORLA FERGUSON
Address : 17 WARABROOK BOULEVARDE
Telephone : +61 02 8934 0000
Project : 60622873 1.0
Order number : 60622873 1.0
C-O-C number :
Sampler : PETER WADDINGHAM, SIDNEE HARRIS
Site : Eraring Origin Power Station
Quote number : EN/004/20
No. of samples received : 63
No. of samples analysed : 29

Page : 1 of 33
Laboratory : Environmental Division Sydney
Contact : Brenda Hong
Address : 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone : +61 2 8784 8555
Date Samples Received : 20-May-2021 16:24
Date Analysis Commenced : 24-May-2021
Issue Date : 28-May-2021 22:07



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

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

This Certificate of Analysis contains the following information:

- General Comments
Analytical Results
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.

Table with 3 columns: Signatories, Position, Accreditation Category. Lists names like Alana Smylie, Ankit Joshi, Celine Conceicao, Edwandy Fadjar, Franco Lentini, Ivan Taylor and their respective roles and accreditation categories.

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.

- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) per the NEPM (2013) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1,2,3-cd)pyrene (0.1), Dibenz(a,h)anthracene (1.0), Benzo(g,h,i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero, for 'TEQ 1/2LOR' are treated as half the reported LOR, and for 'TEQ LOR' are treated as being equal to the reported LOR. Note: TEQ 1/2LOR and TEQ LOR will calculate as 0.6mg/Kg and 1.2mg/Kg respectively for samples with non-detects for all of the eight TEQ PAHs.
- 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.
- EP068: Where reported, Total Chlordane (sum) is the sum of the reported concentrations of cis-Chlordane and trans-Chlordane at or above the LOR.
- EP068: Where reported, Total OCP is the sum of the reported concentrations of all Organochlorine Pesticides at or above LOR.
- EP075(SIM): Where reported, Total Cresol is the sum of the reported concentrations of 2-Methylphenol and 3- & 4-Methylphenol at or above the LOR.
- 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. The results have been confirmed by re-extraction and re-analysis.
- EP231X: Sample ES2119057_057 required dilution due to sample matrix interferences (Internal Standard suppression). LOR values have been adjusted accordingly.
- 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	HA012_0.05_210520	HA013_0.05_210520	HA016_0.05_210520	HA017_0.05_210520	HA022_0.05_210520
Sampling date / time				20-May-2021 00:00					
Compound	CAS Number	LOR	Unit	ES2119057-001	ES2119057-004	ES2119057-006	ES2119057-007	ES2119057-010	
				Result	Result	Result	Result	Result	
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	---	0.1	%	13.7	50.2	5.4	10.5	12.9	
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	---	---	No	---	---	
Sample weight (dry)	---	0.01	g	---	---	500	---	---	
APPROVED IDENTIFIER:	---	-	--	---	---	A. SMYLIE	---	---	
EG005(ED093)T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg	---	---	---	<5	<5	
Cadmium	7440-43-9	1	mg/kg	---	---	---	<1	<1	
Chromium	7440-47-3	2	mg/kg	---	---	---	9	11	
Copper	7440-50-8	5	mg/kg	---	---	---	24	<5	
Lead	7439-92-1	5	mg/kg	---	---	---	53	11	
Nickel	7440-02-0	2	mg/kg	---	---	---	4	<2	
Zinc	7440-66-6	5	mg/kg	---	---	---	421	17	
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg	---	---	---	<0.1	<0.1	
EP066: Polychlorinated Biphenyls (PCB)									
Total Polychlorinated biphenyls	---	0.1	mg/kg	---	---	---	<0.1	<0.1	
EP068A: Organochlorine Pesticides (OC)									
alpha-BHC	319-84-6	0.05	mg/kg	---	---	---	<0.05	<0.05	
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	---	---	---	<0.05	<0.05	
beta-BHC	319-85-7	0.05	mg/kg	---	---	---	<0.05	<0.05	
gamma-BHC	58-89-9	0.05	mg/kg	---	---	---	<0.05	<0.05	
delta-BHC	319-86-8	0.05	mg/kg	---	---	---	<0.05	<0.05	
Heptachlor	76-44-8	0.05	mg/kg	---	---	---	<0.05	<0.05	
Aldrin	309-00-2	0.05	mg/kg	---	---	---	<0.05	<0.05	
Heptachlor epoxide	1024-57-3	0.05	mg/kg	---	---	---	<0.05	<0.05	
^A Total Chlordane (sum)	---	0.05	mg/kg	---	---	---	<0.05	<0.05	
trans-Chlordane	5103-74-2	0.05	mg/kg	---	---	---	<0.05	<0.05	
alpha-Endosulfan	959-98-8	0.05	mg/kg	---	---	---	<0.05	<0.05	
cis-Chlordane	5103-71-9	0.05	mg/kg	---	---	---	<0.05	<0.05	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	HA012_0.05_210520	HA013_0.05_210520	HA016_0.05_210520	HA017_0.05_210520	HA022_0.05_210520
Sampling date / time				20-May-2021 00:00					
Compound	CAS Number	LOR	Unit	ES2119057-001	ES2119057-004	ES2119057-006	ES2119057-007	ES2119057-010	
				Result	Result	Result	Result	Result	
EP068A: Organochlorine Pesticides (OC) - Continued									
Dieldrin	60-57-1	0.05	mg/kg	---	---	---	<0.05	<0.05	
4,4'-DDE	72-55-9	0.05	mg/kg	---	---	---	<0.05	<0.05	
Endrin	72-20-8	0.05	mg/kg	---	---	---	<0.05	<0.05	
beta-Endosulfan	33213-65-9	0.05	mg/kg	---	---	---	<0.05	<0.05	
^ Endosulfan (sum)	115-29-7	0.05	mg/kg	---	---	---	<0.05	<0.05	
4,4'-DDD	72-54-8	0.05	mg/kg	---	---	---	<0.05	<0.05	
Endrin aldehyde	7421-93-4	0.05	mg/kg	---	---	---	<0.05	<0.05	
Endosulfan sulfate	1031-07-8	0.05	mg/kg	---	---	---	<0.05	<0.05	
4,4'-DDT	50-29-3	0.2	mg/kg	---	---	---	<0.2	<0.2	
Endrin ketone	53494-70-5	0.05	mg/kg	---	---	---	<0.05	<0.05	
Methoxychlor	72-43-5	0.2	mg/kg	---	---	---	<0.2	<0.2	
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg	---	---	---	<0.05	<0.05	
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-29-3	0.05	mg/kg	---	---	---	<0.05	<0.05	
EP075(SIM)A: Phenolic Compounds									
Phenol	108-95-2	0.5	mg/kg	---	---	---	<0.5	<0.5	
2-Chlorophenol	95-57-8	0.5	mg/kg	---	---	---	<0.5	<0.5	
2-Methylphenol	95-48-7	0.5	mg/kg	---	---	---	<0.5	<0.5	
3- & 4-Methylphenol	1319-77-3	1	mg/kg	---	---	---	<1	<1	
2-Nitrophenol	88-75-5	0.5	mg/kg	---	---	---	<0.5	<0.5	
2,4-Dimethylphenol	105-67-9	0.5	mg/kg	---	---	---	<0.5	<0.5	
2,4-Dichlorophenol	120-83-2	0.5	mg/kg	---	---	---	<0.5	<0.5	
2,6-Dichlorophenol	87-65-0	0.5	mg/kg	---	---	---	<0.5	<0.5	
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	---	---	---	<0.5	<0.5	
2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	---	---	---	<0.5	<0.5	
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	---	---	---	<0.5	<0.5	
Pentachlorophenol	87-86-5	2	mg/kg	---	---	---	<2	<2	
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg	---	---	---	<0.5	<0.5	
Acenaphthylene	208-96-8	0.5	mg/kg	---	---	---	<0.5	<0.5	
Acenaphthene	83-32-9	0.5	mg/kg	---	---	---	<0.5	<0.5	
Fluorene	86-73-7	0.5	mg/kg	---	---	---	<0.5	<0.5	
Phenanthrene	85-01-8	0.5	mg/kg	---	---	---	<0.5	<0.5	
Anthracene	120-12-7	0.5	mg/kg	---	---	---	<0.5	<0.5	
Fluoranthene	206-44-0	0.5	mg/kg	---	---	---	<0.5	<0.5	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	HA012_0.05_210520	HA013_0.05_210520	HA016_0.05_210520	HA017_0.05_210520	HA022_0.05_210520
Sampling date / time				20-May-2021 00:00					
Compound	CAS Number	LOR	Unit	ES2119057-001	ES2119057-004	ES2119057-006	ES2119057-007	ES2119057-010	
				Result	Result	Result	Result	Result	
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Pyrene	129-00-0	0.5	mg/kg	---	---	---	<0.5	<0.5	
Benzo(a)anthracene	56-55-3	0.5	mg/kg	---	---	---	<0.5	<0.5	
Chrysene	218-01-9	0.5	mg/kg	---	---	---	<0.5	<0.5	
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	---	---	---	<0.5	<0.5	
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	---	---	---	<0.5	<0.5	
Benzo(a)pyrene	50-32-8	0.5	mg/kg	---	---	---	<0.5	<0.5	
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	---	---	---	<0.5	<0.5	
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	---	---	---	<0.5	<0.5	
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	---	---	---	<0.5	<0.5	
^ Sum of polycyclic aromatic hydrocarbons	---	0.5	mg/kg	---	---	---	<0.5	<0.5	
^ Benzo(a)pyrene TEQ (zero)	---	0.5	mg/kg	---	---	---	<0.5	<0.5	
^ Benzo(a)pyrene TEQ (half LOR)	---	0.5	mg/kg	---	---	---	0.6	0.6	
^ Benzo(a)pyrene TEQ (LOR)	---	0.5	mg/kg	---	---	---	1.2	1.2	
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	---	10	mg/kg	---	---	---	<10	<10	
C10 - C14 Fraction	---	50	mg/kg	---	---	---	<50	<50	
C15 - C28 Fraction	---	100	mg/kg	---	---	---	<100	<100	
C29 - C36 Fraction	---	100	mg/kg	---	---	---	<100	<100	
^ C10 - C36 Fraction (sum)	---	50	mg/kg	---	---	---	<50	<50	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg	---	---	---	<10	<10	
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	---	---	---	<10	<10	
>C10 - C16 Fraction	---	50	mg/kg	---	---	---	<50	<50	
>C16 - C34 Fraction	---	100	mg/kg	---	---	---	<100	<100	
>C34 - C40 Fraction	---	100	mg/kg	---	---	---	<100	<100	
^ >C10 - C40 Fraction (sum)	---	50	mg/kg	---	---	---	<50	<50	
^ >C10 - C16 Fraction minus Naphthalene (F2)	---	50	mg/kg	---	---	---	<50	<50	
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg	---	---	---	<0.2	<0.2	
Toluene	108-88-3	0.5	mg/kg	---	---	---	<0.5	<0.5	
Ethylbenzene	100-41-4	0.5	mg/kg	---	---	---	<0.5	<0.5	
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	---	---	---	<0.5	<0.5	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	HA012_0.05_210520	HA013_0.05_210520	HA016_0.05_210520	HA017_0.05_210520	HA022_0.05_210520
Sampling date / time				20-May-2021 00:00					
Compound	CAS Number	LOR	Unit	ES2119057-001	ES2119057-004	ES2119057-006	ES2119057-007	ES2119057-010	
				Result	Result	Result	Result	Result	
EP080: BTEXN - Continued									
ortho-Xylene	95-47-6	0.5	mg/kg	--	---	---	<0.5	<0.5	
^ Sum of BTEX	---	0.2	mg/kg	--	---	---	<0.2	<0.2	
^ Total Xylenes	---	0.5	mg/kg	--	---	---	<0.5	<0.5	
Naphthalene	91-20-3	1	mg/kg	--	---	---	<1	<1	
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<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	<0.0002	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<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	<0.0002	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<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	<0.0002	
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<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	<0.0002	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<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	<0.0002	
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<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	<0.0002	
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<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	<0.0002	
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<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	<0.0002	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	
EP231C: Perfluoroalkyl Sulfonamides									



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	HA012_0.05_210520	HA013_0.05_210520	HA016_0.05_210520	HA017_0.05_210520	HA022_0.05_210520
Sampling date / time				20-May-2021 00:00					
Compound	CAS Number	LOR	Unit	ES2119057-001	ES2119057-004	ES2119057-006	ES2119057-007	ES2119057-010	
				Result	Result	Result	Result	Result	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	<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	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	<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	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	<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	<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	<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	<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	<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	<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	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	---	0.0002	mg/kg	<0.0002	<0.0002	<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	<0.0002	<0.0002
Sum of PFAS (WA DER List)	---	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP066S: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	0.1	%	---	---	---	85.8	73.2	
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%	---	---	---	98.0	91.1	
EP068T: Organophosphorus Pesticide Surrogate									



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	HA012_0.05_210520	HA013_0.05_210520	HA016_0.05_210520	HA017_0.05_210520	HA022_0.05_210520
Sampling date / time				20-May-2021 00:00					
Compound	CAS Number	LOR	Unit	ES2119057-001	ES2119057-004	ES2119057-006	ES2119057-007	ES2119057-010	
				Result	Result	Result	Result	Result	
EP068T: Organophosphorus Pesticide Surrogate - Continued									
DEF	78-48-8	0.05	%	--	---	---	107	76.6	
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%	--	---	---	78.2	83.2	
2-Chlorophenol-D4	93951-73-6	0.5	%	---	---	---	89.7	84.0	
2,4,6-Tribromophenol	118-79-6	0.5	%	--	---	---	81.9	78.4	
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%	--	---	---	103	88.4	
Anthracene-d10	1719-06-8	0.5	%	---	---	---	100.0	92.1	
4-Terphenyl-d14	1718-51-0	0.5	%	---	---	---	89.4	87.0	
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.2	%	---	---	---	106	116	
Toluene-D8	2037-26-5	0.2	%	---	---	---	111	102	
4-Bromofluorobenzene	460-00-4	0.2	%	---	---	---	112	118	
EP231S: PFAS Surrogate									
13C4-PFOS	---	0.0002	%	81.0	86.5	76.0	76.5	80.5	
13C8-PFOA	---	0.0002	%	94.5	98.0	93.0	95.0	100	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	HA023_0.05_210520	HA024_0.05_210520	HA025_0.05_210520	HA026_0.05_210520	HA027_0.05_210520
Sampling date / time				20-May-2021 00:00					
Compound	CAS Number	LOR	Unit	ES2119057-013	ES2119057-016	ES2119057-019	ES2119057-021	ES2119057-024	
				Result	Result	Result	Result	Result	
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	---	0.1	%	13.1	8.6	50.5	9.0	7.5	
EG005(ED093)T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg	6	<5	---	<5	---	
Cadmium	7440-43-9	1	mg/kg	<1	<1	---	<1	---	
Chromium	7440-47-3	2	mg/kg	16	13	---	8	---	
Copper	7440-50-8	5	mg/kg	<5	<5	---	8	---	
Lead	7439-92-1	5	mg/kg	9	10	---	8	---	
Nickel	7440-02-0	2	mg/kg	<2	<2	---	6	---	
Zinc	7440-66-6	5	mg/kg	15	38	---	27	---	
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	---	<0.1	---	
EP066: Polychlorinated Biphenyls (PCB)									
Total Polychlorinated biphenyls	---	0.1	mg/kg	<0.1	<0.1	---	<0.1	---	
EP068A: Organochlorine Pesticides (OC)									
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	---	<0.05	---	
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	---	<0.05	---	
beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	---	<0.05	---	
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	---	<0.05	---	
delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	---	<0.05	---	
Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	---	<0.05	---	
Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	---	<0.05	---	
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	---	<0.05	---	
^ Total Chlordane (sum)	---	0.05	mg/kg	<0.05	<0.05	---	<0.05	---	
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	---	<0.05	---	
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	---	<0.05	---	
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	---	<0.05	---	
Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	---	<0.05	---	
4,4'-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	---	<0.05	---	
Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	---	<0.05	---	
beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	---	<0.05	---	
^ Endosulfan (sum)	115-29-7	0.05	mg/kg	<0.05	<0.05	---	<0.05	---	
4,4'-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	---	<0.05	---	
Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	---	<0.05	---	
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	---	<0.05	---	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	HA023_0.05_210520	HA024_0.05_210520	HA025_0.05_210520	HA026_0.05_210520	HA027_0.05_210520
Sampling date / time				20-May-2021 00:00					
Compound	CAS Number	LOR	Unit	ES2119057-013	ES2119057-016	ES2119057-019	ES2119057-021	ES2119057-024	
				Result	Result	Result	Result	Result	
EP068A: Organochlorine Pesticides (OC) - Continued									
4,4'-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	---	<0.2	---	
Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	---	<0.05	---	
Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	---	<0.2	---	
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg	<0.05	<0.05	---	<0.05	---	
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/5 0-2	0.05	mg/kg	<0.05	<0.05	---	<0.05	---	
EP075(SIM)A: Phenolic Compounds									
Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	---	<0.5	---	
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	---	<0.5	---	
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	---	<0.5	---	
3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	---	<1	---	
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	---	<0.5	---	
2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	---	<0.5	---	
2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	---	<0.5	---	
2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	---	<0.5	---	
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	---	<0.5	---	
2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	---	<0.5	---	
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	---	<0.5	---	
Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	---	<2	---	
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	---	<0.5	---	
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	---	<0.5	---	
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	---	<0.5	---	
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	---	<0.5	---	
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	---	<0.5	---	
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	---	<0.5	---	
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	---	<0.5	---	
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	---	<0.5	---	
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	---	<0.5	---	
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	---	<0.5	---	
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	---	<0.5	---	
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	---	<0.5	---	
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	---	<0.5	---	
Indeno(1,2,3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	---	<0.5	---	
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	---	<0.5	---	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	HA023_0.05_210520	HA024_0.05_210520	HA025_0.05_210520	HA026_0.05_210520	HA027_0.05_210520
Sampling date / time				20-May-2021 00:00					
Compound	CAS Number	LOR	Unit	ES2119057-013	ES2119057-016	ES2119057-019	ES2119057-021	ES2119057-024	
				Result	Result	Result	Result	Result	
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	---	<0.5	---	
[^] Sum of polycyclic aromatic hydrocarbons	---	0.5	mg/kg	<0.5	<0.5	---	<0.5	---	
[^] Benzo(a)pyrene TEQ (zero)	---	0.5	mg/kg	<0.5	<0.5	---	<0.5	---	
[^] Benzo(a)pyrene TEQ (half LOR)	---	0.5	mg/kg	0.6	0.6	---	0.6	---	
[^] Benzo(a)pyrene TEQ (LOR)	---	0.5	mg/kg	1.2	1.2	---	1.2	---	
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	---	10	mg/kg	<10	<10	---	<10	---	
C10 - C14 Fraction	---	50	mg/kg	<50	<50	---	<50	---	
C15 - C28 Fraction	---	100	mg/kg	140	<100	---	<100	---	
C29 - C36 Fraction	---	100	mg/kg	150	<100	---	<100	---	
[^] C10 - C36 Fraction (sum)	---	50	mg/kg	290	<50	---	<50	---	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	---	<10	---	
[^] C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	---	<10	---	
>C10 - C16 Fraction	---	50	mg/kg	<50	<50	---	<50	---	
>C16 - C34 Fraction	---	100	mg/kg	230	<100	---	<100	---	
>C34 - C40 Fraction	---	100	mg/kg	200	<100	---	<100	---	
[^] >C10 - C40 Fraction (sum)	---	50	mg/kg	430	<50	---	<50	---	
[^] >C10 - C16 Fraction minus Naphthalene (F2)	---	50	mg/kg	<50	<50	---	<50	---	
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	---	<0.2	---	
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	---	<0.5	---	
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	---	<0.5	---	
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	---	<0.5	---	
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	---	<0.5	---	
[^] Sum of BTEX	---	0.2	mg/kg	<0.2	<0.2	---	<0.2	---	
[^] Total Xylenes	---	0.5	mg/kg	<0.5	<0.5	---	<0.5	---	
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	<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	<0.0002	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	HA023_0.05_210520	HA024_0.05_210520	HA025_0.05_210520	HA026_0.05_210520	HA027_0.05_210520
Sampling date / time					20-May-2021 00:00				
Compound	CAS Number	LOR	Unit	ES2119057-013	ES2119057-016	ES2119057-019	ES2119057-021	ES2119057-024	
				Result	Result	Result	Result	Result	
EP231A: Perfluoroalkyl Sulfonic Acids - Continued									
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0004	<0.0002	<0.0002	
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0035	<0.0002	<0.0002	
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<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	<0.001	
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<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	<0.0002	
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<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	<0.0002	
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<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	<0.0002	
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<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	<0.0002	
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<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	<0.0005	
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<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	<0.0005	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<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	<0.0005	
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	HA023_0.05_210520	HA024_0.05_210520	HA025_0.05_210520	HA026_0.05_210520	HA027_0.05_210520
Sampling date / time				20-May-2021 00:00					
Compound	CAS Number	LOR	Unit	ES2119057-013	ES2119057-016	ES2119057-019	ES2119057-021	ES2119057-024	
				Result	Result	Result	Result	Result	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	<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	<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	<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	<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	<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	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	---	0.0002	mg/kg	<0.0002	<0.0002	0.0041	<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	0.0039	<0.0002	<0.0002	<0.0002
Sum of PFAS (WA DER List)	---	0.0002	mg/kg	<0.0002	<0.0002	0.0041	<0.0002	<0.0002	<0.0002
EP066S: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	0.1	%	71.4	77.8	---	99.1	---	---
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%	82.8	92.2	---	82.1	---	---
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%	104	64.4	---	70.8	---	---
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%	82.5	85.6	---	81.0	---	---
2-Chlorophenol-D4	93951-73-6	0.5	%	87.8	84.8	---	85.1	---	---
2,4,6-Tribromophenol	118-79-6	0.5	%	86.8	84.5	---	76.9	---	---
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%	86.9	81.0	---	98.0	---	---
Anthracene-d10	1719-06-8	0.5	%	109	100	---	94.4	---	---
4-Terphenyl-d14	1718-51-0	0.5	%	98.8	83.4	---	107	---	---



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	HA023_0.05_210520	HA024_0.05_210520	HA025_0.05_210520	HA026_0.05_210520	HA027_0.05_210520
Sampling date / time				20-May-2021 00:00					
Compound	CAS Number	LOR	Unit	ES2119057-013	ES2119057-016	ES2119057-019	ES2119057-021	ES2119057-024	
				Result	Result	Result	Result	Result	
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.2	%	102	100	---	120	--	
Toluene-D8	2037-26-5	0.2	%	110	107	---	103	---	
4-Bromofluorobenzene	460-00-4	0.2	%	100	111	---	105	---	
EP231S: PFAS Surrogate									
13C4-PFOS	---	0.0002	%	83.0	80.5	82.0	81.5	80.5	
13C8-PFOA	---	0.0002	%	96.0	97.0	97.0	93.0	102	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	HA028_0.05_210520	HA029_0.05_210520	HA030_0.05_210520	HA031_0.05_210520	HA032_0.05_210520
Sampling date / time				20-May-2021 00:00					
Compound	CAS Number	LOR	Unit	ES2119057-027	ES2119057-030	ES2119057-032	ES2119057-034	ES2119057-037	
				Result	Result	Result	Result	Result	
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	---	0.1	%	24.9	6.4	12.9	14.4	12.6	
EG005(ED093)T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg	5	---	---	---	---	
Cadmium	7440-43-9	1	mg/kg	<1	---	---	---	---	
Chromium	7440-47-3	2	mg/kg	7	---	---	---	---	
Copper	7440-50-8	5	mg/kg	<5	---	---	---	---	
Lead	7439-92-1	5	mg/kg	20	---	---	---	---	
Nickel	7440-02-0	2	mg/kg	<2	---	---	---	---	
Zinc	7440-66-6	5	mg/kg	10	---	---	---	---	
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg	<0.1	---	---	---	---	
EP066: Polychlorinated Biphenyls (PCB)									
Total Polychlorinated biphenyls	---	0.1	mg/kg	<0.1	---	---	---	---	
EP068A: Organochlorine Pesticides (OC)									
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	---	---	---	---	
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	---	---	---	---	
beta-BHC	319-85-7	0.05	mg/kg	<0.05	---	---	---	---	
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	---	---	---	---	
delta-BHC	319-86-8	0.05	mg/kg	<0.05	---	---	---	---	
Heptachlor	76-44-8	0.05	mg/kg	<0.05	---	---	---	---	
Aldrin	309-00-2	0.05	mg/kg	<0.05	---	---	---	---	
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	---	---	---	---	
^ Total Chlordane (sum)	---	0.05	mg/kg	<0.05	---	---	---	---	
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	---	---	---	---	
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	---	---	---	---	
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	---	---	---	---	
Dieldrin	60-57-1	0.05	mg/kg	<0.05	---	---	---	---	
4,4'-DDE	72-55-9	0.05	mg/kg	<0.05	---	---	---	---	
Endrin	72-20-8	0.05	mg/kg	<0.05	---	---	---	---	
beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	---	---	---	---	
^ Endosulfan (sum)	115-29-7	0.05	mg/kg	<0.05	---	---	---	---	
4,4'-DDD	72-54-8	0.05	mg/kg	<0.05	---	---	---	---	
Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	---	---	---	---	
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	---	---	---	---	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	HA028_0.05_210520	HA029_0.05_210520	HA030_0.05_210520	HA031_0.05_210520	HA032_0.05_210520
Sampling date / time				20-May-2021 00:00					
Compound	CAS Number	LOR	Unit	ES2119057-027	ES2119057-030	ES2119057-032	ES2119057-034	ES2119057-037	
				Result	Result	Result	Result	Result	
EP068A: Organochlorine Pesticides (OC) - Continued									
4,4'-DDT	50-29-3	0.2	mg/kg	<0.2	---	---	---	---	---
Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	---	---	---	---	---
Methoxychlor	72-43-5	0.2	mg/kg	<0.2	---	---	---	---	---
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg	<0.05	---	---	---	---	---
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/5-0-2	0.05	mg/kg	<0.05	---	---	---	---	---
EP075(SIM)A: Phenolic Compounds									
Phenol	108-95-2	0.5	mg/kg	<0.5	---	---	---	---	---
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	---	---	---	---	---
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	---	---	---	---	---
3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	---	---	---	---	---
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	---	---	---	---	---
2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	---	---	---	---	---
2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	---	---	---	---	---
2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	---	---	---	---	---
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	---	---	---	---	---
2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	---	---	---	---	---
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	---	---	---	---	---
Pentachlorophenol	87-86-5	2	mg/kg	<2	---	---	---	---	---
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg	<0.5	---	---	---	---	---
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	---	---	---	---	---
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	---	---	---	---	---
Fluorene	86-73-7	0.5	mg/kg	<0.5	---	---	---	---	---
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	---	---	---	---	---
Anthracene	120-12-7	0.5	mg/kg	<0.5	---	---	---	---	---
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	---	---	---	---	---
Pyrene	129-00-0	0.5	mg/kg	<0.5	---	---	---	---	---
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	---	---	---	---	---
Chrysene	218-01-9	0.5	mg/kg	<0.5	---	---	---	---	---
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	---	---	---	---	---
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	---	---	---	---	---
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	---	---	---	---	---
Indeno(1,2,3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	---	---	---	---	---
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	---	---	---	---	---



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	HA028_0.05_210520	HA029_0.05_210520	HA030_0.05_210520	HA031_0.05_210520	HA032_0.05_210520
Sampling date / time				20-May-2021 00:00					
Compound	CAS Number	LOR	Unit	ES2119057-027	ES2119057-030	ES2119057-032	ES2119057-034	ES2119057-037	
				Result	Result	Result	Result	Result	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<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	<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	<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	<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	<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	0.0005	
EP231P: PFAS Sums									
Sum of PFAS	---	0.0002	mg/kg	0.0005	<0.0002	0.0003	0.0002	0.0209	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0005	<0.0002	0.0003	0.0002	<0.0002	
Sum of PFAS (WA DER List)	---	0.0002	mg/kg	0.0005	<0.0002	0.0003	0.0002	0.0048	
EP066S: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	0.1	%	94.1	---	---	---	---	
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%	85.2	---	---	---	---	
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%	104	---	---	---	---	
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%	81.7	---	---	---	---	
2-Chlorophenol-D4	93951-73-6	0.5	%	88.4	---	---	---	---	
2,4,6-Tribromophenol	118-79-6	0.5	%	104	---	---	---	---	
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%	104	---	---	---	---	
Anthracene-d10	1719-06-8	0.5	%	108	---	---	---	---	
4-Terphenyl-d14	1718-51-0	0.5	%	107	---	---	---	---	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	HA028_0.05_210520	HA029_0.05_210520	HA030_0.05_210520	HA031_0.05_210520	HA032_0.05_210520
Sampling date / time				20-May-2021 00:00					
Compound	CAS Number	LOR	Unit	ES2119057-027	ES2119057-030	ES2119057-032	ES2119057-034	ES2119057-037	
				Result	Result	Result	Result	Result	
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.2	%	90.2	---	---	---	---	
Toluene-D8	2037-26-5	0.2	%	95.1	---	---	---	---	
4-Bromofluorobenzene	460-00-4	0.2	%	97.0	---	---	---	---	
EP231S: PFAS Surrogate									
13C4-PFOS	---	0.0002	%	73.0	74.0	80.5	80.5	81.5	
13C8-PFOA	---	0.0002	%	92.0	91.0	92.5	94.5	96.0	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	HA033_0.05_210520	HA034_0.05_210520	HA035_0.05_210520	HA036_0.05_210520	HA037_0.05_210520
Sampling date / time				20-May-2021 00:00					
Compound	CAS Number	LOR	Unit	ES2119057-039	ES2119057-041	ES2119057-043	ES2119057-045	ES2119057-048	
				Result	Result	Result	Result	Result	
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	---	0.1	%	15.0	12.1	6.8	11.5	12.3	
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<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	<0.0002	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<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	<0.0002	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0002	<0.0002	0.0004	<0.0002	<0.0002	
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<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	<0.001	
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<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	<0.0002	
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<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	<0.0002	
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<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	<0.0002	
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<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	<0.0002	
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<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	<0.0005	
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<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	<0.0005	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	HA033_0.05_210520	HA034_0.05_210520	HA035_0.05_210520	HA036_0.05_210520	HA037_0.05_210520
Sampling date / time				20-May-2021 00:00					
Compound	CAS Number	LOR	Unit	ES2119057-039	ES2119057-041	ES2119057-043	ES2119057-045	ES2119057-048	
				Result	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	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	<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	<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	<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	<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	<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	<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	<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	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	---	0.0002	mg/kg	0.0002	<0.0002	0.0004	<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	0.0004	<0.0002	<0.0002	<0.0002
Sum of PFAS (WA DER List)	---	0.0002	mg/kg	0.0002	<0.0002	0.0004	<0.0002	<0.0002	<0.0002
EP231S: PFAS Surrogate									
13C4-PFOS	---	0.0002	%	80.5	79.5	78.0	80.5	81.0	81.0
13C8-PFOA	---	0.0002	%	92.5	93.5	95.0	91.0	93.0	93.0



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	HA038_0.05_210520	HA039_0.05_210520	HA040_0.05_210520	QC103_210520	QC502_210520
Sampling date / time				20-May-2021 00:00	14-May-2021 00:00				
Compound	CAS Number	LOR	Unit	ES2119057-051	ES2119057-053	ES2119057-055	ES2119057-057	ES2119057-061	
				Result	Result	Result	Result	Result	
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	---	0.1	%	15.1	5.5	9.7	7.8	7.8	
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	---	No	---	---	---	
Sample weight (dry)	---	0.01	g	---	484	---	---	---	
APPROVED IDENTIFIER:	---	-	--	---	A. SMYLIE	---	---	---	
EG005(ED093)T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg	15	8	---	---	---	
Cadmium	7440-43-9	1	mg/kg	<1	<1	---	---	---	
Chromium	7440-47-3	2	mg/kg	12	11	---	---	---	
Copper	7440-50-8	5	mg/kg	6	15	---	---	---	
Lead	7439-92-1	5	mg/kg	8	10	---	---	---	
Nickel	7440-02-0	2	mg/kg	3	21	---	---	---	
Zinc	7440-66-6	5	mg/kg	18	74	---	---	---	
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	---	---	---	
EP066: Polychlorinated Biphenyls (PCB)									
Total Polychlorinated biphenyls	---	0.1	mg/kg	<0.1	<0.1	---	---	---	
EP068A: Organochlorine Pesticides (OC)									
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	---	---	---	
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	---	---	---	
beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	---	---	---	
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	---	---	---	
delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	---	---	---	
Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	---	---	---	
Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	---	---	---	
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	---	---	---	
^A Total Chlordane (sum)	---	0.05	mg/kg	<0.05	<0.05	---	---	---	
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	---	---	---	
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	---	---	---	
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	---	---	---	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	HA038_0.05_210520	HA039_0.05_210520	HA040_0.05_210520	QC103_210520	QC502_210520
Sampling date / time				20-May-2021 00:00	20-May-2021 00:00	20-May-2021 00:00	20-May-2021 00:00	14-May-2021 00:00	
Compound	CAS Number	LOR	Unit	ES2119057-051	ES2119057-053	ES2119057-055	ES2119057-057	ES2119057-061	
				Result	Result	Result	Result	Result	
EP068A: Organochlorine Pesticides (OC) - Continued									
Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	---	---	---	
4,4'-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	---	---	---	
Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	---	---	---	
beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	---	---	---	
^ Endosulfan (sum)	115-29-7	0.05	mg/kg	<0.05	<0.05	---	---	---	
4,4'-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	---	---	---	
Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	---	---	---	
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	---	---	---	
4,4'-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	---	---	---	
Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	---	---	---	
Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	---	---	---	
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg	<0.05	<0.05	---	---	---	
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-29-3	0.05	mg/kg	<0.05	<0.05	---	---	---	
EP075(SIM)A: Phenolic Compounds									
Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	---	---	---	
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	---	---	---	
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	---	---	---	
3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	---	---	---	
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	---	---	---	
2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	---	---	---	
2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	---	---	---	
2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	---	---	---	
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	---	---	---	
2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	---	---	---	
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	---	---	---	
Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	---	---	---	
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	---	---	---	
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	---	---	---	
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	---	---	---	
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	---	---	---	
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	---	---	---	
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	---	---	---	
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	---	---	---	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	HA038_0.05_210520	HA039_0.05_210520	HA040_0.05_210520	QC103_210520	QC502_210520
Sampling date / time				20-May-2021 00:00	14-May-2021 00:00				
Compound	CAS Number	LOR	Unit	ES2119057-051	ES2119057-053	ES2119057-055	ES2119057-057	ES2119057-061	
				Result	Result	Result	Result	Result	
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	---	---	---	
Benzo(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	---	---	---	
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	---	---	---	
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	---	---	---	
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	---	---	---	
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	---	---	---	
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	---	---	---	
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	---	---	---	
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	---	---	---	
^ Sum of polycyclic aromatic hydrocarbons	---	0.5	mg/kg	<0.5	<0.5	---	---	---	
^ Benzo(a)pyrene TEQ (zero)	---	0.5	mg/kg	<0.5	<0.5	---	---	---	
^ Benzo(a)pyrene TEQ (half LOR)	---	0.5	mg/kg	0.6	0.6	---	---	---	
^ Benzo(a)pyrene TEQ (LOR)	---	0.5	mg/kg	1.2	1.2	---	---	---	
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	---	10	mg/kg	<10	<10	---	---	---	
C10 - C14 Fraction	---	50	mg/kg	<50	<50	---	---	---	
C15 - C28 Fraction	---	100	mg/kg	<100	<100	---	---	---	
C29 - C36 Fraction	---	100	mg/kg	<100	<100	---	---	---	
^ C10 - C36 Fraction (sum)	---	50	mg/kg	<50	<50	---	---	---	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	---	---	---	
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	---	---	---	
>C10 - C16 Fraction	---	50	mg/kg	<50	<50	---	---	---	
>C16 - C34 Fraction	---	100	mg/kg	<100	<100	---	---	---	
>C34 - C40 Fraction	---	100	mg/kg	<100	<100	---	---	---	
^ >C10 - C40 Fraction (sum)	---	50	mg/kg	<50	<50	---	---	---	
^ >C10 - C16 Fraction minus Naphthalene (F2)	---	50	mg/kg	<50	<50	---	---	---	
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	---	---	---	
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	---	---	---	
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	---	---	---	
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	---	---	---	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	HA038_0.05_210520	HA039_0.05_210520	HA040_0.05_210520	QC103_210520	QC502_210520
Sampling date / time				20-May-2021 00:00	14-May-2021 00:00				
Compound	CAS Number	LOR	Unit	ES2119057-051	ES2119057-053	ES2119057-055	ES2119057-057	ES2119057-061	
				Result	Result	Result	Result	Result	
EP080: BTEXN - Continued									
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	---	---	---	
^ Sum of BTEX	---	0.2	mg/kg	<0.2	<0.2	---	---	---	
^ Total Xylenes	---	0.5	mg/kg	<0.5	<0.5	---	---	---	
Naphthalene	91-20-3	1	mg/kg	<1	<1	---	---	---	
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	<0.001	<0.002	<0.001	
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0012	<0.0005	
EP231C: Perfluoroalkyl Sulfonamides									



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	HA038_0.05_210520	HA039_0.05_210520	HA040_0.05_210520	QC103_210520	QC502_210520
Sampling date / time				20-May-2021 00:00	14-May-2021 00:00				
Compound	CAS Number	LOR	Unit	ES2119057-051	ES2119057-053	ES2119057-055	ES2119057-057	ES2119057-061	
				Result	Result	Result	Result	Result	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0012	<0.0005	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0012	<0.0005	
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0012	<0.0005	
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0012	<0.0005	
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0005	<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	<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	<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	<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	<0.0005	
EP231P: PFAS Sums									
Sum of PFAS	---	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	
Sum of PFAS (WA DER List)	---	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	
EP066S: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	0.1	%	128	109	---	---	---	
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%	97.4	93.0	---	---	---	
EP068T: Organophosphorus Pesticide Surrogate									



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	HA038_0.05_210520	HA039_0.05_210520	HA040_0.05_210520	QC103_210520	QC502_210520
Sampling date / time				20-May-2021 00:00	14-May-2021 00:00				
Compound	CAS Number	LOR	Unit	ES2119057-051	ES2119057-053	ES2119057-055	ES2119057-057	ES2119057-061	
				Result	Result	Result	Result	Result	
EP068T: Organophosphorus Pesticide Surrogate - Continued									
DEF	78-48-8	0.05	%	105	98.4	---	---	---	
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%	84.6	80.6	---	---	---	
2-Chlorophenol-D4	93951-73-6	0.5	%	84.2	87.7	---	---	---	
2,4,6-Tribromophenol	118-79-6	0.5	%	87.0	82.7	---	---	---	
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%	95.3	102	---	---	---	
Anthracene-d10	1719-06-8	0.5	%	110	107	---	---	---	
4-Terphenyl-d14	1718-51-0	0.5	%	88.9	80.6	---	---	---	
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.2	%	131	104	---	---	---	
Toluene-D8	2037-26-5	0.2	%	108	108	---	---	---	
4-Bromofluorobenzene	460-00-4	0.2	%	106	109	---	---	---	
EP231S: PFAS Surrogate									
13C4-PFOS	---	0.0002	%	70.0	67.5	65.5	60.0	81.0	
13C8-PFOA	---	0.0002	%	99.0	108	104	85.0	95.5	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	QC602_210520	Trip Spike Control	---	---	---
				Sampling date / time	13-May-2021 00:00	13-May-2021 00:00	---	---	---
Compound	CAS Number	LOR	Unit	ES2119057-062	ES2119057-063	-----	-----	-----	
				Result	Result	---	---	---	
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	---	10	mg/kg	25	44	---	---	---	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg	36	58	---	---	---	
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	20	31	---	---	---	
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	---	---	---	
Toluene	108-88-3	0.5	mg/kg	5.5	11.1	---	---	---	
Ethylbenzene	100-41-4	0.5	mg/kg	1.2	2.0	---	---	---	
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	6.4	9.9	---	---	---	
ortho-Xylene	95-47-6	0.5	mg/kg	2.9	4.1	---	---	---	
^ Sum of BTEX	---	0.2	mg/kg	16.0	27.1	---	---	---	
^ Total Xylenes	---	0.5	mg/kg	9.3	14.0	---	---	---	
Naphthalene	91-20-3	1	mg/kg	<1	<1	---	---	---	
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.2	%	115	109	---	---	---	
Toluene-D8	2037-26-5	0.2	%	116	107	---	---	---	
4-Bromofluorobenzene	460-00-4	0.2	%	116	108	---	---	---	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)		Sample ID		SW01_210520	QC302_210520	---	---	---
Sampling date / time		20-May-2021 00:00		20-May-2021 00:00	---	---	---	---
Compound	CAS Number	LOR	Unit	ES2119057-056	ES2119057-060	-----	-----	-----
				Result	Result	---	---	---
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.03	<0.02	---	---	---
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	---	---	---
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	<0.02	<0.02	---	---	---
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	0.02	<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	---	---	---
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	---	---	---



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	SW01_210520	QC302_210520	---	---	---
				Sampling date / time	20-May-2021 00:00	20-May-2021 00:00	---	---	---
Compound	CAS Number	LOR	Unit	ES2119057-056	ES2119057-060	-----	-----	-----	
				Result	Result	---	---	---	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
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	0.05	<0.01	---	---	---	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.02	<0.01	---	---	---	
Sum of PFAS (WA DER List)	---	0.01	µg/L	0.05	<0.01	---	---	---	
EP231S: PFAS Surrogate									
13C4-PFOS	---	0.02	%	86.8	81.7	---	---	---	
13C8-PFOA	---	0.02	%	97.0	94.4	---	---	---	

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	HA016_0.05_210520 - 20-May-2021 00:00	Mid brown soil.
EA200: Description	HA039_0.05_210520 - 20-May-2021 00:00	Mid brown soil.



Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP066S: PCB Surrogate			
Decachlorobiphenyl	2051-24-3	39	149
EP068S: Organochlorine Pesticide Surrogate			
Dibromo-DDE	21655-73-2	49	147
EP068T: Organophosphorus Pesticide Surrogate			
DEF	78-48-8	35	143
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	63	123
2-Chlorophenol-D4	93951-73-6	66	122
2,4,6-Tribromophenol	118-79-6	40	138
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	70	122
Anthracene-d10	1719-06-8	66	128
4-Terphenyl-d14	1718-51-0	65	129
EP080S: TPH(V)/BTEX Surrogates			
1,2-Dichloroethane-D4	17060-07-0	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 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	: ES2119057	Page	: 1 of 21
Client	: AECOM Australia Pty Ltd	Laboratory	: Environmental Division Sydney
Contact	: MS ORLA FERGUSON	Contact	: Brenda Hong
Address	: 17 WARABROOK BOULEVARDE WARABROOK NSW, AUSTRALIA 2304	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: +61 02 8934 0000	Telephone	: +61 2 8784 8555
Project	: 60622873 1.0	Date Samples Received	: 20-May-2021
Order number	: 60622873 1.0	Date Analysis Commenced	: 24-May-2021
C-O-C number	: —	Issue Date	: 28-May-2021
Sampler	: PETER WADDINGHAM, SIDNEE HARRIS		
Site	: Eraring Origin Power Station		
Quote number	: EN/004/20		
No. of samples received	: 63		
No. of samples analysed	: 29		



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

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

This Quality Control Report contains the following information:

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

Signatories

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

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Alana Smylie	Asbestos Identifier	Newcastle - Asbestos, Mayfield West, NSW
Ankit Joshi	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Franco Lentini	LCMS Coordinator	Sydney Inorganics, 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

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%.

			Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EG005(ED093): Total Metals by ICP-AES (QC Lot: 3701370)									
ES2118713-003	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	23	26	12.3	0% - 50%
		EG005T: Nickel	7440-02-0	2	mg/kg	14	16	13.8	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	7	7	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	12	11	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	11	10	12.2	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	41	45	9.3	No Limit
ES2118960-001	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	7	10	32.8	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	<2	4	68.6	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	226	186	19.3	0% - 20%
		EG005T: Lead	7439-92-1	5	mg/kg	61	68	10.5	0% - 50%
		EG005T: Zinc	7440-66-6	5	mg/kg	124	111	10.5	0% - 20%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 3699285)									
ES2119057-006	HA016_0.05_210520	EA055: Moisture Content	---	0.1	%	5.4	5.0	8.1	0% - 20%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 3699565)									
ES2118930-009	Anonymous	EA055: Moisture Content	---	0.1	%	7.2	7.4	3.1	0% - 20%
ES2119057-034	HA031_0.05_210520	EA055: Moisture Content	---	0.1	%	14.4	14.8	2.7	0% - 20%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 3699566)									
ES2119057-061	QC502_210520	EA055: Moisture Content	---	0.1	%	7.8	7.3	7.0	0% - 20%
ES2119159-001	Anonymous	EA055: Moisture Content	---	0.1	%	82.5	82.4	0.0	0% - 20%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 3701373)									
ES2118822-003	Anonymous	EA055: Moisture Content	---	0.1	%	4.2	4.2	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 (%)
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 3701373) - continued									
ES2119057-007	HA017_0.05_210520	EA055: Moisture Content	---	0.1	%	10.5	9.0	15.9	0% - 20%
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3701369)									
ES2118713-003	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
ES2118960-001	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	0.8	0.7	21.5	No Limit
EP066: Polychlorinated Biphenyls (PCB) (QC Lot: 3694994)									
ES2119057-053	HA039_0.05_210520	EP066: Total Polychlorinated biphenyls	---	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
ES2118814-034	Anonymous	EP066: Total Polychlorinated biphenyls	---	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EP068A: Organochlorine Pesticides (OC) (QC Lot: 3694993)									
ES2119057-053	HA039_0.05_210520	EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4,4'-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4,4'-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4,4'-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.0	No Limit		
ES2118814-034	Anonymous	EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit



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 (%)		
EP068A: Organochlorine Pesticides (OC) (QC Lot: 3694993) - continued											
ES2118814-034	Anonymous	EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit		
		EP068: 4,4'-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit		
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit		
		EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit		
		EP068: 4,4'-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit		
		EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.0	No Limit		
		EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit		
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit		
		EP068: 4,4'-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.0	No Limit		
EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.0	No Limit				
EP075(SIM)A: Phenolic Compounds (QC Lot: 3694992)											
ES2119057-053	HA039_0.05_210520	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): 2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): 2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): 2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.0	No Limit		
		EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.0	No Limit		
		ES2118814-034	Anonymous	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
				EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075(SIM): 2-Methylphenol	95-48-7			0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
EP075(SIM): 2-Nitrophenol	88-75-5			0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
EP075(SIM): 2,4-Dimethylphenol	105-67-9			0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
EP075(SIM): 2,4-Dichlorophenol	120-83-2			0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
EP075(SIM): 2,6-Dichlorophenol	87-65-0			0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
EP075(SIM): 4-Chloro-3-methylphenol	59-50-7			0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
EP075(SIM): 2,4,6-Trichlorophenol	88-06-2			0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
EP075(SIM): 2,4,5-Trichlorophenol	95-95-4			0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.0	No Limit				
EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.0	No Limit				
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3694992)											
ES2119057-053	HA039_0.05_210520	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		



Sub-Matrix: SOIL			Laboratory Duplicate (DUP) Report								
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)		
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3694992) - continued											
ES2119057-053	HA039_0.05_210520	EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): Indeno(1,2,3,cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	---	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	---	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		ES2118814-034	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
				EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
				EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075(SIM): Fluorene	86-73-7			0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
EP075(SIM): Phenanthrene	85-01-8			0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
EP075(SIM): Anthracene	120-12-7			0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
EP075(SIM): Fluoranthene	206-44-0			0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
EP075(SIM): Pyrene	129-00-0			0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
EP075(SIM): Benz(a)anthracene	56-55-3			0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
EP075(SIM): Chrysene	218-01-9			0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3			0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
EP075(SIM): Benzo(k)fluoranthene	207-08-9			0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
EP075(SIM): Benzo(a)pyrene	50-32-8			0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
EP075(SIM): Indeno(1,2,3,cd)pyrene	193-39-5			0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
EP075(SIM): Dibenz(a,h)anthracene	53-70-3			0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
EP075(SIM): Benzo(g,h,i)perylene	191-24-2			0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
EP075(SIM): Sum of polycyclic aromatic hydrocarbons	---			0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
EP075(SIM): Benzo(a)pyrene TEQ (zero)	---	0.5	mg/kg	<0.5	<0.5	0.0	No Limit				
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3693311)											
ES2118822-003	Anonymous	EP080: C6 - C9 Fraction	---	10	mg/kg	<10	<10	0.0	No Limit		
EW2102268-081	Anonymous	EP080: C6 - C9 Fraction	---	10	mg/kg	<10	<10	0.0	No Limit		
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3694991)											



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 (%)
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3694991) - continued									
ES2118814-034	Anonymous	EP071: C15 - C28 Fraction	---	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	---	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	---	50	mg/kg	<50	<50	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3696051)									
ES2118814-034	Anonymous	EP080: C6 - C9 Fraction	---	10	mg/kg	<10	<10	0.0	No Limit
ES2119057-007	HA017_0.05_210520	EP080: C6 - C9 Fraction	---	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 3693311)									
ES2118822-003	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
EW2102268-081	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: 3694991)									
ES2118814-034	Anonymous	EP071: >C16 - C34 Fraction	---	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	---	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	---	50	mg/kg	<50	<50	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 3696051)									
ES2118814-034	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
ES2119057-007	HA017_0.05_210520	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
EP080: BTEXN (QC Lot: 3693311)									
ES2118822-003	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
EW2102268-081	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
EP080: BTEXN (QC Lot: 3696051)									
ES2118814-034	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



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: 3696051) - continued										
ES2119057-007	HA017_0.05_210520	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: 3692976)										
ES2119057-006	HA016_0.05_210520	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	
ES2119057-027	HA028_0.05_210520	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	0.0005	0.0006	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: 3698664)										
EP2105677-001	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	
ES2119057-057	QC103_210520	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0005	<0.0005	0.0	No Limit	
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0005	<0.0005	0.0	No Limit	
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0005	<0.0005	0.0	No Limit	
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0005	<0.0005	0.0	No Limit	
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0005	<0.0005	0.0	No Limit	
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0005	<0.0005	0.0	No Limit	
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 3692976)										
ES2119057-006	HA016_0.05_210520	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	



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: 3692976) - continued											
ES2119057-006	HA016_0.05_210520	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		
ES2119057-027	HA028_0.05_210520	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		
		EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 3698664)									
		EP2105677-001	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		
ES2119057-057	QC103_210520			EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0005	<0.0005	0.0	No Limit
				EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0005	<0.0005	0.0	No Limit		
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0005	<0.0005	0.0	No Limit		
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0005	<0.0005	0.0	No Limit		
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0005	<0.0005	0.0	No Limit		
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0005	<0.0005	0.0	No Limit		
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0005	<0.0005	0.0	No Limit		
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0005	<0.0005	0.0	No Limit		
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0012	<0.0012	0.0	No Limit		
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.002	<0.002	0.0	No Limit		
		EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 3692976)									



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: 3692976) - continued									
ES2119057-006	HA016_0.05_210520	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
ES2119057-027	HA028_0.05_210520	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
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 3698664)									
EP2105677-001	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
ES2119057-057	QC103_210520	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	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 (%)
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 3698664) - continued									
ES2119057-057	QC103_210520	EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0012	<0.0012	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0012	<0.0012	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0012	<0.0012	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0012	<0.0012	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 3692976)									
ES2119057-006	HA016_0.05_210520	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
ES2119057-027	HA028_0.05_210520	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: 3698664)									
EP2105677-001	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
ES2119057-057	QC103_210520	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	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: 3698664) - continued									
ES2119057-057	QC103_210520	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

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
				Result	Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low High	
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 3701370)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	121.1 mg/kg	90.0	88.0	113
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	0.74 mg/kg	78.8	70.0	130
EG005T: Chromium	7440-47-3	2	mg/kg	<2	19.6 mg/kg	101	68.0	132
EG005T: Copper	7440-50-8	5	mg/kg	<5	52.9 mg/kg	96.7	89.0	111
EG005T: Lead	7439-92-1	5	mg/kg	<5	60.8 mg/kg	92.1	82.0	119
EG005T: Nickel	7440-02-0	2	mg/kg	<2	15.3 mg/kg	85.9	80.0	120
EG005T: Zinc	7440-66-6	5	mg/kg	<5	139.3 mg/kg	83.0	66.0	133
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3701369)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	0.087 mg/kg	93.1	70.0	125
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 3694994)								
EP066: Total Polychlorinated biphenyls	---	0.1	mg/kg	<0.1	1 mg/kg	89.3	62.0	126
EP068A: Organochlorine Pesticides (OC) (QCLot: 3694993)								
EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	0.5 mg/kg	100	69.0	113
EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	0.5 mg/kg	102	65.0	117
EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	0.5 mg/kg	94.4	67.0	119
EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	0.5 mg/kg	103	68.0	116
EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	92.7	65.0	117
EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	0.5 mg/kg	96.6	67.0	115
EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	0.5 mg/kg	101	69.0	115
EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	0.5 mg/kg	103	62.0	118
EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	0.5 mg/kg	101	63.0	117
EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	0.5 mg/kg	103	66.0	116
EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	0.5 mg/kg	102	64.0	116
EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	0.5 mg/kg	99.1	66.0	116
EP068: 4,4'-DDE	72-55-9	0.05	mg/kg	<0.05	0.5 mg/kg	97.9	67.0	115
EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	0.5 mg/kg	99.4	67.0	123
EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	0.5 mg/kg	108	69.0	115
EP068: 4,4'-DDD	72-54-8	0.05	mg/kg	<0.05	0.5 mg/kg	103	69.0	121
EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	0.5 mg/kg	105	56.0	120
EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	0.5 mg/kg	103	62.0	124
EP068: 4,4'-DDT	50-29-3	0.2	mg/kg	<0.2	0.5 mg/kg	103	66.0	120
EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	0.5 mg/kg	101	64.0	122
EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	0.5 mg/kg	94.4	54.0	130
EP075(SIM)A: Phenolic Compounds (QCLot: 3694992)								



Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB)	Laboratory Control Spike (LCS) Report				
				Report	Spike	Spike Recovery (%)		Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High	
EP075(SIM)A: Phenolic Compounds (QCLot: 3694992) - continued									
EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	6 mg/kg	89.8	71.0	125	
EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	6 mg/kg	98.6	72.0	124	
EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	6 mg/kg	91.4	71.0	123	
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	12 mg/kg	91.3	67.0	127	
EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	6 mg/kg	79.4	54.0	114	
EP075(SIM): 2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	6 mg/kg	89.4	68.0	126	
EP075(SIM): 2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	6 mg/kg	90.3	66.0	120	
EP075(SIM): 2,6-Dichlorophenol	87-85-0	0.5	mg/kg	<0.5	6 mg/kg	90.8	70.0	120	
EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	6 mg/kg	93.7	70.0	116	
EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	6 mg/kg	75.5	54.0	114	
EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	6 mg/kg	74.2	60.0	114	
EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	12 mg/kg	23.8	10.0	57.0	
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3694992)									
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	6 mg/kg	91.2	77.0	125	
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	6 mg/kg	88.9	72.0	124	
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	6 mg/kg	91.5	73.0	127	
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	6 mg/kg	92.6	72.0	126	
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	6 mg/kg	93.6	75.0	127	
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	6 mg/kg	94.2	77.0	127	
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	6 mg/kg	93.5	73.0	127	
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	6 mg/kg	96.6	74.0	128	
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	6 mg/kg	89.4	69.0	123	
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	6 mg/kg	93.1	75.0	127	
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	6 mg/kg	95.8	68.0	116	
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	6 mg/kg	95.0	74.0	126	
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	6 mg/kg	92.2	70.0	126	
EP075(SIM): Indeno(1,2,3,cd)pyrene	193-39-5	0.5	mg/kg	<0.5	6 mg/kg	86.4	61.0	121	
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	6 mg/kg	83.3	62.0	118	
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	6 mg/kg	87.2	63.0	121	
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3693311)									
EP080: C6 - C9 Fraction	---	10	mg/kg	<10	26 mg/kg	81.4	68.4	128	
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3694991)									
EP071: C10 - C14 Fraction	---	50	mg/kg	<50	300 mg/kg	90.2	75.0	129	
EP071: C15 - C28 Fraction	---	100	mg/kg	<100	450 mg/kg	87.6	77.0	131	
EP071: C29 - C36 Fraction	---	100	mg/kg	<100	300 mg/kg	88.7	71.0	129	
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3696051)									
EP080: C6 - C9 Fraction	---	10	mg/kg	<10	26 mg/kg	109	68.4	128	



Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB)	Laboratory Control Spike (LCS) Report				
				Report	Spike Concentration	Spike Recovery (%)		Acceptable Limits (%)	
				Result		LCS	Low	High	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3693311)									
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	76.6	68.4	128	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3694991)									
EP071: >C10 - C16 Fraction	---	50	mg/kg	<50	375 mg/kg	88.4	77.0	125	
EP071: >C16 - C34 Fraction	---	100	mg/kg	<100	525 mg/kg	87.8	74.0	138	
EP071: >C34 - C40 Fraction	---	100	mg/kg	<100	225 mg/kg	94.9	63.0	131	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3696051)									
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	109	68.4	128	
EP080: BTEXN (QCLot: 3693311)									
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	102	62.0	116	
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	90.6	67.0	121	
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	80.4	65.0	117	
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	80.9	66.0	118	
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	77.2	68.0	120	
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	105	63.0	119	
EP080: BTEXN (QCLot: 3696051)									
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	110	62.0	116	
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	104	67.0	121	
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	105	65.0	117	
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	102	66.0	118	
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	110	68.0	120	
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	101	63.0	119	
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3692976)									
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.00125 mg/kg	82.8	72.0	128	
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	90.8	73.0	123	
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	89.2	67.0	130	
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	90.8	70.0	132	
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	87.6	68.0	136	
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	92.8	59.0	134	
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3698664)									
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.00125 mg/kg	107	72.0	128	
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	108	73.0	123	
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.4	67.0	130	
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	107	70.0	132	
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	113	68.0	136	
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	106	59.0	134	
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3692976)									



Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB)	Laboratory Control Spike (LCS) Report				
				Report	Spike Concentration	Spike Recovery (%)	Acceptable Limits (%)		
				Result			Low	High	
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3692976) - continued									
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	107	71.0	135	
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	97.2	69.0	132	
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	95.2	70.0	132	
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	99.6	71.0	131	
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.0	69.0	133	
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.0	72.0	129	
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	108	69.0	133	
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.0	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	86.8	66.0	139	
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	103	69.0	133	
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3698664)									
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	112	71.0	135	
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	104	69.0	132	
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	104	70.0	132	
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	116	71.0	131	
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	112	69.0	133	
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	124	72.0	129	
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	122	69.0	133	
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	122	64.0	136	
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	112	69.0	135	
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.0	66.0	139	
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	107	69.0	133	
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3692976)									
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	91.6	67.0	137	
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	102	71.6	129	
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	90.7	69.8	131	
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	97.1	68.7	130	
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	93.6	65.1	134	
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	97.2	63.0	144	
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	92.0	61.0	139	
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3698664)									
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	114	67.0	137	
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	127	71.6	129	
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	112	69.8	131	



Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB)	Laboratory Control Spike (LCS) Report			
				Report	Spike Concentration	Spike Recovery (%)	Acceptable Limits (%)	
				Result			Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3698664) - continued								
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	121	68.7	130
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	105	65.1	134
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.8	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.4	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3692976)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	89.2	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	89.2	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	104	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	96.4	69.2	143
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3698664)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	99.6	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	100	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	92.0	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	84.8	69.2	143

Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB)	Laboratory Control Spike (LCS) Report			
				Report	Spike Concentration	Spike Recovery (%)	Acceptable Limits (%)	
				Result			Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3694689)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	122	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	122	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	<0.02	0.25 µg/L	124	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	123	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	94.6	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	126	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3694689)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	109	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	125	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	128	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	113	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	127	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	125	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	129	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	118	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	125	72.0	134



Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB)	Laboratory Control Spike (LCS) Report			
				Report	Spike Concentration	Spike Recovery (%)	Acceptable Limits (%)	
				Result			Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3694689) - continued								
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	127	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	110	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3694689)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	116	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	99.0	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EiFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	103	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	97.6	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EiFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	109	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	123	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EiFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	120	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3694689)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	128	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	107	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	85.8	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**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report			
				Spike Concentration	Spike Recovery (%)	Acceptable Limits (%)	
				MS	Low	High	
EG005(ED093T): Total Metals by ICP-AES (QCLot: 3701370)							
ES2118713-003	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	85.2	70.0	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	94.5	70.0	130
		EG005T: Chromium	7440-47-3	50 mg/kg	105	68.0	132
		EG005T: Copper	7440-50-8	250 mg/kg	90.5	70.0	130
		EG005T: Lead	7439-92-1	250 mg/kg	89.6	70.0	130
		EG005T: Nickel	7440-02-0	50 mg/kg	90.2	70.0	130
		EG005T: Zinc	7440-66-6	250 mg/kg	90.7	66.0	133
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3701369)							
ES2118713-003	Anonymous	EG035T: Mercury	7439-97-6	0.5 mg/kg	93.3	70.0	130
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 3694994)							



Sub-Matrix: SOIL

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report			
				Spike Concentration	Spike Recovery(%) MS	Acceptable Limits (%)	
						Low	High
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 3694994) - continued							
ES2118814-034	Anonymous	EP066: Total Polychlorinated biphenyls	---	1 mg/kg	81.3	70.0	130
EP068A: Organochlorine Pesticides (OC) (QCLot: 3694993)							
ES2118814-034	Anonymous	EP068: gamma-BHC	58-89-9	0.5 mg/kg	84.4	70.0	130
		EP068: Heptachlor	76-44-8	0.5 mg/kg	77.3	70.0	130
		EP068: Aldrin	309-00-2	0.5 mg/kg	86.0	70.0	130
		EP068: Dieldrin	60-57-1	0.5 mg/kg	92.0	70.0	130
		EP068: Endrin	72-20-8	2 mg/kg	77.4	70.0	130
		EP068: 4,4'-DDT	50-29-3	2 mg/kg	77.8	70.0	130
EP075(SIM)A: Phenolic Compounds (QCLot: 3694992)							
ES2118814-034	Anonymous	EP075(SIM): Phenol	108-95-2	10 mg/kg	90.7	70.0	130
		EP075(SIM): 2-Chlorophenol	95-57-8	10 mg/kg	88.2	70.0	130
		EP075(SIM): 2-Nitrophenol	88-75-5	10 mg/kg	83.3	60.0	130
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	10 mg/kg	89.6	70.0	130
		EP075(SIM): Pentachlorophenol	87-86-5	10 mg/kg	40.7	20.0	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3694992)							
ES2118814-034	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	103	70.0	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	100	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3693311)							
ES2118822-003	Anonymous	EP080: C6 - C9 Fraction	---	32.5 mg/kg	79.3	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3694991)							
ES2118814-034	Anonymous	EP071: C10 - C14 Fraction	---	523 mg/kg	76.2	73.0	137
		EP071: C15 - C28 Fraction	---	2319 mg/kg	114	53.0	131
		EP071: C29 - C36 Fraction	---	1714 mg/kg	109	52.0	132
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3696051)							
ES2118814-034	Anonymous	EP080: C6 - C9 Fraction	---	32.5 mg/kg	93.1	70.0	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3693311)							
ES2118822-003	Anonymous	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	74.9	70.0	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3694991)							
ES2118814-034	Anonymous	EP071: >C10 - C16 Fraction	---	860 mg/kg	93.4	73.0	137
		EP071: >C16 - C34 Fraction	---	3223 mg/kg	121	53.0	131
		EP071: >C34 - C40 Fraction	---	1058 mg/kg	67.5	52.0	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3696051)							
ES2118814-034	Anonymous	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	93.2	70.0	130
EP080: BTEXN (QCLot: 3693311)							
ES2118822-003	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	98.0	70.0	130



Sub-Matrix: SOIL

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report			
				Spike Concentration	SpikeRecovery(%) MS	Acceptable Limits (%)	
						Low	High
EP080: BTEXN (QCLot: 3693311) - continued							
ES2118822-003	Anonymous	EP080: Toluene	108-88-3	2.5 mg/kg	93.0	70.0	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	87.4	70.0	130
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	88.0	70.0	130
		EP080: ortho-Xylene	106-42-3	2.5 mg/kg	87.0	70.0	130
		EP080: Naphthalene	95-47-6	2.5 mg/kg	87.4	70.0	130
EP080: BTEXN (QCLot: 3696051)							
ES2118814-034	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	82.6	70.0	130
		EP080: Toluene	108-88-3	2.5 mg/kg	85.1	70.0	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	90.3	70.0	130
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	87.8	70.0	130
		EP080: ortho-Xylene	106-42-3	2.5 mg/kg	88.8	70.0	130
		EP080: Naphthalene	95-47-6	2.5 mg/kg	83.2	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3692976)							
ES2119057-006	HA016_0_05_210520	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00125 mg/kg	82.0	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00125 mg/kg	95.2	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00125 mg/kg	90.0	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00125 mg/kg	94.4	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00125 mg/kg	88.0	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.00125 mg/kg	92.0	59.0	134
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3698664)							
EP2105677-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00125 mg/kg	96.8	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00125 mg/kg	92.0	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00125 mg/kg	82.4	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	112	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.00125 mg/kg	103	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3692976)							
ES2119057-006	HA016_0_05_210520	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	106	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	96.4	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	92.4	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	98.4	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	98.8	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	97.6	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	103	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUNDA)	2058-94-8	0.00125 mg/kg	100	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	96.4	69.0	135



Laboratory sample ID		Sample ID		Method: Compound		CAS Number		Matrix Spike (MS) Report					
								Spike		Spike Recovery (%)		Acceptable Limits (%)	
								Concentration	MS	Low	High		
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3692976) - continued													
ES2119057-006	HA016_0_05_210520	EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	83.2	66.0	139						
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	102	69.0	133						
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3698664)													
EP2105677-001	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	97.0	71.0	135						
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	85.6	69.0	132						
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	86.8	70.0	132						
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	106	71.0	131						
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	103	69.0	133						
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	118	72.0	129						
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	116	69.0	133						
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	108	64.0	136						
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	102	69.0	135						
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	94.8	66.0	139						
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	94.7	69.0	133						
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3692976)													
ES2119057-006	HA016_0_05_210520	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	92.0	67.0	137						
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	102	71.6	129						
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	92.0	69.8	131						
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	97.0	68.7	130						
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	93.8	65.1	134						
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	98.8	63.0	144						
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	87.2	61.0	139						
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3698664)													
EP2105677-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	106	67.0	137						
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	123	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	125	68.7	130						
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	87.3	65.1	134						
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	92.8	63.0	144						



Sub-Matrix: SOIL

				Matrix Spike (MS) Report			
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Spike	SpikeRecovery(%)	Acceptable Limits (%)	
				Concentration		MS	Low
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3698664) - continued							
EP2105677-001	Anonymous	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (ElFOSAA)	2991-50-6	0.00125 mg/kg	93.6	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3692976)							
ES2119057-006	HA016_0.05_210520	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	100	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00125 mg/kg	88.4	69.2	143
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3698664)							
EP2105677-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00125 mg/kg	84.8	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00125 mg/kg	89.2	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.00125 mg/kg	76.8	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	: ES2119057	Page	: 1 of 11
Client	: AECOM Australia Pty Ltd	Laboratory	: Environmental Division Sydney
Contact	: MS ORLA FERGUSON	Telephone	: +61 2 8784 8555
Project	: 60622873 1.0	Date Samples Received	: 20-May-2021
Site	: Eraring Origin Power Station	Issue Date	: 28-May-2021
Sampler	: PETER WADDINGHAM, SIDNEE HARRIS	No. of samples received	: 63
Order number	: 60622873 1.0	No. of samples analysed	: 29

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

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



Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	0	17	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	0	17	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results. This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein. Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters. Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

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

Method	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)							
HDPE Soil Jar (EA055) QC103_210520	20-May-2021	---	---	---	26-May-2021	03-Jun-2021	✓
Soil Glass Jar - Unpreserved (EA055) QC502_210520	14-May-2021	---	---	---	26-May-2021	28-May-2021	✓
Soil Glass Jar - Unpreserved (EA055) HA012_0.05_210520, HA013_0.05_210520, HA016_0.05_210520, HA025_0.05_210520, HA027_0.05_210520, HA028_0.05_210520, HA029_0.05_210520, HA030_0.05_210520, HA031_0.05_210520, HA032_0.05_210520, HA033_0.05_210520, HA034_0.05_210520, HA035_0.05_210520, HA036_0.05_210520, HA037_0.05_210520, HA040_0.05_210520	20-May-2021	---	---	---	26-May-2021	03-Jun-2021	✓
Soil Glass Jar - Unpreserved (EA055) HA017_0.05_210520, HA022_0.05_210520, HA023_0.05_210520, HA024_0.05_210520, HA026_0.05_210520, HA038_0.05_210520, HA039_0.05_210520	20-May-2021	---	---	---	27-May-2021	03-Jun-2021	✓
EA200: AS 4964 - 2004 Identification of Asbestos in Soils							
Snap Lock Bag: Separate bag received (EA200) HA016_0.05_210520, HA039_0.05_210520	20-May-2021	---	---	---	25-May-2021	16-Nov-2021	✓



Matrix: **SOIL** 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	
EG005(ED093)T: Total Metals by ICP-AES								
Soil Glass Jar - Unpreserved (EG005T)								
HA017_0.05_210520,	HA022_0.05_210520,	20-May-2021	27-May-2021	16-Nov-2021	✓	28-May-2021	16-Nov-2021	✓
HA023_0.05_210520,	HA024_0.05_210520,							
HA026_0.05_210520,	HA028_0.05_210520,							
HA038_0.05_210520,	HA039_0.05_210520							
EG035T: Total Recoverable Mercury by FIMS								
Soil Glass Jar - Unpreserved (EG035T)								
HA017_0.05_210520,	HA022_0.05_210520,	20-May-2021	27-May-2021	17-Jun-2021	✓	28-May-2021	17-Jun-2021	✓
HA023_0.05_210520,	HA024_0.05_210520,							
HA026_0.05_210520,	HA028_0.05_210520,							
HA038_0.05_210520,	HA039_0.05_210520							
EP066: Polychlorinated Biphenyls (PCB)								
Soil Glass Jar - Unpreserved (EP066)								
HA017_0.05_210520,	HA022_0.05_210520,	20-May-2021	25-May-2021	03-Jun-2021	✓	27-May-2021	04-Jul-2021	✓
HA023_0.05_210520,	HA024_0.05_210520,							
HA026_0.05_210520,	HA028_0.05_210520,							
HA038_0.05_210520,	HA039_0.05_210520							
EP068A: Organochlorine Pesticides (OC)								
Soil Glass Jar - Unpreserved (EP068)								
HA017_0.05_210520,	HA022_0.05_210520,	20-May-2021	25-May-2021	03-Jun-2021	✓	27-May-2021	04-Jul-2021	✓
HA023_0.05_210520,	HA024_0.05_210520,							
HA026_0.05_210520,	HA028_0.05_210520,							
HA038_0.05_210520,	HA039_0.05_210520							
EP075(SIM)A: Phenolic Compounds								
Soil Glass Jar - Unpreserved (EP075(SIM))								
HA017_0.05_210520,	HA022_0.05_210520,	20-May-2021	25-May-2021	03-Jun-2021	✓	26-May-2021	04-Jul-2021	✓
HA023_0.05_210520,	HA024_0.05_210520,							
HA026_0.05_210520,	HA028_0.05_210520,							
HA038_0.05_210520,	HA039_0.05_210520							
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Soil Glass Jar - Unpreserved (EP075(SIM))								
HA017_0.05_210520,	HA022_0.05_210520,	20-May-2021	25-May-2021	03-Jun-2021	✓	26-May-2021	04-Jul-2021	✓
HA023_0.05_210520,	HA024_0.05_210520,							
HA026_0.05_210520,	HA028_0.05_210520,							
HA038_0.05_210520,	HA039_0.05_210520							



Matrix: SOIL 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	
EP080/071: Total Petroleum Hydrocarbons								
Soil Glass Jar - Unpreserved (EP080) QC602_210520,	Trip Spike Control	13-May-2021	24-May-2021	27-May-2021	✔	26-May-2021	27-May-2021	✔
Soil Glass Jar - Unpreserved (EP071) HA017_0.05_210520, HA023_0.05_210520, HA026_0.05_210520, HA038_0.05_210520,	HA022_0.05_210520, HA024_0.05_210520, HA028_0.05_210520, HA039_0.05_210520	20-May-2021	25-May-2021	03-Jun-2021	✔	26-May-2021	04-Jul-2021	✔
Soil Glass Jar - Unpreserved (EP080) HA017_0.05_210520, HA023_0.05_210520, HA026_0.05_210520, HA038_0.05_210520,	HA022_0.05_210520, HA024_0.05_210520, HA028_0.05_210520, HA039_0.05_210520	20-May-2021	25-May-2021	03-Jun-2021	✔	27-May-2021	03-Jun-2021	✔
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
Soil Glass Jar - Unpreserved (EP080) QC602_210520,	Trip Spike Control	13-May-2021	24-May-2021	27-May-2021	✔	26-May-2021	27-May-2021	✔
Soil Glass Jar - Unpreserved (EP071) HA017_0.05_210520, HA023_0.05_210520, HA026_0.05_210520, HA038_0.05_210520,	HA022_0.05_210520, HA024_0.05_210520, HA028_0.05_210520, HA039_0.05_210520	20-May-2021	25-May-2021	03-Jun-2021	✔	26-May-2021	04-Jul-2021	✔
Soil Glass Jar - Unpreserved (EP080) HA017_0.05_210520, HA023_0.05_210520, HA026_0.05_210520, HA038_0.05_210520,	HA022_0.05_210520, HA024_0.05_210520, HA028_0.05_210520, HA039_0.05_210520	20-May-2021	25-May-2021	03-Jun-2021	✔	27-May-2021	03-Jun-2021	✔
EP080: BTEXN								
Soil Glass Jar - Unpreserved (EP080) QC602_210520,	Trip Spike Control	13-May-2021	24-May-2021	27-May-2021	✔	26-May-2021	27-May-2021	✔
Soil Glass Jar - Unpreserved (EP080) HA017_0.05_210520, HA023_0.05_210520, HA026_0.05_210520, HA038_0.05_210520,	HA022_0.05_210520, HA024_0.05_210520, HA028_0.05_210520, HA039_0.05_210520	20-May-2021	25-May-2021	03-Jun-2021	✔	27-May-2021	03-Jun-2021	✔



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

Method	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE Soil Jar (EP231X)								
HA012_0.05_210520,	HA013_0.05_210520,	20-May-2021	24-May-2021	16-Nov-2021	✓	25-May-2021	03-Jul-2021	✓
HA016_0.05_210520,	HA017_0.05_210520,							
HA022_0.05_210520,	HA023_0.05_210520,							
HA024_0.05_210520,	HA025_0.05_210520,							
HA026_0.05_210520,	HA027_0.05_210520,							
HA028_0.05_210520,	HA029_0.05_210520,							
HA030_0.05_210520,	HA031_0.05_210520,							
HA032_0.05_210520,	HA033_0.05_210520,							
HA034_0.05_210520,	HA035_0.05_210520,							
HA036_0.05_210520,	HA037_0.05_210520							
HDPE Soil Jar (EP231X)								
HA038_0.05_210520,	HA039_0.05_210520,	20-May-2021	26-May-2021	16-Nov-2021	✓	26-May-2021	05-Jul-2021	✓
HA040_0.05_210520,	QC103_210520							
Soil Glass Jar - Unpreserved (EP231X)								
QC502_210520		14-May-2021	26-May-2021	10-Nov-2021	✓	26-May-2021	05-Jul-2021	✓
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE Soil Jar (EP231X)								
HA012_0.05_210520,	HA013_0.05_210520,	20-May-2021	24-May-2021	16-Nov-2021	✓	25-May-2021	03-Jul-2021	✓
HA016_0.05_210520,	HA017_0.05_210520,							
HA022_0.05_210520,	HA023_0.05_210520,							
HA024_0.05_210520,	HA025_0.05_210520,							
HA026_0.05_210520,	HA027_0.05_210520,							
HA028_0.05_210520,	HA029_0.05_210520,							
HA030_0.05_210520,	HA031_0.05_210520,							
HA032_0.05_210520,	HA033_0.05_210520,							
HA034_0.05_210520,	HA035_0.05_210520,							
HA036_0.05_210520,	HA037_0.05_210520							
HDPE Soil Jar (EP231X)								
HA038_0.05_210520,	HA039_0.05_210520,	20-May-2021	26-May-2021	16-Nov-2021	✓	26-May-2021	05-Jul-2021	✓
HA040_0.05_210520,	QC103_210520							
Soil Glass Jar - Unpreserved (EP231X)								
QC502_210520		14-May-2021	26-May-2021	10-Nov-2021	✓	26-May-2021	05-Jul-2021	✓



Matrix: **SOIL** 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
EP231C: Perfluoroalkyl Sulfonamides							
HDPE Soil Jar (EP231X) HA012_0.05_210520, HA016_0.05_210520, HA022_0.05_210520, HA024_0.05_210520, HA026_0.05_210520, HA028_0.05_210520, HA030_0.05_210520, HA032_0.05_210520, HA034_0.05_210520, HA036_0.05_210520, HA013_0.05_210520, HA017_0.05_210520, HA023_0.05_210520, HA025_0.05_210520, HA027_0.05_210520, HA029_0.05_210520, HA031_0.05_210520, HA033_0.05_210520, HA035_0.05_210520, HA037_0.05_210520	20-May-2021	24-May-2021	16-Nov-2021	✓	25-May-2021	03-Jul-2021	✓
HDPE Soil Jar (EP231X) HA038_0.05_210520, HA040_0.05_210520, HA039_0.05_210520, QC103_210520	20-May-2021	26-May-2021	16-Nov-2021	✓	26-May-2021	05-Jul-2021	✓
Soil Glass Jar - Unpreserved (EP231X) QC502_210520	14-May-2021	26-May-2021	10-Nov-2021	✓	26-May-2021	05-Jul-2021	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE Soil Jar (EP231X) HA012_0.05_210520, HA016_0.05_210520, HA022_0.05_210520, HA024_0.05_210520, HA026_0.05_210520, HA028_0.05_210520, HA030_0.05_210520, HA032_0.05_210520, HA034_0.05_210520, HA036_0.05_210520, HA013_0.05_210520, HA017_0.05_210520, HA023_0.05_210520, HA025_0.05_210520, HA027_0.05_210520, HA029_0.05_210520, HA031_0.05_210520, HA033_0.05_210520, HA035_0.05_210520, HA037_0.05_210520	20-May-2021	24-May-2021	16-Nov-2021	✓	25-May-2021	03-Jul-2021	✓
HDPE Soil Jar (EP231X) HA038_0.05_210520, HA040_0.05_210520, HA039_0.05_210520, QC103_210520	20-May-2021	26-May-2021	16-Nov-2021	✓	26-May-2021	05-Jul-2021	✓
Soil Glass Jar - Unpreserved (EP231X) QC502_210520	14-May-2021	26-May-2021	10-Nov-2021	✓	26-May-2021	05-Jul-2021	✓



Matrix: **SOIL** 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
EP231P: PFAS Sums							
HDPE Soil Jar (EP231X) HA012_0.05_210520, HA016_0.05_210520, HA022_0.05_210520, HA024_0.05_210520, HA026_0.05_210520, HA028_0.05_210520, HA030_0.05_210520, HA032_0.05_210520, HA034_0.05_210520, HA036_0.05_210520, HA013_0.05_210520, HA017_0.05_210520, HA023_0.05_210520, HA025_0.05_210520, HA027_0.05_210520, HA029_0.05_210520, HA031_0.05_210520, HA033_0.05_210520, HA035_0.05_210520, HA037_0.05_210520	20-May-2021	24-May-2021	16-Nov-2021	✓	25-May-2021	03-Jul-2021	✓
HDPE Soil Jar (EP231X) HA038_0.05_210520, HA040_0.05_210520, HA039_0.05_210520, QC103_210520	20-May-2021	26-May-2021	16-Nov-2021	✓	26-May-2021	05-Jul-2021	✓
Soil Glass Jar - Unpreserved (EP231X) QC502_210520	14-May-2021	26-May-2021	10-Nov-2021	✓	26-May-2021	05-Jul-2021	✓

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
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X) SW01_210520, QC302_210520	20-May-2021	25-May-2021	16-Nov-2021	✓	25-May-2021	16-Nov-2021	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X) SW01_210520, QC302_210520	20-May-2021	25-May-2021	16-Nov-2021	✓	25-May-2021	16-Nov-2021	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X) SW01_210520, QC302_210520	20-May-2021	25-May-2021	16-Nov-2021	✓	25-May-2021	16-Nov-2021	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X) SW01_210520, QC302_210520	20-May-2021	25-May-2021	16-Nov-2021	✓	25-May-2021	16-Nov-2021	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X) SW01_210520, QC302_210520	20-May-2021	25-May-2021	16-Nov-2021	✓	25-May-2021	16-Nov-2021	✓



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	Method	Count		Rate (%)			Quality Control Specification
		QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	7	64	10.94	10.00	✔	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	2	18	11.11	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	4	32	12.50	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	2	12	16.67	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	2	12	16.67	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-AES	EG005T	2	20	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	10	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	4	38	10.53	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)	EP075(SIM)	1	18	5.56	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	32	6.25	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	12	8.33	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	12	8.33	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-AES	EG005T	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	10	10.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	38	5.26	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
PAH/Phenols (SIM)	EP075(SIM)	1	18	5.56	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	32	6.25	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	12	8.33	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	12	8.33	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-AES	EG005T	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	10	10.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	38	5.26	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	1	18	5.56	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	32	6.25	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	12	8.33	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	12	8.33	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-AES	EG005T	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	10	10.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	38	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	Method	Count		Rate (%)			Quality Control Specification
		QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	0	17	0.00	10.00	✖	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	17	5.88	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	17	5.88	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	0	17	0.00	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
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
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl ₂) (Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl ₂ which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM Schedule B(3)
Polychlorinated Biphenyls (PCB)	EP066	SOIL	In house: Referenced to USEPA SW 846 - 8270 Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM Schedule B(3).
Pesticides by GCMS	EP068	SOIL	In house: Referenced to USEPA SW 846 - 8270 Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This technique is compliant with NEPM Schedule B(3).
TRH - Semivolatle Fraction	EP071	SOIL	In house: Referenced to USEPA SW 846 - 8015 Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C40. Compliant with NEPM Schedule B(3).
PAH/Phenols (SIM)	EP075(SIM)	SOIL	In house: Referenced to USEPA SW 846 - 8270. Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM Schedule B(3)
TRH Volatiles/BTEX	EP080	SOIL	In house: Referenced to USEPA SW 846 - 8260. Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. Compliant with NEPM Schedule B(3) amended.
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.



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
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	In house: Referenced to USEPA 200.2. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM Schedule B(3).
Methanolic Extraction of Soils for Purge and Trap	ORG16	SOIL	In house: Referenced to USEPA SW 846 - 5030A. 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids	ORG17	SOIL	In house: Mechanical agitation (tumbler). 10g of sample, Na ₂ SO ₄ and surrogate are extracted with 30mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.
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.
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.

ANZ FQM - Chain of Custody Form

Q4AN(EV)-007-FM1

CONSULTANT: AECOM Maree Welch		ADDRESS 17 Warabrook Boulevard, NSW 2304		SAMPLER: Peter Waddingham, James Hughes, Sidnee Harris		Destination Laboratory ALS Newcatsle	
PROJECT MANAGER (PM): Orla Ferguson		SITE: Eraring Origin Power Station		MOBILE: 0447 724 581		PHONE:	
PROJECT NUMBER & TASK CODE: 60622873		P.O. NO.:		EMAIL REPORT TO: Maree.Welch@aecom.com			
RESULTS REQUIRED (Date):		QUOTE NO.:		ANALYSIS REQUIRED including SUITES (note - suite codes must be listed to attract suite prices)			
		COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:		PFAS (full suite - 28 analyses) Asbestos (present / absent) HOLD		Notes: e.g. Highly contaminated sample e.g. "High PAHs expected". Extra volume for QC or trace LORs etc.	
SAMPLE INFORMATION (note: S = Soil, W=Water)				CONTAINER INFORMATION			
ALS ID	SAMPLE ID	MATRIX	DATE	Time	Type / Code	Total bottles	
1	HA012_0.05_210520	Soil	20/05/21				X
2	HA012_0.5_210520	Soil	20/05/21				X
3	HA012_1.0_210520	Soil	20/05/21				X
4	HA013_0.05_210520	Soil	20/05/21				X
5	HA013_0.5_210520	Soil	20/05/21				X
6	HA016_0.05_210520	Soil	23/05/21				X X
7	HA017_0.05_210520	Soil	20/05/21				X
8	HA017_0.5_210520	Soil	20/05/21				X
9	HA017_1.0_210520	Soil	20/05/21				X
10	HA022_0.05_210520	Soil	20/05/21				X
11	HA022_0.5_210520	Soil	20/05/21				X
12	HA022_1.0_210520	Soil	20/05/21				X
13	HA023_0.05_210520	Soil	20/05/21				X
14	HA023_0.5_210520	Soil	20/05/21				X
15	HA023_1.0_210520	Soil	20/05/21				X
16	HA024_0.05_210520	Soil	20/05/21				X
17	HA024_0.5_210520	Soil	20/05/21				X
18	HA024_0.8_210520	Soil	20/05/21				X
19	HA025_0.05_210520	Soil	20/05/21				X

Subcon / Forward Lab / Split WO: _____
 Lab / Analysis: ELWEPHW → QC203, QC204, QC205
 Organised By / Date: _____
 Relinquished By / Date: _____
 Connote / Courier: _____
 WO No: _____
 Attached By PO / Internal Sheet: _____

Asbestos analysis on HOLD

Environmental Division
 Sydney
 Work Order Reference
ES2119057

LAB O
 [Stamp]

Telephone: 01-2-8746 9947

RELINQUISHED BY:		RECEIVED BY:		RECEIVED BY:		METHOD OF SHIPMENT	
Name: <u>Sidnee Harris</u>	Date: <u>20/5/21</u>	Name: <u>AS</u>	Date: <u>20/5/21</u>	Name: <u>[Signature]</u>	Date: <u>20/5/21</u>	Con' Note No:	
Of: <u>AECOM</u>	Time: <u>1650</u>	Of: <u>AS</u>	Time: <u>4:50 PM</u>	Of: <u>[Signature]</u>	Time: <u>20/5/21</u>	Transport Co:	

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Gd 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
 Soil Container Codes: Jar = Unpreserved glass jar

rel: AS 20/5-21

asbestos etc.

COC Page 2 of 3
1 of 4

ANZ
FQM - Chain of Custody Form

Q4AN(EV)-007-FM1

CONSULTANT: AECOM Maree Welch		ADDRESS 17 Warabrook Boulevard, NSW 2304		SAMPLER: Peter Waddingham, James Hughes, Sidnee Harris		Destination Laboratory ALS Newcatsle	
PROJECT MANAGER (PM): Ora Ferguson		SITE: Earing Origin Power Station		MOBILE: 0447 724 581		PHONE:	
PROJECT NUMBER & TASK CODE: 60622873		P.O. NO.:		EMAIL REPORT TO: Maree.Welch@aecom.com			
RESULTS REQUIRED (Date):		QUOTE NO.:		ANALYSIS REQUIRED including SUITES (note - suite codes must be listed to attract suite prices)			
<p>FOR LABORATORY USE ONLY</p> <p>CONSTRUCTION: _____</p> <p>DATE: _____</p> <p>ANALYST: _____</p> <p>CLIENT: _____</p>		COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:		<p>PPAS (full suite - 28 analyses)</p> <p>Absorbs (present / absent)</p> <p>HOLD</p>		<p>Notes: e.g. Highly contaminated sample e.g. "High PAHs expected".</p> <p>Extra volume for QC or trace LORs etc.</p>	
SAMPLE INFORMATION (note: S = Soil, W=Water)				CONTAINER INFORMATION			
ALS ID	SAMPLE ID	MATRIX	DATE	Time	Type / Code	Total bottles	
20	HA025 0.5 210520	Soil	20/05/21				X
21	HA026 0.05 210520	Soil	20/05/21				X
22	HA028 0.5 210520	Soil	20/05/21				X
23	HA026 0.7 210520	Soil	20/05/21				X
24	HA027 0.05 210520	Soil	20/05/21			X	
25	HA027 0.5 210520	Soil	20/05/21				X
26	HA027 1.0 210520	Soil	20/05/21				X
27	HA028 0.05 210520	Soil	20/05/21			X	
28	HA028 0.5 210520	Soil	20/05/21				X
29	HA028 1.0 210520	Soil	20/05/21				X
30	HA029 0.05 210520	Soil	20/05/21			X	
31	HA029 0.5 210520	Soil	20/05/21				X
32	HA030 0.05 210520	Soil	20/05/21			X	
33	HA030 0.2 210520	Soil	20/05/21				X
34	HA031 0.05 210520	Soil	20/05/21			X	
35	HA031 0.5 210520	Soil	20/05/21				X
36	HA031 1.0 210520	Soil	20/05/21				X
37	HA032 0.05 210520	Soil	20/05/21			X	
38	HA032 0.2 210520	Soil	20/05/21				X

REMAILED

LAB OF ORIGIN
NEWCASTLE

RELINQUISHED BY:		RECEIVED BY:		RECEIVED BY:		METHOD OF SHIPMENT	
Name: Sidnee Harris	Date: 20/5/21	Name: KS	Date: 20/5/21	Name: KS	Date: 20/5/21	Con' Note No.:	
Of: AECOM	Time: 1650	Of: ALS	Time: 4:57	Of: ALS	Time: 2:55	Transport Co.:	

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 Bottle; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Solids; B = Unpreserved Bag; Soil Container Codes: Jar = Unpreserved glass jar

Vol: KS 20-5-21

COC Page 2 of 2
2 of 4

ANZ
FQM - Chain of Custody Form

Q4AN(EV)-007-FM1

CONSULTANT: AECOM Maree Welch		ADDRESS 17 Warwick Boulevard, NSW 2304		SAMPLER: Peter Waddingham, James Hughes, Sidnae Harris		Destination Laboratory ALS Newcatsle	
PROJECT MANAGER (PM): Orla Ferguson		SITE: Earing Origin Power Station		MOBILE: 0447 724 581		PHONE:	
PROJECT NUMBER & TASK CODE: 60622873		P.O. NO.:		EMAIL REPORT TO: Maree.Welch@aecom.com			
RESULTS REQUIRED (Date):		QUOTE NO.:		ANALYSIS REQUIRED including SUITES (note - suite codes must be listed to attract suite prices)			
POLYMERIZATION POLY COOLING/HEAT (if pre-approved) TEMPERATURE SUPERATURE COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:				PFAS (full suite - 28 analysis) Asbestos (present / absent) HOLD		Notes: e.g. Highly contaminated sample e.g. "High PAHs expected". Extra volume for QC or trace LORs etc.	
SAMPLE INFORMATION (note: S = Soil, W=Water)				CONTAINER INFORMATION			
ALS ID	SAMPLE ID	MATRIX	DATE	Time	Type / Code	Total bottles	
39	HA033_0.05_210520	Soil	20/05/21				X
40	HA033_0.2_210520	Soil	20/05/21				X
41	HA034_0.05_210520	Soil	20/05/21				X
47	HA034_0.2_210520	Soil	20/05/21				X
43	HA035_0.05_210520	Soil	20/05/21				X
44	HA035_0.2_210520	Soil	20/05/21				X
45	HA036_0.05_210520	Soil	20/05/21				X
46	HA036_0.5_210520	Soil	20/05/21				X
47	HA036_1.0_210520	Soil	20/05/21				X
48	HA037_0.05_210520	Soil	20/05/21				X
48	HA037_0.5_210520	Soil	20/05/21				X
49	HA037_1.0_210520	Soil	20/05/21				X
51	HA038_0.05_210520	Soil	20/05/21				X
52	HA038_0.5_210520	Soil	20/05/21				X
53	HA039_0.05_210520	Soil	20/05/21				X
54	HA039_0.5_210520	Soil	20/05/21				X
55	HA040_0.05_210520	Soil	20/05/21				X
56	SW01_210520	Water	20/05/21				X



Asbestos analysis on HPLD

LAB OF ORIGIN:
NEWCASTLE

RELINQUISHED BY:		RECEIVED BY:		RECEIVED BY:		METHOD OF SHIPMENT	
Name: Sidnae Harris	Date: 20/5/21	Name: [Signature]	Date: 20/5/21	Name: [Signature]	Date: 20/5/21	Con' Note No:	
Of: AECOM	Time: 1650	Of: [Signature]	Time: 1650	Of: [Signature]	Time: 20/5	Transport Co:	

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 GG = 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 Bottle; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag
 Soil Container Codes: Jar = Unpreserved glass jar

Handwritten notes: **III: 15 20/5/21 5m**

COC Page 2 of 3
3 of 4

ANZ
FQM - Chain of Custody Form

Q4AN(EV)-007-FM1

CONSULTANT: AECOM Maree Welch		ADDRESS: 17 Warabrook Boulevard, NSW 2304		SAMPLER: Peter Waddingham, James Hughes, Sidnee Harris		Destination Laboratory ALS Newcatsle	
PROJECT MANAGER (PM): Orla Ferguson		SITE: Eraring Origin Power Station		MOBILE: 0447 724 581		PHONE:	
PROJECT NUMBER & TASK COI: 60622873		P.O. NO.:		EMAIL REPORT TO: Maree.Welch@aecom.com			
RESULTS REQUIRED (Date):		QUOTE NO.:		ANALYSIS REQUIRED including SUITES (note - suite codes must be listed to attract suite prices)			
FOR LABORATORY USE ONLY		COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:		PRAS (full suite - 28 analyses)		Notes: e.g. Highly contaminated sample e.g. "High PAHs expected" Extra volume for QC or trace LORs etc.	
				Absent (present / absent)			
				HOLD			
SAMPLE INFORMATION (note: S = Soil, W = Water)				CONTAINER INFORMATION			
ALS ID	SAMPLE ID	MATRIX	DATE	Time	Type / Code	Total bottles	
57	QC103_210520	Soil	20/05/21				X
58	QC104_210520	Soil	20/05/21				X
59	QC105_210520	Soil	20/05/21				X
-	QC203_210520	Soil	20/05/21				X
-	QC204_210520	Soil	20/05/21				X
-	QC205_210520	Soil	20/05/21				X
60	QC302_210520 IN	Soil	20/05/21				X
61	QC502_210520	Soil	20/05/21				X
62	QC602_210520	Soil	20/05/21				X
RELINQUISHED BY:		RECEIVED BY:		RECEIVED BY:		METHOD OF SHIPMENT	
Name: Sidnee Harris		Name: V/S		Name: Sidnee Harris		Cony' Note No:	
Date: 20/5/24		Date: 20/5/24		Date: 20/5/24		Transport Co:	
Time: 1650		Time: 1650		Time: 1650			
Of: Aecom		Of: A/S		Of: A/S			

REMAILED

REMAILED

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Gd 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 = 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 Bottle; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.
Soil Container Codes: Jar = Unpreserved glass jar

rel: 68 20-5-24

COC Page 2 of 3
4 of 4



CERTIFICATE OF ANALYSIS

Work Order : ES2120685
Client : AECOM Australia Pty Ltd
Contact : MS ORLA FERGUSON
Address : 17 WARABROOK BOULEVARDE
 WARABROOK NSW, AUSTRALIA 2304
Telephone : +61 02 8934 0000
Project : 60622873 1.0
Order number : 60622873/1.0
C-O-C number : —
Sampler : JAMES HUGHES, PETER WADDINGHAM, SIDNEE HARRIS
Site : Eraring Origin Power Station
Quote number : EN/004/20
No. of samples received : 20
No. of samples analysed : 20

Page : 1 of 13
Laboratory : Environmental Division Sydney
Contact : Brenda Hong
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Date Samples Received : 19-May-2021 19:30
Date Analysis Commenced : 04-Jun-2021
Issue Date : 10-Jun-2021 14:16



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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

Signatories

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

Signatories	Position	Accreditation Category
Franco Lentini	LCMS Coordinator	Sydney Inorganics, 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.
- 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.
- EN33: Where leachable PFAS analysis is requested, centrifugation rather than pressure filtration is used as the default approach for removal of particulates, in line with AS 4439.3.



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	HA018_0.05	HA018_0.5	HA019_0.05	HA019_0.5	HA019_0.7
Sampling date / time				19-May-2021 00:00					
Compound	CAS Number	LOR	Unit	ES2120685-001	ES2120685-002	ES2120685-003	ES2120685-004	ES2120685-005	
				Result	Result	Result	Result	Result	
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	---	0.1	%	---	19.3	---	33.8	23.6	
EN33: TCLP Leach - Inorganics/PFAS (Plastic Vessel)									
Initial pH	---	0.1	pH Unit	8.6	---	8.4	---	---	
After HCl pH	---	0.1	pH Unit	1.5	---	1.4	---	---	
Extraction Fluid Number	---	1	-	1	---	1	---	---	
Final pH	---	0.1	pH Unit	6.0	---	5.1	---	---	
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	---	<0.0002	---	<0.0002	<0.0002	
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	---	<0.0002	---	<0.0002	<0.0002	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	---	<0.0002	---	<0.0002	<0.0002	
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	---	<0.0002	---	<0.0002	<0.0002	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	---	<0.0002	---	0.0002	<0.0002	
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	---	<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	
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	---	<0.0002	---	<0.0002	<0.0002	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	---	<0.0002	---	<0.0002	<0.0002	
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	---	<0.0002	---	<0.0002	<0.0002	
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	---	<0.0002	---	<0.0002	<0.0002	
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	---	<0.0002	---	<0.0002	<0.0002	
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	---	<0.0002	---	<0.0002	0.0003	
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	---	<0.0002	---	<0.0002	<0.0002	
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	---	<0.0002	---	<0.0002	<0.0002	
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	---	<0.0002	---	<0.0002	<0.0002	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	---	<0.0005	---	<0.0005	<0.0005	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	HA018_0.05	HA018_0.5	HA019_0.05	HA019_0.5	HA019_0.7
Sampling date / time				19-May-2021 00:00					
Compound	CAS Number	LOR	Unit	ES2120685-001	ES2120685-002	ES2120685-003	ES2120685-004	ES2120685-005	
				Result	Result	Result	Result	Result	
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	--	<0.0002	---	<0.0002	<0.0002	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	--	<0.0005	---	<0.0005	<0.0005	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	--	<0.0005	---	<0.0005	<0.0005	
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	--	<0.0005	---	<0.0005	<0.0005	
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	--	<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	
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	--	<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	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	--	<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	
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	--	<0.0005	---	<0.0005	<0.0005	
EP231P: PFAS Sums									
Sum of PFAS	---	0.0002	mg/kg	--	<0.0002	---	0.0002	0.0003	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	--	<0.0002	---	0.0002	<0.0002	
Sum of PFAS (WA DER List)	---	0.0002	mg/kg	--	<0.0002	---	0.0002	<0.0002	
EP231S: PFAS Surrogate									
13C4-PFOS	---	0.0002	%	--	94.0	---	62.5	80.0	
13C8-PFOA	---	0.0002	%	--	99.5	---	90.5	92.0	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	HA021_0.3	HA025_0.05	HA025_0.5	HA028_0.05	HA028_0.5
Sampling date / time				19-May-2021 00:00	20-May-2021 00:00	20-May-2021 00:00	20-May-2021 00:00	20-May-2021 00:00	
Compound	CAS Number	LOR	Unit	ES2120685-006	ES2120685-007	ES2120685-008	ES2120685-009	ES2120685-010	
				Result	Result	Result	Result	Result	
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	---	0.1	%	9.8	---	68.4	---	15.0	
EN33: TCLP Leach - Inorganics/PFAS (Plastic Vessel)									
Initial pH	---	0.1	pH Unit	---	5.7	---	4.0	---	
After HCl pH	---	0.1	pH Unit	---	1.2	---	---	---	
Extraction Fluid Number	---	1	-	---	1	---	1	---	
Final pH	---	0.1	pH Unit	---	4.9	---	4.9	---	
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	---	<0.0002	---	<0.0002	
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	---	<0.0002	---	<0.0002	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	---	0.0006	---	<0.0002	
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	---	<0.0002	---	<0.0002	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	---	0.0042	---	<0.0002	
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<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	
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	---	<0.0002	---	<0.0002	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	---	<0.0002	---	<0.0002	
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	---	<0.0002	---	<0.0002	
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	---	<0.0002	---	<0.0002	
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	---	<0.0002	---	<0.0002	
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	---	<0.0002	---	<0.0002	
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	---	<0.0002	---	<0.0002	
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	---	<0.0002	---	<0.0002	
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	---	<0.0002	---	<0.0002	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	---	<0.0005	---	<0.0005	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	HA021_0.3	HA025_0.05	HA025_0.5	HA028_0.05	HA028_0.5
Sampling date / time				19-May-2021 00:00	20-May-2021 00:00	20-May-2021 00:00	20-May-2021 00:00	20-May-2021 00:00	
Compound	CAS Number	LOR	Unit	ES2120685-006	ES2120685-007	ES2120685-008	ES2120685-009	ES2120685-010	
				Result	Result	Result	Result	Result	
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	---	<0.0002	---	<0.0002	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	---	<0.0005	---	<0.0005	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	---	<0.0005	---	<0.0005	
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	---	<0.0005	---	<0.0005	
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<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	
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<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	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<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	
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	---	<0.0005	---	<0.0005	
EP231P: PFAS Sums									
Sum of PFAS	---	0.0002	mg/kg	<0.0002	---	0.0048	---	<0.0002	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	---	0.0048	---	<0.0002	
Sum of PFAS (WA DER List)	---	0.0002	mg/kg	<0.0002	---	0.0048	---	<0.0002	
EP231S: PFAS Surrogate									
13C4-PFOS	---	0.0002	%	77.5	---	91.5	---	90.0	
13C8-PFOA	---	0.0002	%	93.0	---	89.5	---	92.0	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	HA028_1.0	HA030_0.2	HA031_0.5	HA031_1.0	HA032_0.05
Sampling date / time				20-May-2021 00:00					
Compound	CAS Number	LOR	Unit	ES2120685-011	ES2120685-012	ES2120685-013	ES2120685-014	ES2120685-015	
				Result	Result	Result	Result	Result	
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	---	0.1	%	16.8	10.3	12.7	13.4	--	
EN33: TCLP Leach - Inorganics/PFAS (Plastic Vessel)									
Initial pH	---	0.1	pH Unit	---	---	---	---	5.8	
After HCl pH	---	0.1	pH Unit	---	---	---	---	1.3	
Extraction Fluid Number	---	1	-	---	---	---	---	1	
Final pH	---	0.1	pH Unit	---	---	---	---	4.9	
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	---	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	HA028_1.0	HA030_0.2	HA031_0.5	HA031_1.0	HA032_0.05
Sampling date / time				20-May-2021 00:00					
Compound	CAS Number	LOR	Unit	ES2120685-011	ES2120685-012	ES2120685-013	ES2120685-014	ES2120685-015	
				Result	Result	Result	Result	Result	
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	--	
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	%	102	94.0	93.0	98.0	--	
13C8-PFOA	---	0.0002	%	93.5	97.5	95.0	96.5	--	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	HA032_0.5	HA033_0.2	HA035_0.2	QC104	QC105
Sampling date / time				20-May-2021 00:00					
Compound	CAS Number	LOR	Unit	ES2120685-016	ES2120685-017	ES2120685-018	ES2120685-019	ES2120685-020	
				Result	Result	Result	Result	Result	
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	---	0.1	%	11.6	11.2	6.2	23.9	28.2	
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<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	<0.0002	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<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	<0.0002	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0002	0.0004	<0.0002	
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<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	<0.001	
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	0.0003	<0.0002	<0.0002	<0.0002	<0.0002	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	0.0003	<0.0002	<0.0002	<0.0002	<0.0002	
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	0.0004	<0.0002	<0.0002	<0.0002	<0.0002	
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	0.0006	<0.0002	<0.0002	<0.0002	<0.0002	
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	0.0023	<0.0002	<0.0002	<0.0002	<0.0002	
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	0.0005	<0.0002	<0.0002	<0.0002	<0.0002	
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	0.0004	<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	<0.0002	
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<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	<0.0005	
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<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	<0.0005	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	HA032_0.5	HA033_0.2	HA035_0.2	QC104	QC105
Sampling date / time				20-May-2021 00:00					
Compound	CAS Number	LOR	Unit	ES2120685-016	ES2120685-017	ES2120685-018	ES2120685-019	ES2120685-020	
				Result	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	<0.0005	
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<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	<0.0005	
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<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	<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	<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	<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	<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	<0.0005	
EP231P: PFAS Sums									
Sum of PFAS	---	0.0002	mg/kg	0.0048	<0.0002	0.0002	0.0004	<0.0002	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0002	0.0004	<0.0002	
Sum of PFAS (WA DER List)	---	0.0002	mg/kg	0.0016	<0.0002	0.0002	0.0004	<0.0002	
EP231S: PFAS Surrogate									
13C4-PFOS	---	0.0002	%	104	93.5	99.0	102	72.5	
13C8-PFOA	---	0.0002	%	97.0	94.0	92.5	86.0	88.5	



Analytical Results

Sub-Matrix: TCLP LEACHATE
 (Matrix: WATER)

		Sample ID		HA018_0.05	HA019_0.05	HA025_0.05	HA028_0.05	HA032_0.05
		Sampling date / time		19-May-2021 00:00	19-May-2021 00:00	20-May-2021 00:00	20-May-2021 00:00	20-May-2021 00:00
Compound	CAS Number	LOR	Unit	ES2120685-001	ES2120685-003	ES2120685-007	ES2120685-009	ES2120685-015
				Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.02	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	0.03
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	<0.01	<0.01	0.05
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	0.12
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	0.06
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05



Analytical Results

Sub-Matrix: TCLP LEACHATE (Matrix: WATER)				Sample ID	HA018_0.05	HA019_0.05	HA025_0.05	HA028_0.05	HA032_0.05
Sampling date / time				19-May-2021 00:00	19-May-2021 00:00	20-May-2021 00:00	20-May-2021 00:00	20-May-2021 00:00	
Compound	CAS Number	LOR	Unit	ES2120685-001	ES2120685-003	ES2120685-007	ES2120685-009	ES2120685-015	
				Result	Result	Result	Result	Result	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	<0.02	<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	<0.05	<0.05	<0.05	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
EP231P: PFAS Sums									
Sum of PFAS	---	0.01	µg/L	<0.01	<0.01	0.02	<0.01	0.26	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.02	<0.01	<0.01	
Sum of PFAS (WA DER List)	---	0.01	µg/L	<0.01	<0.01	0.02	<0.01	0.08	
EP231S: PFAS Surrogate									
13C4-PFOS	---	0.02	%	90.6	82.6	90.7	91.1	99.4	
13C8-PFOA	---	0.02	%	113	114	113	113	114	



Surrogate Control Limits

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

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



QUALITY CONTROL REPORT

Work Order	: ES2120685	Page	: 1 of 8
Client	: AECOM Australia Pty Ltd	Laboratory	: Environmental Division Sydney
Contact	: MS ORLA FERGUSON	Contact	: Brenda Hong
Address	: 17 WARABROOK BOULEVARDE	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
	: WARABROOK NSW, AUSTRALIA 2304		
Telephone	: +61 02 8934 0000	Telephone	: +61 2 8784 8555
Project	: 60622873 1.0	Date Samples Received	: 19-May-2021
Order number	: 60622873/1.0	Date Analysis Commenced	: 04-Jun-2021
C-O-C number	: —	Issue Date	: 10-Jun-2021
Sampler	: JAMES HUGHES, PETER WADDINGHAM, SIDNEE HARRIS		
Site	: Eraring Origin Power Station		
Quote number	: EN/004/20		
No. of samples received	: 20		
No. of samples analysed	: 20		



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

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

This Quality Control Report contains the following information:

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

Signatories

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

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Franco Lentini	LCMS Coordinator	Sydney Inorganics, 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

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: 3726677)									
ES2120685-004	HA019_0.5	EA055: Moisture Content	---	0.1	%	33.8	34.4	1.6	0% - 20%
ES2120685-018	HA035_0.2	EA055: Moisture Content	---	0.1	%	6.2	6.3	0.0	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 3717500)									
ES2120351-003	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	0.0065	0.0049	28.3	0% - 50%
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	0.0133	0.0131	1.5	0% - 20%
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	0.160	0.160	0.6	0% - 20%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	0.0152	0.0144	4.7	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.240	0.220	8.5	0% - 20%
ES2120685-012	HA030_0.2	EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		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
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 3717500)									
ES2120351-003	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	0.0012	0.0009	21.2	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	0.0136	0.0133	2.6	0% - 20%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	0.0020	0.0018	10.5	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	0.0078	0.0074	5.4	0% - 20%
		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: 3717500) - continued									
ES2120351-003	Anonymous	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
ES2120685-012	HA030_0.2	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: 3717500)									
ES2120351-003	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
ES2120685-012	HA030_0.2	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: 3717500)									
ES2120351-003	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
ES2120685-012	HA030_0.2	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

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
				Result	Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low High	
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3717500)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.00125 mg/kg	91.2	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	118	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	90.8	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	100	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	87.2	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	105	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3717500)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	101	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	104	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	101	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	106	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	106	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	95.6	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	102	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 (PFTTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	97.2	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	108	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3717500)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.8	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	111	71.6	129
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	102	69.8	131
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	110	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	103	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.4	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3717500)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	94.0	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	116	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	123	65.0	137



Sub-Matrix: SOIL				Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report			
Method: Compound	CAS Number	LOR	Unit		Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low High	
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3717500) - continued								
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.00125 mg/kg	114	69.2	143

Sub-Matrix: WATER				Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report			
Method: Compound	CAS Number	LOR	Unit		Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low High	
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3720298)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	109	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	0.02	µg/L	<0.02	0.25 µg/L	105	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	115	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	95.4	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	116	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3720298)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	96.2	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	111	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	112	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	115	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	122	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	116	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	122	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	116	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	111	72.0	134
EP231X: Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	94.0	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	108	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3720298)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	123	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	118	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	118	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	108	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	142	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	121	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	114	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3720298)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	111	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	114	64.0	140



Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB)	Laboratory Control Spike (LCS) Report			
				Report	Spike Concentration	Spike Recovery (%)	Acceptable Limits (%)	
				Result			Low	High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3720298) - continued								
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	125	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	94.0	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**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report			
				Spike Concentration	Spike Recovery (%)	Acceptable Limits (%)	
						MS	Low
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3717500)							
ES2120351-003	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00125 mg/kg	# Not Determined	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00125 mg/kg	# Not Determined	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00125 mg/kg	# Not Determined	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00125 mg/kg	# Not Determined	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	123	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3717500)							
ES2120351-003	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	104	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	77.6	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	# Not Determined	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	# Not Determined	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	92.4	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	95.2	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	90.4	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	86.8	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTriDA)	72629-94-8	0.00125 mg/kg	81.2	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	97.1	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3717500)							
ES2120351-003	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	89.2	67.0	137



Sub-Matrix: SOIL

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
				Concentration	MS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3717500) - continued							
ES2120351-003	Anonymous	EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	93.9	71.6	129
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	83.5	69.8	131
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	88.6	68.7	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	95.8	65.1	134
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	86.0	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	86.0	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3717500)							
ES2120351-003	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00125 mg/kg	89.6	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00125 mg/kg	90.8	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.00125 mg/kg	97.6	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00125 mg/kg	76.0	69.2	143



QA/QC Compliance Assessment to assist with Quality Review

Work Order	: ES2120685	Page	: 1 of 8
Client	: AECOM Australia Pty Ltd	Laboratory	: Environmental Division Sydney
Contact	: MS ORLA FERGUSON	Telephone	: +61 2 8784 8555
Project	: 60622873 1.0	Date Samples Received	: 19-May-2021
Site	: Eraring Origin Power Station	Issue Date	: 10-Jun-2021
Sampler	: JAMES HUGHES, PETER WADDINGHAM, SIDNEE HARRIS	No. of samples received	: 20
Order number	: 60622873/1.0	No. of samples analysed	: 20

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

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



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	ES2120351--003	Anonymous	Perfluorobutane sulfonic acid (PFBS)	375-73-5	Not Determined	---	MS recovery not determined, background level greater than or equal to 4x spike level.
EP231A: Perfluoroalkyl Sulfonic Acids	ES2120351--003	Anonymous	Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	Not Determined	---	MS recovery not determined, background level greater than or equal to 4x spike level.
EP231A: Perfluoroalkyl Sulfonic Acids	ES2120351--003	Anonymous	Perfluorohexane sulfonic acid (PFHxS)	355-46-4	Not Determined	---	MS recovery not determined, background level greater than or equal to 4x spike level.
EP231A: Perfluoroalkyl Sulfonic Acids	ES2120351--003	Anonymous	Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	Not Determined	---	MS recovery not determined, background level greater than or equal to 4x spike level.
EP231A: Perfluoroalkyl Sulfonic Acids	ES2120351--003	Anonymous	Perfluorooctane sulfonic acid (PFOS)	1763-23-1	Not Determined	---	MS recovery not determined, background level greater than or equal to 4x spike level.
EP231B: Perfluoroalkyl Carboxylic Acids	ES2120351--003	Anonymous	Perfluorohexanoic acid (PFHxA)	307-24-4	Not Determined	---	MS recovery not determined, background level greater than or equal to 4x spike level.
EP231B: Perfluoroalkyl Carboxylic Acids	ES2120351--003	Anonymous	Perfluorooctanoic acid (PFOA)	335-67-1	Not Determined	---	MS recovery not determined, background level greater than or equal to 4x spike level.

Outliers : Analysis Holding Time Compliance

Matrix: **SOIL**

Method	Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EA055: Moisture Content (Dried @ 105-110°C)							
HDPE Soil Jar							
HA018_0.5,	HA019_0.5,	---	---	---	09-Jun-2021	02-Jun-2021	7
HA019_0.7,	HA021_0.3						
HDPE Soil Jar							
HA025_0.5,	HA028_0.5,	---	---	---	09-Jun-2021	03-Jun-2021	6
HA028_1.0,	HA030_0.2,						
HA031_0.5,	HA031_1.0,						
HA032_0.5,	HA033_0.2,						
HA035_0.2,	QC104,						
QC105							

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**



Matrix: SOIL 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	
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE Soil Jar (EP231X) HA018_0.5, HA019_0.7,	HA019_0.5, HA021_0.3	19-May-2021	04-Jun-2021	15-Nov-2021	✓	04-Jun-2021	14-Jul-2021	✓
HDPE Soil Jar (EP231X) HA025_0.5, HA028_1.0, HA031_0.5, HA032_0.5, HA035_0.2, QC105	HA028_0.5, HA030_0.2, HA031_1.0, HA033_0.2, QC104,	20-May-2021	04-Jun-2021	16-Nov-2021	✓	04-Jun-2021	14-Jul-2021	✓
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE Soil Jar (EP231X) HA018_0.5, HA019_0.7,	HA019_0.5, HA021_0.3	19-May-2021	04-Jun-2021	15-Nov-2021	✓	04-Jun-2021	14-Jul-2021	✓
HDPE Soil Jar (EP231X) HA025_0.5, HA028_1.0, HA031_0.5, HA032_0.5, HA035_0.2, QC105	HA028_0.5, HA030_0.2, HA031_1.0, HA033_0.2, QC104,	20-May-2021	04-Jun-2021	16-Nov-2021	✓	04-Jun-2021	14-Jul-2021	✓
EP231C: Perfluoroalkyl Sulfonamides								
HDPE Soil Jar (EP231X) HA018_0.5, HA019_0.7,	HA019_0.5, HA021_0.3	19-May-2021	04-Jun-2021	15-Nov-2021	✓	04-Jun-2021	14-Jul-2021	✓
HDPE Soil Jar (EP231X) HA025_0.5, HA028_1.0, HA031_0.5, HA032_0.5, HA035_0.2, QC105	HA028_0.5, HA030_0.2, HA031_1.0, HA033_0.2, QC104,	20-May-2021	04-Jun-2021	16-Nov-2021	✓	04-Jun-2021	14-Jul-2021	✓



Matrix: **SOIL** 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	
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE Soil Jar (EP231X) HA018_0.5, HA019_0.7,	HA019_0.5, HA021_0.3	19-May-2021	04-Jun-2021	15-Nov-2021	✓	04-Jun-2021	14-Jul-2021	✓
HDPE Soil Jar (EP231X) HA025_0.5, HA028_1.0, HA031_0.5, HA032_0.5, HA035_0.2, QC105	HA028_0.5, HA030_0.2, HA031_1.0, HA033_0.2, QC104,	20-May-2021	04-Jun-2021	16-Nov-2021	✓	04-Jun-2021	14-Jul-2021	✓
EP231P: PFAS Sums								
HDPE Soil Jar (EP231X) HA018_0.5, HA019_0.7,	HA019_0.5, HA021_0.3	19-May-2021	04-Jun-2021	15-Nov-2021	✓	04-Jun-2021	14-Jul-2021	✓
HDPE Soil Jar (EP231X) HA025_0.5, HA028_1.0, HA031_0.5, HA032_0.5, HA035_0.2, QC105	HA028_0.5, HA030_0.2, HA031_1.0, HA033_0.2, QC104,	20-May-2021	04-Jun-2021	16-Nov-2021	✓	04-Jun-2021	14-Jul-2021	✓

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	
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE (no PTFE) (EP231X) HA018_0.05, HA025_0.05, HA032_0.05	HA019_0.05, HA028_0.05,	04-Jun-2021	07-Jun-2021	01-Dec-2021	✓	07-Jun-2021	01-Dec-2021	✓
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE (no PTFE) (EP231X) HA018_0.05, HA025_0.05, HA032_0.05	HA019_0.05, HA028_0.05,	04-Jun-2021	07-Jun-2021	01-Dec-2021	✓	07-Jun-2021	01-Dec-2021	✓
EP231C: Perfluoroalkyl Sulfonamides								
HDPE (no PTFE) (EP231X) HA018_0.05, HA025_0.05, HA032_0.05	HA019_0.05, HA028_0.05,	04-Jun-2021	07-Jun-2021	01-Dec-2021	✓	07-Jun-2021	01-Dec-2021	✓



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	
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE (no PTFE) (EP231X) HA018_0.05, HA025_0.05, HA032_0.05	HA019_0.05, HA028_0.05,	04-Jun-2021	07-Jun-2021	01-Dec-2021	✓	07-Jun-2021	01-Dec-2021	✓
EP231P: PFAS Sums								
HDPE (no PTFE) (EP231X) HA018_0.05, HA025_0.05, HA032_0.05	HA019_0.05, HA028_0.05,	04-Jun-2021	07-Jun-2021	01-Dec-2021	✓	07-Jun-2021	01-Dec-2021	✓



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	Method	Count		Rate (%)			Quality Control Specification
		QC	Regular	Actual	Expected	Evaluation	
Analytical Methods							
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	19	10.53	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
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	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

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

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Regular	Actual	Expected	Evaluation	
Analytical Methods							
Laboratory Duplicates (DUP)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	0	20	0.00	10.00	✖	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	0	20	0.00	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
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 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
TCLP for Non & Semivolatile Analytes - Plastic Leaching Vessel	EN33a-P	SOIL	In house QWI-EN/33 referenced to USEPA SW846-1311: The TCLP procedure is designed to determine the mobility of both organic and inorganic analytes present in wastes. The standard TCLP leach is for non-volatile and Semivolatile test parameters.
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.
Solid Phase Extraction (SPE) for PFAS in water	ORG72	SOIL	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.

Appendix G

Field Sheets

Project Name:	Eraring BESS Contamination	Project Number:	60622873	Borehole No.:	HA001
Project Location:	Eraring	Client:	Origin	Sheet	1 of 1
PM Name:	Orla Ferguson	Date Commenced:	18/5/21		
Bore Location:	32.069919, 151.509692	Date Completed:	18/5/21		
Drill Contractor:	NA	Fieldwork Staff:	J. Hughes, J. Harris		
Drill Model:	Hole Angle:	deg	Bore Size:	RL	
Drilling Fluid:	Orientation:	deg	Co-ords:	Permit No.:	

Field Data															
Method	Casing	Penetration	Depth	Graphic Log	USCS Classification	Material Description Type, colour/mottling, plasticity/particle size, secondary/minor components, soil origin	Moisture	Consistency/Rel Density	PID (ppm)	Sampling	Field Notes Odour, staining, groundwater observations/remarks, additional information	Well Construction			
												Depth	Anulus	Casing	Anulus
HA			0.0			SAND w/ trace gravel. Black to dark brown, trace orange. Dry. Medium grain, coarse, very loose.			2.1	0.1	BH001-0.1-210518				
			0.1			CLAY w/ trace gravel/sand. Dark orange to light brown. Moist. Medium grain, coarse, loose. Rounded, firm, medium plasticity.				0.5	BH001-0.5-210518				
			0.5			As above, white mottling, high plasticity.									
			0.6			As above, black with orange trace brown. Hard, high plasticity.									
			0.8			As above.									
			1.0			As above.									
						Target depth reached at 1.0m.									

FQM - Borehole Monitoring Bore Field Log

Project Name:		Eraring BESS Contamination		Project Number:		60000250 60622873		Borehole No.:		HA002	
Project Location:		Eraring		Client:		Orghin		Date Commenced:		18/5/21	
PM Name:		Orla Ferguson		Date Completed:		18/5/21		Sheet		1 of 1	
Bore Location:		-33.069647; 151.509840		Fieldwork Staff:		J. Hughes; S. Haynes		Drill Model:		Hole Angle:	
Drill Contractor:		NA		Orientation:		deg		Bore Size:		deg	
Drilling Fluid:		Orientation:		deg		Co-ords:		RL:		Permit No.:	

Method	Casing	Penetration	Depth	Graphic Log	USCS Classification	Material Description			Field Data		Field Notes	Well Construction			
						Type, colour/mottling, plasticity/particle size, secondary/minor components, soil origin	Moisture	Consistency/Rel Density	PID (ppm)	Sampling		Depth	Annulus	Casing	Annulus
HA			0.0 0.1 0.2			<p>Bravelery CLAY w/ trace sand. Brown with trace orange/red, with black and white mottling. Moist. very coarse to medium grain. Loose.</p> <p>As above. Unable to reach target depth due to large rock.</p> <p>Reached depth at 0.2m</p>			2.6	0.1	BH002-0.1-210518				

FQM - Borehole Monitoring Bore Field Log

Project Name:		Eraring BESS Contamination		Project Number:		60630250 60622873		Borehole No.:		HA003	
Project Location:		Eraring		Client:		Origin		Sheet		1 of 1	
PM Name:		Orla Ferguson		Date Commenced:		18/05/21		Date Completed:		18/05/21	
Bore Location:		-23 06970S; 151 510274		Fieldwork Staff:		J. Hughes, SHAMJ		Drill Model:		Hole Angle	
Drill Contractor:		NA		Drilling Fluid:		Orientation		Bore Size:		RL	
										Permit No.:	

Method	Casing	Penetration	Depth	Graphics Log	USCS Classification	Material Description			Field Data		Field Notes	Well Construction							
						Type, colour/mottling, plasticity/particle size, secondary/minor components, soil origin	Moisture	Consistency/Rel Density	PID (ppm)	Sampling		Depth	Anulus	Casing	Anulus				
HA			0.0																
			0.1			Sandy GRAVEL. Light brown colour. Dry. Very coarse grain. very loose, moderate sorting, sub-rounded.			0.1	0.1	BH003-0.1-210518								
			0.2			CLAY. Light brown w/ trace orange. Moist. Fine grain. Stiff, non-plastic			0.0	0.5	BH003-0.5-210518								
			0.5			As above, medium stiff, low plasticity. Light brown/orange w/ trace red colour													
			0.6			As above, stiff, non-plastic. Red colouring w/ white mottling													
			0.7			As above, red colouring w/ white mottling and trace orange/black. Hard to friable													
			1.0			As above.			0.0	1.0	BH003-1.0-210518								
						Target depth reached at 1.0m.													

Project Name:		Eraring BESS Contamination		Project Number:		60622873		Borehole No.:		HA004	
Project Location:		Eraring		Client:		Origin					
PM Name:		Orle Ferguson		Date Commenced:		18/05/11					
Bore Location:		-23.069500, 151.510767		Date Completed:		18/05/11		Sheet		1 of 1	
Drill Contractor:		NA		Fieldwork Staff:		J. Hughes; S-HA m					
Drill Model:		Hole Angle:		deg.		Bore Size:		deg.		RL:	
Drilling Fluid:		Orientation:		deg.		Co-ords:				Permit No.:	

Field Data															
Method	Casing	Penetration	Depth	Graphic Log	USCS Classification	Material Description Type, colour/mottling, plasticity/particle size, secondary/minor components, soil origin	Moisture	Consistency/Rel Density	PID (ppm)	Sampling	Field Notes Colour, staining, groundwater observations/regime, additional information	Well Construction			
												Depth	Anulus	Casing	Anulus
HA			0.0			CLAY Sandy GRAVEL. Light brown w/ white streaks. Damp, coarse to fine grains. Medium stiff, sub-angular, low plasticity. As above, trace rootlets.			0.7	0.1	BH004-0.1-210518				
			0.1			As above, trace rootlets.									
			0.2			As above, no rootlets, more white colouring.									
			0.3			As above									
			0.5			As above, more red staining, As above, more light orange colour			0.2	0.5	BH004-0.5-210518				
			0.6			As above, white and red staining, light brown colour w/ trace orange									
			0.7												
			1.0			Target depth reached at 1.0m.			0.0	1.0	BH004-1.0-210518				

Project Name:	Eraring BESS Contamination	Project Number:	60602200 60622873	Borehole No.:	HA005 1 of 1
Project Location:	Eraring	Client:	Origin		
PM Name:	Orla Ferguson	Date Commenced:	18/05/21		
Bore Location:	-33.069122; 151.510321	Date Completed:	18/05/21		
Drill Contractor:	NA	Fieldwork Staff:	J. Hughes, J. Hamill	Sheet	
Drill Method:	Hole Angle:	deg	Bore Size:	RL:	
Drilling Fluid:	Orientation:	deg	Co-ords:	Permit No.:	

Field Data						Well Construction														
Method	Casing	Penetration	Depth	Material Description	Field Notes	Well Construction														
						Moisture	Consistency/Rel Density	PID (ppm)	Sampling	Depth	Anulus	Casing	Anulus							
Graphic Log	USCS Classification	Type, colour/mottling, plasticity/particle size, secondary/minor components, soil origin	Odour, staining, groundwater observations/regime, additional information	Gate:	Standpipe:	Well Cap:	Surface Seal:	Backfill:	See:	Filter pack:										
			0.0 0.1 0.2	Gravelly SAND. Light brown w/ trace white/grey. Dry coarse to fine gravels/sand. Well sorted, sub-rounded.																
				As above. Unable to reach target depth due to large rock. Reached depth at 0.25m																

Project Name:	Eraring BESS Contamination	Project Number:	60630250	Borehole No.:	HA006
Project Location:	Eraring	Client:	Origin		
PM Name:	Cris Ferguson	Date Commenced:	19/5/21	Sheet	1 of 1
Bore Location:		Date Completed:			
Drill Contractor:		Fieldwork Staff:			
Drill Model:	Hole Angle:	deg.	Bore Size:	RL	
Drilling Fluid	Orientation:	deg.	Co-ords:	Permit No.:	

Field Data															
Method	Casing	Penetration	Depth	Graphic Log	USCS Classification	Material Description Type, colour/mottling, plasticity/particle size, secondary/minor components, soil origin	Moisture	Consistency/Rel Density	PID (ppm)	Sampling	Field Notes Odour, staining, groundwater observations/regime, additional information	Well Construction			
												Depth	Anulus	Casing	Anulus
			0.0			gravelly sand, brown, Dry, loose, few fine-medium grain, few rocklets no colour.	D				HA006 0.05				
			0.100			Sandy clay Dark brown, moist, loose, fine-medium grain, few gravels, cobbles, no colour.	M				HA006-0.5				
			0.5			As above									
			1.0			As above					HA006-1.0				
						GPS -33.068776 151.509747									

Project Name:		Eraring BESS Contamination		Project Number:		60630250		Borehole No.:		HA007	
Project Location:		Eraring		Client:		Origin					
PM Name:		Orla Ferguson		Date Commenced:		14/5/21					
Bore Location:		-33.068380, 151.509893		Date Completed:				Sheet		1 of 1	
Drill Contractor:				Fieldwork Staff:		PW					
Drill Model:		Hole Angle:		deg		Bore Size:		RL:			
Drilling Fluid:		Orientation:		deg		Co-ords:		Permit No.:			

Field Data															
Method	Casing	Penetration	Depth	Graphic Log	USCS Classification	Material Description Type, colour/mottling, plasticity/particle size, secondary/minor components, soil origin	Moisture	Consistency/Rel Density	PID (ppm)	Sampling	Field Notes Colour, staining, groundwater observations/regime, additional information	Well Construction			
												Depth	Anulus	Casing	Anulus
			0.0			Sand, brown colour, too dry, some grass, gravels, no odour	0		0.0		0.05 HA007-0.05				
			0.100			sand clay, orange brown colour moist, loose low plasticity with gravels, no odour									
			0.5			Sandy clay, bright brown, moist, medium plasticity soft, few gravels, no odour	m		0.0		0.5 HA007-0.5				
			1.0			clay, light brown, moist high plasticity soft few gravels, no odour	m		0.0		1.0 HA007-1.0				
GPS -33.068380 151.509893															

ANZ
FQM - Borehole Monitoring Bore Field Log

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Project Name:	Eraring BESS Contamination	Project Number:	60630250 60622873	Borehole No.:	
Project Location:	Eraring	Client:	Origin		
PM Name:	Orle Ferguson	Date Commenced:	19/5/21		HA008
Bore Location:	-33 068663; 151 510963	Date Completed:			Sheet 1 of 1
Drill Contractor:	NA	Fieldwork Staff:	P. Wood/ingham; S. Harris		
Drill Mode:	Hole Angle: deg	Bore Size:		RL:	
Drilling Fluid:	Orientation: deg	Co-ords:		Permit No.:	

Field Data															
Mudhead	Casing	Penetration	Depth	Graphic Log	USCS Classification	Material Description Type, colour/mottling, plasticity/particle size, secondary/minor components, soil origin	Moisture	Consistency/Rel Density	PID (ppm)	Sampling	Field Notes Odour, staining, groundwater observations/regime, additional information	Well Construction			
												Depth	Anulus	Casing	Anulus
HA			0.0			w/ trace gravels CLAY: light brown. Firm, medium plasticity. Sandy CLAY, light brown w/ orange. soft, low plasticity.			0.0	0.05	HA-0.05-210519				
			0.05						0.0	0.5	HA-0.05-210519				
			0.5												
			0.8			As above. unable reach target depth, due to rock. stopped at 0.8m				0.8	HA-0.08-210519				

Project Name:		Eraring BESS Contamination		Project Number:		60630260 60622873		Borehole No.:		HA009	
Project Location:		Eraring		Client:		Origin		Sheet		1 of 1	
PM Name:		Ole Ferguson		Date Commenced:		19/5/21		Date Completed:			
Bore Location:		-23.068877; 151.511955		Fieldwork Staff:		P. WILKINSON, S. HAYNIE		Drill Model:		Hole Angle: deg. Bore Size: Co-ords: RL Permit No.	
Drilling Fluid:		Orientation: deg.		Moisture		Consistency/Rel Density		Field Notes		Well Construction	
Method		Casing		Penetration		Depth		Graphic Log		USCS Classification	
Material Description		Type, colour/mottling, plasticity/particle size, secondary/minor components, soil origin		Moisture		Consistency/Rel Density		Field Notes		Well Construction	
Field Data		Moisture		Consistency/Rel Density		PID (ppm)		Sampling		Well Construction	
Field Notes		Odour, staining, groundwater observations/ regime, additional information		Gatic:		Standpipe:		Well Cap:		Surface Seal:	
Well Construction		Backfill:		Seal:		File/rock:		Depth		Annulus	
Well Construction		Casing		Annulus		Casing		Annulus		Annulus	
HA			0.0								
			0.05	sandy CLAY w/ trace gravels, light brown w/ flecks of orange/black firm, low plasticity.			0.2	0.05	HA009_0.05-210519		
			0.5	CLAY w/ sand. Light brown w/ white mottlets. soft, high plasticity. Damp			0.0	0.5	HA009_0.5-210519		
			0.8	CLAY w/ trace gravels. soft, high plasticity. moist.							
			1.0	Light brown w/ white/orange mottlets As above			0.0	1.0	HA009_1.0-210519		
				Target depth reached at 1.0m.							

Project Name: Eraring BESS Contamination		Project Number: 60630260 60622873		Borehole No.: HAO10	
Project Location: Eraring		Client: Origin		Sheet 1 of 1	
PM Name: Orie Ferguson		Date Commenced: 19/5/21			
Bore Location: -33.068022; 151.512858		Date Completed:			
Drill Contractor: NA		Fieldwork Staff: P. Woodingham, S. Harvill			
Drill Model: Hole Angle: deg		Bore Size: deg		RL: Permit No.:	
Drilling Fluid: Orientation: deg		Co-ords: deg			

Field Data															
Method	Casing	Penetration	Depth	Graphic Log	USCS Classification	Material Description Type, colour/mottling, plasticity/particle size, secondary/minor components, soil origin	Moisture	Consistency/Rel. Density	PID (ppm)	Sampling	Field Notes Colour, staining, groundwater observations/ regime, additional information	Well Construction			
												Depth	Anulus	Casing	Anulus
HA			0.0 0.05 0.2 0.3			Gravelly SAND. Light brown, w/ trace orange. Dry, fine to medium grain. no odour. As above, w/ cobbles.			0.0 0.05 0.0 0.3		HAO10-0.05-210519* no visual ACM HAO10-0.3-210519				
						Target depth not reached due to hard sub-surface depth reached 0.3m									

Project Name:		Eraring BESS Contamination		Project Number:		60830290 60622873		Borehole No.:			
Project Location:		Eraring		Client:		Origin		HA011		Sheet 1 of 1	
PM Name:		Ode Ferguson		Date Commenced:		19/5/21					
Bore Location:		-33 06 7840; 151 513142		Date Completed:							
Drill Contractor:		NA		Fieldwork Staff:		P. Waddipati, S. Harris					
Drill Model:		Hole Angle:		deg.		Bore Size		RL:			
Drilling Fluid:		Orientation:		deg.		Co-ords:		Permit No.:			

Method	Casing	Penetration	Depth	Graphic Log	USCS Classification	Material Description Type, colour/mottling, plasticity/particle size, secondary/minor components, soil origin	Field Data			Field Notes Odour, staining, groundwater observations/regime, additional information	Well Construction				
							Moisture	Consistency/Rel Density	PID (ppm)		Sampling	Depth	Anulus	Casing	Anulus
NA			0.0			Gravelly SAND. Brown. wet				HA011-0.05-210519					
			0.05			Fine to medium grain. Rootlets			0.0	0.05	Q102-210519				
			0.2			As above, but brown and grey colours					Q202-210519				
			0.5			Sandy CLAY, moist, soft, high-plasticity. Grey w/ red mottles. Trace gravel soft.			0.0	0.5	HA011-0.5-210519				
			1.0			sandy CLAY. Moist, firm, high plasticity. Grey w/ trace red. Trace gravel			0.0	1.0	HA011-1.0-210519				
						Target depth reached at 1.0m									

FQM - Borehole Monitoring Bore Field Log

Project Name:	Eraring BESS Contamination	Project Number:	60630250 60632873	Borehole No.:	
Project Location:	Eraring	Client:	Origin		
PM Name:	Oria Ferguson	Date Commenced:	2018/12		HA012
Bore Location:	-23.067137, 151.513409	Date Completed:		Sheet	1 of 1
Drill Contractor:	NA	Fieldwork Staff:	P. Wood, J. Palmer, S. Harvey		
Drill Model:	Hole Angle:	deg.	Bore Size:	RL	
Drilling Fluid:	Orientation:	deg.	Co-ords:	Permit No.:	

Field Data					Field Notes	Well Construction												
Method	Casing	Penetration	Depth	Material Description		Moisture	Consistency/Rel Density	PID (ppm)	Sampling	Odour, staining, groundwater observations/regime, additional information	Gate	Stand pipe	Well Cap	Surface Seal	Backfill	Seal	Filter pack	
			0.05	Sandy CLAY. ^{damp} moist, trace gravel, brown. As above, clay firm, no plasticity, red/white mottles			0.0	0.05	HA012-0.05-210520									
			0.1															
			0.5						0.5	HA012-0.5-210520								
			0.7	Sandy CLAY. moist, soft, high plasticity, light brown. w/ white mottles. As above														
			1.0					1.0		HA012-1.0-210520								
				Target depth reached at 1.0m														

ANZ
FQM - Borehole Monitoring Bore Field Log

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Project Name:	Eraring BESS Contamination	Project Number:	60630290 <i>60622873</i>	Borehole No.:	HA013 Sheet 1 of 1
Project Location:	Eraring	Client:	Orion		
PM Name:	Orla Ferguson	Date Commenced:	2015/21		
Bore Location:	-23.067315, 151.511549	Date Completed:			
Drill Contractor:	NA	Fieldwork Staff:	S. Harms, P. Waddingham		
Drill Model:	Hole Angle:	deg	Bore Size:	RL:	
Drilling Fluid:	Orientation:	deg	Co-ords:	Permit No.:	

Field Data						Field Notes	Well Construction			
Method	Casing	Penetration	Depth	Material Description	Sampling		Depth	Anulus	Casing	Anulus
HA			0.0 0.05 0.5	sandy Topsoil/ Fine mulch. Brown, with rootlets, dry. Trace gravel As above. Unable to reach target depth due to rock. Depth reached 0.5m	0.0 0.05 0.5	HA013-0.05-210520 HA013-0.5-210520				

Project Name:	Eraring BESS Contamination	Project Number:	60609260 <i>60629873</i>	Borehole No.:	<i>HA014</i> 1 of 1
Project Location:	Eraring	Client:	Origin		
PM Name:	Orle Ferguson	Date Commenced:	19/5/21		
Bore Location:	<i>-33.067449, 151.512365</i>	Date Completed:			
Drill Contractor:	<i>NA</i>	Fieldwork Staff:	<i>R. Waddington, S. Harris</i>	Sheet	
Drill Model:	Hole Angle:	deg.	Bore Size:	RL:	
Drilling Fluid:	Orientation:	deg.	Co-ords:	Permit No.:	

		Material Description				Field Data		Field Notes		Well Construction							
Method	Casing	Penetration	Depth	Graphic Log	USCS Classification	Type, colour/mottling, plasticity/particle size, secondary/minor components, soil origin	Moisture	Consistency/Rel Density	PID (ppm)	Sampling	Odour, staining, groundwater observations/ regime, additional information	Depth	Anulus	Casing	Anulus		
<i>HA</i>			<i>0.0</i>			<i>SAND. Brown colour, dry. Rootlets. Trace gravelly fine. no odour. As above, dark brown colour</i>			<i>0.4</i>	<i>0.05</i>	<i>HA014-0.05-210519⁹ no visual ACM</i>						
			<i>0.05</i>														
			<i>0.3</i>														
			<i>0.5</i>							<i>0.5</i>	<i>HA014-0.5-210519</i>						
			<i>0.7</i>			<i>sandy clay. Brown w/ grey. Hard, no plasticity.</i>											
			<i>1.0</i>			<i>As above.</i>			<i>1.0</i>		<i>HA014-1.0-210519</i>						
						<i>Target depth reached at 1.0m</i>											

FQM - Borehole Monitoring Bore Field Log

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Project Name:		Eraring BESS Contamination		Project Number:		60830250 60622873		Borehole No.:		HA015	
Project Location:		Eraring		Client:		Origin		Sheet		1 of 1	
PM Name:		Ora Ferguson		Date Commenced:		17/5/21		Date Completed:			
Bore Location:		-33.094020, 151.514607		Fieldwork Staff:		P. Waddingham, S. Hami		Drill Model:		Hole Angle:	
Drill Contractor:		NA		Orientation:		deg deg		Bore Size:		Co-ords	
Drilling Fluid:				RL:		Permit No.:					

Field Data																
Method	Casing	Penetration	Depth	Graphic Log	USCS Classification	Material Description				Field Notes		Well Construction				
						Type, colour/mottling, plasticity/particle size, secondary/minor components, soil origin	Moisture	Consistency/Rel Density	PID (ppm)	Sampling	Odour, staining, groundwater observations/regime, additional information	Depth	Anulus	Casing	Anulus	
HA			0.0 0.05 0.3 0.5 1.0			SAND w/ trace gravel. light brown, soft. Rootless As above.			0.05 0.3 0.5 1.0		HA015-0.05-210519 QC100-210519 QC200-210519 HA015-0.05-210519					
						unable to reach target depth due to rock. rock location										
						Depth reached 0.3m										

FQM - Borehole Monitoring Bore Field Log

Project Name:	Eraring BESS Contamination	Project Number:	60630250	Borehole No.:	HA016
Project Location:	Eraring	Client:	Origin		
PM Name:	Orla Ferguson	Date Commenced:	7/15/16		
Bore Location:		Date Completed:	27/10/16	Sheet 1 of 1	
Drill Contractor:		Fieldwork Staff:			
Drill Model:	Hole Angle:	deg.	Bore Size:	RL:	
Drilling Fluid:	Orientation:	deg.	Co-ords:	Permit No.:	

		Field Data				Field Notes		Well Construction						
Method	Casing	Penetration	Depth	USCS Classification	Material Description	Moisture	Consistency/Rel Density	PID (ppm)	Sampling	Odour, staining, groundwater observations/remarks, additional information	Well Construction			
											Depth	Anulus	Casing	Anulus
			0-0		Gravelly sand, light brown, fine medium grain. Dry loose. No odour, No ACM. Few cobbles	D		0-0		HA016-0-05				
			0-100		rock, unable to go deeper									
					GPS -33.067398 151.510498									

Project Name:		Eraring BESS Contamination		Project Number:		60622873		Borehole No.:			
Project Location:		Eraring		Client:		Origin		HA017			
PM Name:		Orla Ferguson		Date Commenced:		20/5/21		Sheet		1 of 1	
Bore Location:		-32 066718; 151-51 0666		Date Completed:				Fieldwork Staff:		P. Waddingham, S. Adams	
Drill Contractor:		NA		Hole Angle:		deg		Bore Size:		RL	
Drill Model:		Orientation:		deg		Co-ords:		Permit No			

Method	Casing	Penetration	Depth	Graphic Log	USCS Classification	Material Description				Field Data		Field Notes		Well Construction						
						Type, colour/mottling, plasticity/particle size, secondary/minor components, soil origin	Moisture	Consistency/Rear Density	PID (ppm)	Sampling	Odour, staining, groundwater observations/regime, additional information	Gatic	Stand-off	Well Cap	Surface Seal	Backfill	Seat	Filter pack	Depth	Anulus
HA			0.0			Sandy CLAY. Fine to medium grain. Firm, medium plasticity, red/white mottles. Light brown colour.			0.0	0.05	HA017-0.05-210520									
			0.05																	
			0.2																	
			0.5			Sandy CLAY. Fine to medium grain. Firm, medium plasticity. Orange flecks, light brown. Gravel present				0.5	HA017-0.5-210520									
			1.0			As above.				1.0	HA017-1.0-210520									
						Target depth reached at 1.0m														

ANZ
FQM - Borehole Monitoring Bore Field Log

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Project Name:	Eraring BESS Contamination	Project Number:	60630200 60627873	Borehole No.:	HA018
Project Location:	Eraring	Client:	Origin	Sheet	1 of 1
PM Name:	Orle Ferguson	Date Commenced:	19/5/21		
Bore Location:	-33.067073; 151.512926	Date Completed:			
Drill Contractor:	NA	Fieldwork Staff:	P. Woodingham; S. Harms		
Drill Model:	Hole Angle	deg	Bore Size	RL	
Drilling Fluid:	Orientation	deg	Co-ords	Permit No	

		Material Description				Field Data		Field Notes		Well Construction								
Method	Casing	Penetration	Depth	Graphic Log	USCS Classification	Type, colour/mottling, plasticity/particle size, secondary/minor components, soil origin	Moisture	Consistency/Rel Density	PID (ppm)	Sampling	Odour, staining, groundwater observations/ regime, additional information	Gate:	Stand pipe:	Well Cap:	Surface Seal:	Backfill:	Seal:	Filter pack:
												Depth	Annulus	Casing	Annulus			
HA			0.0			SAND. Black. Damp. Loose, fine to medium grain. Rootless			0.0	0.05	HA018-0.05-210519							
			0.05			sandy CLAY. Black sand w/ orange clay white mottles												
			0.2			Firm, high-plastic. CLAY. Orange and white in colour. Stiff high-plastic.												
			0.4			CLAY. Orange/white, light brown mottles. Stiff, high plasticity. No odour.			0.0	0.5	HA018-0.5-210519							
			0.5															
			1.0			Unable to reach target depth due to stiff clay. Depth reached 0.5m												

Project Name:		Eraring BESS Contamination		Project Number:		6060250 60672873		Borehole No.:		HA019	
Project Location:		Eraring		Client:		Origin		Sheet		1 of 1	
PM Name:		Oris Ferguson		Date Commenced:		19/5/21		Date Completed:			
Bore Location:		+33.067028; 151.512216		Fieldwork Staff:		P. Waddington; S. Harris		Hole Angle:		deg.	
Drill Contractor:		NA		Orientation:		deg.		Bore Size:		Co-ords	
Drilling Fluid:								RL:		Permit No.	

Field Data																					
Method	Casing	Penetration	Depth	Graphic Log	UBCS Classification	Material Description				Field Notes		Well Construction									
						Type, colour/mottling, plasticity/particle size, secondary/minor components, soil origin	Moisture	Consistency/Rel Density	PID (ppm)	Sampling	Odour, staining, groundwater observations/regime, additional information	Gate	Standpipe	Well Cap	Surface Seal	Backfill	Seal	Filter pack			
HA			0.0																		
			0.05			sandy TOPSOIL. Dark brown colour, rootlets. Firm, damp organic matter. No odour			0.0	0.05	HA019_0.05-210519 ^a										
			0.4			sandy CLAY. Dark brown, grey clay. Firm, low-plasticity.				0.5	HA019_0.5-210519										
			0.5			CLAY. Grey w/ orange.															
			0.6			Firm, no-plasticity Bark.				0.7	HA019_0.7-210519										
			0.7			Sandy CLAY w/ trace gravel															
			1.0			Dark light brown, w/ orange. Grey gravel, coarse, rounded. As above.															
						Unable to reach target depth due to gravel.															
						Depth reached 0.7m															

Project Name:		Eraring BESS Contamination		Project Number:		60630250		Borehole No.:		HA020	
Project Location:		Eraring		Client:		Origin					
PM Name:		Orla Ferguson		Date Commenced:		19/5/21					
Bore Location:		-33.067952, 151.511918		Date Completed:				Sheet		1 of 1	
Drill Contractor:		NA		Fieldwork Staff:		P. Wackingham, S. Hami					
Drill Model:		Hole Angle:		deg		Bore Size:		RL:			
Drilling Fluid:		Orientation:		deg		Co-ords:		Permit No.:			

		Material Description				Field Data		Field Notes		Well Construction							
Method	Casing	Penetration	Depth	USCS Classification	Type, colour/mottling, plasticity/particle size, secondary/minor components, soil origin	Moisture	Consistency/Rel Density	PID (ppm)	Sampling	Odour, staining, groundwater observations/regime, additional information	Gate:	Standpipe:	Well Cap:	Surface Seal:			
											Backfill:	Seal:	Filterpack:	Depth	Anulus	Casing	Anulus
HA			0.0		Gravelly SAND, light brown, medium to coarse grain, dry, loose. Rocklets			0.0	0.05	HA020-0.05-210519							
			0.05														
			0.5		As above			0.0	0.5	HA020-0.5-210519							
					unable to reach target depth due to rock												
					depth reached 0.5m.												

ANZ
FQM - Borehole Monitoring Bore Field Log

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Project Name:	Eraring BESS Contamination	Project Number:	60898250 60622873	Borehole No.:	
Project Location:	Eraring	Client:	Origin		
PM Name:	Oris Ferguson	Date Commenced:	17/5/21		HA021
Bore Location:	-33 066874; 151-511703	Date Completed:		Sheet	1 of 1
Drill Contractor:	NA	Fieldwork Staff:	P. Waddington, S. Halim		
Drill Model:	Hole Angle:	Bore Size:		RL:	
Drilling Fluid:	Orientation:	Co-ords:		Permit No.:	

Field Data															
Method	Casing	Penetration	Depth	Graphic Log	USCS Classification	Material Description Type, colour/mottling, plasticity/particle size, secondary/minor components, soil origin	Moisture	Consistency/Rel Density	PID (ppm)	Sampling	Field Notes Odour, staining, groundwater observations/regime, additional information	Well Construction			
												Depth	Anulus	Casing	Anulus
HA			0.0 0.05 0.3			Sandy GRAVEL. Light brown colour. Rootless. As above. Unable to reach target depth. due to root. Reached 0.3m			0.0 0.05 0.0 0.3		HA021-0.05-210519* NO VISUAL ACM HA021-0.3-210519				

FQM - Borehole Monitoring Bore Field Log

Project Name:	Eraring BESS Contamination	Project Number:	60622873	Borehole No.:	HA022
Project Location:	Eraring	Client:	Origin	Sheet	1 of 1
PM Name:	Oria Ferguson	Date Commenced:	2015/21		
Bore Location:	-22.094994, 151.511353	Date Completed:			
Drill Contractor:	NA	Fieldwork Staff:	P. Waddingham, S. Haines		
Drill Model:	Hole Angle:	Bore Size:		RL	
Drilling Fluid:	Orientation:	Co-ords		Permit No.	

		Field Data				Material Description		Well Construction					
Method	Casing	Penetration	Depth	Graphic Log	USCS Classification	Type, colour/mottling, plasticity/particle size, secondary/minor components, soil origin	Moisture	Consistency/Rel Density	PID (ppm)	Sampling	Field Notes	Odour, staining, groundwater observations/regime, additional information	Well Construction
													Catic: Stand Pipe: Well Cap: Surface Seal: Backfill: Seat: Filter pack: Depth: Annulus: Casing: Annulus:
HA			0.05			sandy GRAVEL, fine grain, dry, light brown, soft.			0.0	0.05	HA022-0.05-210520		
			0.4			sandy CLAY, soft, low-plasticity, dry, light brown				0.5	HA022-0.5-210520		
			0.5			sandy CLAY w/ trace gravel							
			0.6			orange colour, soft, low plasticity, yellow/white mottles							
			0.9			As above, orange/red colour							
			1.0			As above, w/ trace orange/red clay w/ white mottles.				1.0	HA022-1.0-210520		
						Target depth reached at 1.0m							

FQM - Borehole Monitoring Bore Field Log

Project Name:	Eraring BESS Contamination	Project Number:	6060280 60622873	Borehole No.:	HA023
Project Location:	Eraring	Client:	Origin	Sheet	1 of 1
PM Name:	Orla Ferguson	Date Commenced:	201914		
Bore Location:	-33.066041, 151.61144	Date Completed:			
Drill Contractor:	NA	Fieldwork Staff:	P. Waddingham, S. Harris		
Drill Model:	Hole Angle:	deg	Bore Size:	RL	
Drilling Fluid:	Orientation:	deg	Co-ords	Permit No.	

		Material Description				Field Data		Field Notes		Well Construction									
Method	Casing	Penetration	Depth	Graphic Log	USCS Classification	Type, colour/mottling, plasticity/particle size, secondary/minor components, soil origin	Moisture	Consistency/Rel Density	PID (ppm)	Sampling	Colour, staining, groundwater observations/ regime, additional information	Gatic:	Stand pipe:	Well Cap:	Surface Seal:	Backfill:	Seal:	Filter pack:	
HA			0.0			CLAY w/ gravels. Sandy gravel. Light brown, no odour, any. Rootlets. soft, crumbly. No-plasticity			0.0	0.05	HA023-0.05-210520								
			0.5			As above				0.5	HA023-0.5-210520								
			0.6			Sandy CLAY. Light brown with orange/white mottles. Firm, dry. No-plasticity.													
			1.0			As above.				1.0	HA023-1.0-210520								
						Target depth reached at 1.0m													

Project Name:	Eraring BESS Contamination	Project Number:	60622873	Borehole No.:	HA024
Project Location:	Eraring	Client:	Origin	Sheet	1 of 1
PM Name:	Orla Ferguson	Date Commenced:	2015/21		
Bore Location:	33 065973; 151 512177	Date Completed:			
Drill Contractor:	NA	Fieldwork Staff:	S. HQ MNS		
Drill Model:	Hole Angle:	deg.	Bore Size:	RL:	
Drilling Fluid:	Orientation:	deg.	Co-ords:	Permit No.:	

Field Data															
Method	Casing	Penetration	Depth	Graphic Log	USCS Classification	Material Description Type, colour/mottling, plasticity/particle size, secondary/minor components, soil origin	Moisture	Consistency/Rel Density	PID (ppm)	Sampling	Field Notes Odour, staining, groundwater observations/regime, additional information	Well Construction			
												Depth	Anulus	Casing	Anulus
HA			0.05			Gravelly SAND, light brown, dry, small gravel. Rootlets					HA024-0.05-210520				
			0.4			As above, slightly darker brown. No rootlets					HA024-0.5-210520				
			0.8			As above, rootlets/stringy bark					HA024-0.8-210520				
						unable to reach target depth due to hard surface depth reached 0.8m									

Project Name:	Eraring BSS Contamination	Project Number:	60630250 60622813	Borehole No.:	HA025
Project Location:	Eraring	Client:	Origin	Sheet	
PM Name:	Orle Ferguson	Date Commenced:	2015/21	of	
Bore Location:	-33 06 196; 151.513200	Date Completed:		1	
Drill Contractor:	NA	Fieldwork Staff:	S. HAYES	Permit No.:	
Drill Model:	Hole Angle:	deg.	Bore Size:		
Drilling Fluid:	Orientation:	deg.	Co-ords:		

		Field Data				Field Notes		Well Construction									
Method	Casing	Penetration	Depth	USCS Classification	Material Description	Moisture	Consistency/Rel Density	PID (ppm)	Sampling	Odour, staining, groundwater observations/regime, additional information	Well Construction						
											Gate	Standpipe	Well Cap	Surface Seal	Backfill	Seal	Filterpack
NA			0.0 0.05 0.1 0.5		<p>organic odour</p> <p>sandy GRAVEL. wet, rootlets, brown. Gravel coarse, grey. Sand fine to medium grain. Sandy GRAVEL. saturated, rootlets, bank, grey colour soil. Bark brown & 10-20mm. As above, but brown colour, more mulch. As above.</p> <p>unable to reach target depth due to rootlets and water.</p> <p>depth reached 0.5m</p>			0.05 0.5	<p>HA025-0.05-210520</p> <p>*at 0.2m water (grey)</p> <p>HA025-0.5-210520</p>								

FQM - Borehole Monitoring Bore Field Log

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Project Name:	Eraring BESS Contamination	Project Number:	60830250	Borehole No.:	HA026
Project Location:	Eraring	Client:	Origin		
PM Name:	Orle Ferguson	Date Commenced:	2012		
Bore Location:		Date Completed:	2012	Sheet	1 of 1
Drill Contractor:		Fieldwork Staff:	Blackdigh		
Drill Method:	Hole Angle:	deg.	Bore Size:	RL:	
Drilling Fluid:	Orientation:	deg.	Co-ords	Permit No.:	

		Field Data				Field Notes		Well Construction								
Method	Casing	Penetration	Depth	USCS Classification	Material Description		Moisture	Consistency/Rel Density	PID (ppm)	Sampling	Field Notes	Well Construction				
					Type, colour/mottling, plasticity/particle size, secondary/minor components, soil origin							Depth	Annulus	Casing	Annulus	
			0.0		gravelly sand, light brown dry (loose, fine medium grain No odour, No ACM						HA026 0.05					
			0.3		clay, grey, mottled red stiff, medium plasticity stiff, No odour											
			0.5		As above						HA026 - 0.5					
			0.7		As above,						HA026 - 0.7					
					unable to go below 0.7m bgs, very stiff clay.											
					GPS - 33.066508 - 151.514508											

ANZ
FQM - Borehole Monitoring Bore Field Log

Q4AN(EV)-101-FM1

Project Name:	Eraring BESS Contamination	Project Number:	60630250	Borehole No.:	HA027
Project Location:	Eraring	Client:	Origin		
PM Name:	Oris Ferguson	Date Commenced:	2015/01		
Bore Location:		Date Completed:		Sheet	1 of 1
Drill Contractor:		Fieldwork Staff:	P. Weddington		
Drill Model:	Hole Angle:	deg.	Bore Size:	RL	
Drilling Fluid:	Orientation:	deg.	Co-ords:	Permit No.	

Field Data															
Method	Casing	Penetration	Depth	Graphic Log	USCS Classification	Material Description Type, colour/mottling, plasticity/particle size, secondary/minor components, soil origin	Moisture	Consistency/Rel Density	PID (ppm)	Sampling	Field Notes Colour, staining, groundwater observations/remarks, additional information	Well Construction			
												Depth	Anulus	Casing	Anulus
			0.0			gravelly sand, grey, Dry loose, Fine-medium grain, reddlets, No odour, No ACM			0.0		HA027-0.05 QC103 - 210520 QC203 - 210520				
			0.2			sand, Orange mottled gray, Dry loose, Fine-medium grain, No odour, No ACM									
			0.5			sandy clay, Orange moist, Fine-medium grain, No odour					HA027-0.5				
			1.0			As above					HA027-1.0				
						GPS - 33.866925 151.514496									

Project Name:		Eraring BESS Contamination		Project Number:		60630250		Borehole No.:		HA028	
Project Location:		Eraring		Client:		Origin					
PM Name:		Orla Ferguson		Date Commenced:		20/5/21					
Bore Location:				Date Completed:				Sheet		of 1	
Drill Contractor:				Fieldwork Staff:		P. Wardington					
Drill Model:		Hole Angle:		deg.		Bore Size:		RL:			
Drilling Fluid:		Orientation		deg.		Co-ords		Permit No.:			

Field Data															
Method	Casing	Penetration	Depth	Graphic Log	USCS Classification	Material Description				Field Notes	Well Construction				
						Type, colour/mottling, plasticity/particle size, secondary/minor components, soil origin	Moisture	Consistency/Rel Density	PID (ppm)		Sampling	Depth	Annulus	Casing	Annulus
			0.0			Sandy topsoil, Dark brown, Dry, loose fine medium grain No odour, No ACM	D		0.0		HA028-0.05- Q4104-210520 Q4204-210520				
			0.1			Sand, grey, moist loose, medium-coarse grain, No odour with pebbles.	M				HA028-0.5				
			0.5			Sand grey, wet, loose fine-medium grain No odour. Few pebbles									
			1.0			As above					HA028-1.0				

Project Name:		Eraring BESS Contamination		Project Number:		60630200 60622873		Borehole No.:		HA029	
Project Location:		Eraring		Client:		Origin					
PM Name:		Orie Ferguson		Date Commenced:		20/5/21					
Bore Location:		- 33 066717.151 515694		Date Completed:				Shoot		1 of 1	
Drill Contractor:		NA		Fieldwork Staff:		P. Wainwright; S. Harris					
Drill Model:		Hole Angle:		deg.		Bore Size:		RL			
Drilling Fluid:		Orientation:		deg.		Co-ords:		Permit No.:			

Field Data															
Method	Casing	Penetration	Depth	Graphic Log	USCS Classification	Material Description Type, colour/mottling, plasticity/particle size, secondary/minor components, soil origin	Moisture	Consistency/Rel Density	PID (ppm)	Sampling	Field Notes Odour, staining, groundwater observations/regime, additional information	Well Construction			
												Depth	Anulus	Casing	Anulus
HA			0.05			Sandy GRAVEL. Light brown dry. Rootlets. sand fine to medium, gravels coarse As above, but cobbles present			0.05		HA029-0.05-210520 QC108-210520 QC205-210520 HA029-0.5-210520				
			0.5			unable to reach target depth due to hard surface / rock (most likely cobble) Depth reached 0.5m			0.5						

ANZ
FQM - Borehole Monitoring Bore Field Log

Q4AN(EV)-101-FM1

Project Name:		Eraring BESS Contamination		Project Number:		60630250 60622873		Borehole No.:		HA030	
Project Location:		Eraring		Client:		Origin		Sheet		1 of 1	
PM Name:		Orle Ferguson		Date Commenced:		2015/21					
Bore Location:		~33 066171, 151.514585		Date Completed:							
Drill Contractor:		NA		Fieldwork Staff:		S.H.A.M.S					
Drill Model:		Hole Angle:		deg		Bore Size:		RL:			
Drilling Fluid:		Orientation:		deg		Co-ords:		Permit No.:			

Field Data															
Method	Casing	Penetration	Depth	Graphic Log	USCS Classification	Material Description Type, colour/mottling, plasticity/particle size, secondary/minor components, soil origin	Moisture	Consistency/Rel Density	PID (ppm)	Sampling	Field Notes Odour, staining, groundwater observations/regims, additional information	Well Construction			
												Depth	Anulus	Casing	Anulus
NA			0.0 0.05 0.2			Gravelly TOPSOIL, dark brown, moist. Rootlets Gravelly SAND w/ pebbles, dark brown, moist rootlets SANDY GRAVEL, dark brown, damp, large cobbles ~15mm Unable to reach target depth due to hard surface (presumably larger cobbles) Depth reached 0.2m			0.0 0.05 0.2		HA030_0.05-210520 HA030_0.2-210520				

Project Name:		Eraring BESS Contamination		Project Number:		60620260 60622873		Borehole No.:		HA031											
Project Location:		Eraring		Client:		Origin		Sheet		1 of 1											
PM Name:		Orla Ferguson		Date Commenced:		2015/21		Date Completed:													
Bore Location:		~33.065341; 151.514800		Fieldwork Staff:		S. HORN		RL:													
Drill Contractor:		NA		Bore Size:				Permit No.:													
Drill Mode:		Hole Angle:		deg:				Co-ords:													
Drilling Fluid:		Orientation:		deg:																	
Field Data																					
Method	Casing	Penetration	Depth	Graphic Log	USCS Classification	Material Description			Moisture	Consistency/Rel Density	PID (ppm)	Sampling	Field Notes	Well Construction							
						Type, colour/mottling, plasticity/particle size, secondary/minor components, soil origin								Gate:	Standpipe:	Well Cap:	Surface Seal:	Backfill:	Seal:	Filter pack:	
HA			0.0																		
			0.05								0.0	0.05	HA031-0.05-210520								
			0.3																		
			0.5									0.5	HA031-0.05-210520								
			1.0									1.0	HA031-0.05-210520								

FQM - Borehole Monitoring Bore Field Log

Project Name:	Eraring BESS Contamination	Project Number:	606300260 60622873	Borehole No.:	
Project Location:	Eraring	Client:	Origin		HA032
PM Name:	Oria Ferguson	Date Commenced:	20/5/21	Sheet	1 of 1
Bore Location:	-33.0605095, 151.514314	Date Completed:			
Drill Contractor:	NA	Fieldwork Staff:	R. Harris		
Drill Model:	Hole Angle: deg.	Bore Size:		RL:	
Drilling Fluid:	Orientation: deg.	Co-ords:		Permit No.:	

		Material Description				Field Data		Field Notes		Well Construction													
Method	Casing	Penetration	Depth	Graphic Log	USCS Classification	Type, colour/mottling, plasticity/particle size, secondary/minor components, soil origin	Moisture	Consistency/Plastic Density	PID (ppm)	Sampling	Odour, staining, groundwater observations/regime, additional information	Gatic:	Stand pipe:	Well Cap:	Surface Seal:	Backfill:	Seal:	Filter pack:	Depth:	Anulus:	Casing:	Anulus:	
HA			0.0			Sandy TOPSOIL. Dark brown moist, rootlets			0.0	0.05	HA032-0.05-210520												
			0.05			Sandy CLAY. Dark brown, firm, moist, no-plasticity.																	
			0.2			COAL. Black																	
			0.3			Sandy CLAY. Light brown, red/white mottling. coarse gravels, damp.			0.0	0.5	HA032-0.5-210520												
			0.5			As above, large cobbles.																	
						unable to reach target depth due to hard surface (presumably cobbles)																	
						depth reached 0.5m.																	

Project Name:		Eraring BESS Contamination		Project Number:		60690260 60622873		Borehole No.:		4A034	
Project Location:		Eraring		Client:		Origin		Sheet		1 of 1	
PM Name:		Orla Ferguson		Date Commenced:		2015/4		Fieldwork Staff:		S. HDVNS	
Bore Location:		-33 065963, 151.513480		Date Completed:				Hole Angle:		deg	
Drill Contractor:		NA		Fieldwork Staff:				Bore Size:		deg	
Drill Model:		Hole Angle:		deg		Bore Size:		deg		RL	
Drilling Fluid:		Orientation:		deg		Co-ords.		deg		Permit No.	

Method	Casing	Penetration	Depth	Graphic Log	USCS Classification	Material Description				Field Data		Field Notes	Well Construction			
						Type, colour/mottling, plasticity/particle size, secondary/minor components, soil origin	Moisture	Consistency/Rel Density	PID (ppm)	Sampling	Occur, staining, groundwater observations/regime, additional information		Depth	Anulus	Casing	Anulus
HA			0.0			Sandy TOPSOIL w/ gravels. Brown, moist, Gravelly SAND. cobbles present throughout ~5-15mm. Brown, moist Rootlets sandy COAL. Black to brown chitter ~2-5mm. Trace gravels. unable to reach target depth due to com. unable to reach target depth due to com. depth reached 0.2m			0.0	0.05	HA034-0.05-210520					
			0.05						0.0	0.2	HA034-0.2-210520					
			0.2													

Project Name:		Eraring BESS Contamination		Project Number:		60630260 60622873		Borehole No.:			
Project Location:		Eraring		Client:		Origin		HA035			
PM Name:		Orla Ferguson		Date Commenced:		20/5/21		Sheet		1 of 1	
Bore Location:		-33.066014; 151.514105		Date Completed:				Fieldwork Staff:		S. HAYNS	
Drill Contractor:		NA		Hole Angle:		deg.		Bore Size:		RL:	
Drill Model:		Orientation:		deg.		Co-ords:		deg.		Permit No.:	

		Field Data				Field Notes		Well Construction						
Method	Casing	Penetration	Depth	USCS Classification	Material Description Type, colour/mottling, plasticity/particle size, secondary/minor components, soil origin	Moisture	Consistency/Rel Density	PID (ppm)	Sampling	Odour, staining, groundwater observations/regime, additional information	Well Construction			
											Depth	Anulus	Casing	Anulus
NA			0.0 0.05 0.2		Jandy TOPSOIL. Light brown, dry, rootlets As above As above, gravel (cobbles) unable to reach target depth due to rock/hard surface depth reached 0.2m			0.0 0.05 0.2		HA035-0.05-210520 HA035-0.2-210520				

FQM - Borehole Monitoring Bore Field Log

Project Name:		Eraring BESS Contamination		Project Number:		60630250		Borehole No.:		HA036	
Project Location:		Eraring		Client:		Origin					
PM Name:		Oria Ferguson		Date Commenced:		2015/11					
Bore Location:				Date Completed:				Sheet		1 of 1	
Drill Contractor:				Fieldwork Staff:		P. Waddington					
Drill Model:		Hole Angle:		deg:		Bore Size:		RL:			
Drilling Fluid:		Orientation:		deg:		Co-ords:		Permit No.:			

Field Data											
Material Description				Field Notes				Well Construction			
Method	Casing	Penetration	Depth	Type, colour/mottling, plasticity/particle size, secondary/minor components, soil origin	Moisture	Consistency/Rel Density	PH (ppm)	Sampling	Odour, staining, groundwater observations/regime, additional information	Gate:	Standpipe:
Graphic Log	USCS Classification									Well Cap:	Surface Seal:
										Backfill:	Seal:
										Filter/sock:	
										Depth	Anulus
										Casing	Anulus
			0.0	grass							
			0.05	gravelly sandy clay, brown moist, loose, few cobbles, NO odor NO Ach	m		0.0		HA036 - 0.05		
			0.5	Sandy clay, brown mottled orange, moist, high Plasticity Firm, few gravels, no odor, NO Ach					HA036 - 0.5		
			1.0	As above					HA036 - 1.0 -		
				GPS - 33.066135							
				151.516112							

Project Name:		Eraring BESS Contamination		Project Number:		60630250		Borehole No:		HA038	
Project Location:		Eraring		Client:		Origin					
PM Name:		Orle Ferguson		Date Commenced:							
Bore Location:				Date Completed:		20/5/21		Sheet		1 of 1	
Drill Contractor:				Fieldwork Staff:		P. Waddingham					
Drill Model:		Hole Angle:		deg.		Bore Size:		RL:			
Drilling Fluid:		Orientation:		deg.		Co-ords.		Permit No.:			

Field Data																	
Method	Casing	Penetration	Depth	Graphic Log	Material Description				Moisture	Consistency/Rel Density	PID (ppm)	Sampling	Field Notes	Well Construction			
					Type, colour/mottling, plasticity/particle size, secondary/minor components, soil origin									Depth	Anulus	Casing	Anulus
			0-0 0.05		grass gravelly sand, brown, loose. Dry, fine-medium grain, No odour, No ACM.								HA038-0.05				
			0.07		Sandy gravelly clay, brown mottled orange, mo Dry, loose, No odour, No ACM few cobbles								HA038-0.5				
			0.5		As above, unable to get past 0.5m bgs cobbles												
GPS - 33-064780 151-516568																	

Project Name:		Eraring BESS Contamination		Project Number:		60630250		Borehole No.:		HA039	
Project Location:		Eraring		Client:		Orghin					
PM Name:		Orla Ferguson		Date Commenced:		2015/11					
Bore Location:				Date Completed:				Sheet		1 of 1	
Drill Contractor:				Fieldwork Staff:		Phaedra...					
Drill Method:		Hole Angle:		deg.		Bore Size:		RL.			
Drilling Fluid:		Orientation:		deg.		Co-ords:		Permit No.:			

Field Data															
Method	Casing	Penetration	Depth	Graphic Log	USCS Classification	Material Description Type, colour/mottling, plasticity/particle size, secondary/minor components, soil origin	Moisture	Consistency/Rel Density	PID (ppm)	Sampling	Field Notes Odour, staining, groundwater observations/regime, additional information	Well Construction			
												Depth	Anulus	Casing	Anulus
			0.0			beam fine needles, gravelly sand fill material, Dry, loose, fine to medium grain No odour. No ACM visible	D		0.0		HA039 0.05				
			0.5			as above, unable to go beyond 0.5m bgl - gravel/cobbles					HA039 0.5				
						GPS									

Surface Water Sampling Field Description

Sample ID: SW01-210520

Date: 20/05/21	Photographs: Attached w/ coordinates
Time: 1405	GPS Coordinates: -33.066188; 151.513077

Descriptions

Shape of the channel	oblong.
Approx channel dimensions	~30m, x ~10m wide
Water Depth measurement	0.1m (100mm)
Flow in waterbody (description, i.e. fast flowing, limited evidence of movement, still water surface)	still
Gradient (flat, steep, etc)	flat
Evidence of erosion	none.
Evidence of variation in water levels or recent flooding (presence of trashline)	none.
Any hydraulic structures nearby (tidal gates, weirs, culverts) including approx dimensions	Culvert at end of dammed under Rocky Point Rd. ~1m wide.
Description of water - colour, turbidity, debris	clear colour, no turbidity. Fallen braced and ferns growing in channel.
Description of sediment - colour, grain size, organisms present, organic matter	Orange, fine grain size, no organisms present, organic matter such a tree debris present. Orange filaments when soil is disrupted. in water
Extent of vegetation in channel (clear, sparse, dense)	sparse vegetation in current water filled section. sparse to none in empty filled section.
Description of vegetation in channel (reeds, lillies)	Popper bark trees, blade grass, ferns, reeds.
Visual evidence of contamination (e.g. hydrocarbon sheen)	NO sheen present - hydrocarbon? → sheen doesn't re-form soil red/orange most likely iron.
Evidence of fish or other aquatic life	YES (NO)
Birds/ ducks present in waterbody	YES (NO)
Any other fauna near sampling location (cattle, chickens)	YES (NO)
Evidence of crops or vegetables nearby	YES (NO)
Weather - is it raining?	YES (NO)
Has it rained in preceding week	YES (NO)
If so, how much (light showers, heavy rain, etc)	N/A.

