Port of Brisbane Sediment Sampling and Analysis Plan Implementation Report - 2023

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Executive Summary

Background

Port of Brisbane Pty Ltd (PBPL) undertakes annual maintenance dredging within the navigational areas of the Brisbane River and western Moreton Bay, primarily using the Trailer Suction Hopper Dredge 'Brisbane'. Sampling and analysis was undertaken in accordance with National Assessment Guidelines for Dredging (NAGD) in 2023 to assess the suitability of maintenance dredged material for unconfined ocean disposal.

The dredge area was divided into different dredging subareas based on existing contaminant data, comprising Zone 2 (Colmslie to Pinkenba), Zone 3 (within Port reaches) and Zone 4 (Entrance Channel). Zone 1 (upstream of the dredge area) is not part of the annual dredging and provide 'background' contextual data. Sediment was also sampled at the Mud Island Dredge Material Placement Area (MIDMPA) and reference sites in Bramble Bay north of the Port of Brisbane.

Assessment

Sediments within Zone 2 displayed low spatial variability with high proportions of fines (clay and silts) contents and low sand contents, whereas Zones 3 and 4 were comprised of both sands and fines, with slightly higher sand content. The Moreton Bay reference sites were comprised mostly of fines, whereas the MIDMPA was similar to Zone 4. The 2023 results were generally comparable to previous sampling. However, sediments in Zone 2 had lower fines content than in previous years.

The sediments in the dredging Zones were found to be suitable for ocean disposal in accordance with the NAGD guidelines based on the following results:

- The upper 95 % confidence limits (95 % UCL) of the mean concentration of most analysed metals and metalloids (except nickel) were less than their respective NAGD screening levels, and therefore considered suitable for ocean disposal in accordance with NAGD guidelines.
- Nickel concentrations were lower in Zones 2, 3, 4 and some reference sites than concentrations in 2022; however, higher than previous years. This is likely a result in increased fines content, which is positively correlated with nickel.
- The 95% UCL for nickel concentrations recorded for the overall dredge Zone areas (23.3 mg/kg) was higher than the NAGD screening level of 21 mg/kg. As a result, phase III bioavailability testing was carried out on 16 samples of which nickel concentrations were the highest. The bioavailable fraction of nickel in waters and sediments were below relevant guideline values. Therefore, dredged material was considered suitable for ocean disposal in accordance with NAGD.
- All organic contaminants including organotins, Total Petroleum Hydrocarbons (TPH), Polycyclic Aromatic Hydrocarbons (PAHs), Polychlorinated Biphenyls (PCBs), and organochlorine pesticides (OCPs) had concentrations below the LOR in most samples. This indicates dredged sediments were suitable for ocean disposal in accordance with NAGD.
- Acid Sulphate Soil testing indicated that while sediments were characterised as potential acid sulphate soils (PASS), upon corroboration the acid neutralizing capacity is sufficient for neutralising acids upon oxidation.

The evaluation of laboratory and field QA/QC procedures and assessments indicated that all sampling, sample handling and storage and laboratory analysis was undertaken to a high standard providing scientific confidence that the presented results are valid to allow an assessment of sediment quality against the NAGD.

Contents

1 Introduction

1.1 Background

Port of Brisbane Pty Ltd (PBPL) is obligated to uphold a specific minimum depth clearance beneath the keel of ships arriving at the port. This is essential for ensuring safe and efficient access for shipping operations and overall maritime safety. PBPL undertakes an annual maintenance dredging program to ensure these minimum depths are maintained.

PBPL intends to undertake its annual maintenance dredging within the navigational areas of the Brisbane River and Moreton Bay, primarily using the Trailer Suction Hopper Dredge (TSHD) 'Brisbane'. Maintenance dredging works extend from the Hamilton Reach of the Brisbane River to the northwest channel located in northern Moreton Bay.

It is proposed that dredged material is placed at sea within the Mud Island Dredge Material Placement Area (MIDMPA) or on land in the Future Port Expansion (FPE) reclamation area. To assess suitability of dredged material for unconfined ocean placement, characterisation of the physical and chemical properties of proposed dredged sediment was required to be undertaken in accordance with the National Assessment Guidelines for Dredging (Commonwealth of Australia 2009; henceforth NAGD).

This report documents the findings of a sampling campaign conducted in September 2023. The overall aim of this study is to assess the physico-chemical properties of sediments to be dredged from the Port of Brisbane and based on the approach set out in the NAGD, assess the suitability of dredged material for unconfined ocean disposal (if required). The specific objectives of the study were to:

- Describe and quantify the physical properties of sediments to be dredged;
- Quantify concentrations of potential contaminants in sediments to be dredged;
- Compare contaminant concentrations to screening levels set out in the NAGD to determine whether there is a need for further assessment; and
- Assess the bioavailability of contaminants and potential toxicity effects based on comparisons of contaminant concentrations to guideline values.

1.2 Proposed Dredging

PBPL's area of responsibility in relation to maintenance and capital dredging within port limits can be broadly divided into two locations on the basis of the water body type, navigable depths and nature of dredged material:

- Moreton Bay dredge area (enclosed/open coastal waters); and
- Brisbane River dredge area, including the Port of Brisbane (middle/lower estuary).

This SAP specifically focusses on sediments in the Brisbane River dredge area, as well as the MIDMPA and 'reference' areas in western Moreton Bay. The Brisbane River dredge area extends from Hamilton Reach to the Outer Bar Cutting. Annual maintenance dredging is required to remove sediments accumulated by natural siltation processes within the catchment.

To ensure that declared depths of navigational channels are maintained at all times, PBPL undertakes 'insurance' dredging of up to -0.5 metres below the declared depth. On average, PBPL dredges about 300,000 m3 to 350,000 m3 of material each year. Dredging volumes are predominantly driven by catchment rainfall events and subsequently additional dredging needs to be undertaken following major flood events, as occurred in 2011 and 2013 and 2022.

The Brisbane River zone is divided into different dredging subareas based on existing contaminant data, comprising Zone 2, Zone 3 and Zone 4. It is noted that Zone 1 is not part of the annual dredging and samples from this zone have been used to collect reference samples upstream of the actual dredging areas.

Table 1.1 Approximate dredging volumes for maintenance

Dredging subarea	Location	Average dredge volume (m3)
Zone 2	Hamilton Reach to Lytton Rocks Cutting	83,000
Zone 3	Pelican Banks to Inner Bar Cutting	241,000
Zone 4	Outer Bar Cutting	26,000

The maintenance dredging program is structured to maximise efficiencies and utilisation of PBPL's largest dredger, the TSHD Brisbane. The TSHD Brisbane typically carries out the majority of the port's maintenance dredging over a two-month period between January and May (actual period varies depending on other commitments of the TSHD Brisbane and siltation patterns). The PBPL may also utilise smaller, more manoeuvrable dredging plant, such as grab dredgers and bed levellers, to maintain more confined areas within the Port Limits.

1.3 Offshore Disposal

The PBPL's policy with regard to dredged material is to maximise its beneficial reuse. In general, most of the material dredged by the PBPL from within Port Limits is used in reclamation works associated with development of the port. The reuse of this dredged material provides several benefits, including:

- Reduced pressure on sea disposal sites;
- The placement of any actual or potential acid sulphate material at depth beneath the water surface; and
- The containment of any contaminated material within a designated boundary, disconnected from the marine system and monitored to ensure the immobility of identified contaminants.

In 2009, the reclamation life of the FPE area was estimated to be approximately 30 years, based on the current level of port development at that time. Following extreme flood events in both 2011 and 2013 and the subsequent disposal of additional material in the FPE area, the estimated life of the FPE area was reduced by 20 years to 10 years. Given the importance of the FPE as an area to dispose of material unsuitable for ocean disposal, there has been a shift in thinking around the management of the FPE area.

The current proposed management of dredged material is to, where practical, dispose at sea all dredged material deemed suitable for ocean disposal. This proposed management initiative will ensure the long-term viability of the FPE area for the disposal of material deemed unsuitable for ocean disposal.

In the past, significant quantities of dredged material from the Brisbane River have been placed offshore at the MIDMPA. In recent years, only smaller volumes of dredged material from boat harbours in southern Moreton Bay were placed at the MIDMPA. However, it is proposed that the MIDMPA will be utilised for material found suitable for ocean disposal in future PBPL maintenance dredging campaigns.

1.4 Marine Communities and Environmental Value

The loading (dredging) site is located within the lower Brisbane River. The foreshore of the lower Brisbane River is in a highly modified condition, but still retains isolated patches of mangrove forest and tidal flats. The river channel is comprised of muds and sands and supports a locally important trawl fishery (BMT WBM 2008c).

The Port of Brisbane port facilities are located at the Brisbane River mouth on land reclaimed over a shallow sub-tidal river delta containing a series of low-lying mangrove islands, collectively called the Fisherman Islands. Brisbane River and adjacent waters of Moreton Bay experiences freshwater flows and ongoing inputs of sediments and contaminants derived from human activities in its catchment. Two major sewage treatment plants also have their sewage discharges within kilometres of the Port facilities (Luggage Point and Wynnum North wastewater treatment plant).

Construction of the present-day port facilities over intertidal and subtidal areas has resulted in extensive changes to the environmental character of the Fisherman Islands area. However, significant areas of mangrove, saltmarsh and seagrass have also been retained, and form part of the Fisherman Islands wetland complex on the southeastern side of the Port of Brisbane (BMT WBM 2014). Moreton Bay Marine Park is situated to the south and east of the FPE seawall. This area contains one of the largest semi-contiguous seagrass beds in western Moreton Bay. A Ramsar listed wetland (Moreton Bay Ramsar site) is situated only kilometres to the south of the port facilities, comprising intertidal portions of the Fisherman Islands wetland complex. The seagrass and mudflats of the Ramsar site are recognised for their importance to dugong, marine turtles and migratory and resident shorebirds (BMT WBM 2008a).

MIDMPA is located between Mud Island and Fisherman Islands. Mud Island is an ancient coral reef that is no longer actively accreting coral skeletons, but still contains coral communities (Johnson and Neil 1998). MIDMPA is comprised of a mix of mud and sand substrates that provide habitat for benthic invertebrate (BMT WBM 2008b) and fish assemblages.

2 Methodology

2.1 Compliance with SAP and Guidelines

All sampling and analysis of sediments was undertaken in accordance with the NAGD (Commonwealth of Australia 2009). All sampling and analysis procedures followed the approach outlined in the sampling and analysis plan (SAP) provided in Annex A.

2.2 Timing of Sampling

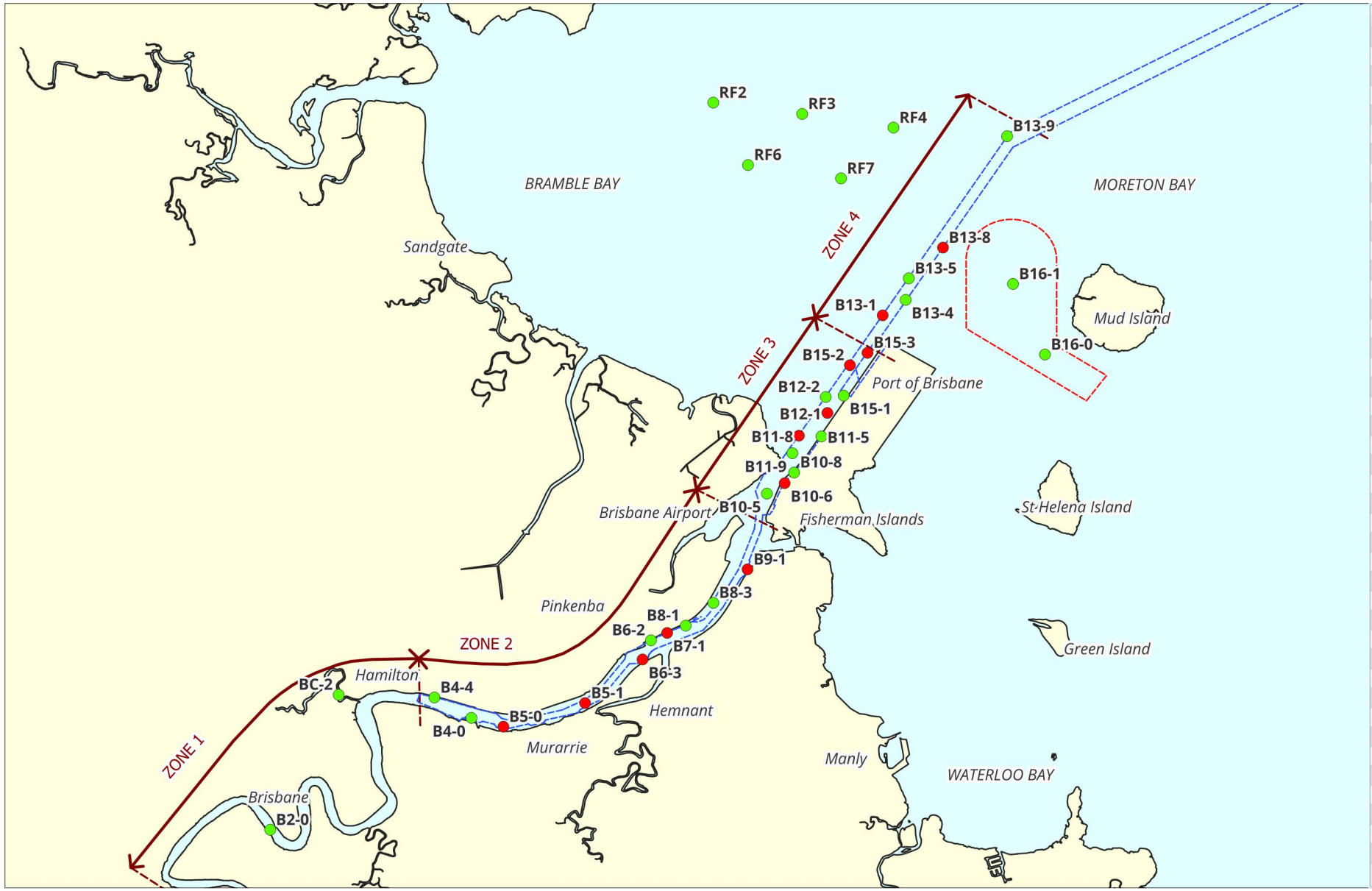
Sampling was undertaken between 12th and 14th and on the 27th of September 2023.

2.3 Sampling Locations and Sample Numbers

2.3.1 Sampling Locations

The sampling locations are illustrated in Figure 2.1. A total of 35 sites were sampled with a Van-Veen grab sampler in accordance with the SAP and NAGD guidelines. This included 26 sample locations within the proposed dredging area (Zones 2, 3 and 4) and nine reference locations (Zone 1, MIDMPA and Moreton Bay reference sites).

As per the SAP, all samples were analysed for the basic suite with a detailed suite analysed at selected study locations.



Site	Easting	Northing
RF2	514,083	6,982,366
RF3	516,442	6,982,026
RF4	518,863	6,981,618
RF6	515,003	6,980,511
RF7	517,470	6,980,112
B16-0	522,872	6,974,873
B16-1	522,028	6,976,970
B2-0	502,319	6,960,782
BC-2	504,133	6,964,789
B6-2R	512,413	6,966,396
B5-1R	510,663	6,964,656
B4-0	507,652	6,964,101
B4-4	506,671	6,964,708
B5-0	508,498	6,963,840
B6-2	512,413	6,966,401
B6-3	512,189	6,965,833
B7-1	512,842	6,966,620
B8-1	513,334	6,966,836
B8-3	514,068	6,967,511
B9-1	514,975	6,968,505
B5-1	510,665	6,964,540
B11-9R	516,163	6,971,958
B10-8R	516,205	6,971,378
B10-5	515,491	6,970,754
B10-6	515,963	6,971,063
B10-8	516,214	6,971,379
B11-5	516,940	6,972,451
B11-8	516,343	6,972,473
B11-9	516,167	6,971,952
B12-1	517,099	6,973,147
B15-1	517,530	6,973,661
B15-2	517,698	6,974,564
B15-3	518,165	6,974,930
B12-2	517,055	6,973,621
B13-8R	520,125	6,978,050
B13-5R	519,281	6,977,138
B13-4R	519,166	6,976,497
B13-1R	518,598	6,976,032
B13-1	518,570	6,976,043
B13-4	519,180	6,976,502
B13-5	519,264	6,977,141
B13-8	520,173	6,978,053
B13-9	521,880	6,981,357

LEGEND

- Dredge Area
- Dredge Material Placement Area

Sampling Locations

- Basic Suite
- Basic Suite and Detailed Suite

Title:

Actual Sediment Sampling Locations

Figure: **2-1**

Rev: **A**

N

0 2.5 5 km

BMT
www.bmt.org

Filepath: I:\B20259_I_BRH Port of Brisbane DLR\QGIS\ECO_022_131212 Sediment Sampling Locations.qgz

2.3.2 Additional Field QA/QC Samples

In accordance with NAGD requirements and based on the number of sample locations, the following field and laboratory quality control samples were taken:

- Three field triplicate samples at 10% of locations to determine the small scale (measured in metres) spatial variability of the sediment physical and chemical characteristics, i.e. two additional grab samples at locations 5-1 (Zone 2), 11-9 (Zone 3) and 13-4 (Zone 4);
- Two triplicate split samples (primary sample from 5% of locations thoroughly mixed and split into three sample container sets) to assess laboratory variation, with one of the three samples sent to a second (reference) laboratory for analysis. Split samples were obtained at location 6-2 (Zone 2) and 10-6 (Zone 3); and
- Three trip blank containers filled with inert material (e.g. chromatographic sand) to be analysed concurrent with the analysis of volatile organic substances such as BTEX and TPH C6-C9.

2.3.3 Elutriate and Bioavailability Analyses

Elutriate and bioavailability testing was undertaken for parameters which have frequently exceeded the NAGD screening levels in the past. Based on the review of historical data in the SAP this included:

- Metals and metalloids;
- Organotins (TBT); and
- Organochlorine Pesticides (DDT, DDD, DDE, chlordane).

Testing for metals/metalloids (and potential other metals/metalloids) was undertaken from the primary samples collected for the sediment quality assessment and based on the initial analysis results. Analysis was performed on the samples with the highest concentrations.

Bioavailability analysis for the organic contaminants (organotins and organochlorine pesticides) required porewater testing as per NAGD. Additional samples were collected for porewater testing at the locations which have historically shown the highest percentage of screening level exceedances. To meet required holding times, elutriate and bioavailability analysis for the organic contaminants was undertaken concurrent with the analysis of the primary samples.

As per the SAP, additional samples for porewater testing were obtained from five locations in Zone 2 and six locations in Zone 3.

2.4 Sample Collection and Handling

2.4.1 Survey Vessel, Sampling Equipment and Personnel

BMT's vessel "Resolution II" was used for sampling the sediments. A handheld GPS was used on the survey vessel for position fixing and navigation to each sampling location. All sediment sampling was undertaken by a team of three qualified marine scientists with experience in the implementation of sediment sampling and analysis programs.

2.4.2 Sampling Procedure

Sediment samples were collected using a stainless steel Van Veen grab sampler (0.14 m^2 grab). Only samples obtained with properly closed grab jaws were processed to ensure that the fine sediment fractions were retained.

In order to overcome issues with potential high variability at sampling locations, a minimum of two grabs were collected at each sampling location and pooled as one sample. An adequate number of grabs was obtained and pooled for each sample location ensuring that sufficient sediment was collected for all analyses.

2.4.3 Survey Vessel and Equipment

The vessel was thoroughly inspected and washed down prior to the beginning of sediment sampling each day. The workspace on the vessel was washed down regularly with ambient seawater to clean all surfaces and minimize the potential for dust contamination of samples. All sample processing was undertaken away from any potential contamination sources such as engine exhausts, fuels, oils, greases, lead weights, zinc anodes, antifouling paint etc.

The grab sampler was thoroughly cleaned with De-con 90 solution prior to use and cleaned and rinsed with seawater between samples to prevent cross contamination between samples.

2.4.4 Sample Collection, Handling and Storage

Photographs of the grab samples were taken and grab samples were logged for its physical characteristics and variations in sediment type and texture (refer Annex B). The grab samples from each location were carefully homogenized in a clean container prior to the filling of analytical laboratory-supplied sterile sampling jars.

Nitrile gloves were worn by all field personnel handling the sediment, and gloves were disposed of after processing of each sample.

Sample bottles were labelled with a waterproof marker pen on the bottle label and lid. Sample bottles for organic analyses were filled with zero headspace to minimise volatilisation. A field trip blank sample container filled with clean chromatographic sand was placed with opened lid near the sample processing site while a sediment sample was completely processed.

All storage containers were chilled on ice immediately following sample collection. The samples were then transferred to BMT office in sealed eskies at the end of each sampling day. Acid Sulfate Soil samples were frozen at the end of each sampling day to minimise potential oxidation of the sediment material.

At the end of the sampling campaign, all samples were submitted to the primary and secondary analytical laboratories with Chain of Custody documentation (Annex C and Annex D).

2.5 Laboratory Analysis

As per the SAP, all samples were analysed for a basic suite with a detailed suite analysed at selected study locations (refer to Annex A).

2.5.1 Analytical Tests

Primary analysis of sediment samples was conducted by Australian Laboratory Services (ALS). Symbio Laboratories was selected as the secondary (reference) laboratory for inter-laboratory quality assurance.

A total of 35 locations were analysed for a basic suite of parameters. Of these, 12 locations were additionally analysed for a detailed list of contaminants. Furthermore, elutriate and bioavailability (porewater and dilute acid extraction) testing was undertaken at selected locations as per the SAP.

Table 2.1 Analysis and parameters

Analysis	Parameters
Basic analysis	• Metals/Metalloids (As, Cd, Cr, Cu, Pb, Hg, Ni, Ag, Zn, Al, Fe); • Organotins (MBT, DBT, TBT); • Organochlorine pesticides (including DDT, DDD, DDE, chlordane); • Particle Size Distribution (PSD); • Moisture content • Total Organic Carbon (TOC)
Detailed analysis	• -Polycyclic Aromatic Hydrocarbons (PAHs); • -Total Petroleum Hydrocarbons (TPHs); • -Polychlorinated Biphenyls (PCBs); • -Acid Sulfate Soils; • -Nutrients (TP, TN, NOx, TKN); and • -Radionuclides
Elutriate and bioavailability analysis	• Metals/Metalloids; • Organotins (TBT); and • Organochlorine pesticides (DDT, DDD, DDE, chlordane).

2.5.2 Laboratory Quality Control

Both laboratories followed laboratory Quality Control (QC) procedures in accordance with requirements outlined in NAGD. This included analysis of laboratory blanks, duplicates, certified surrogate materials and spiked samples.

Validation of all laboratory QC analyses was conducted in accordance with NAGD to confirm suitable data quality for undertaking a rigorous characterisation of the proposed dredge material.

Laboratory Blanks

The purpose of this assessment is to monitor potential laboratory contamination of samples due to potential cross-contamination of samples during laboratory preparation, extraction or analysis. Blank sample concentrations should be at or near the LOR of the method used.

Laboratory Duplicates

This assessment refers to a randomly selected intra-laboratory split sample, which provides information regarding the method precision and sample heterogeneity. Results are presented as Relative Percent Difference (RPD) values of two sample concentrations for a specific contaminant.

NAGD recommends that duplicates should agree within a typical RPD of the method of ±35 %. This recommended RPD is typically not adopted by analytical laboratories as it does not account for the greater uncertainty for contaminant concentrations close to the method's LOR. NAGD also notes that RPDs may not always agree within these limits where sediments are very inhomogeneous or vary greatly in grain size.

The primary laboratory ALS uses the following approach to assess duplicate RPD's:

- Result <10 times LOR – no limit to RPD; and
- Result >10 times LOR – RPD between 0% and 50%.

The secondary laboratory Symbio follows this approach:

- Result <10 times LOR – no limit to RPD;
- Result between 10 and 20 times LOR – RPD between 0% and 50%; and
- Result >20 times LOR – RPD between 0% and 20%.

Refer to Appendices C and D for the acceptance criteria of subcontracted laboratories.

Surrogate and Matrix Spikes
Laboratory Control Samples are either certified reference materials or a blank sample spiked with known concentrations of the analytes of interest. The purpose of this measurement is to monitor method accuracy.

Matrix spikes refer to an intra-laboratory split sample spiked with a representative set of target analytes of known concentration. Matrix spikes are assessed to monitor potential sample matrix effects on analyte recoveries.

Surrogate spikes are used for organic analytes. Surrogates are known additions to samples which mimic the compounds of interested and are not normally expected to be present in the sample.

For both surrogate and matrix spikes, a calculation of the percent recovery of the spiked amount against the returned concentration is performed indicating analytical performance in terms of extraction efficiency.

NAGD states that recovery limits of 75% - 125% are generally acceptable. Analytical laboratories typically adopt specific surrogate and matrix spike recovery limits for the various contaminant compound groups. It is also noted that ideal recovery ranges may be waived in the event of sample matrix interference.

The primary laboratory AAA adopts the following acceptable surrogate and matrix spike recovery limits:

- Trace elements: 70-130%;
- Organic analyses: 50-150%;
- SVOC & speciated phenols: 10-140%; and
- Surrogates: 10-140%.

The secondary laboratory ALS adopts specific recovery limits for individual compounds.

2.6 Data Analysis

2.6.1 Sediment Contaminants

Concentrations of chemicals measured in sediment samples were compared to screening levels of NAGD to determine whether the material is suitable for unconfined placement at sea or if further analyses, such as elutriate, bioavailability or toxicity testing, are required.

Specifically, mean concentrations of chemical parameters at the upper 95% confidence level (95% UCL) were compared against NAGD guideline levels.

Data Pre-Treatment

Analytical values below Limit of Reporting (LOR) were set to one-half of the LOR as per NAGD recommendation to facilitate 95% UCL calculation. This was only undertaken where there was greater than 30% detections within the dredge Zone. Any replacement technique is a source of bias (Croghan and Egeghy 2003). Only parameters with greater than 30% detections were subject to analysis due to the high probability of bias created by the replacement technique.

Organic contaminant results were normalised to 1% TOC where the measured value is within the range of 0.2-10%. If TOC values were outside of this range, the highest (10%) or lowest (0.2%) value was adopted as appropriate. Organic parameters with concentrations below LORs were not normalised to 1% TOC but were included at half their LOR.

One assumption in the calculation of the 95% UCL is that the samples are statistically independent. Therefore, field triplicate samples and laboratory split samples were averaged for each location in the 95% UCL calculation.

Selection of Appropriate 95% UCL Calculation Method

ProUCL Version 4.1.00 was used to calculate the 95% UCL (Singh et al. 2010). In accordance with NAGD, for normally distributed data, the arithmetic mean was calculated, and the 95% UCL was calculated using the one-tailed Student's t UCL test. For data that followed a log-normal distribution, the geometric mean was calculated and the 95% UCL was calculated using Chebyshev method. For data that did not follow either a normal or log-normal distribution, the 95% UCL was calculated using non-parametric techniques as per NAGD. Should 95% UCL values for all analysed parameters fall below NAGD screening levels, the sediment was considered chemically acceptable for ocean disposal.

In accordance with NAGD, ambient baseline concentrations of chemicals were determined by sampling of sediment at reference areas near the existing disposal site. The 80th percentile value was calculated from reference site data. The mean of the sediment concentrations at the dredge site was then compared with the 80th percentile of ambient baseline levels. Sediment was chemically acceptable for ocean disposal the mean concentration at the dredge site was less than or at the 80th percentile value.

If chemicals were found to be above ambient baseline levels and the screening level, they were considered a Contaminant of Potential Concern and Phase III testing was required.

Variability in Sediment Properties and Correlation Analysis

Summary statistics, for analytical results, namely minimum, maximum, mean and relative standard deviation (RSD) values are presented and referred to throughout this report. Relative standard deviation (also known as coefficient of variation) indicates the extent of variability in a dataset in relation to the mean value, by expressing the standard deviation as a percentage of the mean. For the purposes of this report, nominal percentage ranges have been selected to aid in interpretation. Therefore, an RSD of less than 30 % will be considered low variability, 30 % to 70 % will be considered moderate variability and more than 70 % will be considered high variability.

In addition, Pearson product-moment correlation analysis was performed on select parameters to measure the strength of the linear association between the chosen parameters. The Pearson correlation coefficient, r, can take a range of values from +1 indicating a positive association to -1 indicating a negative association.

2.6.2 Elutriate and Bioavailability Testing

Elutriate and bioavailability testing was undertaken as per NAGD for a range of contaminants which have regularly exceeded screening levels in the past.

Elutriate Testing

The elutriate test is designed to simulate release of contaminants from sediment during dredged material disposal. Testing was carried out using the USEPA's standard seawater elutriate test which involves shaking the sediment samples with four times the volume of seawater at room temperature for 30 minutes. The sample was allowed to settle for one hour and the supernatant was centrifuged or filtered (0.45 µm) within 60 minutes and analysed using analytical methods appropriate for determining ultra-trace levels in seawater.

Results were compared to the respective ANZECC/ARMCANZ (2000) marine water quality trigger value (for 95% protection of species).

Bioavailability Testing

The Dilute Acid Extraction (DAE) method was used to provide an estimate of the bioavailable fraction of metals/metalloids. The sediment samples were extracted using a weak acid and result compared against the respective NAGD screening levels.

For organic contaminants, analysis of pore water is the recommended bioavailability test as per NAGD. Porewater is assumed to represent the major route of exposure to sediment contaminants by benthic organisms. Porewater results were compared to the respective ANZECC/ARMCANZ (2000) marine water quality trigger value (for 95% protection of species).

Should both elutriate and bioavailability tests result in values less than the respective guideline limits, the material would be considered clean and suitable for ocean disposal.

2.6.3 Acid Sulfate Soils

The results of the chromium-suite acid sulfate analysis were assessed against the Australian framework for Acid Sulfate Soil management in coastal systems (Ahern et al. 1998). The risk of acidification was determined by the acid-base accounting approach (Ahern et al. 2004). Net acidity was calculated from the results as a measure of the acid producing capacity of the sampled sediment upon complete oxidation.

The calculated net acidity was then compared to the QASSIT action criteria of 0.03% S or 18 mol H+/tonne to assess the need for acid sulfate soil management if the dredged sediments were to be placed on land. Department of Environment and Science advises that acid neutralising capacity (ANC) values should be verified by further leachate testing (slab/tray incubation) to allow its use in the net acidity calculation. The liming rate indicates the amount of lime that needs to be added to the soil to manage its acid generating capacity.

3 Results

Sediment logs of the sampled sediments are shown in Appendix B. Detailed laboratory results are provided in Appendices C and D for the primary and secondary laboratory, respectively.

3.1 Physical Sediment Characteristics

presents the sediment grain particle size distribution (PSD) results for each location during the current survey and the 2022 survey.

Zone 2
Sediments from Zone 2 were dominated by fines fractions, ranging from 36 to 91 %, with a mean of 76% and low variability (RSD 26%). The sand content ranged from 8 to 60%, with a mean content of 23 % and high variability (RSD 80%). Gravel was present in 5 samples in low proportions (<4 %). The mean fines content from the current survey was lower than the mean fines content recorded in 2022 (92 %; BMT, 2022); however broadly comparable to the mean values obtained in 2021 (78%; BMT, 2021) and 2020 (68%; BMT, 2020).

Zone 3 and 4
Sediments obtained from Zones 3 and 4, displayed a moderate variability in composition relaying a degree of spatial variation. However, similar to Zone 2, sediments were generally dominated by the fine fractions (Zone 3 mean 67%; Zone 4 mean 59%). The mean sand content for sediments in Zone 3 (32%) and 4 (38%) were higher than the mean sand content in Zone 2. Gravel proportions were low and generally less than 1% in most samples. Ten samples within Zones 3 and 4 recorded gravel proportions, with a maximum of 8% (sample B13-8).

The mean fines content in Zone 3 (67%) was lower than the mean fines content in 2022 (76%; BMT, 2022), but broadly comparable to the fines content recorded in 2020 (60%; BMT, 2020) and 2021 (52%; BMT, 2021). The mean fines content in Zone 4 (59%) was broadly comparable to the mean fines content recorded in 2022 (61%; BMT, 2022), 2021 (66%; BMT, 2021) and 2020 (65%; BMT, 2020).

MIDMPA and Reference/Background
Sediments recovered at the MIDMPA had sand content (40-54%), consistent with previous years (BMT, 2022; BMT, 2021). Moreton Bay reference sites were characterised by a high proportion of fines content (mean 89%). This was consistent with results from 2022 (90%; BMT, 2022), 2021 (83%; BMT, 2021) and 2020 (76%; BMT, 2020).

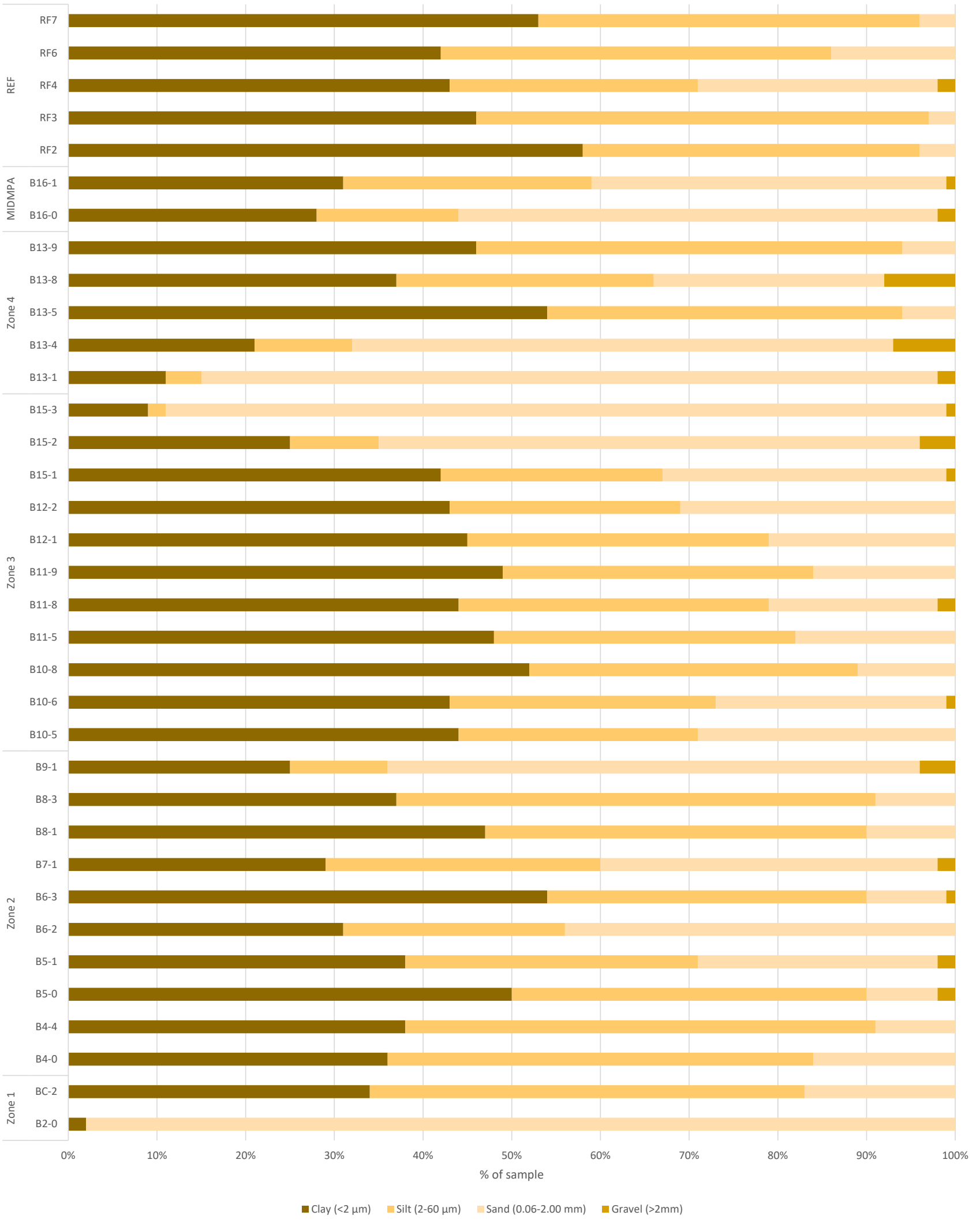


Figure 3.1 Sediment particle size distribution analysis results, 2023

3.2 Analysis Results

3.2.1 Metals and Metalloids

Bulk Sediments
Results for metals and metalloids are presented in Table 3.2. Consistent with previous survey results, cadmium and silver had concentrations less than the LOR (0.1 mg/kg) in most samples from Zones 2, 3 and 4.

Concentrations of most metals and metalloids within individual or dredged areas were generally below NAGD screening levels across the study area, except for nickel at 19 sites. The trace metal and metalloid concentrations recorded at reference locations follow similar trends to those at the dredge sites and were also consistent with trends observed in previous surveys.

Mercury
Mercury concentrations across the dredge Zones ranged from 0.03 mg/kg to 0.15 mg/kg, with a mean concentration of 0.08 mg/kg. Mercury concentrations across the survey area, including the 95% UCL (0.09 mg/kg) and the reference 80th percentile (0.09 mg/kg) were below the NAGD screening level (0.15 mg/kg). Sample B12-2 had a mercury concentration of 0.15 mg/kg, which was at the screening level. Phase III testing was conservatively undertaken on site B12-2 to assess the bioavailability of mercury at this location.

Nickel
Across the dredge Zones, nickel concentrations ranged from 9.5 mg/kg to 30.1 mg/kg, with a mean of 21.4 mg/kg. The mean nickel concentration in September 2023 was lower than the mean concentration in 2022 (27.4 mg/kg; BMT, 2022), but higher than the concentration recorded in 2021 (18.0 mg/kg; BMT, 2021) and 2020 (19.2 mg/kg; BMT, 2020).

The physical and chemical characteristics of sediment particles influence how other chemical components and biological species interact with marine sediments. The clay/silt fraction is widely known to adsorb petroleum hydrocarbons/heavy metals out of seawater acting as an environmental sink for these pollutants; and through this pathway, these chemicals become incorporated into sediment systems (Meyers and Quinn, 1973). Consistent with this, there was a strong positive correlation between fines content and nickel concentrations ($r = 0.80$, $p<0.05$), indicating that the delivery of fine catchment sediments by floodwaters is a key driver of temporal changes in nickel concentrations in the dredge area and surrounds. As discussed earlier (Section 3.1), the sediments within dredge Zones 2 and 3 contained higher proportions of the finer clay and silt particle fractions. Due to the low variability in fines content observed in both Zone 2 and 3, it is likely that the high nickel concentrations recorded in bulk sediment are influenced by natural variations in sediment characteristics within the area.

The 95 % UCL for nickel concentrations within the dredge area (Zone 2, 3 and 4) was 23.3 mg/kg. Both the mean nickel concentration and the 95 % UCL exceeded the NAGD screening value of 21 mg/kg. In accordance with NAGD, nickel concentrations at the dredge sites were compared to reference sites. The 80th percentile nickel concentration at the reference sites was 22.9 mg/kg, which is broadly comparable to both the mean nickel concentration and the 95 % UCL value. As a result, Phase III testing was undertaken to assess the bioavailability of nickel in sediments.

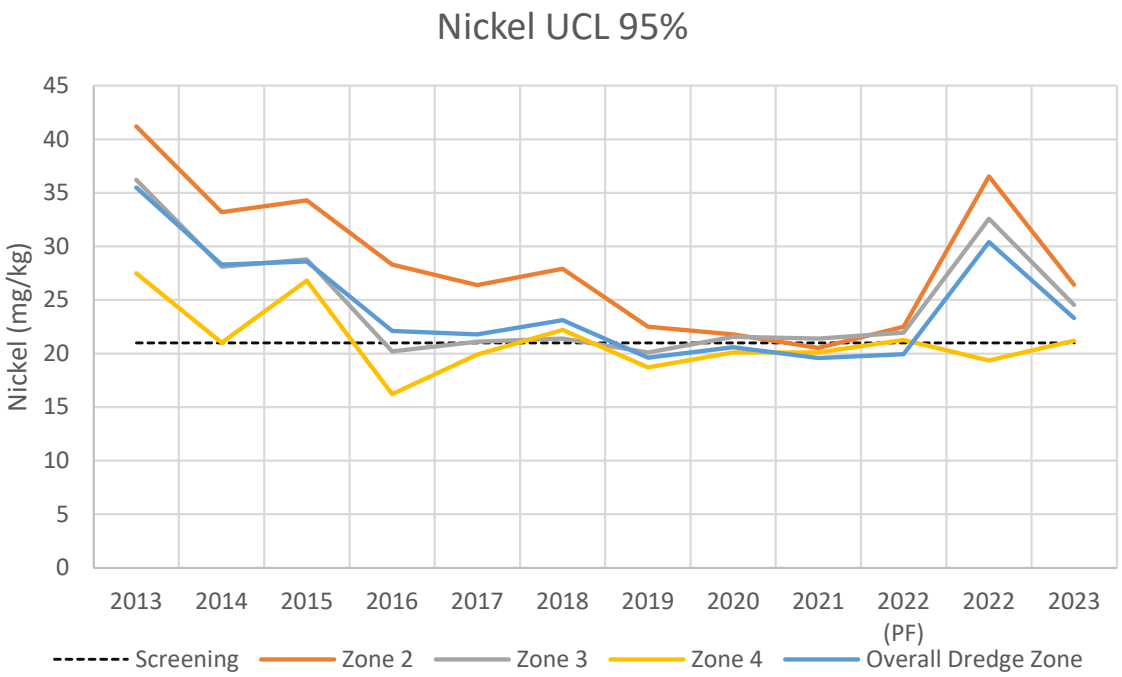


Figure 3.2 95 % UCL of Nickel concentrations over time

3.2.2 Bioavailability Testing

For samples that underwent further bioavailability testing there were no samples that reported a concentration of nickel in exceedance of the NAGD (2009) screening level and ANZG (2018) guideline value (Table 3.1). There were strong positive correlations between fines content and nickel in bulk sediment and DAE. There was no significant correlation between fines content and nickel in elutriate samples, indicating that most nickel is bound to sediment and unlikely to pose to significant water quality risk.

The bioavailable mercury concentration at site at B12-2 was <0.10 mg/kg, below the NAGD screening level (0.15 mg/kg)

These results indicate that the bioavailable proportion of nickel and mercury is unlikely to result in adverse ecological impacts. Based on Phase II and III testing, dredge sediments are considered suitable for ocean disposal.

Table 3.1 Nickel bioavailability results 2023

Zone	Sample	Nickel		
		Bulk sed. mg/kg	DAE mg/kg	Elutriate µg/L
Guideline value		*21*		*70*
2	B4-0	25.7	9.5	3.0
	B4-4	29.5	10.7	2.7
	B8-1	30.1	10.8	2.6
	B6-2b	23.9	7.5	2.3
	B9-1	21.9	5.2	2.2
	B5-0	25.0	11.5	2.7
	B5-1b	39.2	7.4	1.0
	B6-3	27.4	11.5	2.2
	B7-1	21.8	7.6	2.0
3	B10-5	22.4	7.4	1.2
	B11-9	25.4	8.5	1.8
	B11-9b	25.6	7.4	1.4
	B11-8	24.5	8.4	1.3
	B12-1	23.4	8.6	1.3
	B11-5	23.9	8.6	1.6
	B10-8	28.4	9.4	2.1

Red text – exceeds NAGD screening level.

3.2.3 Nutrients and Carbon Content

Results for nutrients and total organic carbon (TOC) content of marine sediment samples are presented in Table 3.2. No screening values exist for TOC and nutrients in sediments within NADG (2009).

Inorganic nitrogen concentrations (NOx) were low and ranged from 0.1 mg/kg to 2.2 mg/kg. Therefore, Total nitrogen (TN) and Total Kjeldahl nitrogen (TKN) concentrations were analogous. TN and TKN concentrations across the dredge Zones ranged from 290 mg/kg to 1760 mg/kg, with a mean of 1099 mg/kg and a 95% UCL of 1309 mg/kg (Table 3.2). The TN and TKN concentrations recorded across the survey area were broadly comparable to the ranges recorded previously in 2022 (280 to 1670 mg/kg; BMT, 2022), 2021(180 to 2300 mg/kg; BMT, 2021) and 2020 (300 to 1300 mg/kg; BMT, 2020).

Total phosphorus (TP) concentrations ranged from 325 mg/kg to 1040 mg/kg, with a mean of 681 mg/kg and a 95% UCL of 781 mg/kg. TP concentrations were broadly comparable to the range of concentrations recorded previously in 2022 (242 to 1010 mg/kg; BMT, 2022), 2021 (183 to 929 mg/kg; BMT, 2021) and 2020 (312 to 847 mg/kg; BMT, 2020).

TOC content ranged from 0.20 % to 1.80 % across the dredge zones, with a mean of 1.5 % and low variability (RSD 26 %). The TOC 95 % UCL for dredge zones was 1.47 %, which was slightly higher than the reference sites (1.1 %). TOC content was comparable to or slightly higher than the TOC content previously recorded in 2022 (1.57 %; BMT, 2022), 2021 (0.99 %; BMT, 2021) and 2020 (1.00 %; BMT, 2020).

Table 3.2 Summary statistics and 95% UCLs for combined locations in Zones 2, 3, and 4 - trace metals/metalloids and nutrients (mg/L)

Parameter	LOR (mg/kg)	No. detects	Screening level	Statistical distribution	95 % UCL	Min	Max	Mean	Geometric average
Moisture content	1	26 (100%)	n/a	Normal	55.82	27.5	66.3	51.2	49.6
Aluminium	50	26 (100%)	n/a	Normal	14704	5670	18900	13495	12904
Arsenic	1	26 (100%)	20	Normal	7.491	4.52	10.7	6.97	6.80
Cadmium	0.1	3 (12%)	1.5	Normal	0.264	0.1	0.2	0.16	0.15
Chromium	1	26 (100%)	80	Normal	30.43	13.2	37.1	28.1	27.1
Copper	1	26 (100%)	65	Normal	24.66	5.6	34.6	21.9	19.8
Iron	50	26 (100%)	n/a	Normal	36150	16800	43800	33504	32385
Lead	1	26 (100%)	50	Normal	16.62	5.4	27.2	15.1	14.4
Mercury	0.01	26 (100%)	0.15	Normal	0.09	0.03	0.15	0.08	0.07
Nickel	1	26 (100%)	21	Normal	23.32	9.5	30.1	21.4	20.5
Silver	0.1	14 (54%)	1	Nonparametric	0.193	0.1	0.3	0.15	0.14
Zinc	1	26 (100%)	200	Normal	86.41	30.3	115	78.8	75.1
TOC	0.02	26 (100%)	n/a	Normal	1.41	0.2	1.8	1.3	1.1
TKN	20	12 (100%)	n/a	Normal	1309	290	1760	1099	975
TN	20	12 (100%)	n/a	Normal	1309	290	1760	1099	975
TP	2	12 (100%)	n/a	Normal	781	325	1040	681	645

Red text – exceeds NAGD screening level

3.2.4 Organotin

Monobutyltin (MBT), Dibutyltin (DBT) and Tributyltin (TBT) were analysed in all sediment samples obtained; results are presented in Table 3.4. MBT was below the detection limit in all sediment samples analysed. DBT was detected in 6 samples across the dredge zones ranging from 1 µgSn/kg to 4 µgSn/kg. TBT was detected in 15 samples located across the dredge Zones ranging from <0.5 µgSn/kg to 3.4 µgSn/kg, all of which were below the NADG screening level of 9 µSn/kg. The 95% UCL for TBT could not be calculated due to the percentage of non-detects amounting to greater than 30% of the total dataset. All reference locations recorded concentrations below the LOR for all three analytes.

3.2.5 Total Petroleum Hydrocarbons (TPHs)

Total petroleum hydrocarbon (TPH) concentrations within the C10 to C14, C15 to C28 and C29 to C36 carbon fractions were recorded at most locations within the dredge Zones. The TPH carbon fraction C6 to C9 was below the LOR in all sediment samples. The 95% UCL for TPHs C10 to C36 was 62.4 mg/kg (normalised to 1% TOC), which is below the screening level of 280 mg/kg (Table 3.4). The 95% UCL for TPHs C10 to C36 from the current survey was comparable to the 95% UCL recorded previously in 2022 (84.5 mg/kg; BMT, 2022), 2020 (69.7 mg/kg; BMT, 2020) and 2021 (108 mg/kg; BMT, 2021).

3.2.6 Polyaromatic Hydrocarbons (PAHs)

Low level detections of PAHs were recorded at all locations analysed within the dredge Zones (Table 3.3). Total PAHs concentrations (corrected to 1% TOC) ranged from 108 µg/kg to 710 µg/kg, well below the NADG screening level of 10,000 µg/kg in all samples. The 95% UCL for total PAHs across all dredge Zones was 375.2 µg/kg. The 95% UCL for total PAHs was comparable to the value calculated in 2020 (493 µg/kg; BMT, 2020) and lower than the values calculated in 2022 (567 µ/kg; BMT, 2022) and 2021 (761 µg/kg; BMT, 2021).

3.2.7 Organochlorine Pesticides (OCPS)

The OCP p p'-DDE was detected at 11 locations. When normalised to 1% TOC, two samples (B10-6 and B7-1) recorded concentrations higher than the screening level (1.2 µg/kg). The UCL was not calculated due to the percentage of non-detects exceeding 30%. Phase III analysis was undertaken on sample B10-6 and B7-1, both of which reported concentrations of less than the laboratory detection limit (< 0.01 µg/L). There were no detections of any other OCPs.

3.2.8 Polychlorinated Biphenyl's (PCBS)

Concentrations of PCBs were below the laboratory LOR at all investigated locations. No assessment of PCBs was undertaken at the reference locations.

Therefore, the sediments in the dredge Zones are considered suitable for ocean disposal as per the NAGD guidelines with respect to PCBs.

3.2.9 Radionuclides

Gross alpha and gross beta activity ranged between <0.5 Bq/g (LOR) to 1.04 Bq/g dry weight and <0.5 Bq/g (LOR) to 0.63 Bq/g dry weight respectively. The gross alpha and beta activities were comparable to the ranges recorded in 2022 (<0.5 Bq/g to 1.08 Bq/g dry weight and <0.5 Bq/g to 0.61 Bq/g dry weight; BMT, 2022). Furthermore, activities were comparable to activities in previous years (BMT, 2021; BMT; 2020).

Therefore, the NAGD screening level for the sum of gross alpha and beta (35 Bq/g) was not exceeded in any samples, and on this basis sediments within the dredge zones, are considered suitable for ocean disposal as per the NAGD guidelines with respect to radionuclides.

3.2.10 Acid Sulphate Soils

Acid sulphate soil test results are presented in Table 3.4. All samples recorded pH potassium chloride (pH KCL) values ranging from 7.8 to 8.6 (neutral to alkaline), indicating there was no existing acidity present in any of the sediments tested. Furthermore, all samples had sulfidic titratable actual acidity (sTAA) values less than the LOR (< 0.02 %S).

All samples recorded chromium reducible sulphur values above the LOR, in the range of 0.047 to 0.59 %S, indicating low to moderate presence of inorganic potential acidity in these samples.

Results of acid neutralising capacity (ANC) ranged from 1.99 to 9.07 % $CaCO_3$. The mean ANC in the current survey was 3.97% $CaCO_3$, which indicates sediments have a potentially high capacity to self-neutralise if exposed to oxygen. Net acidity (excluding ANC) ranged from 0.05 to 0.59 %S, relating directly to the potential acidity as no actual acidity was recorded. The inclusion of ANC significantly reduces net acidity with all samples recording a net acidity value of less than the LOR (< 0.2%S). Notwithstanding this, the ANC values should be considered indicative only and require corroboration through leachate testing (~8 weeks) to validate its inclusion to the calculation of net acidity, therefore leachate testing was carried out on all samples. The leachate test results confirmed that the ANC of all samples was sufficient to neutralise acid upon oxidation, indicating no treatment would be required if the material was placed on land.

Table 3.3 Summary statistics and 95% ucls (µg/kg) for combined locations in Zones 2, 3 and 4 - organic compounds (normalised to 1% TOC)

	Parameter	LOR	No. Detects	Screening level	Distribution	95% UCL	Min	Max	Mean	Geometric Average
Organochlorine pesticides (OCP)	Aldrin	0.5	0(0%)	n/a	NC1	NC1	<0.50	NC1	NC1	NC1
	alpha-BHC	0.5	0(0%)	n/a	NC1	NC1	<0.50	NC1	NC1	NC1
	beta-BHC	0.5	0(0%)	n/a	NC1	NC1	<0.50	NC1	NC1	NC1
	delta-BHC	0.5	0(0%)	n/a	NC1	NC1	<0.50	NC1	NC1	NC1
	4.4`-DDD	0.5	0(0%)	2	NC2	NC2	<0.50	NC1	NC2	NC2
	4.4`-DDE	0.5	11(42%)	1.4	NC2	NC2	<0.50	1.5	NC2	NC2
	4.4`-DDT	0.5	0(0%)	1.2	NC1	NC1	<0.50	NC1	NC1	NC1
	Dieldrin	0.5	0(0%)	280	NC1	NC1	<0.50	NC1	NC1	NC1
	alpha-Endosulfan	0.5	0(0%)	n/a	NC1	NC1	<0.50	NC1	NC1	NC1
	beta-Endosulfan	0.5	0(0%)	n/a	NC1	NC1	<0.50	NC1	NC1	NC1
	Endosulfan sulphate	0.5	0(0%)	n/a	NC1	NC1	<0.50	NC1	NC1	NC1
	Endrin	0.5	0(0%)	2.7	NC1	NC1	<0.50	NC1	NC1	NC1
	Endrin aldehyde	0.5	0(0%)	n/a	NC1	NC1	<0.50	NC1	NC1	NC1
	Endrin ketone	0.5	0(0%)	n/a	NC1	NC1	<0.50	NC1	NC1	NC1
	Heptachlor	0.5	0(0%)	n/a	NC1	NC1	<0.50	NC1	NC1	NC1
	Heptachlor epoxide	0.5	0(0%)	n/a	NC1	NC1	<0.50	NC1	NC1	NC1
	Hexachlorobenzene (HCB)	0.5	0(0%)	n/a	NC1	NC1	<0.50	NC1	NC1	NC1
	gamma-BHC (Lindane)	0.25	0(0%)	0.32	NC1	NC1	<0.25	NC1	NC1	NC1
	Methoxychlor	0.5	0(0%)	n/a	NC1	NC1	<0.50	NC1	NC1	NC1
	cis-Chlordane	0.5	0(0%)	0.5	NC1	NC1	<0.50	NC1	NC1	NC1
	trans-Chlordane	0.5	0(0%)	n/a	NC1	NC1	<0.50	NC1	NC1	NC1
	Oxychlordane	0.5	0(0%)	n/a	NC1	NC1	<0.50	NC1	NC1	NC1

	Parameter	LOR	No. Detects	Screening level	Distribution	95% UCL	Min	Max	Mean	Geometric Average
Organotins compounds	Monobutyltin as Sn	1	0 (0%)	n/a	NC1	NC1	<0.50	NC1	NC1	NC1
	Dibutyltin as Sn	1	4 (15%)	n/a	NC1	NC1	<0.50	NC1	NC1	NC1
	Tributyltin as Sn	0.5	11 (42%)	9	NC2	NC2	<0.50	1.6	NC2	NC2
Total Petroleum Hydrocarbons (TPH)	TPH C_{10}-C_{14}	3	14 (93%)	n/a	Normal	6.88	3.8	10.7	5.7	5.4
	TPH C_{15}-C_{28}	3	15 (100%)	n/a	Normal	33.1	14.6	55.0	26.9	24.5
	TPH C_{29}-C_{36}	5	15 (100%)	n/a	Normal	23.9	9.7	40.0	19.7	17.9
	TPH C_{10}-C_{36}	3	15 (100%)	280	Normal	62.4	28.5	95.0	51.8	47.8
Polynuclear aromatic hydrocarbons (PAHs)	Naphthalene	5	6 (40%)	n/a	Normal	6.2	< 5	6.3	5.8	5.7
	2-Methylnaphthalene	5	0 (0%)	n/a	Normal	NC2	< 5	NC2	NC2	NC2
	Acenaphthylene	4	7 (67%)	n/a	Normal	7.6	< 4	9.0	6.3	6.0
	Acenaphthene	4	0 (0%)	n/a	Normal	NC2	< 4	NC2	NC2	NC2
	Fluorene	4	0 (0%)	n/a	Normal	NC2	< 4	NC2	NC2	NC2
	Phenanthrene	4	13 (87%)	n/a	Nonparametric	25.3	< 4	60.0	16.6	12.3
	Anthracene	4	11 (73%)	n/a	Normal	13.1	< 4	25.0	9.3	7.8
	Fluoranthene	4	15 (100%)	n/a	Normal	53.5	13.1	120.0	38.9	31.1
	Pyrene	4	15 (100%)	n/a	Normal	52.1	14.3	110.0	39.2	32.7
	Benz(a)anthracene	4	15 (100%)	n/a	Normal	26.0	< 4	50.0	19.9	16.9
	Chrysene	4	15 (100%)	n/a	Normal	23.2	< 4	45.0	17.8	15.1
	Benzo(b+j)fluoranthene	4	15 (100%)	n/a	Normal	35.2	< 4	51.4	28.3	25.0
	Benzo(k)fluoranthene	4	13 (87%)	n/a	Normal	16.4	< 4	30.0	12.4	10.6
	Benzo(e)pyrene	4	15 (100%)	n/a	Normal	22.7	< 4	35.0	18.5	16.6
	Benzo(a)pyrene	4	15 (100%)	n/a	Normal	32.5	< 4	55.0	25.7	22.5

	Parameter	LOR	No. Detects	Screening level	Distribution	95% UCL	Min	Max	Mean	Geometric Average
	Perylene	4	15 (100%)	n/a	Normal	54.4	14.3	69.1	46.8	44.2
	Benzo(g.h.i)perylene	4	15 (100%)	n/a	Normal	24.9	< 4	40.0	20.0	17.9
	Dibenz(a.h)anthracene	4	8 (53%)	n/a	Normal	6.8	< 4	6.9	5.0	4.6
	Indeno(1.2.3.cd)pyrene	4	15 (100%)	n/a	Normal	20.0	< 4	30.0	16.1	14.3
	Coronene	5	10 (67%)	n/a	Normal	6.8	< 4	8.4	5.4	5.1
	Sum of PAHs	4	15 (100%)	10,000	Normal	395.6	108.3	710.0	311.5	272.1

Table 3.4 Acid sulphate soil results (chromium suite and SPOCAS)

Parameter	Units	LOR	Zone 2					Zone 3					Zone 4	
			B5-0	B5-1	B6-3	B7-1	B9-1	B15-3	B15-2	B12-1	B11-8	B10-6	B13-8	B13-1
Actual Acidity														
pH KCl	pH Unit	0.1	7.8	8.4	8.3	8.4	8.6	9.1	8.9	8.8	8.5	8.6	8.7	8.6
Titratable Actual Acidity	mole H^+/t	2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
sulfidic - Titratable Actual Acidity	% pyrite S	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
Potential Acidity														
Chromium Reducible Sulfur	% S	0.005	0.205	0.595	0.392	0.272	0.047	0.052	0.168	0.15	0.189	0.447	0.168	0.36
acidity - Chromium Reducible Sulfur	mole H^+/t	10	128	371	244	169	30	32	105	94	118	279	105	225
Acid Neutralising Capacity														
Acid Neutralising Capacity	% $CaCO_3$	0.01	2.05	3.48	2.68	2.96	6.77	1.99	9.07	6.72	2.65	3.29	5.28	4.56
acidity - Acid Neutralising Capacity	mole H^+/t	10	410	696	534	592	1350	398	1810	1340	530	657	1060	911
sulfidic - Acid Neutralising Capacity	% pyrite S	0.01	0.66	1.12	0.86	0.95	2.17	0.64	2.9	2.15	0.85	1.05	1.69	1.46
Acid Base Accounting														
ANC Fineness Factor	-	0.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Net Acidity (sulfur units)	% S	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
Net Acidity (acidity units)	mole H^+/t	10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Liming Rate	kg $CaCO_3$/t	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Net Acidity excluding ANC (sulfur units)	% S	0.02	0.2	0.59	0.39	0.27	0.05	0.05	0.17	0.15	0.19	0.45	0.17	0.36
Net Acidity excluding ANC (acidity units)	mole H^+/t	10	128	371	244	169	30	32	105	94	118	279	105	225
Liming Rate excluding ANC	kg $CaCO_3$/t	1	10	28	18	13	2	2	8	7	9	21	8	17

4 Data Validation

4.1 Laboratory QA/QC

Details of the laboratory QA/QC for the primary and secondary laboratories is provided in the following sections. Refer to Section 2.5 for a description of laboratory QA/QC procedures.

4.1.1 Limits of Reporting (LORs)

LOR was raised for the following parameters. Note LORs for all parameters were below the NAGD screening levels.

- Organotins: The LOR for dibutyltin for sample 'RF7' (EB2328877_001) has been raised due to matrix interference.

4.1.2 Sampling Holding Times and Storage Conditions

All samples were received by the laboratories in appropriately pre-treated and preserved containers. Samples were chilled with ice whilst in the field and during delivery (ice packs). Laboratory holding times were breached for:

- Soil - Samples B5-0, B5-1, B6-3 and B7-1, B12-2 - extractable mercury
- Soil - Samples B5-0, B5-1, B6-3 and B7-1, B12-2 - Organotins
- Water - Sample B7-1 - Organochlorine pesticides

4.1.3 Laboratory Blanks

Results indicated that the laboratory blank assessment was within the acceptable criteria.

4.1.4 Laboratory Duplicates

Results indicate that the laboratory duplicate assessment was generally within the acceptable criteria. The exceptions were:

- TRH Semi volatile Fractions Only: Sample ‘B12-1’ shows poor duplicate results due to heterogeneity. Confirmed by visual inspection.

4.1.5 Surrogate and Matrix Spikes

The assessment of surrogate and matrix spike recoveries was satisfactory for most samples. The exceptions were:

- Total Phosphorus: Sample B13-1 (EB2328877-013) shows poor matrix spike recovery due to sample heterogeneity. Confirmed by visual inspection.
- Organotins: Sample 'RF6' (EB2328877_002) shows poor matrix spike recovery due to matrix interference.
- Total Metals in Sediments by ICP-MS: Sample B5-1 (EB2331615-016) shows poor matrix spike recovery due to sample heterogeneity. Confirmed by visual inspection.

4.2 Field QA/QC

4.2.1 Field Triplicates and Splits

Analyses of field triplicate and field triplicate splits were within the NAGD criterion for RSDs or RPDs for most samples. The exceptions are shown below. In all cases the range of values was less than screening levels.

- Triplicates - B13-4 - Copper (7.3 - 30.7; 85.7%), Lead (9.2 - 30.0; 70.3%), Zinc (39.8 - 111; 64.3%)
- Splits - B10-6 - Chromium (30.2 - 110; 77.1%), Zinc (74.1 - 325; 89.3%); B6-2 - Chromium (25.4 - 1020; 160%)

4.2.2 Summary of Data Validation

Results from the present study indicated that the survey was undertaken to a high standard providing scientific confidence that the presented results are valid to allow an assessment of sediment quality against NADG guidelines. Exceptions are discussed above and relate mostly to high sample heterogeneity and sample matrix interferences.

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Annex A SAP

BMT WBM

Port of Brisbane Maintenance Dredging - Sediment Sampling and Analysis Plan 2013

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Date: October 2013
Confidential

Port of Brisbane Maintenance Dredging - Sediment Sampling and Analysis Plan 2013

Prepared for:	Port of Brisbane Pty Ltd
Prepared by:	BMT WBM Pty Ltd (Member of the BMT group of companies)

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Synopsis: **A sediment sampling and analysis plan for the assessment of physical and chemical sediment properties associated with Port of Brisbane maintenance dredging**

REVISION/CHECKING HISTORY

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1 Introduction

Port of Brisbane Pty Ltd (PBPL) is required to maintain a minimum depth of clearance below the keel of vessels calling at the port to allow for effective shipping access to the port and ensure ship safety. Channel depths are declared by the Harbour Master (Maritime Safety Queensland) and displayed on various shipping charts. PBPL undertakes an annual maintenance dredging program to ensure these minimum depths are maintained.

PBPL propose to undertake its annual maintenance dredging within the navigational areas of the Brisbane River and Moreton Bay, primarily using the Trailer Suction Hopper Dredge (TSHD) 'Brisbane'. Maintenance dredging works extend from the Hamilton Reach of the Brisbane River to the North West Channel located in northern Moreton Bay.

PBPL aims to ensure that all dredging activities, including extraction and placement of material, are undertaken in accordance with existing legislation and with minimal environmental harm. A key component of achieving this aim is to undertake a contaminant assessment of the material proposed for dredging prior to the commencement of the dredging program.

1.1 Sediment Sampling and Analysis Plan (SAP) Objectives

The aim of this SAP is to provide a set of procedures that will allow a statistically valid evaluation of the physical and chemical sediment properties of the sediments to be dredged. The results of this assessment will assist in determining the likely impacts of unconfined offshore disposal of the dredged sediment.

The assessment of physico-chemical sediment properties will be undertaken on the basis of the approach set out in the National Assessment Guidelines for Dredging (Commonwealth of Australia 2009; henceforth NAGD).

The specific SAP objectives are to:

- Provide a summary of proposed dredging and disposal operations for the project;
- Identify a list of contaminants based on a review of existing data and potential contaminant sources;
- Determine the number of samples required to provide an adequate characterisation of the physical and chemical sediment properties;
- Develop procedures for adequate field collection and handling of sediment samples;
- Outline adequate quality assurance and quality control (QA/QC) procedures for field sampling and laboratory analysis;
- Provide a description of statistical procedures used to determine the contaminant status of the dredged material;
- Describe procedures for validating the analytical data to assess whether the sample collection, handling and laboratory analysis was undertaken to a standard allowing assessment of sediment quality against the NAGD guidelines; and

- Outline the proposed reporting framework for the sediment quality results that will address the requirements of the Determining Authority.

1.2 Proposed Dredging

PBPL's area of responsibility in relation to maintenance and capital dredging within port limits can be broadly divided into two zones on the basis of the water body type, navigable depths and nature of dredged material:

- Moreton Bay zone (enclosed/open coastal waters); and
- Brisbane River zone including the Port of Brisbane (middle/lower estuary).

This SAP only considers assessment of sediments for the Brisbane River zone. The Brisbane River zone extends from Hamilton Reach to the Outer Bar Cutting. Annual maintenance dredging is required to remove sediments accumulated by natural siltation processes within the catchment and sediment loads from residential and commercial developments.

To ensure that declared depths of navigational channels are maintained at all times, PBPL undertakes 'insurance' dredging of up to -0.5 metres below the declared depth.

On average, PBPL dredges about 400,000 m^3 to 450,000 m^3 of material each year. Additional dredging needs to be undertaken following major flood events, i.e. in 2011 and 2013.

The Brisbane River zone is divided into different dredging subareas based on existing contaminant data (Figure 2-1), comprising Zone 2, Zone 3 and Zone 4. It is noted that Zone 1 is not part of the annual dredging and samples from this zone have been used to collect control samples upstream of the actual dredging areas.

The following average dredge volumes apply to the dredge subareas (Table 1-1):

Table 1-1 Approximate Maintenance Dredge Volumes

Dredging Subarea	Extents	Average Dredge Volume (m^3)
Zone 2	Colmslie to Pinkenba	150,000
Zone 3	Within port reaches	250,000
Zone 4	Moreton Bay entrance channel	30,000

The maintenance dredging program is structured to maximise efficiencies and utilisation of PBPL's largest dredger, the trailing suction hopper dredge *TSHD Brisbane*. The *TSHD Brisbane* typically carries out the majority of the ports maintenance dredging over a two month period between January and May (actual period varies depending on other commitments of the *TSHD Brisbane* and siltation patterns). The PBPL may also utilise smaller, more manoeuvrable dredging plant, such as grab dredgers and bed levellers, to maintain more confined areas within the Port Limits.

1.3 Offshore Disposal

The PBPL's policy with regard to dredged material is to maximise its beneficial reuse. In general, most of the material dredged by the PBPL from within Port Limits is used in reclamation works

associated with development of the port. The reuse of this dredged material provides several benefits, including:

- Reduced pressure on sea disposal sites;
- The placement of any actual or potential acid sulphate material at depth beneath the water surface; and
- The containment of any contaminated material within a designated boundary, disconnected from the marine system and monitored to ensure the immobility of identified contaminants.

In 2009, the reclamation life of the Future Port Expansion (FPE) area was estimated to be approximately 30 years, based on the current level of port development at that time. Following extreme flood events in both 2011 and 2013 and the subsequent disposal of additional material in the FPE area, the estimated life of the FPE area was reduced by 20 years to 10 years. Given the importance of the FPE as an area to dispose of material unsuitable for ocean disposal, there has been a shift in thinking around the management of the FPE area.

The current proposed management of dredged material is to, where practical, dispose at sea all dredged material deemed suitable for ocean disposal. This proposed management initiative will ensure the long term viability of the FPE area for the disposal of material deemed unsuitable for ocean disposal.

In the past, significant quantities of dredged material from the Brisbane River have been placed offshore at the Mud Island Dredge Material Placement Area (DMPA) (Figure 2-1). In recent years only smaller volumes of dredged material from boat harbours in southern Moreton Bay were placed at the Mud Island DMPA. However, it is proposed that the Mud Island DMPA will be utilised for material found suitable for ocean disposal in future PBPL maintenance dredging campaigns.

2 Review of Existing Information

Prior to each annual maintenance dredging campaign, PBPL undertook assessments of sediment quality at 45 sampling locations within the dredging zones 2 to 4 (Figure 2-1).

Additional samples were obtained from three locations in Zone 1 and Breakfast Creek upstream of the dredging area in order to assess potential sediment quality impacts from the upstream catchment. The sediment quality results for the annual sampling program between 2000 and 2013 are summarised in Section 2.1.

Due to major flooding in the Brisbane River catchment in early January 2011 and late January 2013, emergency dredging was required to maintain declared depths. Twelve to twenty locations were sampled within the port and three to four locations within the Mud Island DMPA for the 2011 and 2013 flood sampling campaigns, respectively. The sediment quality assessments included elutriate and bioavailability analyses for selected trace metals and organic contaminants.

Additionally, a comparison of sediment quality (organochlorine pesticides and dioxins) at 14 sampling locations at the Mud Island DMPA and seven reference sites in Moreton Bay (Sites RF1 to RF7 in Figure 2-1) was undertaken in 2013 to assess if the emergency dredging and disposal activities impacted on sediment and water quality in Moreton Bay. The sediment quality results for the 2011 and 2013 flood sampling are summarised in Section 2.2.

Conclusions based on the review of the annual and flood sampling data are provided in Section 2.3.

2.1 Annual Sediment Quality Data 2000 – 2013

Detailed sediment quality studies have been undertaken within the Port of Brisbane since 1998. This review considers sediment quality data collected between 2000 and 2012. This comprises the studies detailed in Table 2-1.

In addition to the routine monitoring documented in Table 2-1, further sampling was carried in 2011 and 2013 (Worley Parsons 2011b, 2013b, 2013c, 2013d) to assess the effects of floods on sediment quality. Refer to Section 2.2 for a description of these studies.

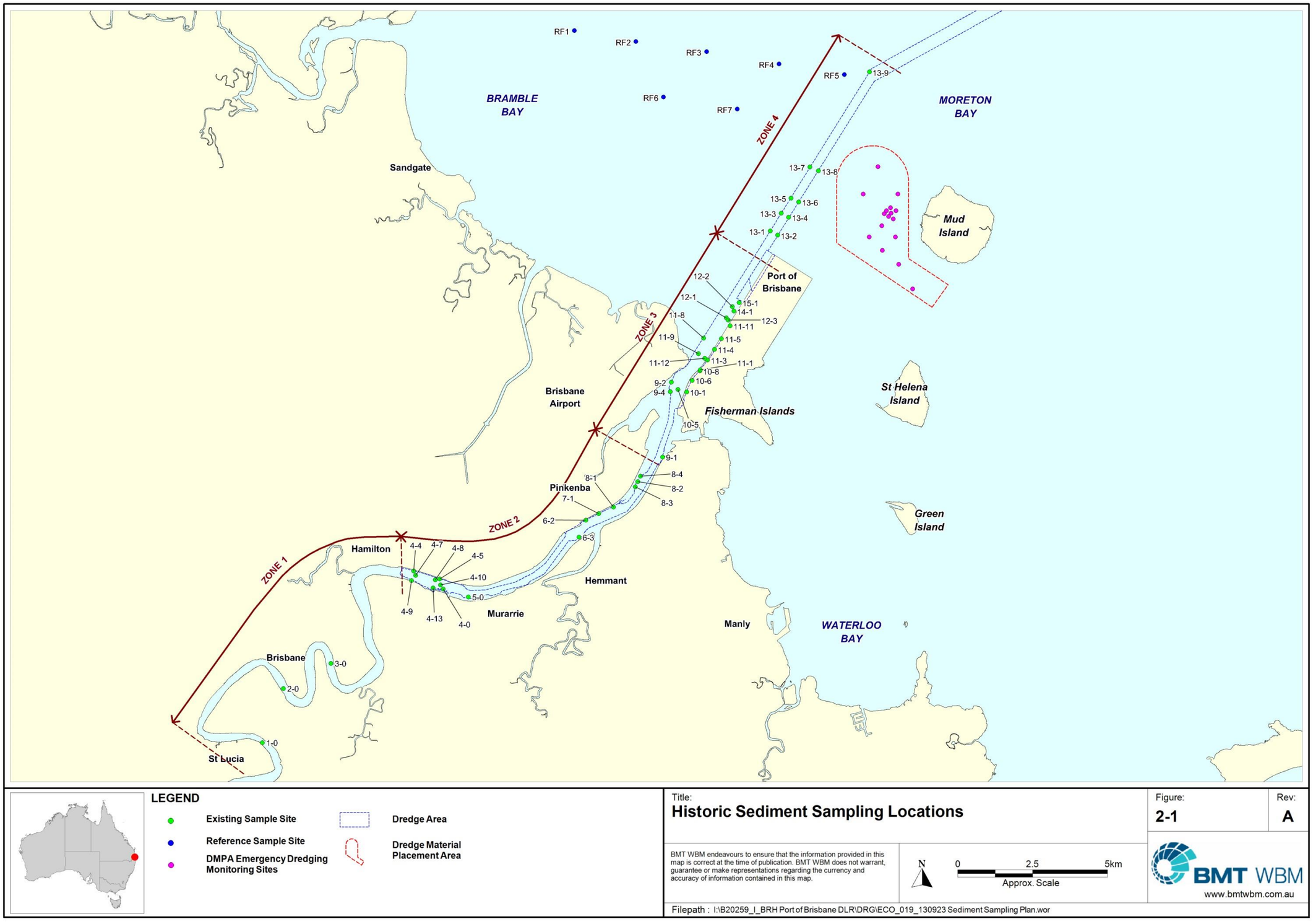
Table 2-1 Previous Routine Annual Sediment Quality Studies

Reference	Sampling Date
Maunsell McIntyre (2001)	November 2000
Butler Partners (2002)	November 2001
Hydrobiology (2003)	November 2002
Hydrobiology (2004)	November 2003
SKM (2005)	November 2004
SKM (2006)	January 2006
SKM (2007)	February 2007
Worley Parsons (2008)	January 2008
Worley Parsons (2009)	February 2009
GHD (2010)	January 2010
Worley Parsons (2011a)	December 2010
Worley Parsons (2012)	December 2011
Worley Parsons (2013a)	December 2012

A wide range of analytical parameters have been measured between 2000 and 2012 as summarised in Table 2-2. Analysis was undertaken at a total of 45 locations within the dredge areas. Additional samples were collected from three control locations upstream of the dredging areas as well as from Breakfast Creek (these locations are not within the dredge areas).

Table 2-2 Summary of Sediment Quality Data 2000 - 2012

Analytical Parameter	Measurement Events
Inorganics	
Metals & Metalloids	2000-2012
Organics	
Organotins	2000-2012
Total Petroleum Hydrocarbons (TPHs)	2000-2012
Benzene, Toluene, Ethylbenzene, Xylene (BTEX)	2000-2012
Polycyclic Aromatic Hydrocarbons (PAHs)	2000-2012 (30% of locations)
Organophosphate and Organochlorine Pesticides (OPPs and OCPs)	2000-2012 (40% of locations between 2000 and 2006)
Polychlorinated Biphenyls (PCBs)	2000-2012 (30% of locations)
Radionuclides	2010-2012
Acid Sulfate Soils	2000-2012


RF1
RF2
RF3
RF4
RF5
RF6
RF7
BRAMBLE BAY
MORETON BAY
Sandgate
ZONE 4
ZONE 3
ZONE 2
ZONE 1
13-9
13-7
13-8
13-5
13-6
13-3
13-4
13-1
13-2
Mud Island
Port of Brisbane
12-2
12-1
15-1
14-1
11-8
12-3
11-11
11-9
11-5
11-4
11-12
11-3
11-1
10-8
10-6
9-2
9-4
10-1
10-5
Brisbane Airport
Fisherman Islands
St Helena Island
9-1
8-1
8-4
8-2
8-3
Pinkenba
7-1
6-2
6-3
Green Island
Hamilton
4-4
4-7
4-8
4-5
4-10
5-0
4-9
4-13
4-0
Hemmant
Murarrie
Manly
WATERLOO BAY
Brisbane
3-0
2-0
1-0
St Lucia
LEGEND
Existing Sample Site
Reference Sample Site
DMPA Emergency Dredging Monitoring Sites
Dredge Area
Dredge Material Placement Area
Title:
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2.1.1 Metals and Metalloids

Testing for metals and metalloids has included analysis of arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc between 2000 and 2012. Antimony and silver were also tested between 2001 and 2004.

The main contaminants of potential concern in terms of metals and metalloids were mercury and nickel. Mercury and nickel concentrations frequently exceeded the NAGD screening level at the 95% Upper Confidence Limit of the mean (95% UCL). Silver exceeded the NAGD screening level at the 95% UCL between 2002 and 2004. All other metals and metalloid 95% UCL concentrations were generally below the 95% UCL between 2000 and 2013.

The temporal and spatial trends observed for trace metals between 2000 and 2012 are detailed in the following sections.

2.1.1.1 Mercury

The NAGD screening level for mercury (0.15 mg/kg) was exceeded on numerous occasions in the Brisbane River dredge zones, particularly in Zone 2. Figure 2-2 shows the number of occasions when the screening level was exceeded between 2000 and 2012 and the number of sites for dredge zones 2 to 4 where exceedances were noted.

For Zone 2, mercury concentrations exceeded the screening level on 61 - 70% of occasions at 25% of locations. At a similar number of sites in Zone 2 exceedances were noted on 20 – 40% of occasions between 2000 and 2012.

Some exceedances of the mercury screening level were noted also for Zone 3 and Zone 4. However, those exceedances occurred only at a limited number of sites whilst no screening level exceedances were noted at 70 – 80% of locations in Zone 3 and Zone 4 between 2000 and 2012.

In Zone 3 most exceedances of the mercury screening level occurred at three sites (9-2, 10-6 and 11-8) occurring on 31 – 69% of occasions. In Zone 4, exceedances were only noted at two sites (13-5 and 13-6) on 8 – 23% of occasions.

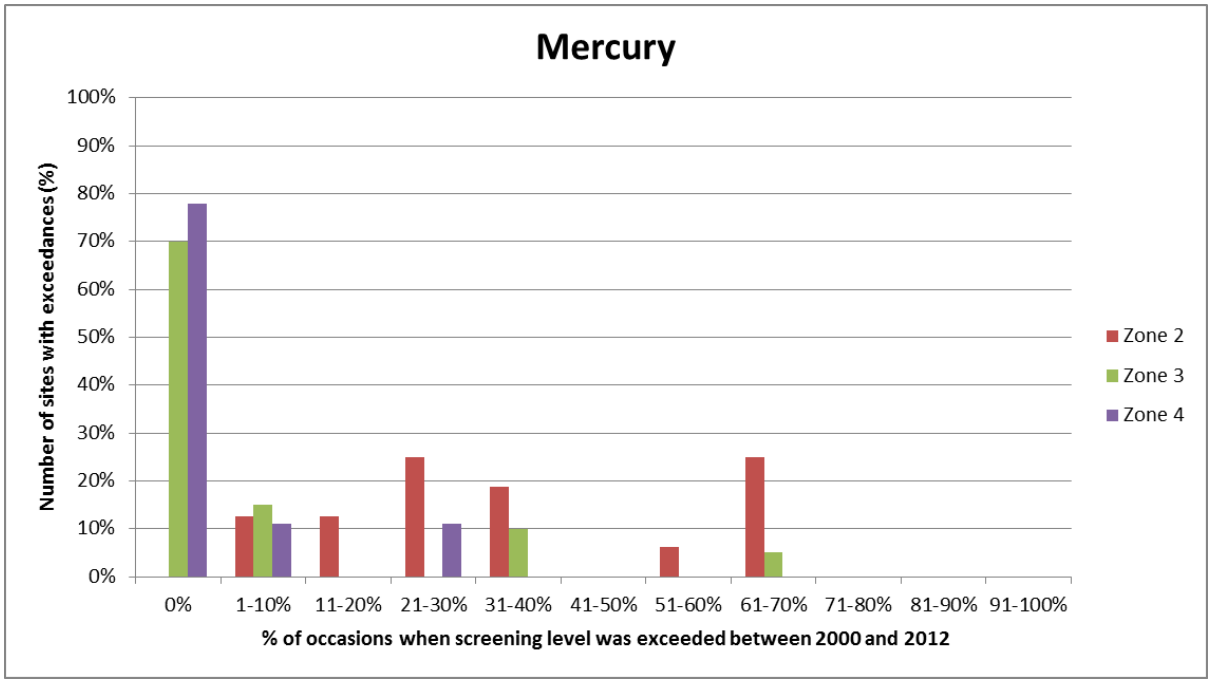


Figure 2-2 Exceedances of the NAGD Screening Level for Mercury between 2000 and 2012 in Dredge Zones 2, 3 and 4

2.1.1.2 Nickel

Exceedances of the nickel screening level (21 mg/kg) were noted for most locations across all dredge zones (Figure 2-3). Exceedances of the screening level on more than 80% of occasions were noted at a cumulative 56% of sites in Zone 2, 20% of sites in Zone 3 and 11% of sites in Zone 4. Average Nickel concentrations were 24.2 mg/kg for Zone 2, 20.1 mg/kg for Zone 3 and 21.4 mg/kg for Zone 4, i.e. close to the nickel screening level of 21 mg/kg.

Given the widespread exceedances of the nickel screening level across all dredge zones and that exceedances were also commonly noted for the upstream control sites, it appears likely that the elevated nickel concentrations are of natural origin. It is recognised that sediments in Australia including South-East Queensland commonly have high natural levels of nickel (NAGD 2009 and Preda & Cox 2002).

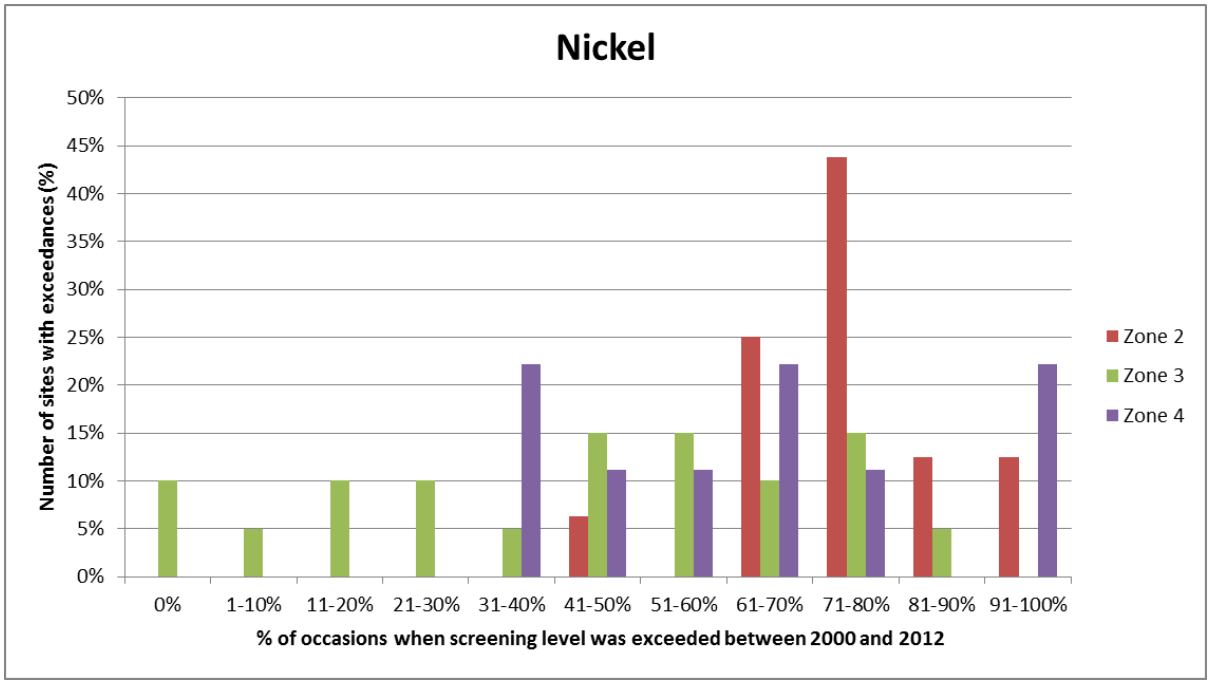


Figure 2-3 Exceedances of the NAGD Screening Level for Nickel between 2000 and 2012 in Dredge Zones 2, 3 and 4

2.1.1.3 Arsenic

Concentrations for arsenic were below the NAGD screening level of 20 mg/kg at all locations and dredge zones between 2000 and 2012.

2.1.1.4 Cadmium

Cadmium concentrations were below the NAGD screening level of 1.5 mg/kg with the exception of one site in Zone 2 (Site 6-2) where the screening level was met or exceeded between 2007 and 2009 with concentrations ranging between 1.5 – 6.3 mg/kg.

However, cadmium concentrations were below screening level at all locations between 2010 and 2012. The 95% UCL for cadmium was below the screening level between 2000 and 2013 for all dredge zones.

Average cadmium concentrations between 2000 and 2012 were 0.30 mg/kg for Zone 2, 0.20 mg/kg for Zone 3 and 0.17 mg/kg for Zone 4, i.e. well below the screening level across all dredge zones.

2.1.1.5 Chromium

Chromium concentrations were mostly below the screening level of 80 mg/kg. The only exceptions were noted at site 9-1 in Zone 3 where the screening level was exceeded in 2002 and 2012 with concentrations ranging between 94 – 100 mg/kg. However, the 95% UCL remained below the screening level. Furthermore, exceedances of the chromium screening level were noted at four sites in Zone 2 in 2000 with concentrations ranging between 88.6 – 101 mg/kg.

2.1.1.6 Copper

Copper concentrations exceeded the NAGD screening level of 65 mg/kg on a few occasions in Zone 2 and Zone 3. No exceedances of the copper screening level were noted for Zone 4 (Figure 2-4).

In Zone 2 exceedances were noted at five out of sixteen locations, with only one to two detections noted at four of these locations between 2000 and 2012. At site 6-2 in Zone 2 exceedances of the screening level occurred on 46% of occasions. However, in 2011 and 2012 copper concentrations were below the screening level at this site.

The only exceedances of the copper screening level in Zone 3 were noted for site 9-1 in 2000 and 2008.

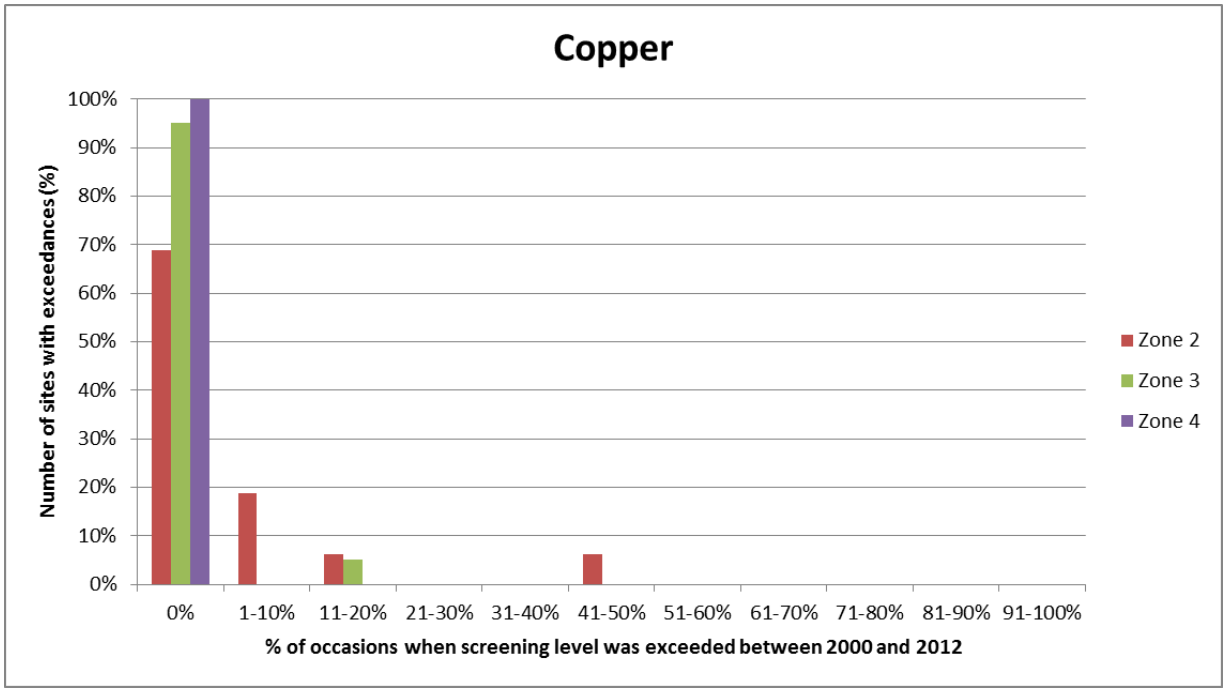


Figure 2-4 Exceedances of the NAGD Screening Level for Copper between 2000 and 2012 in Dredge Zones 2, 3 and 4

2.1.1.7 Lead

Some individual exceedances of the lead screening level (50 mg/kg) were noted, in particular in Zone 2 where exceedances were noted at seven locations (Figure 2-5). Since 2001 there were only single detections of lead above the screening level noted per annual sampling event. The 95% UCL for lead was below the NAGD screening level since 2001.

Exceedances on individual sites were noted on less than 20% of occasions, i.e. only once or twice between 2000 and 2012 in Zone 2. In Zone 3 and Zone 4, the only exceedances of the lead screening level were noted at single sites (9-1 in Zone 3 and 13-4 in Zone 4) and only on one or two occasions between 2000 and 2012.

The last screening level exceedance was noted in 2009 for Zone 2, in 2000 for Zone 3 and in 2010 for Zone 4. The average concentrations of lead between 2000 and 2012 were 26.9 mg/kg for Zone

2, 13.7 mg/kg for Zone 3 and 12.3 mg/kg for Zone 4, i.e. well below the screening level across all dredge zones.

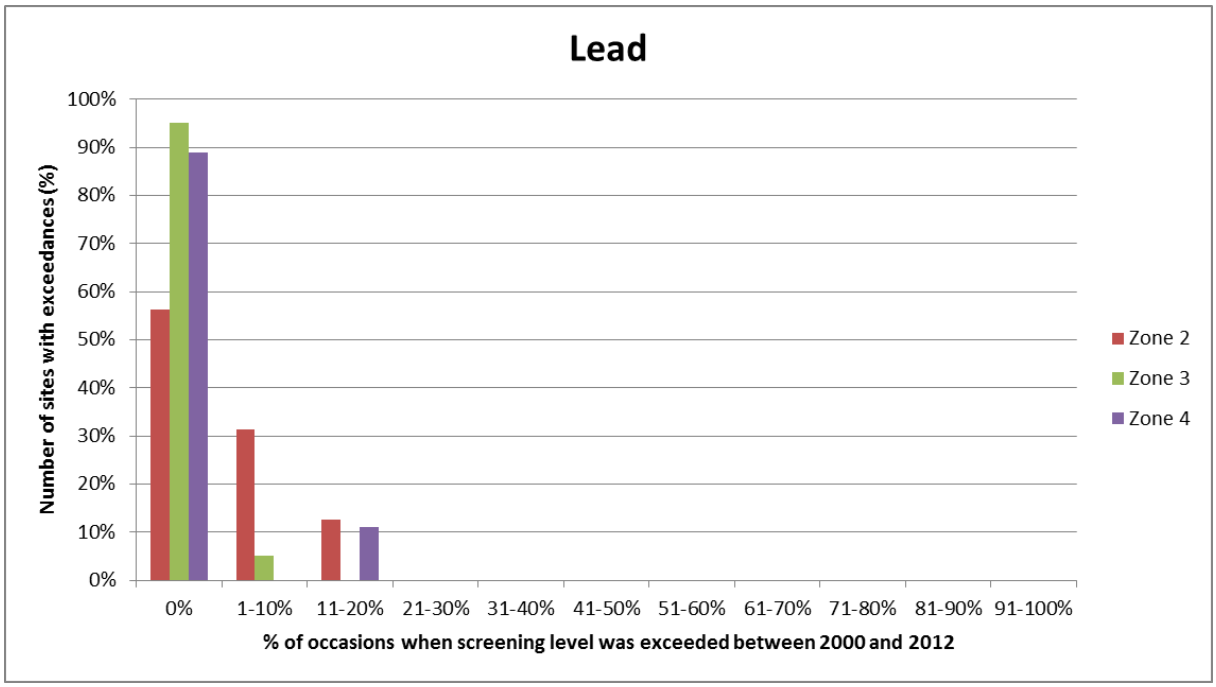


Figure 2-5 Exceedances of the NAGD Screening Level for Lead between 2000 and 2012 in Dredge Zones 2, 3 and 4

2.1.1.8 Zinc

Individual exceedances of the zinc screening level (200 mg/kg) were noted at eight locations in Zone 2. However, most of these exceedances occurred only once or twice (<15% occurrence) between 2000 and 2012 (Figure 2-6). Only at location 6-2 exceedances occurred on more than 30% of occasions (four times between 2000 and 2012). It is noted that the last exceedance of the zinc screening level in Zone 2 occurred in 2010.

In Zone 3 only a single exceedances was noted at location 9-1 in 2000. No exceedances of the zinc screening level were noted in Zone 4.

The average zinc concentration between 2000 and 2012 was 130.3 mg/kg for Zone 2, 74.0 mg/kg for Zone 3 and 57.1 mg/kg for Zone 4, i.e. well below the NAGD screening level across all dredge zones.

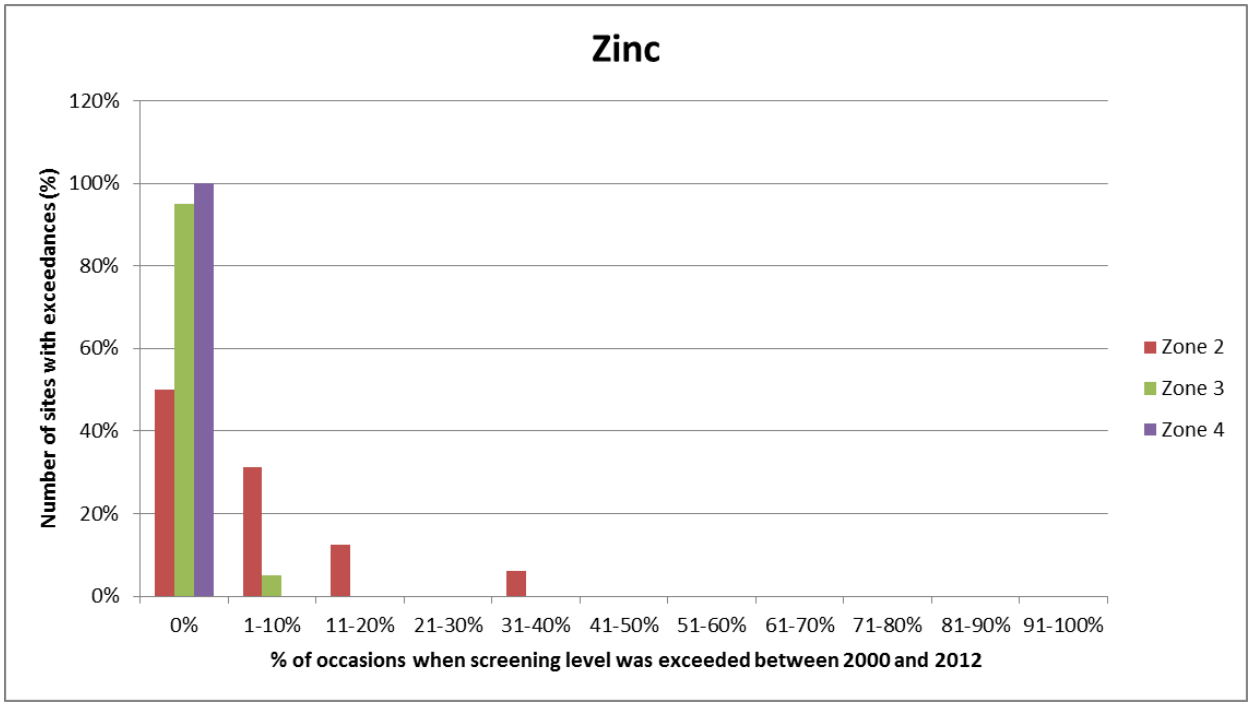


Figure 2-6 Exceedances of the NAGD Screening Level for Zinc between 2000 and 2012 in Dredge Zones 2, 3 and 4

2.1.1.9 Antimony and Silver

In addition to the metals and metalloids outlined above, antimony and silver were tested between 2001 and 2004. While antimony concentrations remained below the Limit of Reporting (LOR) for all sampling events, silver was detected at several locations and concentrations exceeded the screening level at one site in Zone 3 (11-8) between 2002 and 2004.

2.1.2 Organotins

Concentrations of TBT at the 95% UCL frequently exceeded the NAGD screening level (9 µg Sn/kg) between 2000 and 2012, particularly in dredge zones 2 and 3.

Exceedances of the TBT screening level were noted predominantly in Zone 2, including several exceedances of the NAGD high level of 70 µg Sn/kg (Figure 2-7). At sampling site 4-4 in Zone 2, the screening level was exceeded during all sampling events except in 2001, including six exceedances of the NAGD high level. At several other locations in Zone 2, screening level exceedances were noted between 20 to 70% of occasions.

In Zone 3, exceedances of the TBT screening level were typically only noted once or twice between 2000 and 2013, corresponding to 8% and 15% of occasions in Figure 2-7. The only exception was site 9-1, where exceedances of the screening level were noted on 69% of occasions. This included five sampling events where the NAGD high level was exceeded. This corresponds to a generally higher occurrence of metal/metalloid exceedances at this site as outlined in Section 1.1.1. It is noted that site 9-1 is the site located closest to Zone 2.

Only a single exceedance of the TBT screening level was noted at site 13-1 in Zone 4 in 2006.

The average normalised TBT concentration between 2000 and 2012 was 28.8 µg Sn/kg for Zone 2, 21.8 µg Sn/kg for Zone 3 and 0.7 µg Sn/kg for Zone 4. If site 9-1 is excluded from Zone 3, the average concentration is 4.4 µg Sn/kg, i.e. less than the NAGD screening level.

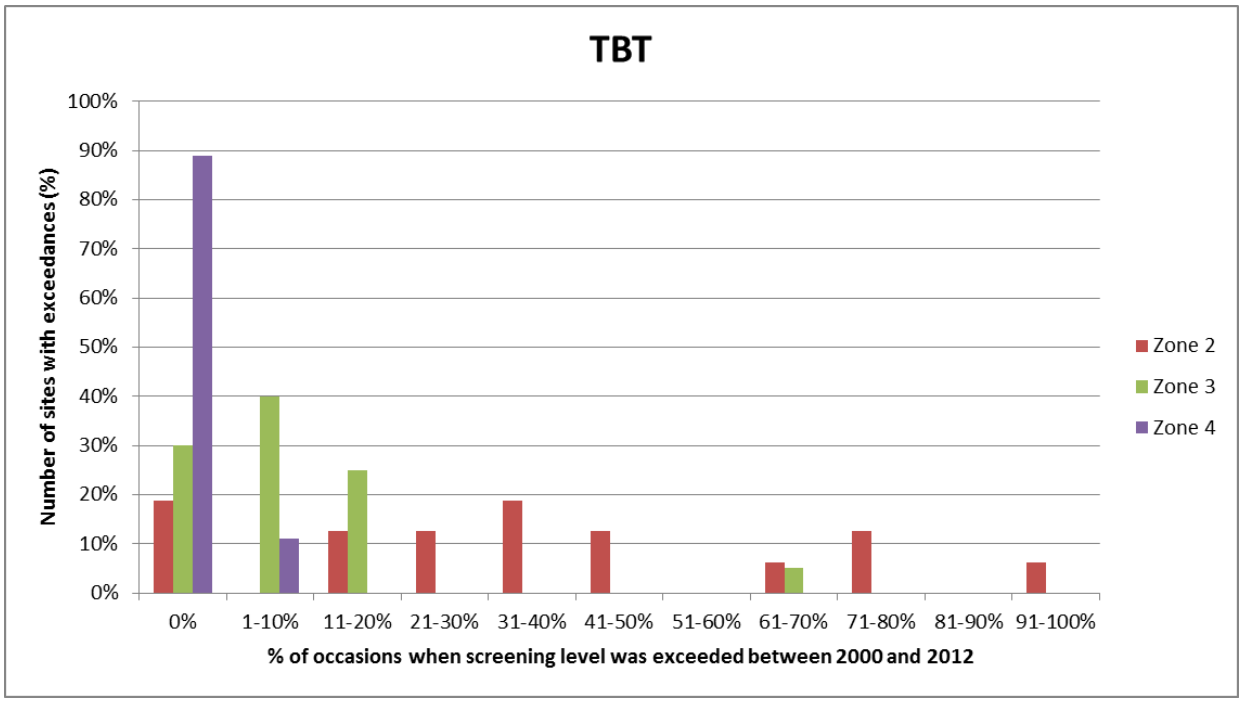


Figure 2-7 Exceedances of the NAGD Screening Level for TBT between 2000 and 2012 in Dredge Zones 2, 3 and 4

2.1.3 Benzene, Toluene, Ethylbenzene and Xylene (BTEX)

BTEX concentrations were below LOR in all samples and all zones between 2000 and 2012.

2.1.4 Total Petroleum Hydrocarbons (TPHs)

While TPHs were detected on several occasions across all dredge zones, the total TPH concentration was below the NAGD screening level of 550 mg/kg at all sampling locations between 2000 and 2012. Most detections of TPHs were noted in Zone 2, with less detections noted for Zone 3 and only some isolated detections recorded in Zone 4.

2.1.5 Polycyclic Aromatic Hydrocarbons (PAHs)

Total PAHs concentrations were mostly below the NAGD screening level of 10,000 µg/kg except for two individual detections above screening level in Zone 2 and Zone 3 in 2001. The 95% UCL for PAHs exceeded the screening level in 2011. However, since 2001, the total PAHs concentrations remained well below the screening level for all dredge zones.

2.1.6 Polychlorinated Biphenyls (PCBs)

Total PCBs concentrations were mostly well below the NAGD screening level of 23 µg/kg or below LOR. The only exceptions were site 10-6 in Zone 3 where detections above the screening level were noted in 2001 and 2012 and site 13-1 in Zone 4, where a detection above screening level was noted in 2011.

2.1.7 Organochlorine Pesticides (OCPs)

The 95% UCL concentrations of the OCPs dichlorodiphenyltrichloroethane (DDT), dichlorodiphenyldichloroethane (DDD) and Dichlordiphenyldichloroethylene (DDE) frequently exceeded the NAGD screening level between 2000 and 2013. In some cases the 95% UCL concentrations of chlordane also exceeded the NAGD screening level.

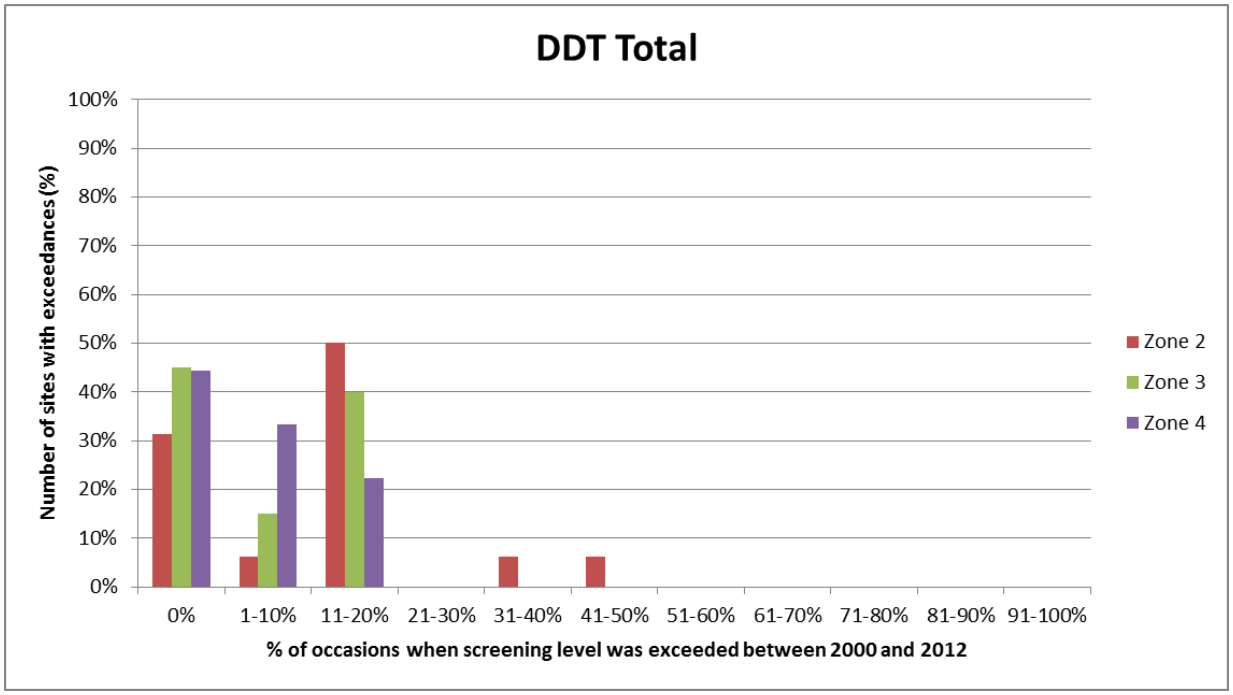
Total DDT concentrations and its metabolites DDD and DDE exceeded their respective screening levels (1.6, 2 and 2.2 µg/kg for DDT, DDD and DDE, respectively) on numerous occasions across all dredge zones (). This includes some exceedances of the NAGD high levels for DDT (46 µg/kg) and DDD (20 µg/kg), but DDE concentrations did not exceed the NADG high level of 27 µg/kg.

Most of these screening level exceedances for DDT, DDD and DDE were recorded at Zone 2, occasional exceedances of all three parameters were also recorded in Zone 3 and 4 between 2000 and 2012. The DDT breakdown product DDE was generally detected more frequently than DDT and DDD (Figure 2-8).

The presence of DDT and its metabolites across all dredge zones and consistent detections over the last decade demonstrates the long term environmental persistence of DDT and its metabolites.

Furthermore, several exceedances of the chlordane NAGD screening level of 0.5 µg/kg and the NAGD high level of 6 µg/kg were noted between 2000 and 2012.

In 2002, chlordane concentrations exceeded the screening level at all tested sampling locations in Zone 2, 3 and 4. Whilst no screening level exceedances were noted between 2003 and 2007, one to three locations in Zone 2 had concentrations higher than the screening level in 2008, 2009 and 2011 (sites 4-0, 4-4, 4-5, 4-7 and 4-8). One exceedance of the chlordane screening level was also noted in 2011 in Zone 3 (site 11-8).



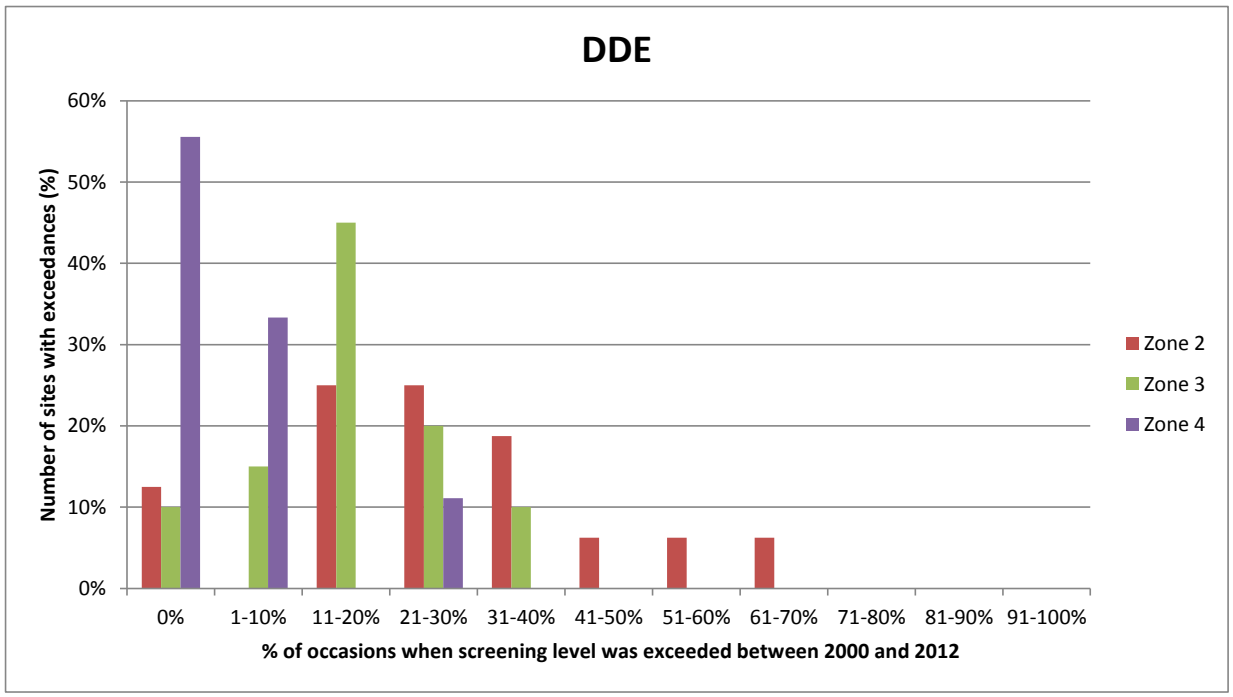


Figure 2-8 Exceedances of the NAGD Screening Level for total DDT (upper plot) and DDE (lower plot) between 2000 and 2012 in Dredge Zones 2, 3 and 4. Similar Trends for DDD.

2.1.9 Organophosphorus Pesticides (OPPs)

Concentrations of OPPs were below LOR for all sampled locations between 2000 and 2012.

2.1.10 Radionuclides

Radionuclides (gross alpha and beta) were analysed at eight sites across all dredge zones between 2010 and 2012.

Concentrations of radionuclides were detected in the January 2010 sampling but in concentrations well below the NAGD screening level of 35 Bq/g (maximum concentration 0.97 Bq/g). Radionuclide concentrations were below the LOR at all sites in all following sampling campaigns.

2.1.11 Acid Sulfate Potential

Acid sulfate soil testing indicates that the sediments in the dredge zone have no actual acidity but are generally considered to be Potential Acid Sulfate Soils (PASS). Assessments of the buffer capacity indicate that the sediments in all dredge zones have sufficient acid neutralizing capacity to buffer any acid potentially generated through onshore disposal.

Acid Sulfate Soil test results were generally consistent between 2000 and 2012.

2.2 Flood Sampling 2011 and 2013

The review of flood sampling sediment quality results included Worley Parsons (2011b, 2013b, 2013c, 2013d).

The 2011 and 2013 sampling campaigns (Worley Parsons 2011b and 2013b) included all parameters as per Table 1 of the NAGD. Additionally, porewater ammonium concentrations were measured and acid sulfate soils assessed in 2011. For both studies elutriate and bioavailability testing for nickel and mercury was undertaken.

Further testing for DDT, DDD, DDE and dioxins/furans was undertaken in 2013 including a comparison of 14 sampling locations at the Mud Island DMPA against seven Moreton Bay reference locations to assess whether the emergency dredging and disposal has affected sediment quality in Moreton Bay (Worley Parsons 2013c and 2013d).

2.2.1 Metals and Metalloids

In 2011, nickel (9 of 15 locations), mercury (3 of 15 locations) and lead (1 location) were the only metals to exceed their respective NAGD screening levels. In 2013, nickel was the only metal to exceed screening levels at 18 of the 24 locations sampled. All other metals/metalloids were below their respective screening levels.

Elutriate and bioavailability testing was undertaken for nickel and mercury in 2011 and 2013. For both sampling events, the elutriate concentrations for mercury were below LOR and nickel elutriate concentrations were well below the ANZECC/AMRCANZ (2000) 95% species protection level of 70 µg/L or below LOR. Furthermore, dilute acid extraction results for mercury and nickel indicated low bioavailability of these metals with concentrations below their respective NAGD screening level in all samples in 2011 and 2013.

These results indicated low likelihood for adverse water quality and sediment quality impacts during dredging and disposal for mercury and nickel.

2.2.1.1 Comparison to Annual Sampling

Consistent with the annual sampling undertaken between 2000 and 2012, nickel and mercury concentrations were the main contaminants of concern within the dredge areas with concentrations similar to the annual sampling events. Lead was detected above the screening level on some occasions during the annual sampling. Similar to the flood sampling, detections were noted only at single locations per annual event and 95% UCL concentrations were below the NAGD screening level.

2.2.2 Organochlorine Pesticides (OCPs)

DDT and its metabolites were detected in 2011 with DDE detected in nine of 15 locations. Whilst normalised DDD and DDE concentrations remained below their respective screening levels, normalised DDT concentrations exceeded the NAGD screening level at two locations. All other OCPs were below LOR at all locations in 2011.

In 2013, DDD was detected in one sample with a concentration exceeding the NAGD screening level. DDE exceeded the NAGD screening level of 2.2 µg/kg in all samples with a 95% UCL of 5.25 µg/kg.

2.2.2.1 Comparison to Annual Sampling

Similar to the annual sampling events, DDT and its metabolites were detected above the NAGD screening level in the flood sampling. Concentrations were similar to those detected in the annual sampling.

2.2.2.2 Comparison to Background Concentrations (2013)

Total DDT concentrations were below the LOR at all locations, including those at Mud Island DMPA and reference locations.

Sampling carried out prior to the 2013 emergency dredged material disposal event detected DDE at all 20 sampling locations within the dredged area, and one of the four locations within the DMPA. DDD was above the LOR in one sample within the dredged area (10µg/kg normalised to % TOC), and was also above the NAGD Screening level of 2 µg/kg.

Further more detailed sampling was carried out to compare contaminant concentrations at 14 locations in the DMPA and seven reference locations, following the 2013 emergency dredged material disposal event. The results of this sampling indicated that:

- DDT was again below the LOR at all locations, including those at Mud Island DMPA and reference locations.
- DDE was detected at all sampling locations with 95% UCL concentrations exceeding the NAGD screening level at both the DMPA and reference locations. This indicates that DDE was widespread throughout the study area.
- A comparison of the 80th percentile DDE of the reference locations was higher than historical levels of DDE in the Brisbane River. This indicates that the Brisbane River flood plume in

January 2013 impacted on the Brisbane River, Bramble Bay and the wider Moreton Bay region and the maintenance dredging operations undertaken by PBPL were not likely to have caused or spread this contamination.

- Additional elutriate and pore water analyses for OCPs indicated that DDD and DDE are likely adsorbed to the clay fraction of the sediment and thus not bioavailable.

2.2.3 Dioxins

Dioxins and furans were detected in the 2011 and 2013 flood sampling events. A toxic effect factor is allocated to each compounds which allows the total toxicity of combined dioxins and furans to be determined using the toxic equivalence (TEQ).

In 2011, the WHO-TEQ$_{(0.5\ LOR)}$ value (concentrations below LOR are assigned a concentration equal to half the LOR) was elevated at one location in Zone 3 with a concentration of 25.36 pg/g. All other sampling locations, including at the DMPA had concentrations between 6.02 and 10.89 pg/g WHO-TEQ.

In 2013, the WHO-TEQ concentrations were generally lower ranging between 0.5 pg/g to 5.3 pg/g.

There are no sediment quality guideline values for comparison that would apply to Australian sediments.

2.2.3.1 Comparison to Background Concentrations (2013)

The WHO-TEQ concentrations at the Mud Island DMPA sites ranged between 4.24 to 4.94 pg/g. The WHO-TEQ concentrations were higher at the reference site in comparison ranging between 7.87 to 7.97 pg/g. Approximately 99% of the sediment concentrations at all sampling locations comprised of 99% dioxins and 1% furans.

Pore water WHO-TEQs ranged between 0.5 and 7.3 pg/g at the DMPA and between 3.1 and 8.0 pg/g at the reference sites. Mean values and 95% UCL concentrations were lower than the 80th percentile of dioxins/furans at the reference area.

A comparison with historical data (Hermanussen et al. 2004; Mueller et al. 2004) shows that dioxins/furans have been historically present within Moreton Bay in elevated concentrations and that their concentrations are not directly related to dredging activities.

2.2.4 Organotins

Organotin concentrations were below the NAGD screening level or below LOR in 2011 and 2013.

2.2.4.1 Comparison to Annual Sampling

The relatively low concentrations of organotins in the flood sampling of 2011 and 2013 appear to be different to the pattern observed in the annual sampling campaigns. However, it should be noted that TBT was only detected at three locations above the NAGD screening for the annual 2010 and 2012 sampling events.

The overall low organotin concentrations across the dredge area after the 2011 and 2013 floods may be due to burial and mixing with sediments from the catchment.

2.2.5 Polychlorinated Biphenyls (PCBs)

PCB concentrations were below LOR at all sampling locations in 2011. In 2013, one location in Zone 3 had a normalised total PCB concentration (38.9 µg/kg) exceeding the NAGD screening level of 23 µg/kg. PCB concentrations were below LOR at all other locations in 2013.

2.2.5.1 Comparison to Annual Sampling

Similar to the annual sampling events, PCBs exceeded the NAGD screening level at only one location or were not detected.

2.2.6 Other Organic Contaminants

Concentrations of BTEX, TPHs, PAHs, OPPs, Phenols, Chlorobenzenes, halogenated compounds and non-organochlorine pesticides were either below LOR or below their respective screening levels in 2011 and 2013.

2.2.6.1 Comparison to Annual Sampling

The pattern observed for BTEX, TPHs, PAHs, OPPs were similar to the those observed in the annual sampling events, i.e. BTEX and OPPs were below their laboratory LORs whereas TPHs and PAHs were typically detected but at concentrations well below the respective NAGD screening levels.

2.2.7 Porewater Ammonia

Sediments at all locations had porewater concentrations below the literature derived guideline level of 11 mg/L (Batley and Simpson 2009). The only exception was one site in Zone 2 where the guideline level was marginally exceeded (16.6 mg/L).

2.2.8 Acid Sulfate Soil

Acid sulfate soils were tested in the 2011 flood sampling. Actual acidity was below the laboratory LOR for all samples, but potential acidity exceeded the QASSIT guideline limit identifying the samples as potential acid sulfate soils (PASS).

The acid neutralising capacity was sufficient in all samples resulting in a net acidity less than the LOR indicating that no liming would be required if the material would be placed on land.

2.2.8.1 Comparison to Annual Sampling

Results for the flood sampling were consistent with the annual maintenance dredge sampling.

2.3 Summary of Annual and Flood Sampling Data

Consistent across the annual and flood sampling events, the main contaminants of concern in the Brisbane River dredge area were the metals nickel and mercury, and DDT metabolites. TBT was also found above screening levels during routine annual monitoring, but was below screening levels in the 2011 and 2013 post-flood sampling episodes. This could suggest that the flood events had dispersed, diluted or buried TBT contaminated material.

Exceedances of the NAGD screening level for mercury, organochlorine pesticides and organotins were most frequently detected upstream of the Port area, i.e. in Zone 2 with a lower occurrence of screening level exceedances in the Port area (Zone 3) and the Entrance Channel area (Zone 4).

The similar spatial patterns of contaminant distribution observed between the regular annual sampling and the flood sampling indicates that catchment runoff from the urbanised and industrialised area upstream of the Port and not the Port of Brisbane is likely the main contributor of contaminants in the dredge area.

Organochlorine pesticides may be present due to broad non-point catchment sources or as legacy material. TBT is mainly originating from local marine industry sources and ships. Mercury may be introduced to the system via sewage treatment plant discharges (including trade waste) or other industrial point sources along the river.

The wide distribution of high nickel concentrations across the entire dredge area and upstream reference locations indicates that nickel is of natural origin (due to local mineralogy) across the broader catchment.

3 Sampling and Analysis

3.1 Sampling Rationale

3.1.1 Number of Sampling Locations

As per NAGD, the number of sample locations for medium sized projects (up to 500,000 m^3) should be divided into distinct sites based on their chemical characteristics. Based on the review of historical data (Section 2) and consistent with previous sampling campaigns, the dredge area was divided into three zones (Table 3-1).

Table 6 of NAGD was used to determine the number of sampling locations for each dredging subarea. Given that current, good quality data were available to support the classification, the number of sampling locations was halved and rounded up as per NAGD. Table 3-1 also shows the required number of sampling locations for Phase III testing (elutriate and bioavailability).

In addition to the required samples to be obtained from the dredge areas, samples will be collected also from upstream and downstream 'reference' areas. This includes two locations from Zone 1 which were sampled in previous sampling campaigns and five locations from Moreton Bay which were sampled as part of additional sediment sampling following the 2011 and 2013 flooding. Furthermore, two samples will be collected from the Mud Island DMPA.

Table 3-1 Number of Sampling Locations as per NAGD

Dredging Subarea	Classification	Dredge Volume (m^3)	# Locations – Phase II	# Locations – Phase III
Zone 2	Probably contaminated	150,000	10	5 + 1 replicate
Zone 3	Probably clean	250,000	11	6 + 2 replicates
Zone 4	Probably clean	30,000	5	3 + 1 replicate
Additional Samples				
Zone 1	Upstream Reference	N/A	2	N/A
Moreton Bay	Downstream Reference	N/A	5	N/A
Mud Island	DMPA	N/A	2	N/A

3.1.2 QA/QC Samples

In accordance with NAGD requirements, the following field and laboratory quality control samples will be obtained:

- Field triplicate samples (two additional grab samples at 10% of sample locations) to determine the small scale variability of the sediment physical and chemical characteristics. Based on a total of 26 primary locations in dredged areas (Zones 2, 3 and 4), field triplicate samples would be required at three locations. Two additional samples would therefore be collected at location 5-1 (Zone 2), 11-9 (Zone 3) and 13-4 (Zone 4).
- Triplicate split samples (primary sample from 5% of locations thoroughly mixed and split into three sample container sets) to assess laboratory variation, with one of the three samples sent to a second (reference) laboratory for analysis. Based on a total of 26 primary locations in dredged areas (Zones 2, 3 and 4), field split samples would be required at two locations. Split samples would be undertaken at location 6-2 (Zone 2) and 10-6 (Zone 3).

- One trip blank container per sampling day filled with inert material (e.g. chromatographic sand) to be analysed concurrent with the analysis of volatile organic substances such as; and
- One inter-batch sample from a previous batch of samples if more than one batch is submitted to the laboratory, to determine the analytical variation between batches. However, it is anticipated that all samples will be submitted in one batch.

Table 3-2 provides a summary of QA/QC samples to be obtained for the three dredging subareas.

Table 3-2 Number of Primary and QA/QC Samples

Dredging Subarea	Primary Samples	Field Triplicate Samples	Triplicate Split Samples	Trip blanks
Zone 2	10	2	2	1 per sampling day
Zone 3	11	2	2	
Zone 4	5	2		

3.1.3 Sampling for Elutriate and Bioavailability Testing

The sediment sampling will include additional sediment samples for Phase III testing (elutriate and bioavailability). Phase III testing will be undertaken for parameters which have frequently exceeded the NAGD screening levels in the past. Based on the review of historical data (Section 2) this will include:

- Metals and metalloids (nickel and mercury);
- Organotins (TBT); and
- Organochlorine Pesticides (DDT, DDD, DDE, chlordane).

Exceedances of NAGD screening levels were predominantly detected in Zone 2 and Zone 3. In accordance with Table 7 of NAGD, five locations would need to be sampled for Zone 2 and six locations for Zone 3 (Table 3-1).

In order to allow elutriate analysis, 20 L of seawater will be collected from the Mud Island DMPA.

Phase III testing for nickel and mercury (and potential other metals/metalloids) can be undertaken from the primary samples collected for the sediment quality assessment. The bioavailability analysis for nickel and mercury will involve dilute acid extraction as per NAGD. Analysis will be performed on the samples with the highest concentrations.

Bioavailability analysis for the organic contaminants (organotins and organochlorine pesticides) will require porewater testing as per NAGD. Additional samples will be collected for porewater testing at the locations which have historically shown the highest percentage of screening level exceedances. The proposed sampling locations for this testing are provided in Section 3.2.1. In order to meet required holding times, elutriate and bioavailability analysis for the organic contaminants will be undertaken concurrent with the analysis of the primary samples.

3.2 Sampling Locations

A map with the proposed sampling locations is provided in Figure 3-1. In order to provide consistency with previous sampling and to facilitate comparisons with historical data, most of the proposed sampling locations were selected from the set of historical sampling locations, and to

also focus on areas that are most frequently dredged. Additionally, sampling locations were added to close spatial gaps in sediment quality data. These include sampling locations 5-1 in Zone 2 as well as locations 9-5 and 9-6 in Zone 3 (Figure 3-1).

As outlined in more detail in Section 3.5, samples from all locations will be analysed for a basic suite of parameters. A selection of these sites will also be analysed for a detailed suite in addition to the basic suite including 'low risk' parameters that have been detected in the past but were typically below their respective NAGD screening levels.

3.2.1 Sampling Locations for Porewater Testing

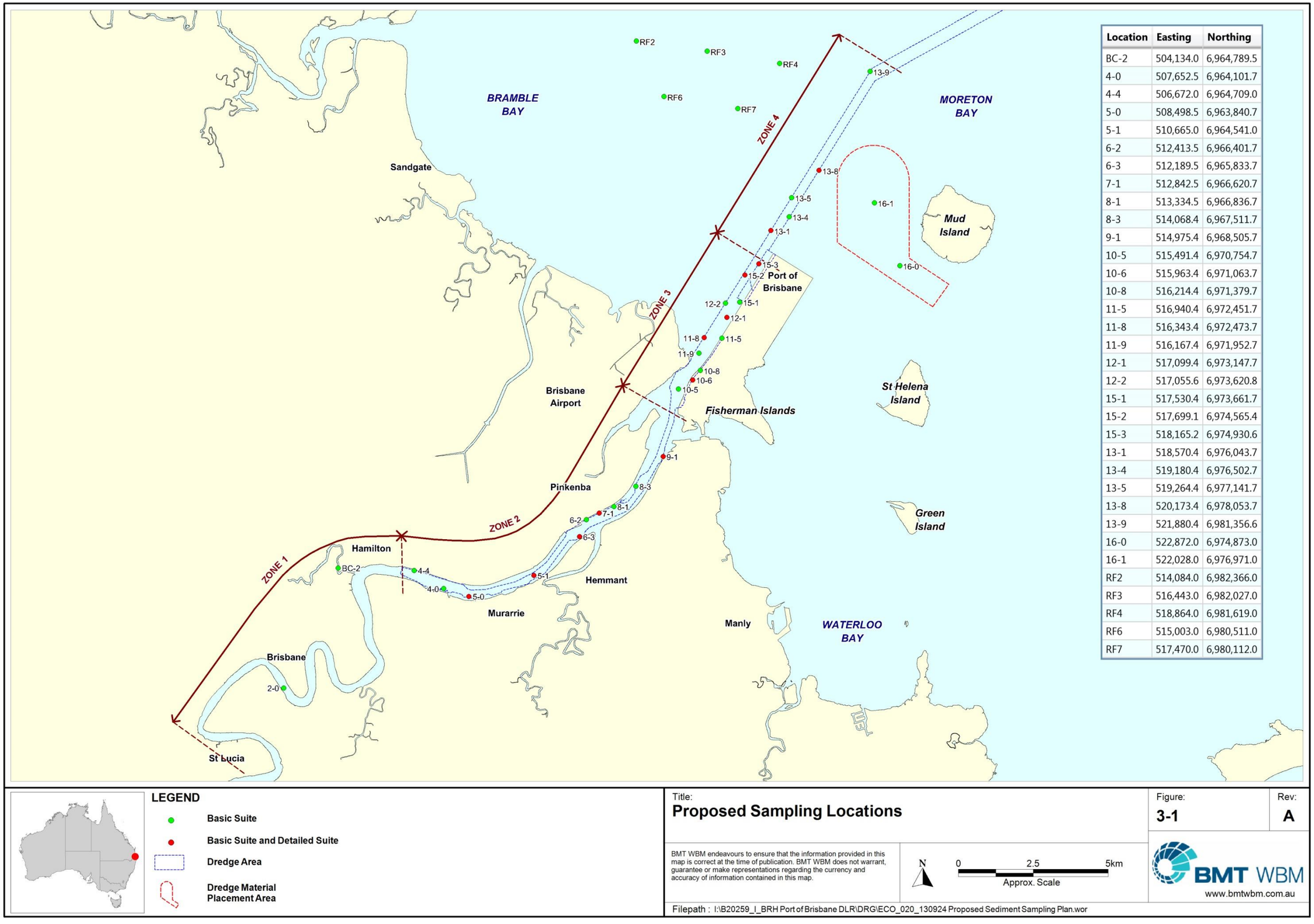
Additional sediment samples will be collected at selected locations for pore water testing of organic contaminants as part of the Phase III elutriate and bioavailability assessments (refer to Section 3.1.3).

Exceedances of NAGD screening levels were predominantly detected in Zone 2 and Zone 3. Five additional pore water samples (plus one replicate) and six samples (plus two replicates) will be collected from zones 2 and 3, respectively (see also Table 3-1). Four samples will be collected from Zone 4 however based on the historical data samples will only be analysed if contaminants exceed screening levels during Phase II sampling.

Based on the review of historical data, sample locations with the highest percentage of screening level exceedances between 2000 and 2012 were chosen for the additional pore water testing:

Zone 2: Locations 4-0, 5-0, 6-2, 7-1 and 8-3.

Zone 3: Locations 10-5, 10-6, 10-8, 11-8, 11-9 and 12-1.



Location	Easting	Northing
BC-2	504,134.0	6,964,789.5
4-0	507,652.5	6,964,101.7
4-4	506,672.0	6,964,709.0
5-0	508,498.5	6,963,840.7
5-1	510,665.0	6,964,541.0
6-2	512,413.5	6,966,401.7
6-3	512,189.5	6,965,833.7
7-1	512,842.5	6,966,620.7
8-1	513,334.5	6,966,836.7
8-3	514,068.4	6,967,511.7
9-1	514,975.4	6,968,505.7
10-5	515,491.4	6,970,754.7
10-6	515,963.4	6,971,063.7
10-8	516,214.4	6,971,379.7
11-5	516,940.4	6,972,451.7
11-8	516,343.4	6,972,473.7
11-9	516,167.4	6,971,952.7
12-1	517,099.4	6,973,147.7
12-2	517,055.6	6,973,620.8
15-1	517,530.4	6,973,661.7
15-2	517,699.1	6,974,565.4
15-3	518,165.2	6,974,930.6
13-1	518,570.4	6,976,043.7
13-4	519,180.4	6,976,502.7
13-5	519,264.4	6,977,141.7
13-8	520,173.4	6,978,053.7
13-9	521,880.4	6,981,356.6
16-0	522,872.0	6,974,873.0
16-1	522,028.0	6,976,971.0
RF2	514,084.0	6,982,366.0
RF3	516,443.0	6,982,027.0
RF4	518,864.0	6,981,619.0
RF6	515,003.0	6,980,511.0
RF7	517,470.0	6,980,112.0

LEGEND

- Basic Suite
- Basic Suite and Detailed Suite
- Dredge Area
- Dredge Material Placement Area

Title:
Proposed Sampling Locations

Figure: **3-1**

Rev: **A**

N

0 2.5 5km

Approx. Scale

BMT WBM
www.bmtwbm.com.au

Filepath : I:\B20259_I_BRH Port of Brisbane DLR\DRG\ECO_020_130924 Proposed Sediment Sampling Plan.wor

3.3 Sample Collection Methodology

3.3.1 Survey Vessel and Positioning

A suitable sampling vessel will be used to undertake sediment sampling. Navigation to the sampling locations will be undertaken using a differentially corrected global positioning system (GPS) with an accuracy of approximately ±1 m.

3.3.2 Sediment Grab Sampling

NAGD Appendix D states that:

'*grab samplers may be used, i.e., for maintenance dredging surveys in frequently dredged areas with substantial shipping traffic. Here, because the sediments are mixed continually, samples taken with a grab sampler can be representative as long as the grab is designed to retain the entire sample.*'

It is also noted that the one metre long sediment cores obtained in all previous sampling campaigns were always composited to single samples. Furthermore, highest contamination levels are typically expected in the top sediment layer, which would be sampled using a grab sampler. It is therefore proposed that a grab sampler will be used to obtain representative sediment samples.

All sediment sampling will be undertaken by experienced personnel. A Van Veen grab sampler (0.14 m^2 gape) will be used to collect surface sediments from all sample locations. Only samples obtained with properly closed grab jaws will be processed to ensure that the fine sediment fractions are retained.

The grab sampler will be thoroughly cleaned with De-con 90 solution prior to use and cleaned and rinsed with seawater to prevent cross contamination between samples.

In order to overcome issues with potential high variability at sampling locations, a minimum of two grabs will be collected at each sampling location and pooled as one sample. An adequate number of grabs will be obtained and pooled for each sample location to ensure that sufficient sediment is collected for all analyses.

3.3.3 Sample Handling

3.3.3.1 Sample Processing

Sample management procedures on the sampling vessel will include the careful processing of sediment samples following the recovery of the sediment grab sample from the seabed.

Photographs of the grab samples will be taken and field personnel will log each sample for its physical characteristics and variations in sediment type and texture. The grab samples from each location will be carefully homogenized in a clean container prior to the filling of analytical laboratory-supplied clean sampling jars.

Sample bottles will be labelled with a waterproof marker pen on the bottle label and lid. Sample bottles for organic analyses will be filled with zero headspace to prevent volatilisation. QA/QC samples will be blind-labelled to ensure that the laboratories cannot relate the QA sample back to the primary sample.

3.3.3.2 Sample Log

All sediment samples will be geotechnically logged upon collection on a standardised pro-forma. The following information will be recorded:

- Project name and number;
- The name of the sample collector;
- Date and Time of sampling;
- Type of grab sampler used;
- Field sample number;
- Northing and Easting of sample location (from onboard DGPS);
- Sediment colour;
- Sediment odour;
- Field texture (fine sand, silt, clay, sand, clayey sand);
- Tidal predictions and water depth at sample location (derived from onboard depth sounder);
- Weather and sea state conditions at the time of sampling; and
- General comments pertaining to the sample (e.g. presence of organic matter or benthic organisms, etc.

3.3.3.3 Sample Processing QA/QC

All sample handling and processing will be performed to minimise contamination and sample mix-ups. All sample equipment will be cleaned prior to sample collection using a scrub with decontamination solution followed by a rinse with seawater.

The workspace on the vessel will be washed down regularly with ambient seawater to clean all surfaces and minimize the potential for dust contamination of samples. All sample processing will be undertaken away from any potential contamination sources such as engine exhausts, fuels, oils, greases, lead weights, zinc anodes, antifouling paint etc.

Nitrile gloves will be worn by all field personnel handling the sediment, and gloves will be disposed of after processing of each sample.

Utmost care will be maintained in ensuring that cross-contamination between samples is not possible. Samples collected from each location will be placed into appropriately cleaned and preserved containers (labelled prior to filling) provided by the analytical laboratories.

Following sample processing and filling of sample containers, all samples will be immediately chilled on ice following sample collection. All acid sulfate soil samples will be transferred to a freezer at the end of each sampling day to minimise potential oxidation of the samples.

3.3.3.4 Sample Submission and Chain of Custody

All samples will be traced using Chain of Custody (COC) documentation submitted to the laboratory. This will ensure that sample possession and processing can be traced from sample collection to reporting of results.

The COC record may include, but is not limited to, the following information:

- Project name and number;
- Name(s) of sampler(s);
- Sample type, identification number and location;
- Date of collection;
- Number and types of containers;
- Required analyses;
- Preservatives (if any) and storage conditions; and
- Signatures documenting change of sample custody.

At the conclusion of the sampling program the sediment samples will be submitted to the analytical laboratories for processing and analysis in a single batch within prescribed holding times.

3.4 Health & Safety and Contingency Plan

3.4.1 Health and Safety

The vessel skipper will keep in close contact with Brisbane VTS/Harbour Control during sampling. Grab sampling can be completed at each location in around 20 minutes with logging and processing undertaken in locations out of the path of large vessels (as necessary and dependent upon shipping movements).

A single anchor may be used to anchor the vessel. The anchor would be placed upstream and upwind of the vessel. A marker buoy may be placed on the anchor if required.

The sampling vessel will display appropriate flags (R over Y) for the work being carried out at all times. Interactions with other vessel traffic will be minimised by being mindful of approaching vessels.

3.4.2 Adverse Weather

The planning of field sampling will involve regular checking of available weather forecast services for the study area. There are no unusual hazards in operating the grab sampler in wet weather.

In case of adverse weather conditions that would make sampling unacceptable due to strong winds and high waves, the sampling team and vessel operator would remain on stand-by until weather conditions improve to allow rigorous and safe collection of sediment samples.

3.4.3 Equipment Failure

The grab sampler and lifting arrangement is sufficiently robust and no failure of the equipment is expected to occur during the sampling. Prior to sampling, all equipment will be thoroughly checked and repaired if necessary.

In the unlikely event of equipment failure during sampling, repairs to any equipment would be undertaken as soon as possible to minimise delays as far as practical.

3.5 Contaminants List

3.5.1 Rationale for Selection of Sampling Parameters

In accordance with NAGD, the contaminants to be investigated should include:

- Toxic substances known, from previous investigations, to occur in dredge area sediments at levels greater than one-tenth of the screening levels; or
- Based on the historical review, substances potentially present at such levels in the sediments to be dredged.

Based on the review of existing sediment quality data (Section 2), samples will be analysed as follows:

Basic List of Parameters:

- Analysis undertaken at all sampling locations;
- Analysis includes contaminants of (potential) concern and supplementary parameters:
  - Metals/Metalloids (As, Cd, Cr, Cu, Pb, Hg, Ni, Ag, Zn, Al, Fe);
  - Organotins (MBT, DBT, TBT);
  - Organochlorine Pesticides (including DDT, DDD, DDE, chlordane);
  - Particle size distribution;
  - Moisture content; and
  - Total Organic Carbon.

Detailed List of Parameters:

- Analysis undertaken at 30% of sampling locations and new sampling locations (i.e. 5-1, 9-5 and 9-6).
- Analysis includes ‘low risk’ parameters that have been detected in the past but generally in concentrations below LOR or NAGD screening levels:
  - Polycyclic Aromatic Hydrocarbons (PAHs);
  - Total Petroleum Hydrocarbons (TPHs);
  - Polychlorinated Biphenyls (PCBs);
  - Acid Sulfate Soils;
  - Nutrients (TP, TN, NOx, TKN); and

- Radionuclides.

Elutriate and Bioavailability Testing:

- Metals/Metalloids (Hg and Ni);
- Organotins (TBT); and
- Organochlorine Pesticides (DDT, DDD, DDE, chlordane).

3.6 Laboratory Analysis

3.6.1 Analytical Laboratories

Primary analysis of the sediment samples will be conducted by Advanced Analytical Australia Pty Ltd (AAA). Australian Laboratory Services (ALS) will be used as the secondary (reference) laboratory for inter-laboratory quality testing.

Both analytical laboratories are fully accredited by the National Association of Testing Authorities (NATA). AAA will subcontract some of the analyses to specialised NATA accredited laboratories, i.e. Sydney Analytical Laboratories (ammonia, Total Organic Carbon) and Microanalysis (Particle Size Distribution).

3.6.2 Analytical Tests

The primary laboratory Advanced Analytical Australia will perform all analyses in accordance with NAGD and will meet or provide better practical quantitation limits (PQL) than the target PQL's (Table 3-3).

Table 3-3 Analytical Parameters and Practical Quantitation Limits

Parameter	Target Practical Quantitation Limit (required)	Practical Quantitation Limit (Advanced Analytical Australia)
Moisture Content	0.1%	0.1%
Particle Size (sieve and sedigraph)	Size distribution (sieve + hydrometer or equivalent) and rates of settlement after 50% and 90% of settlement in seawater if possible.	10 to 0.001mm Settling velocities in m/s for all particle size fractions
Total Organic Carbon	0.1%	0.01%
Total Petroleum Hydrocarbons	100 mg/kg	10-50 mg/kg
Polychlorinated Biphenyls	5 µg/kg	5 µg/kg
PAHs (naphthalene, acenaphthalene, acenapthene, fluorene, phenanthene, anthracene, total fluoranthene, benzo [a]anthracene, benzo [a] pyrene, chrysene, dibenz[a,h] anthracene, pyrene, 2-methylnapthalene)	Individual - 5 µg/kg; Sum of PAHs - 100 µg/kg	Individual - 5 µg/kg; Sum of PAHs - 100 µg/kg

Parameter	Target Practical Quantitation Limit (required)	Practical Quantitation Limit (Advanced Analytical Australia)
Trace Metals and Metalloids (arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, zinc)	0.1 – 100 mg/kg, Hg- 0.01 mg/kg	0.1 – 5 mg/kg, Hg – 0.01 mg/kg
Organotins (MBT, DBT, TBT)	1 µg Sn/kg	0.5 µg Sn/kg
OCP Pesticides	1 µg/kg	OCP-1 µg/kg
Total Nitrogen Total Kjeldahl Nitrogen Nitrate & Nitrite as N Total Phosphorus	N/A N/A 0.1 mg/kg N/A	20 mg/kg 20 mg/kg 0.1 mg/kg 1 mg/kg
Acid Sulfate Soils	N/A	2 mole H^+/tonne
Radionuclides	N/A	35 Bq/g

3.6.3 Sample Containers

Based on the proposed analyses, the following sample containers would be required per sample:

- 2 x 250 mL glass jar – organic/inorganic chemical analysis;
- 1 x 125 mL glass jar – nutrient analyses;
- 1 x medium plastic clipseal bag (50-100 g) – particle size distribution; and
- 1 x small clipseal bag (200 g) – acid sulfate soil.

3.6.4 Quality Control – Laboratory Analysis

Both laboratories will follow laboratory QC procedures in accordance with requirements outlined in Appendix F of NAGD. This includes analysis of laboratory blanks, duplicates, certified reference materials and spiked samples.

3.6.4.1 Laboratory Blanks

The purpose of this assessment is to monitor a potential laboratory contamination of samples due to potential cross-contamination of samples during laboratory preparation, extraction or analysis. Blank sample concentrations should be at or near the detection limit of the method used.

3.6.4.2 Laboratory Duplicates

This assessment refers to a randomly selected intra-laboratory split sample, which provides information regarding the method precision and sample heterogeneity. Results are presented as Relative Percent Difference (RPD) values of two sample concentrations for a specific contaminant.

NAGD recommends that duplicates should agree within a typical RPD of the method of ±35 %. This recommended RPD is typically not adopted by analytical laboratories as it does not account for the greater uncertainty for contaminant concentrations close to the method's detection limit.

The primary laboratory AAA uses the following approach to assess duplicate RPD's:

- Result <10 times LOR – no limit to RPD; and
- Result >10 times LOR – RPD between 0% and 50%.

The secondary laboratory ALS adopts specific RPDs for individual compounds.

3.6.4.3 Surrogate and Matrix Spikes

Laboratory Control Samples are either certified reference materials or a blank sample spiked with known concentrations of the analytes of interest. The purpose of this measurement is to monitor method accuracy.

Matrix spikes refer to an intra-laboratory split sample spiked with a representative set of target analytes of known concentration. Matrix spikes are assessed to monitor potential sample matrix effects on analyte recoveries.

Surrogate spikes are used for organic analytes. Surrogates are known additions to samples which mimic the compounds of interest and are not normally expected to be present in the sample.

For both surrogate and matrix spikes, a calculation of the percent recovery of the spiked amount against the returned concentration is performed indicating analytical performance in terms of extraction efficiency.

NAGD states that recovery limits of 75% - 125% are generally acceptable. Analytical laboratories typically adopt specific surrogate and matrix spike recovery limits for the various contaminant compound groups. It is also noted that ideal recovery ranges may be waived in the event of sample matrix interference.

The primary laboratory AAA adopts the following acceptable surrogate and matrix spike recovery limits:

- Trace elements: 70-130%;
- Organic analyses: 50-150%;
- SVOC & speciated phenols: 10-140%; and
- Surrogates: 10-140%.

The secondary laboratory ALS adopts specific recovery limits for individual compounds.

3.7 Data Analysis

3.7.1 Sediment Contaminants

Concentrations of chemicals measured in sediment samples at each dredging sub-area (or reference area) will be compared to screening levels listed in Table 2 of NAGD. This will provide a basis for determining whether dredged material is suitable for unconfined placement at sea or if further analyses, such as elutriate, bioavailability or toxicity testing, are required.

For each dredging sub-area, the mean concentrations of chemical parameters at the upper 95% confidence level (95% UCL) will be calculated and compared against NAGD guideline levels. This involves the following steps.

Data pre-treatment

Analytical values below detection limit will be set to one-half of the laboratory Limit of Reporting (LOR) as per NAGD recommendation to facilitate 95% UCL calculation. Organic contaminant results will be normalised to 1% Total Organic Carbon (TOC) where the measured value is within the range of 0.2-10%. If TOC values are outside of this range, the highest (10%) or lowest (0.2%) value will be adopted as appropriate. Organic parameters with concentrations below detection limits will not be normalised to 1% TOC but included at half their LOR.

One assumption in the calculation of the 95% UCL is that the samples are statistically independent. Therefore, field triplicate samples and laboratory split samples will not be included in the 95% UCL calculation.

Outliers

Outliers will be treated in accordance with the procedure in NAGD. In summary this will involve:

(a) Outliers (for all parameters) will be identified as any data points greater than two standard deviations.

(b) For TBT, where outliers are detected, the stored portion of the sample will be analysed in triplicate.

(c) If the original result is not confirmed through the re-analysis, it will be discarded in favour of the mean of the three triplicate samples.

NAGD does not provided guidance on treatment of outliers for other parameters. Outliers for other parameters will be noted in the report but included in calculation of the 95% UCL.

Selection of appropriate 95% UCL Calculation Method

The methodology for calculating the 95% UCL follows the approach recommended in Appendix A of NAGD. A Shapiro-Wilk test will be used to determine whether data followed a normal distribution. The ProUCL (Version 4.1.00) software package will be used for these calculations (Singh et al. 2010).

Calculation of 95% UCL and Comparison to Screening Levels

ProUCL Version 4.1.00 will be used to calculate the 95% UCL. For normally distributed data, the arithmetic mean and standard deviation will be calculated, and the 95% UCL calculated using the one-tailed Student's *t* UCL test. For data that follows a log-normal (or other) distribution, the geomean will be calculated, and the 95% UCL analysed using non-parametric Jack-Knife analysis as per NAGD recommendation.

In cases where an insufficient number of discrete values in the dataset would not allow calculation of the 95% UCL (e.g. most values below LOR), the maximum recorded value of the dataset will be conservatively used instead for comparison against NAGD trigger levels.

Should 95% UCL values for all analysed parameters fall below NAGD screening levels, the sediment would be considered clean and suitable for unconfined disposal at sea.

3.7.2 Baseline Concentrations

NAGD states that ambient baseline concentrations can be determined by sampling of sediment at reference areas in the vicinity of an existing disposal site. Similar to the approach followed in Worley Parsons (2013c, d), the data collected from the five reference locations in Moreton Bay would be used to derive ambient baseline concentrations if required (RF2, 3, 4, 6 and 7 in Figure 3-1).

3.8 Elutriate and Bioavailability Testing

As outlined on Section 3.1.3, elutriate and bioavailability testing will be undertaken as per NAGD for a range of contaminants which have regularly exceeded screening levels in the past.

Elutriate Testing:

The elutriate test is designed to simulate release of contaminants from sediment during dredged material disposal. Testing will be carried out using the USEPA's standard seawater elutriate test which involves shaking the sediment samples with four times the volume of seawater at room temperature for 30 minutes. The sample will be allowed to settle for one hour and the supernatant centrifuged or filtered (0.45 µm) within sixty minutes, and analysed using analytical methods appropriate for determining ultra-trace levels in seawater.

Results will be compared to the respective ANZECC/ARMCANZ (2000) marine water quality trigger value (for 95% or 99% protection of species, as appropriate).

Bioavailability Testing:

The Dilute Acid Extraction (DAE) method will be used to provide an estimate of the bioavailable fraction of the contaminant of concern in case of metal/metalloid analysis. The sediment samples will be extracted using a weak acid and the results compared against the respective NAGD screening levels.

Porewater analysis would be undertaken for organic contaminants such as TBT. Porewater is assumed to represent the major route of exposure to sediment contaminants by benthic organisms and is the recommended bioavailability test for organic contaminants as per NAGD. Porewater results would be compared to the respective ANZECC/ARMCANZ (2000) marine water quality trigger value (for 95% protection of species).

Should both elutriate and bioavailability tests result in values less than the respective guideline limits, the material would be considered clean and suitable for ocean disposal.

3.8.1 Acid Sulfate Soils

The results of the chromium-suite acid sulfate analysis will be assessed against the Australian framework for Acid Sulfate Soil management in coastal systems (Ahern et al. 1998). The risk of acidification will be determined by the acid-base accounting approach (Ahern et al. 2004). Net acidity will be calculated from the results as a measure of the acid producing capacity of the sampled sediment upon complete oxidation.

The calculated net acidity will then be compared to the QASSIT action criteria of 0.03% S or 18 mol H+/tonne to assess the need for acid sulfate soil management if the dredged sediments were to be placed on land.

The liming rate will indicate the amount of lime that needs to be added to the soil to manage its acid generating capacity.

3.9 Data Validation

All laboratory analyses will be validated in accordance with Appendix A of NAGD to confirm suitable data quality for undertaking a rigorous characterisation of the proposed dredge material.

Data Validation will involve assessment of the following:

- Sample holding times and storage conditions;
- Laboratory blanks, duplicates and surrogate/matrix spikes; and
- Field triplicates samples, triplicate sample splits and trip blank.

The proposed data quality objectives for data validation are outlined in Table 3-4.

Table 3-4 Data Quality Objectives for Data Validation

Parameter	Data Quality Objective
Holding Time	Samples received within specified holding time (NAGD Appendix H)
Field Triplicate Samples	Relative Standard Deviation <50%
Triplicate Split Samples, including inter-laboratory samples	Relative Standard Deviation <50%
Laboratory Blanks	At or near the Limit of Reporting (LOR)
Laboratory Duplicate Samples	Relative Percent Difference (RPD) <35% or as per laboratory requirements
Laboratory Matrix Spikes	Recovery as per laboratory requirements
Surrogate Spikes	Recovery as per laboratory requirements

3.10 Reporting

The reporting of sediment quality results will be undertaken in a SAP Implementation Report in accordance with NAGD including the following components:

- Summary of the SAP, or SAP appended to the report;
- Outline of potential problems encountered and deviations from the SAP, including justification;
- Description of the sampling carried out, along with the actual sampling locations, sample numbers (including replicates and QA samples), completed COC forms, field logs and description of sediments;
- Comparison of the 95% UCL of mean chemical concentrations of sediments in the dredge subareas;
- Assessment of QA/QC procedures for both field and laboratory data;

- Data validation including comparison to data quality objectives;
- Appendices including all laboratory and field data; and
- Conclusions as to the acceptability or otherwise of the dredge material for unconfined ocean disposal and recommendations as to further work required.

4 References

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Ahern, C.R., McElnea, A.E., Sullivan, L.A. (2004) Acid Sulfate Soils Laboratory Methods Guidelines. Department of Natural Resources, Mines and Energy, Indooroopilly, Queensland, Australia.

ANZECC/ARMCANZ. (2000). Australian and New Zealand Guidelines for Fresh and Marine Water Quality (Vol. 4). Canberra: Australian and New Zealand Environment and Conservation Council, and Agriculture and Resource Management Council of Australia and New Zealand.

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Worley Parsons (2009) Sediment Sampling and Analysis Plan – Brisbane River and Moreton Bay (February 2009). Report prepared for Port of Brisbane Corporation.

Worley Parsons (2011a) Brisbane River and Moreton Bay – Annual Sediment Characterisation Report 2011. Report prepared for Port of Brisbane Pty Ltd.

Worley Parsons (2011b) Emergency Dredging Sediment Sampling Results 2011. Report prepared for Port of Brisbane Pty Ltd.

Worley Parsons (2012) Brisbane River and Moreton Bay – Annual Sediment Characterisation Report 2012. Report prepared for Port of Brisbane Pty Ltd.

Worley Parsons (2013a) Brisbane River and Moreton Bay – Annual Sediment Characterisation Report 2013. Report prepared for Port of Brisbane Pty Ltd.

Worley Parsons (2013b) Emergency Dredging Sediment Sampling Results 2013. Report prepared for Port of Brisbane Pty Ltd.

Worley Parsons (2013c) Emergency Dredging Sediment Sampling – Round 2 Organochlorine Pesticides Results. Report prepared for Port of Brisbane Pty Ltd.

Worley Parsons (2013d) Emergency Dredging Sediment Sampling – Round 2 Dioxin Results. Report prepared for Port of Brisbane Pty Ltd.

Annex B Photolog


B2-0


BC-2


B4-4


B4-0


B5-0


B5-1


B7-1


B8-3


B8-1


B6-2


RF7


RF6

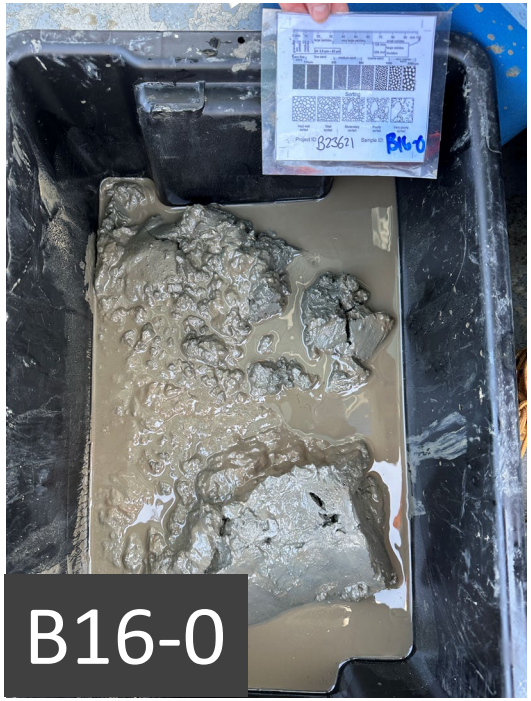

RF2


RF3


RF4


B13-9


B16-1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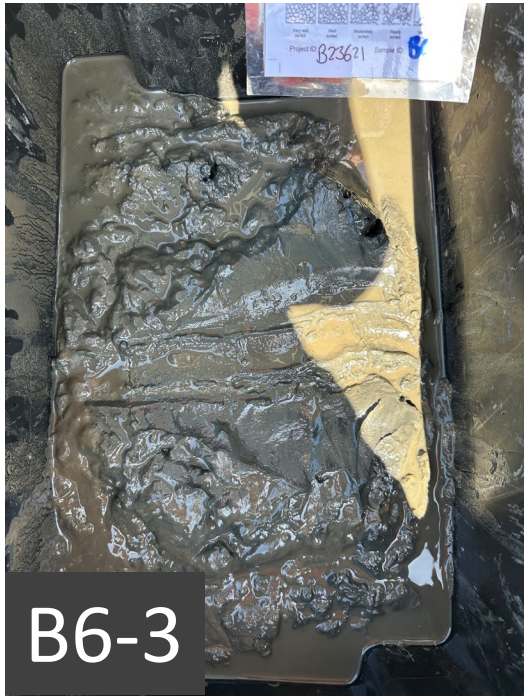
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Annex C Primary Lab—ALS Chain of Custody

CERTIFICATE OF ANALYSIS

Work Order	: **EB2328877**	Page	: 1 of 53
Client	: **BMT COMMERCIAL AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: MACKENZIE STACEY	Contact	: Nathan King
Address	: PO BOX 203 SPRING HILL BRISBANE QLD 4004	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: ----	Telephone	: +61-7-3243 7222
Project	: B23621 PoB Monitoring 2019-2025	Date Samples Received	: 14-Sep-2023 15:00
Order number	: ----	Date Analysis Commenced	: 19-Sep-2023
C-O-C number	: ----	Issue Date	: 04-Oct-2023 11:39
Sampler	: ANGUS WILLIAMS, CRAIG HEATHERINGTON, MACKENZIE STACEY		
Site	: ----		
Quote number	: BN/016/19		
No. of samples received	: 49		
No. of samples analysed	: 47		

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*
Beatriz Llarinas	Senior Chemist - Inorganics	Brisbane Inorganics, Stafford, QLD
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Layla Hafner	Acid Sulphate Soils - Chemist	Brisbane Acid Sulphate Soils, Stafford, QLD
Layla Hafner	Acid Sulphate Soils - Chemist	Brisbane Soil Preparation, Stafford, QLD
Matt Frost	Assistant Laboratory Manager	Brisbane Organics, Stafford, QLD

General Comments

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

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

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

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

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

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

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP090 - Organotins: Sample 'RF6' (EB2328877_002) shows poor matrix spike recovery due to matrix interference.
- EP090 – Organotin Analysis: Sample (EB2328877-033) shows poor matrix spike recovery due to matrix interference. Confirmed by re-extraction and re-analysis.
- EA150H: Soil particle density results fell outside the scope of AS1289.3.6.3. Results should be scrutinised accordingly.
- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- EP080-SD: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- EP131A: Where reported, Total Chlordane (sum) is the sum of the reported concentrations of cis-Chlordane and trans-Chlordane at or above the LOR.
- EP132B-SD and EP131B : Particular samples raised LOR due to high amount of moistures is present.
- **Speciality organic analysis is conducted by ALS Environmental, Sydney, NATA accreditation no. 825, Site No. 10911 (Micro site no. 14913).**
- EK067G (Total Phosphorus): Sample B13-1 (EB2328877-013) shows poor matrix spike recovery due to sample heterogeneity. Confirmed by visual inspection.
- EP090 - Organotins: The LOR for dibutyltin for sample 'RF7' (EB2328877_001) has been raised due to matrix interference.
- EP071-SD-SV – TRH Semivolatile Fractions Only: Sample ‘B12-1’ (EB2328877-039) shows poor duplicate results due to heterogeneity. Confirmed by visual inspection.

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	RF7	RF6	RF3	RF2	RF4
			Sampling date / time	13-Sep-2023 00:00	13-Sep-2023 00:00	13-Sep-2023 00:00	13-Sep-2023 00:00	13-Sep-2023 00:00
Compound	CAS Number	LOR	Unit	EB2328877-001	EB2328877-002	EB2328877-003	EB2328877-004	EB2328877-005
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	64.4	54.8	64.7	66.3	57.9
EA150: Particle Sizing								
+75µm	----	1	%	1	10	<1	2	27
+150µm	----	1	%	<1	5	<1	1	22
+300µm	----	1	%	<1	2	<1	<1	11
+425µm	----	1	%	<1	2	<1	<1	6
+600µm	----	1	%	<1	1	<1	<1	3
+1180µm	----	1	%	<1	<1	<1	<1	2
+2.36mm	----	1	%	<1	<1	<1	<1	2
+4.75mm	----	1	%	<1	<1	<1	<1	<1
+9.5mm	----	1	%	<1	<1	<1	<1	<1
+19.0mm	----	1	%	<1	<1	<1	<1	<1
+37.5mm	----	1	%	<1	<1	<1	<1	<1
+75.0mm	----	1	%	<1	<1	<1	<1	<1
EA150: Soil Classification based on Particle Size								
Clay (<2 µm)	----	1	%	53	42	46	58	43
Silt (2-60 µm)	----	1	%	43	44	51	38	28
Sand (0.06-2.00 mm)	----	1	%	4	14	3	4	27
Gravel (>2mm)	----	1	%	<1	<1	<1	<1	2
Cobbles (>6cm)	----	1	%	<1	<1	<1	<1	<1
EA152: Soil Particle Density								
Soil Particle Density (Clay/Silt/Sand)	----	0.01	g/cm3	2.48	2.38	2.26	2.74	2.82
EG005(ED093)T: Total Metals by ICP-AES								
Aluminium	7429-90-5	50	mg/kg	20800	18200	19800	18200	16600
Iron	7439-89-6	50	mg/kg	44100	40700	41500	39300	36800
EG020-SD: Total Metals in Sediments by ICPMS								
Arsenic	7440-38-2	1.00	mg/kg	7.66	7.36	7.08	6.81	6.09
Cadmium	7440-43-9	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chromium	7440-47-3	1.0	mg/kg	41.8	37.0	39.0	35.0	32.5
Copper	7440-50-8	1.0	mg/kg	23.4	17.0	18.8	18.0	15.4
Lead	7439-92-1	1.0	mg/kg	20.2	17.8	18.4	17.2	15.0
Nickel	7440-02-0	1.0	mg/kg	27.8	22.4	23.6	21.6	20.2
Silver	7440-22-4	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Zinc	7440-66-6	1.0	mg/kg	92.1	76.1	81.3	76.2	66.1

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	RF7	RF6	RF3	RF2	RF4
			Sampling date / time	13-Sep-2023 00:00	13-Sep-2023 00:00	13-Sep-2023 00:00	13-Sep-2023 00:00	13-Sep-2023 00:00
Compound	CAS Number	LOR	Unit	EB2328877-001	EB2328877-002	EB2328877-003	EB2328877-004	EB2328877-005
				Result	Result	Result	Result	Result
EG035T: Total Recoverable Mercury by FIMS (Low Level)								
Mercury	7439-97-6	0.01	mg/kg	**0.10**	**0.10**	**0.09**	**0.08**	**0.07**
EP003: Total Organic Carbon (TOC) in Soil								
Total Organic Carbon	----	0.02	%	**1.34**	**1.10**	**1.22**	**1.12**	**1.02**
EP090: Organotin Compounds								
Monobutyltin	78763-54-9	1	µgSn/kg	<1	<1	<1	<1	<1
Dibutyltin	1002-53-5	1	µgSn/kg	<2	<1	<1	<1	<1
Tributyltin	56573-85-4	0.5	µgSn/kg	<0.5	<0.5	<0.5	<0.5	<0.5
EP130A: Organophosphorus Pesticides (Ultra-trace)								
Bromophos-ethyl	4824-78-6	10	µg/kg	<10	<10	<10	<10	<10
Carbophenothion	786-19-6	10	µg/kg	<10	<10	<10	<10	<10
Chlorfenvinphos (E)	18708-86-6	10.0	µg/kg	<10.0	<10.0	<10.0	<10.0	<10.0
Chlorfenvinphos (Z)	18708-87-7	10	µg/kg	<10	<10	<10	<10	<10
Chlorpyrifos	2921-88-2	10	µg/kg	<10	<10	<10	<10	<10
Chlorpyrifos-methyl	5598-13-0	10	µg/kg	<10	<10	<10	<10	<10
Demeton-S-methyl	919-86-8	10	µg/kg	<10	<10	<10	<10	<10
Diazinon	333-41-5	10	µg/kg	<10	<10	<10	<10	<10
Dichlorvos	62-73-7	10	µg/kg	<10	<10	<10	<10	<10
Dimethoate	60-51-5	10	µg/kg	<10	<10	<10	<10	<10
Ethion	563-12-2	10	µg/kg	<10	<10	<10	<10	<10
Fenamiphos	22224-92-6	10	µg/kg	<10	<10	<10	<10	<10
Fenthion	55-38-9	10	µg/kg	<10	<10	<10	<10	<10
Malathion	121-75-5	10	µg/kg	<10	<10	<10	<10	<10
Azinphos Methyl	86-50-0	10	µg/kg	<10	<10	<10	<10	<10
Monocrotophos	6923-22-4	10	µg/kg	<10	<10	<10	<10	<10
Parathion	56-38-2	10	µg/kg	<10	<10	<10	<10	<10
Parathion-methyl	298-00-0	10	µg/kg	<10	<10	<10	<10	<10
Pirimphos-ethyl	23505-41-1	10	µg/kg	<10	<10	<10	<10	<10
Prothiofos	34643-46-4	10	µg/kg	<10	<10	<10	<10	<10
EP131A: Organochlorine Pesticides								
Aldrin	309-00-2	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
alpha-BHC	319-84-6	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
beta-BHC	319-85-7	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
delta-BHC	319-86-8	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
4.4`-DDD	72-54-8	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	RF7	RF6	RF3	RF2	RF4
			Sampling date / time	13-Sep-2023 00:00	13-Sep-2023 00:00	13-Sep-2023 00:00	13-Sep-2023 00:00	13-Sep-2023 00:00
Compound	CAS Number	LOR	Unit	EB2328877-001	EB2328877-002	EB2328877-003	EB2328877-004	EB2328877-005
				Result	Result	Result	Result	Result
EP131A: Organochlorine Pesticides - Continued								
4.4`-DDE	72-55-9	0.50	µg/kg	**2.04**	**0.66**	**0.76**	<0.50	**1.33**
4.4`-DDT	50-29-3	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.50	µg/kg	**2.04**	**0.66**	**0.76**	<0.50	**1.33**
Dieldrin	60-57-1	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
alpha-Endosulfan	959-98-8	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
beta-Endosulfan	33213-65-9	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Endosulfan sulfate	1031-07-8	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
^ Endosulfan (sum)	115-29-7	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Endrin	72-20-8	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Endrin aldehyde	7421-93-4	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Endrin ketone	53494-70-5	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Heptachlor	76-44-8	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Heptachlor epoxide	1024-57-3	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Hexachlorobenzene (HCB)	118-74-1	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
gamma-BHC	58-89-9	0.25	µg/kg	<0.25	<0.25	<0.25	<0.25	<0.25
Methoxychlor	72-43-5	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
cis-Chlordane	5103-71-9	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
trans-Chlordane	5103-74-2	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
^ Total Chlordane (sum)	----	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Oxychlordane	27304-13-8	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
EP090S: Organotin Surrogate								
Tripropyltin	----	0.5	%	**125**	**151**	**106**	**118**	**102**
EP130S: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	10	%	**72.1**	**68.4**	**93.3**	**73.4**	**73.7**
EP131S: OC Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.50	%	**61.4**	**61.4**	**75.2**	**59.4**	**58.1**

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	B13-9	B16-1	B13-8	B13-5	B13-4
			Sampling date / time	13-Sep-2023 00:00	13-Sep-2023 00:00	13-Sep-2023 00:00	13-Sep-2023 00:00	13-Sep-2023 00:00
Compound	CAS Number	LOR	Unit	EB2328877-006	EB2328877-007	EB2328877-008	EB2328877-009	EB2328877-010
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	66.3	47.8	----	31.5	34.4
Moisture Content	----	1.0	%	----	----	57.2	----	----
EA150: Particle Sizing								
+75µm	----	1	%	4	35	31	4	66
+150µm	----	1	%	3	17	28	2	57
+300µm	----	1	%	<1	6	20	<1	37
+425µm	----	1	%	<1	2	18	<1	27
+600µm	----	1	%	<1	1	16	<1	18
+1180µm	----	1	%	<1	<1	11	<1	10
+2.36mm	----	1	%	<1	<1	7	<1	6
+4.75mm	----	1	%	<1	<1	2	<1	3
+9.5mm	----	1	%	<1	<1	<1	<1	<1
+19.0mm	----	1	%	<1	<1	<1	<1	<1
+37.5mm	----	1	%	<1	<1	<1	<1	<1
+75.0mm	----	1	%	<1	<1	<1	<1	<1
EA150: Soil Classification based on Particle Size								
Clay (<2 µm)	----	1	%	46	31	37	54	21
Silt (2-60 µm)	----	1	%	48	28	29	40	11
Sand (0.06-2.00 mm)	----	1	%	6	40	26	6	61
Gravel (>2mm)	----	1	%	<1	1	8	<1	7
Cobbles (>6cm)	----	1	%	<1	<1	<1	<1	<1
EA152: Soil Particle Density								
Soil Particle Density (Clay/Silt/Sand)	----	0.01	g/cm3	2.55	2.52	2.56	2.83	2.59
EG005(ED093)T: Total Metals by ICP-AES								
Aluminium	7429-90-5	50	mg/kg	18900	11500	15700	11900	6700
Iron	7439-89-6	50	mg/kg	42500	30000	36600	28500	17900
EG020-SD: Total Metals in Sediments by ICPMS								
Arsenic	7440-38-2	1.00	mg/kg	8.31	6.16	10.7	4.52	5.35
Cadmium	7440-43-9	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chromium	7440-47-3	1.0	mg/kg	36.8	24.5	31.6	23.4	14.1
Copper	7440-50-8	1.0	mg/kg	15.1	17.4	18.4	20.1	7.3
Lead	7439-92-1	1.0	mg/kg	14.2	12.5	12.6	14.5	10.5
Nickel	7440-02-0	1.0	mg/kg	21.3	19.3	19.4	19.0	10.1
Silver	7440-22-4	0.1	mg/kg	<0.1	<0.1	<0.1	0.1	<0.1

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	B13-9	B16-1	B13-8	B13-5	B13-4
			Sampling date / time	13-Sep-2023 00:00	13-Sep-2023 00:00	13-Sep-2023 00:00	13-Sep-2023 00:00	13-Sep-2023 00:00
Compound	CAS Number	LOR	Unit	EB2328877-006	EB2328877-007	EB2328877-008	EB2328877-009	EB2328877-010
				Result	Result	Result	Result	Result
EG020-SD: Total Metals in Sediments by ICPMS - Continued								
Zinc	7440-66-6	1.0	mg/kg	65.5	67.4	64.9	67.5	39.8
EG035T: Total Recoverable Mercury by FIMS (Low Level)								
Mercury	7439-97-6	0.01	mg/kg	0.05	0.07	0.03	0.07	0.06
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	----	----	0.3	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	20	mg/kg	----	----	780	----	----
EK062: Total Nitrogen as N (TKN + NOx)								
^ Total Nitrogen as N	----	20	mg/kg	----	----	780	----	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	2	mg/kg	----	----	463	----	----
EP003: Total Organic Carbon (TOC) in Soil								
Total Organic Carbon	----	0.02	%	1.13	1.12	0.84	1.51	0.91
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	3	mg/kg	----	----	<3	----	----
C10 - C14 Fraction	----	3	mg/kg	----	----	5	----	----
C15 - C28 Fraction	----	3	mg/kg	----	----	16	----	----
C29 - C36 Fraction	----	5	mg/kg	----	----	11	----	----
^ C10 - C36 Fraction (sum)	----	3	mg/kg	----	----	32	----	----
EP080-SD / EP071-SD: Total Recoverable Hydrocarbons								
C6 - C10 Fraction	C6_C10	3	mg/kg	----	----	<3	----	----
>C10 - C16 Fraction	----	3	mg/kg	----	----	4	----	----
C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	3.0	mg/kg	----	----	<3.0	----	----
>C16 - C34 Fraction	----	3	mg/kg	----	----	24	----	----
>C34 - C40 Fraction	----	5	mg/kg	----	----	<5	----	----
^ >C10 - C40 Fraction (sum)	----	3	mg/kg	----	----	28	----	----
EP080-SD: BTEXN								
Benzene	71-43-2	0.2	mg/kg	----	----	<0.2	----	----
Toluene	108-88-3	0.2	mg/kg	----	----	<0.2	----	----
Ethylbenzene	100-41-4	0.2	mg/kg	----	----	<0.2	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.2	mg/kg	----	----	<0.2	----	----
ortho-Xylene	95-47-6	0.2	mg/kg	----	----	<0.2	----	----

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	B13-9	B16-1	B13-8	B13-5	B13-4
			Sampling date / time	13-Sep-2023 00:00	13-Sep-2023 00:00	13-Sep-2023 00:00	13-Sep-2023 00:00	13-Sep-2023 00:00
Compound	CAS Number	LOR	Unit	EB2328877-006	EB2328877-007	EB2328877-008	EB2328877-009	EB2328877-010
				Result	Result	Result	Result	Result
EP080-SD: BTEXN - Continued								
^ Total Xylenes	----	0.5	mg/kg	----	----	<0.5	----	----
^ Sum of BTEX	----	0.2	mg/kg	----	----	<0.2	----	----
Naphthalene	91-20-3	0.2	mg/kg	----	----	<0.2	----	----
EP090: Organotin Compounds								
Monobutyltin	78763-54-9	1	µgSn/kg	<1	<1	<1	<1	<1
Dibutyltin	1002-53-5	1	µgSn/kg	<1	<1	<1	<1	<1
Tributyltin	56573-85-4	0.5	µgSn/kg	<0.5	<0.5	<0.5	<0.5	<0.5
EP130A: Organophosphorus Pesticides (Ultra-trace)								
Bromophos-ethyl	4824-78-6	10	µg/kg	<10	<10	<10	<10	<10
Carbophenothion	786-19-6	10	µg/kg	<10	<10	<10	<10	<10
Chlorfenvinphos (E)	18708-86-6	10.0	µg/kg	<10.0	<10.0	<10.0	<10.0	<10.0
Chlorfenvinphos (Z)	18708-87-7	10	µg/kg	<10	<10	<10	<10	<10
Chlorpyrifos	2921-88-2	10	µg/kg	<10	<10	<10	<10	<10
Chlorpyrifos-methyl	5598-13-0	10	µg/kg	<10	<10	<10	<10	<10
Demeton-S-methyl	919-86-8	10	µg/kg	<10	<10	<10	<10	<10
Diazinon	333-41-5	10	µg/kg	<10	<10	<10	<10	<10
Dichlorvos	62-73-7	10	µg/kg	<10	<10	<10	<10	<10
Dimethoate	60-51-5	10	µg/kg	<10	<10	<10	<10	<10
Ethion	563-12-2	10	µg/kg	<10	<10	<10	<10	<10
Fenamiphos	22224-92-6	10	µg/kg	<10	<10	<10	<10	<10
Fenthion	55-38-9	10	µg/kg	<10	<10	<10	<10	<10
Malathion	121-75-5	10	µg/kg	<10	<10	<10	<10	<10
Azinphos Methyl	86-50-0	10	µg/kg	<10	<10	<10	<10	<10
Monocrotophos	6923-22-4	10	µg/kg	<10	<10	<10	<10	<10
Parathion	56-38-2	10	µg/kg	<10	<10	<10	<10	<10
Parathion-methyl	298-00-0	10	µg/kg	<10	<10	<10	<10	<10
Pirimphos-ethyl	23505-41-1	10	µg/kg	<10	<10	<10	<10	<10
Prothiofos	34643-46-4	10	µg/kg	<10	<10	<10	<10	<10
EP131A: Organochlorine Pesticides								
Aldrin	309-00-2	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
alpha-BHC	319-84-6	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
beta-BHC	319-85-7	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
delta-BHC	319-86-8	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
4.4`-DDD	72-54-8	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	B13-9	B16-1	B13-8	B13-5	B13-4
			Sampling date / time	13-Sep-2023 00:00	13-Sep-2023 00:00	13-Sep-2023 00:00	13-Sep-2023 00:00	13-Sep-2023 00:00
Compound	CAS Number	LOR	Unit	EB2328877-006	EB2328877-007	EB2328877-008	EB2328877-009	EB2328877-010
				Result	Result	Result	Result	Result
EP131A: Organochlorine Pesticides - Continued								
4.4`-DDE	72-55-9	0.50	µg/kg	<0.50	<0.50	<0.50	**1.61**	<0.50
4.4`-DDT	50-29-3	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.50	µg/kg	<0.50	<0.50	<0.50	**1.61**	<0.50
Dieldrin	60-57-1	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
alpha-Endosulfan	959-98-8	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
beta-Endosulfan	33213-65-9	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Endosulfan sulfate	1031-07-8	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
^ Endosulfan (sum)	115-29-7	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Endrin	72-20-8	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Endrin aldehyde	7421-93-4	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Endrin ketone	53494-70-5	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Heptachlor	76-44-8	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Heptachlor epoxide	1024-57-3	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Hexachlorobenzene (HCB)	118-74-1	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
gamma-BHC	58-89-9	0.25	µg/kg	<0.25	<0.25	<0.25	<0.25	<0.25
Methoxychlor	72-43-5	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
cis-Chlordane	5103-71-9	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
trans-Chlordane	5103-74-2	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
^ Total Chlordane (sum)	----	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Oxychlordane	27304-13-8	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
EP131B: Polychlorinated Biphenyls (as Aroclors)								
^ Total Polychlorinated biphenyls	----	5.0	µg/kg	----	----	<6.2	----	----
Aroclor 1016	12674-11-2	5.0	µg/kg	----	----	<6.2	----	----
Aroclor 1221	11104-28-2	5.0	µg/kg	----	----	<6.2	----	----
Aroclor 1232	11141-16-5	5.0	µg/kg	----	----	<6.2	----	----
Aroclor 1242	53469-21-9	5.0	µg/kg	----	----	<6.2	----	----
Aroclor 1248	12672-29-6	5.0	µg/kg	----	----	<6.2	----	----
Aroclor 1254	11097-69-1	5.0	µg/kg	----	----	<6.2	----	----
Aroclor 1260	11096-82-5	5.0	µg/kg	----	----	<6.2	----	----
EP132B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	5	µg/kg	----	----	<5	----	----
2-Methylnaphthalene	91-57-6	5	µg/kg	----	----	<5	----	----

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	B13-9	B16-1	B13-8	B13-5	B13-4
			Sampling date / time	13-Sep-2023 00:00	13-Sep-2023 00:00	13-Sep-2023 00:00	13-Sep-2023 00:00	13-Sep-2023 00:00
Compound	CAS Number	LOR	Unit	EB2328877-006	EB2328877-007	EB2328877-008	EB2328877-009	EB2328877-010
				Result	Result	Result	Result	Result
EP132B: Polynuclear Aromatic Hydrocarbons - Continued								
Acenaphthylene	208-96-8	4	µg/kg	----	----	<5	----	----
Acenaphthene	83-32-9	4	µg/kg	----	----	<5	----	----
Fluorene	86-73-7	4	µg/kg	----	----	<5	----	----
Phenanthrene	85-01-8	4	µg/kg	----	----	<5	----	----
Anthracene	120-12-7	4	µg/kg	----	----	<5	----	----
Fluoranthene	206-44-0	4	µg/kg	----	----	11	----	----
Pyrene	129-00-0	4	µg/kg	----	----	12	----	----
Benz(a)anthracene	56-55-3	4	µg/kg	----	----	7	----	----
Chrysene	218-01-9	4	µg/kg	----	----	6	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	4	µg/kg	----	----	10	----	----
Benzo(k)fluoranthene	207-08-9	4	µg/kg	----	----	5	----	----
Benzo(e)pyrene	192-97-2	4	µg/kg	----	----	7	----	----
Benzo(a)pyrene	50-32-8	4	µg/kg	----	----	9	----	----
Perylene	198-55-0	4	µg/kg	----	----	12	----	----
Benzo(g.h.i)perylene	191-24-2	4	µg/kg	----	----	7	----	----
Dibenz(a.h)anthracene	53-70-3	4	µg/kg	----	----	<5	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	4	µg/kg	----	----	5	----	----
Coronene	191-07-1	5	µg/kg	----	----	<5	----	----
^ Sum of PAHs	----	4	µg/kg	----	----	91	----	----
^ Benzo(a)pyrene TEQ (zero)	----	4	µg/kg	----	----	12	----	----
^ Benzo(a)pyrene TEQ (half LOR)	----	4	µg/kg	----	----	14	----	----
^ Benzo(a)pyrene TEQ (LOR)	----	4	µg/kg	----	----	16	----	----
EP080-SD: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.2	%	----	----	78.5	----	----
Toluene-D8	2037-26-5	0.2	%	----	----	64.6	----	----
4-Bromofluorobenzene	460-00-4	0.2	%	----	----	75.9	----	----
EP090S: Organotin Surrogate								
Tripropyltin	----	0.5	%	108	89.1	103	113	85.4
EP130S: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	10	%	87.9	61.3	59.1	93.1	87.0
EP131S: OC Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.50	%	74.7	51.7	55.3	58.8	79.4
EP131T: PCB Surrogate								
Decachlorobiphenyl	2051-24-3	0.5	%	----	----	50.1	----	----

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	B13-9	B16-1	B13-8	B13-5	B13-4
				Sampling date / time	13-Sep-2023 00:00	13-Sep-2023 00:00	13-Sep-2023 00:00	13-Sep-2023 00:00	13-Sep-2023 00:00
Compound	CAS Number	LOR	Unit		EB2328877-006	EB2328877-007	EB2328877-008	EB2328877-009	EB2328877-010
					Result	Result	Result	Result	Result
EP132T: Base/Neutral Extractable Surrogates									
2-Fluorobiphenyl	321-60-8	10	%		----	----	**80.8**	----	----
Anthracene-d10	1719-06-8	10	%		----	----	**89.0**	----	----
4-Terphenyl-d14	1718-51-0	10	%		----	----	**90.0**	----	----

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)

Compound	CAS Number	LOR	Unit	Sample ID	B13-4b	B13-4c	B13-1	Trip Blank 070339	Trip Blank 070338
				Sampling date / time	13-Sep-2023 00:00	13-Sep-2023 00:00	13-Sep-2023 00:00	13-Sep-2023 00:00	13-Sep-2023 00:00
					EB2328877-011	EB2328877-012	EB2328877-013	EB2328877-015	EB2328877-016
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		34.3	34.1	----	----	----
Moisture Content	----	1.0	%		----	----	27.5	----	----
EA150: Particle Sizing									
+75µm	----	1	%		68	76	83	----	----
+150µm	----	1	%		57	61	72	----	----
+300µm	----	1	%		33	31	31	----	----
+425µm	----	1	%		23	22	21	----	----
+600µm	----	1	%		14	13	10	----	----
+1180µm	----	1	%		7	4	3	----	----
+2.36mm	----	1	%		4	3	1	----	----
+4.75mm	----	1	%		<1	<1	<1	----	----
+9.5mm	----	1	%		<1	<1	<1	----	----
+19.0mm	----	1	%		<1	<1	<1	----	----
+37.5mm	----	1	%		<1	<1	<1	----	----
+75.0mm	----	1	%		<1	<1	<1	----	----
EA150: Soil Classification based on Particle Size									
Clay (<2 µm)	----	1	%		20	14	11	----	----
Silt (2-60 µm)	----	1	%		11	8	4	----	----
Sand (0.06-2.00 mm)	----	1	%		64	75	83	----	----
Gravel (>2mm)	----	1	%		5	3	2	----	----
Cobbles (>6cm)	----	1	%		<1	<1	<1	----	----
EA152: Soil Particle Density									
Soil Particle Density (Clay/Silt/Sand)	----	0.01	g/cm3		2.59	2.52	2.53	----	----
EG005(ED093)T: Total Metals by ICP-AES									
Aluminium	7429-90-5	50	mg/kg		7800	9380	5670	----	----
Iron	7439-89-6	50	mg/kg		20000	24000	16800	----	----
EG020-SD: Total Metals in Sediments by ICPMS									
Arsenic	7440-38-2	1.00	mg/kg		4.65	6.38	5.25	----	----
Cadmium	7440-43-9	0.1	mg/kg		<0.1	0.1	<0.1	----	----
Chromium	7440-47-3	1.0	mg/kg		16.2	21.0	13.2	----	----
Copper	7440-50-8	1.0	mg/kg		8.3	30.7	5.6	----	----
Lead	7439-92-1	1.0	mg/kg		9.2	30.0	11.0	----	----
Nickel	7440-02-0	1.0	mg/kg		11.4	14.0	9.5	----	----

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	B13-4b	B13-4c	B13-1	Trip Blank 070339	Trip Blank 070338
			Sampling date / time	13-Sep-2023 00:00	13-Sep-2023 00:00	13-Sep-2023 00:00	13-Sep-2023 00:00	13-Sep-2023 00:00
Compound	CAS Number	LOR	Unit	EB2328877-011	EB2328877-012	EB2328877-013	EB2328877-015	EB2328877-016
				Result	Result	Result	Result	Result
EG020-SD: Total Metals in Sediments by ICPMS - Continued								
Silver	7440-22-4	0.1	mg/kg	<0.1	**0.2**	<0.1	----	----
Zinc	7440-66-6	1.0	mg/kg	**40.3**	**111**	**49.3**	----	----
EG035T: Total Recoverable Mercury by FIMS (Low Level)								
Mercury	7439-97-6	0.01	mg/kg	**0.04**	**0.12**	**0.04**	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	----	----	**0.2**	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	20	mg/kg	----	----	**310**	----	----
EK062: Total Nitrogen as N (TKN + NOx)								
^ Total Nitrogen as N	----	20	mg/kg	----	----	**310**	----	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	2	mg/kg	----	----	**370**	----	----
EP003: Total Organic Carbon (TOC) in Soil								
Total Organic Carbon	----	0.02	%	**0.52**	**0.49**	**0.28**	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	----	----	----	<10	<10
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	----	----	----	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	----	----	----	<10	<10
EP080: BTEXN								
Benzene	71-43-2	0.2	mg/kg	----	----	----	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	----	----	----	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	----	----	----	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	----	----	----	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	----	----	----	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg	----	----	----	<0.2	<0.2
^ Total Xylenes	----	0.5	mg/kg	----	----	----	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg	----	----	----	<1	<1
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	3	mg/kg	----	----	<3	----	----
C10 - C14 Fraction	----	3	mg/kg	----	----	**3**	----	----
C15 - C28 Fraction	----	3	mg/kg	----	----	**12**	----	----

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)

Compound	CAS Number	LOR	Unit	Sample ID	B13-4b	B13-4c	B13-1	Trip Blank 070339	Trip Blank 070338
				Sampling date / time	13-Sep-2023 00:00	13-Sep-2023 00:00	13-Sep-2023 00:00	13-Sep-2023 00:00	13-Sep-2023 00:00
					EB2328877-011	EB2328877-012	EB2328877-013	EB2328877-015	EB2328877-016
					Result	Result	Result	Result	Result
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons - Continued									
C29 - C36 Fraction	----	5	mg/kg		----	----	8	----	----
^ C10 - C36 Fraction (sum)	----	3	mg/kg		----	----	23	----	----
EP080-SD / EP071-SD: Total Recoverable Hydrocarbons									
C6 - C10 Fraction	C6_C10	3	mg/kg		----	----	<3	----	----
>C10 - C16 Fraction	----	3	mg/kg		----	----	3	----	----
C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	3.0	mg/kg		----	----	<3.0	----	----
>C16 - C34 Fraction	----	3	mg/kg		----	----	17	----	----
>C34 - C40 Fraction	----	5	mg/kg		----	----	<5	----	----
^ >C10 - C40 Fraction (sum)	----	3	mg/kg		----	----	20	----	----
EP080-SD: BTEXN									
Benzene	71-43-2	0.2	mg/kg		----	----	<0.2	----	----
Toluene	108-88-3	0.2	mg/kg		----	----	<0.2	----	----
Ethylbenzene	100-41-4	0.2	mg/kg		----	----	<0.2	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.2	mg/kg		----	----	<0.2	----	----
ortho-Xylene	95-47-6	0.2	mg/kg		----	----	<0.2	----	----
^ Total Xylenes	----	0.5	mg/kg		----	----	<0.5	----	----
^ Sum of BTEX	----	0.2	mg/kg		----	----	<0.2	----	----
Naphthalene	91-20-3	0.2	mg/kg		----	----	<0.2	----	----
EP090: Organotin Compounds									
Monobutyltin	78763-54-9	1	µgSn/kg		<1	<1	<1	----	----
Dibutyltin	1002-53-5	1	µgSn/kg		<1	<1	<1	----	----
Tributyltin	56573-85-4	0.5	µgSn/kg		<0.5	<0.5	<0.5	----	----
EP130A: Organophosphorus Pesticides (Ultra-trace)									
Bromophos-ethyl	4824-78-6	10	µg/kg		<10	<10	<10	----	----
Carbophenothion	786-19-6	10	µg/kg		<10	<10	<10	----	----
Chlorfenvinphos (E)	18708-86-6	10.0	µg/kg		<10.0	<10.0	<10.0	----	----
Chlorfenvinphos (Z)	18708-87-7	10	µg/kg		<10	<10	<10	----	----
Chlorpyrifos	2921-88-2	10	µg/kg		<10	<10	<10	----	----
Chlorpyrifos-methyl	5598-13-0	10	µg/kg		<10	<10	<10	----	----
Demeton-S-methyl	919-86-8	10	µg/kg		<10	<10	<10	----	----
Diazinon	333-41-5	10	µg/kg		<10	<10	<10	----	----
Dichlorvos	62-73-7	10	µg/kg		<10	<10	<10	----	----
Dimethoate	60-51-5	10	µg/kg		<10	<10	<10	----	----

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)

Compound	CAS Number	LOR	Unit	Sample ID	B13-4b	B13-4c	B13-1	Trip Blank 070339	Trip Blank 070338
				Sampling date / time	13-Sep-2023 00:00	13-Sep-2023 00:00	13-Sep-2023 00:00	13-Sep-2023 00:00	13-Sep-2023 00:00
					EB2328877-011	EB2328877-012	EB2328877-013	EB2328877-015	EB2328877-016
					Result	Result	Result	Result	Result
EP130A: Organophosphorus Pesticides (Ultra-trace) - Continued									
Ethion	563-12-2	10	µg/kg		<10	<10	<10	----	----
Fenamiphos	22224-92-6	10	µg/kg		<10	<10	<10	----	----
Fenthion	55-38-9	10	µg/kg		<10	<10	<10	----	----
Malathion	121-75-5	10	µg/kg		<10	<10	<10	----	----
Azinphos Methyl	86-50-0	10	µg/kg		<10	<10	<10	----	----
Monocrotophos	6923-22-4	10	µg/kg		<10	<10	<10	----	----
Parathion	56-38-2	10	µg/kg		<10	<10	<10	----	----
Parathion-methyl	298-00-0	10	µg/kg		<10	<10	<10	----	----
Pirimphos-ethyl	23505-41-1	10	µg/kg		<10	<10	<10	----	----
Prothiofos	34643-46-4	10	µg/kg		<10	<10	<10	----	----
EP131A: Organochlorine Pesticides									
Aldrin	309-00-2	0.50	µg/kg		<0.50	<0.50	<0.50	----	----
alpha-BHC	319-84-6	0.50	µg/kg		<0.50	<0.50	<0.50	----	----
beta-BHC	319-85-7	0.50	µg/kg		<0.50	<0.50	<0.50	----	----
delta-BHC	319-86-8	0.50	µg/kg		<0.50	<0.50	<0.50	----	----
4.4`-DDD	72-54-8	0.50	µg/kg		<0.50	<0.50	<0.50	----	----
4.4`-DDE	72-55-9	0.50	µg/kg		<0.50	<0.50	<0.50	----	----
4.4`-DDT	50-29-3	0.50	µg/kg		<0.50	<0.50	<0.50	----	----
^ **Sum of DDD + DDE + DDT**	72-54-8/72-55-9/50-29-3	0.50	µg/kg		<0.50	<0.50	<0.50	----	----
Dieldrin	60-57-1	0.50	µg/kg		<0.50	<0.50	<0.50	----	----
alpha-Endosulfan	959-98-8	0.50	µg/kg		<0.50	<0.50	<0.50	----	----
beta-Endosulfan	33213-65-9	0.50	µg/kg		<0.50	<0.50	<0.50	----	----
Endosulfan sulfate	1031-07-8	0.50	µg/kg		<0.50	<0.50	<0.50	----	----
^ **Endosulfan (sum)**	115-29-7	0.50	µg/kg		<0.50	<0.50	<0.50	----	----
Endrin	72-20-8	0.50	µg/kg		<0.50	<0.50	<0.50	----	----
Endrin aldehyde	7421-93-4	0.50	µg/kg		<0.50	<0.50	<0.50	----	----
Endrin ketone	53494-70-5	0.50	µg/kg		<0.50	<0.50	<0.50	----	----
Heptachlor	76-44-8	0.50	µg/kg		<0.50	<0.50	<0.50	----	----
Heptachlor epoxide	1024-57-3	0.50	µg/kg		<0.50	<0.50	<0.50	----	----
Hexachlorobenzene (HCB)	118-74-1	0.50	µg/kg		<0.50	<0.50	<0.50	----	----
gamma-BHC	58-89-9	0.25	µg/kg		<0.25	<0.25	<0.25	----	----
Methoxychlor	72-43-5	0.50	µg/kg		<0.50	<0.50	<0.50	----	----
cis-Chlordane	5103-71-9	0.50	µg/kg		<0.50	<0.50	<0.50	----	----

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)

Compound	CAS Number	LOR	Unit	Sample ID	B13-4b	B13-4c	B13-1	Trip Blank 070339	Trip Blank 070338
				Sampling date / time	13-Sep-2023 00:00	13-Sep-2023 00:00	13-Sep-2023 00:00	13-Sep-2023 00:00	13-Sep-2023 00:00
					EB2328877-011	EB2328877-012	EB2328877-013	EB2328877-015	EB2328877-016
					Result	Result	Result	Result	Result
EP131A: Organochlorine Pesticides - Continued									
trans-Chlordane	5103-74-2	0.50	µg/kg		<0.50	<0.50	<0.50	----	----
^ Total Chlordane (sum)	----	0.50	µg/kg		<0.50	<0.50	<0.50	----	----
Oxychlordane	27304-13-8	0.50	µg/kg		<0.50	<0.50	<0.50	----	----
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.50	µg/kg		<0.50	<0.50	<0.50	----	----
EP131B: Polychlorinated Biphenyls (as Aroclors)									
^ Total Polychlorinated biphenyls	----	5.0	µg/kg		----	----	<5.0	----	----
Aroclor 1016	12674-11-2	5.0	µg/kg		----	----	<5.0	----	----
Aroclor 1221	11104-28-2	5.0	µg/kg		----	----	<5.0	----	----
Aroclor 1232	11141-16-5	5.0	µg/kg		----	----	<5.0	----	----
Aroclor 1242	53469-21-9	5.0	µg/kg		----	----	<5.0	----	----
Aroclor 1248	12672-29-6	5.0	µg/kg		----	----	<5.0	----	----
Aroclor 1254	11097-69-1	5.0	µg/kg		----	----	<5.0	----	----
Aroclor 1260	11096-82-5	5.0	µg/kg		----	----	<5.0	----	----
EP132B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	5	µg/kg		----	----	<5	----	----
2-Methylnaphthalene	91-57-6	5	µg/kg		----	----	<5	----	----
Acenaphthylene	208-96-8	4	µg/kg		----	----	<4	----	----
Acenaphthene	83-32-9	4	µg/kg		----	----	<4	----	----
Fluorene	86-73-7	4	µg/kg		----	----	<4	----	----
Phenanthrene	85-01-8	4	µg/kg		----	----	4	----	----
Anthracene	120-12-7	4	µg/kg		----	----	<4	----	----
Fluoranthene	206-44-0	4	µg/kg		----	----	15	----	----
Pyrene	129-00-0	4	µg/kg		----	----	14	----	----
Benz(a)anthracene	56-55-3	4	µg/kg		----	----	7	----	----
Chrysene	218-01-9	4	µg/kg		----	----	7	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	4	µg/kg		----	----	11	----	----
Benzo(k)fluoranthene	207-08-9	4	µg/kg		----	----	<4	----	----
Benzo(e)pyrene	192-97-2	4	µg/kg		----	----	7	----	----
Benzo(a)pyrene	50-32-8	4	µg/kg		----	----	9	----	----
Perylene	198-55-0	4	µg/kg		----	----	14	----	----
Benzo(g.h.i)perylene	191-24-2	4	µg/kg		----	----	7	----	----
Dibenz(a.h)anthracene	53-70-3	4	µg/kg		----	----	<4	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	4	µg/kg		----	----	6	----	----
Coronene	191-07-1	5	µg/kg		----	----	<5	----	----

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)

Compound	CAS Number	LOR	Unit	Sample ID	B13-4b	B13-4c	B13-1	Trip Blank 070339	Trip Blank 070338
				Sampling date / time	13-Sep-2023 00:00	13-Sep-2023 00:00	13-Sep-2023 00:00	13-Sep-2023 00:00	13-Sep-2023 00:00
					EB2328877-011	EB2328877-012	EB2328877-013	EB2328877-015	EB2328877-016
					Result	Result	Result	Result	Result
EP132B: Polynuclear Aromatic Hydrocarbons - Continued									
^ Sum of PAHs	----	4	µg/kg		----	----	101	----	----
^ Benzo(a)pyrene TEQ (zero)	----	4	µg/kg		----	----	12	----	----
^ Benzo(a)pyrene TEQ (half LOR)	----	4	µg/kg		----	----	14	----	----
^ Benzo(a)pyrene TEQ (LOR)	----	4	µg/kg		----	----	16	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		----	----	----	94.2	87.3
Toluene-D8	2037-26-5	0.2	%		----	----	----	79.6	73.4
4-Bromofluorobenzene	460-00-4	0.2	%		----	----	----	86.6	78.9
EP080-SD: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		----	----	85.6	----	----
Toluene-D8	2037-26-5	0.2	%		----	----	73.1	----	----
4-Bromofluorobenzene	460-00-4	0.2	%		----	----	82.5	----	----
EP090S: Organotin Surrogate									
Tripropyltin	----	0.5	%		60.1	86.5	84.8	----	----
EP130S: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	10	%		89.3	59.7	77.3	----	----
EP131S: OC Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.50	%		70.0	54.7	72.3	----	----
EP131T: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	0.5	%		----	----	66.2	----	----
EP132T: Base/Neutral Extractable Surrogates									
2-Fluorobiphenyl	321-60-8	10	%		----	----	82.4	----	----
Anthracene-d10	1719-06-8	10	%		----	----	85.2	----	----
4-Terphenyl-d14	1718-51-0	10	%		----	----	84.4	----	----

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	Trip Blank 070336	B2-0	BC-2	B4-4	B4-0
			Sampling date / time	13-Sep-2023 00:00	12-Sep-2023 00:00	12-Sep-2023 00:00	12-Sep-2023 00:00	12-Sep-2023 00:00
Compound	CAS Number	LOR	Unit	EB2328877-017	EB2328877-018	EB2328877-019	EB2328877-020	EB2328877-021
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	----	21.0	62.2	62.4	57.8
EA150: Particle Sizing								
+75µm	----	1	%	----	98	11	6	11
+150µm	----	1	%	----	98	7	2	5
+300µm	----	1	%	----	76	4	1	1
+425µm	----	1	%	----	33	2	<1	<1
+600µm	----	1	%	----	6	1	<1	<1
+1180µm	----	1	%	----	<1	<1	<1	<1
+2.36mm	----	1	%	----	<1	<1	<1	<1
+4.75mm	----	1	%	----	<1	<1	<1	<1
+9.5mm	----	1	%	----	<1	<1	<1	<1
+19.0mm	----	1	%	----	<1	<1	<1	<1
+37.5mm	----	1	%	----	<1	<1	<1	<1
+75.0mm	----	1	%	----	<1	<1	<1	<1
EA150: Soil Classification based on Particle Size								
Clay (<2 µm)	----	1	%	----	2	34	38	36
Silt (2-60 µm)	----	1	%	----	<1	49	53	48
Sand (0.06-2.00 mm)	----	1	%	----	98	17	9	16
Gravel (>2mm)	----	1	%	----	<1	<1	<1	<1
Cobbles (>6cm)	----	1	%	----	<1	<1	<1	<1
EA152: Soil Particle Density								
Soil Particle Density (Clay/Silt/Sand)	----	0.01	g/cm3	----	2.58	2.33	2.39	2.41
EG005(ED093)T: Total Metals by ICP-AES								
Aluminium	7429-90-5	50	mg/kg	----	4900	5140	17300	15800
Iron	7439-89-6	50	mg/kg	----	15200	18100	40500	38900
EG020-SD: Total Metals in Sediments by ICPMS								
Arsenic	7440-38-2	1.00	mg/kg	----	4.94	3.22	6.53	6.52
Cadmium	7440-43-9	0.1	mg/kg	----	<0.1	<0.1	<0.1	<0.1
Chromium	7440-47-3	1.0	mg/kg	----	10.8	16.8	34.8	32.1
Copper	7440-50-8	1.0	mg/kg	----	4.5	5.3	31.6	33.3
Lead	7439-92-1	1.0	mg/kg	----	5.0	5.6	18.7	19.8
Nickel	7440-02-0	1.0	mg/kg	----	8.9	13.3	29.5	25.7
Silver	7440-22-4	0.1	mg/kg	----	<0.1	<0.1	0.1	0.2
Zinc	7440-66-6	1.0	mg/kg	----	28.1	38.1	110	115

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	Trip Blank 070336	B2-0	BC-2	B4-4	B4-0
			Sampling date / time	13-Sep-2023 00:00	12-Sep-2023 00:00	12-Sep-2023 00:00	12-Sep-2023 00:00	12-Sep-2023 00:00
Compound	CAS Number	LOR	Unit	EB2328877-017	EB2328877-018	EB2328877-019	EB2328877-020	EB2328877-021
				Result	Result	Result	Result	Result
EG020-SD: Total Metals in Sediments by ICPMS - Continued								
EG035T: Total Recoverable Mercury by FIMS (Low Level)								
Mercury	7439-97-6	0.01	mg/kg	----	**0.02**	**0.02**	**0.11**	**0.11**
EP003: Total Organic Carbon (TOC) in Soil								
Total Organic Carbon	----	0.02	%	----	**0.06**	**2.19**	**1.63**	**1.51**
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	----	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	----	----	----	----
EP080: BTEXN								
Benzene	71-43-2	0.2	mg/kg	<0.2	----	----	----	----
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	----	----	----	----
EP090: Organotin Compounds								
Monobutyltin	78763-54-9	1	µgSn/kg	----	<1	<1	<1	<1
Dibutyltin	1002-53-5	1	µgSn/kg	----	<1	**2**	<1	<1
Tributyltin	56573-85-4	0.5	µgSn/kg	----	<0.5	**3.4**	**1.3**	**1.9**
EP130A: Organophosphorus Pesticides (Ultra-trace)								
Bromophos-ethyl	4824-78-6	10	µg/kg	----	<10	<10	<10	<10
Carbophenothion	786-19-6	10	µg/kg	----	<10	<10	<10	<10
Chlorfenvinphos (E)	18708-86-6	10.0	µg/kg	----	<10.0	<10.0	<10.0	<10.0
Chlorfenvinphos (Z)	18708-87-7	10	µg/kg	----	<10	<10	<10	<10
Chlorpyrifos	2921-88-2	10	µg/kg	----	<10	<10	<10	<10
Chlorpyrifos-methyl	5598-13-0	10	µg/kg	----	<10	<10	<10	<10
Demeton-S-methyl	919-86-8	10	µg/kg	----	<10	<10	<10	<10
Diazinon	333-41-5	10	µg/kg	----	<10	<10	<10	<10
Dichlorvos	62-73-7	10	µg/kg	----	<10	<10	<10	<10

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	Trip Blank 070336	B2-0	BC-2	B4-4	B4-0
				Sampling date / time	13-Sep-2023 00:00	12-Sep-2023 00:00	12-Sep-2023 00:00	12-Sep-2023 00:00	12-Sep-2023 00:00
Compound	CAS Number	LOR	Unit		EB2328877-017	EB2328877-018	EB2328877-019	EB2328877-020	EB2328877-021
					Result	Result	Result	Result	Result
EP130A: Organophosphorus Pesticides (Ultra-trace) - Continued									
Dimethoate	60-51-5	10	µg/kg		----	<10	<10	<10	<10
Ethion	563-12-2	10	µg/kg		----	<10	<10	<10	<10
Fenamiphos	22224-92-6	10	µg/kg		----	<10	<10	<10	<10
Fenthion	55-38-9	10	µg/kg		----	<10	<10	<10	<10
Malathion	121-75-5	10	µg/kg		----	<10	<10	<10	<10
Azinphos Methyl	86-50-0	10	µg/kg		----	<10	<10	<10	<10
Monocrotophos	6923-22-4	10	µg/kg		----	<10	<10	<10	<10
Parathion	56-38-2	10	µg/kg		----	<10	<10	<10	<10
Parathion-methyl	298-00-0	10	µg/kg		----	<10	<10	<10	<10
Pirimphos-ethyl	23505-41-1	10	µg/kg		----	<10	<10	<10	<10
Prothiofos	34643-46-4	10	µg/kg		----	<10	<10	<10	<10
EP131A: Organochlorine Pesticides									
Aldrin	309-00-2	0.50	µg/kg		----	<0.50	<0.50	<0.50	<0.50
alpha-BHC	319-84-6	0.50	µg/kg		----	<0.50	<0.50	<0.50	<0.50
beta-BHC	319-85-7	0.50	µg/kg		----	<0.50	<0.50	<0.50	<0.50
delta-BHC	319-86-8	0.50	µg/kg		----	<0.50	<0.50	<0.50	<0.50
4.4`-DDD	72-54-8	0.50	µg/kg		----	<0.50	<0.50	<0.50	<0.50
4.4`-DDE	72-55-9	0.50	µg/kg		----	<0.50	**2.38**	**1.70**	<0.50
4.4`-DDT	50-29-3	0.50	µg/kg		----	<0.50	<0.50	<0.50	<0.50
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.50	µg/kg		----	<0.50	**2.38**	**1.70**	<0.50
Dieldrin	60-57-1	0.50	µg/kg		----	<0.50	<0.50	<0.50	<0.50
alpha-Endosulfan	959-98-8	0.50	µg/kg		----	<0.50	<0.50	<0.50	<0.50
beta-Endosulfan	33213-65-9	0.50	µg/kg		----	<0.50	<0.50	<0.50	<0.50
Endosulfan sulfate	1031-07-8	0.50	µg/kg		----	<0.50	<0.50	<0.50	<0.50
^ Endosulfan (sum)	115-29-7	0.50	µg/kg		----	<0.50	<0.50	<0.50	<0.50
Endrin	72-20-8	0.50	µg/kg		----	<0.50	<0.50	<0.50	<0.50
Endrin aldehyde	7421-93-4	0.50	µg/kg		----	<0.50	<0.50	<0.50	<0.50
Endrin ketone	53494-70-5	0.50	µg/kg		----	<0.50	<0.50	<0.50	<0.50
Heptachlor	76-44-8	0.50	µg/kg		----	<0.50	<0.50	<0.50	<0.50
Heptachlor epoxide	1024-57-3	0.50	µg/kg		----	<0.50	<0.50	<0.50	<0.50
Hexachlorobenzene (HCB)	118-74-1	0.50	µg/kg		----	<0.50	<0.50	<0.50	<0.50
gamma-BHC	58-89-9	0.25	µg/kg		----	<0.25	<0.25	<0.25	<0.25
Methoxychlor	72-43-5	0.50	µg/kg		----	<0.50	<0.50	<0.50	<0.50

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	Trip Blank 070336	B2-0	BC-2	B4-4	B4-0
			Sampling date / time	13-Sep-2023 00:00	12-Sep-2023 00:00	12-Sep-2023 00:00	12-Sep-2023 00:00	12-Sep-2023 00:00
Compound	CAS Number	LOR	Unit	EB2328877-017	EB2328877-018	EB2328877-019	EB2328877-020	EB2328877-021
				Result	Result	Result	Result	Result
EP131A: Organochlorine Pesticides - Continued								
cis-Chlordane	5103-71-9	0.50	µg/kg	----	<0.50	<0.50	<0.50	<0.50
trans-Chlordane	5103-74-2	0.50	µg/kg	----	<0.50	<0.50	<0.50	<0.50
^ Total Chlordane (sum)	----	0.50	µg/kg	----	<0.50	<0.50	<0.50	<0.50
Oxychlordane	27304-13-8	0.50	µg/kg	----	<0.50	<0.50	<0.50	<0.50
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.50	µg/kg	----	<0.50	<0.50	<0.50	<0.50
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.2	%	93.2	----	----	----	----
Toluene-D8	2037-26-5	0.2	%	81.7	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.2	%	86.7	----	----	----	----
EP090S: Organotin Surrogate								
Tripropyltin	----	0.5	%	----	107	86.2	68.8	64.9
EP130S: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	10	%	----	68.8	69.0	76.9	78.0
EP131S: OC Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.50	%	----	101	44.7	70.2	66.0

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	B5-0	B5-1	B5-1b	B5-1c	B6-3
			Sampling date / time	12-Sep-2023 00:00	12-Sep-2023 00:00	12-Sep-2023 00:00	12-Sep-2023 00:00	12-Sep-2023 00:00
Compound	CAS Number	LOR	Unit	EB2328877-022	EB2328877-023	EB2328877-024	EB2328877-025	EB2328877-026
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	57.2	52.8	59.7	58.6	63.5
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	0.4	0.2	0.6	0.5	0.3
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	20	mg/kg	1500	1180	1530	1240	1760
EK062: Total Nitrogen as N (TKN + NOx)								
^ Total Nitrogen as N	----	20	mg/kg	1500	1180	1530	1240	1760
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	2	mg/kg	915	680	926	710	1040
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	3	mg/kg	<3	<3	<3	<3	<3
C10 - C14 Fraction	----	3	mg/kg	6	5	7	5	12
C15 - C28 Fraction	----	3	mg/kg	22	27	18	33	51
C29 - C36 Fraction	----	5	mg/kg	16	22	13	26	35
^ C10 - C36 Fraction (sum)	----	3	mg/kg	44	54	38	64	98
EP080-SD / EP071-SD: Total Recoverable Hydrocarbons								
C6 - C10 Fraction	C6_C10	3	mg/kg	<3	<3	<3	<3	<3
>C10 - C16 Fraction	----	3	mg/kg	6	6	8	6	13
C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	3.0	mg/kg	<3.0	<3.0	<3.0	<3.0	<3.0
>C16 - C34 Fraction	----	3	mg/kg	31	41	25	50	72
>C34 - C40 Fraction	----	5	mg/kg	9	12	8	14	19
^ >C10 - C40 Fraction (sum)	----	3	mg/kg	46	59	41	70	104
EP080-SD: BTEXN								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Ethylbenzene	100-41-4	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
meta- & para-Xylene	108-38-3 106-42-3	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
ortho-Xylene	95-47-6	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Naphthalene	91-20-3	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
EP131B: Polychlorinated Biphenyls (as Aroclors)								

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	B5-0	B5-1	B5-1b	B5-1c	B6-3
			Sampling date / time	12-Sep-2023 00:00	12-Sep-2023 00:00	12-Sep-2023 00:00	12-Sep-2023 00:00	12-Sep-2023 00:00
Compound	CAS Number	LOR	Unit	EB2328877-022	EB2328877-023	EB2328877-024	EB2328877-025	EB2328877-026
				Result	Result	Result	Result	Result
EP131B: Polychlorinated Biphenyls (as Aroclors) - Continued								
^ Total Polychlorinated biphenyls	----	5.0	µg/kg	<6.2	<6.2	<6.2	<6.2	<6.2
Aroclor 1016	12674-11-2	5.0	µg/kg	<6.2	<6.2	<6.2	<6.2	<6.2
Aroclor 1221	11104-28-2	5.0	µg/kg	<6.2	<6.2	<6.2	<6.2	<6.2
Aroclor 1232	11141-16-5	5.0	µg/kg	<6.2	<6.2	<6.2	<6.2	<6.2
Aroclor 1242	53469-21-9	5.0	µg/kg	<6.2	<6.2	<6.2	<6.2	<6.2
Aroclor 1248	12672-29-6	5.0	µg/kg	<6.2	<6.2	<6.2	<6.2	<6.2
Aroclor 1254	11097-69-1	5.0	µg/kg	<6.2	<6.2	<6.2	<6.2	<6.2
Aroclor 1260	11096-82-5	5.0	µg/kg	<6.2	<6.2	<6.2	<6.2	<6.2
EP132B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	5	µg/kg	<5	<5	6	<5	11
2-Methylnaphthalene	91-57-6	5	µg/kg	<5	<5	<5	<5	<5
Acenaphthylene	208-96-8	4	µg/kg	6	11	7	11	8
Acenaphthene	83-32-9	4	µg/kg	<5	<5	<5	<5	<5
Fluorene	86-73-7	4	µg/kg	<5	<5	<5	<5	<5
Phenanthrene	85-01-8	4	µg/kg	13	14	10	15	15
Anthracene	120-12-7	4	µg/kg	7	10	7	12	9
Fluoranthene	206-44-0	4	µg/kg	34	49	34	50	40
Pyrene	129-00-0	4	µg/kg	34	54	38	56	44
Benz(a)anthracene	56-55-3	4	µg/kg	17	28	21	29	20
Chrysene	218-01-9	4	µg/kg	16	25	17	24	19
Benzo(b+j)fluoranthene	205-99-2 205-82-3	4	µg/kg	24	48	34	51	35
Benzo(k)fluoranthene	207-08-9	4	µg/kg	8	17	10	16	13
Benzo(e)pyrene	192-97-2	4	µg/kg	16	30	21	31	22
Benzo(a)pyrene	50-32-8	4	µg/kg	22	42	28	41	30
Perylene	198-55-0	4	µg/kg	59	65	75	130	82
Benzo(g.h.i)perylene	191-24-2	4	µg/kg	18	38	23	33	24
Dibenz(a.h)anthracene	53-70-3	4	µg/kg	<5	8	8	7	5
Indeno(1.2.3.cd)pyrene	193-39-5	4	µg/kg	14	31	21	26	19
Coronene	191-07-1	5	µg/kg	5	11	7	9	6
^ Sum of PAHs	----	4	µg/kg	293	481	367	541	402
^ Benzo(a)pyrene TEQ (zero)	----	4	µg/kg	29	63	45	61	44
^ Benzo(a)pyrene TEQ (half LOR)	----	4	µg/kg	31	63	45	61	44
^ Benzo(a)pyrene TEQ (LOR)	----	4	µg/kg	33	63	45	61	44
EP080-SD: TPH(V)/BTEX Surrogates								

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	B5-0	B5-1	B5-1b	B5-1c	B6-3
				Sampling date / time	12-Sep-2023 00:00	12-Sep-2023 00:00	12-Sep-2023 00:00	12-Sep-2023 00:00	12-Sep-2023 00:00
Compound	CAS Number	LOR	Unit		EB2328877-022	EB2328877-023	EB2328877-024	EB2328877-025	EB2328877-026
					Result	Result	Result	Result	Result
EP080-SD: TPH(V)/BTEX Surrogates - Continued									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		81.4	96.7	87.7	84.9	86.9
Toluene-D8	2037-26-5	0.2	%		69.4	80.0	74.4	71.0	74.5
4-Bromofluorobenzene	460-00-4	0.2	%		79.1	88.7	83.4	82.6	81.8
EP131T: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	0.5	%		68.8	72.5	75.0	63.8	83.8
EP132T: Base/Neutral Extractable Surrogates									
2-Fluorobiphenyl	321-60-8	10	%		75.3	76.0	88.5	72.7	69.5
Anthracene-d10	1719-06-8	10	%		93.9	101	106	96.0	87.0
4-Terphenyl-d14	1718-51-0	10	%		93.1	96.8	103	97.7	86.0

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	B7-1	B8-3	B8-1	B6-2	B6-2b
			Sampling date / time	12-Sep-2023 00:00	12-Sep-2023 00:00	12-Sep-2023 00:00	12-Sep-2023 00:00	12-Sep-2023 00:00
Compound	CAS Number	LOR	Unit	EB2328877-027	EB2328877-028	EB2328877-029	EB2328877-030	EB2328877-031
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	----	50.5	58.2	46.8	54.4
Moisture Content	----	1.0	%	61.7	----	----	----	----
EA150: Particle Sizing								
+75µm	----	1	%	----	4	7	38	34
+150µm	----	1	%	----	1	4	28	24
+300µm	----	1	%	----	<1	<1	5	6
+425µm	----	1	%	----	<1	<1	2	4
+600µm	----	1	%	----	<1	<1	1	3
+1180µm	----	1	%	----	<1	<1	<1	2
+2.36mm	----	1	%	----	<1	<1	<1	1
+4.75mm	----	1	%	----	<1	<1	<1	<1
+9.5mm	----	1	%	----	<1	<1	<1	<1
+19.0mm	----	1	%	----	<1	<1	<1	<1
+37.5mm	----	1	%	----	<1	<1	<1	<1
+75.0mm	----	1	%	----	<1	<1	<1	<1
EA150: Soil Classification based on Particle Size								
Clay (<2 µm)	----	1	%	----	37	47	31	37
Silt (2-60 µm)	----	1	%	----	54	43	25	28
Sand (0.06-2.00 mm)	----	1	%	----	9	10	44	34
Gravel (>2mm)	----	1	%	----	<1	<1	<1	1
Cobbles (>6cm)	----	1	%	----	<1	<1	<1	<1
EA152: Soil Particle Density								
Soil Particle Density (Clay/Silt/Sand)	----	0.01	g/cm3	----	2.48	2.48	2.54	2.54
EG005(ED093)T: Total Metals by ICP-AES								
Aluminium	7429-90-5	50	mg/kg	----	10300	18000	11100	13800
Iron	7439-89-6	50	mg/kg	----	29900	43800	29300	34300
EG020-SD: Total Metals in Sediments by ICPMS								
Arsenic	7440-38-2	1.00	mg/kg	----	5.28	8.13	4.66	5.79
Cadmium	7440-43-9	0.1	mg/kg	----	<0.1	<0.1	0.2	<0.1
Chromium	7440-47-3	1.0	mg/kg	----	23.8	37.1	25.4	29.1
Copper	7440-50-8	1.0	mg/kg	----	17.6	32.6	18.6	23.1
Lead	7439-92-1	1.0	mg/kg	----	12.0	19.5	11.1	13.2
Nickel	7440-02-0	1.0	mg/kg	----	19.5	30.1	20.7	23.9
Silver	7440-22-4	0.1	mg/kg	----	<0.1	0.2	<0.1	<0.1

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	B7-1	B8-3	B8-1	B6-2	B6-2b
			Sampling date / time	12-Sep-2023 00:00	12-Sep-2023 00:00	12-Sep-2023 00:00	12-Sep-2023 00:00	12-Sep-2023 00:00
Compound	CAS Number	LOR	Unit	EB2328877-027	EB2328877-028	EB2328877-029	EB2328877-030	EB2328877-031
				Result	Result	Result	Result	Result
EG020-SD: Total Metals in Sediments by ICPMS - Continued								
Zinc	7440-66-6	1.0	mg/kg	----	66.6	105	77.2	82.0
EG035T: Total Recoverable Mercury by FIMS (Low Level)								
Mercury	7439-97-6	0.01	mg/kg	----	0.07	0.12	0.06	0.08
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	0.9	----	----	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	20	mg/kg	1520	----	----	----	----
EK062: Total Nitrogen as N (TKN + NOx)								
^ Total Nitrogen as N	----	20	mg/kg	1520	----	----	----	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	2	mg/kg	957	----	----	----	----
EP003: Total Organic Carbon (TOC) in Soil								
Total Organic Carbon	----	0.02	%	----	1.35	1.74	1.24	0.97
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	3	mg/kg	<3	----	----	----	----
C10 - C14 Fraction	----	3	mg/kg	8	----	----	----	----
C15 - C28 Fraction	----	3	mg/kg	32	----	----	----	----
C29 - C36 Fraction	----	5	mg/kg	26	----	----	----	----
^ C10 - C36 Fraction (sum)	----	3	mg/kg	66	----	----	----	----
EP080-SD / EP071-SD: Total Recoverable Hydrocarbons								
C6 - C10 Fraction	C6_C10	3	mg/kg	<3	----	----	----	----
>C10 - C16 Fraction	----	3	mg/kg	8	----	----	----	----
C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	3.0	mg/kg	<3.0	----	----	----	----
>C16 - C34 Fraction	----	3	mg/kg	48	----	----	----	----
>C34 - C40 Fraction	----	5	mg/kg	16	----	----	----	----
^ >C10 - C40 Fraction (sum)	----	3	mg/kg	72	----	----	----	----
EP080-SD: BTEXN								
Benzene	71-43-2	0.2	mg/kg	<0.2	----	----	----	----
Toluene	108-88-3	0.2	mg/kg	<0.2	----	----	----	----
Ethylbenzene	100-41-4	0.2	mg/kg	<0.2	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.2	mg/kg	<0.2	----	----	----	----
ortho-Xylene	95-47-6	0.2	mg/kg	<0.2	----	----	----	----

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	B7-1	B8-3	B8-1	B6-2	B6-2b
			Sampling date / time	12-Sep-2023 00:00	12-Sep-2023 00:00	12-Sep-2023 00:00	12-Sep-2023 00:00	12-Sep-2023 00:00
Compound	CAS Number	LOR	Unit	EB2328877-027	EB2328877-028	EB2328877-029	EB2328877-030	EB2328877-031
				Result	Result	Result	Result	Result
EP080-SD: BTEXN - Continued								
^ Total Xylenes	----	0.5	mg/kg	<0.5	----	----	----	----
^ Sum of BTEX	----	0.2	mg/kg	<0.2	----	----	----	----
Naphthalene	91-20-3	0.2	mg/kg	<0.2	----	----	----	----
EP090: Organotin Compounds								
Monobutyltin	78763-54-9	1	µgSn/kg	----	<1	<1	<1	<1
Dibutyltin	1002-53-5	1	µgSn/kg	----	<1	<1	<1	<1
Tributyltin	56573-85-4	0.5	µgSn/kg	----	**0.6**	**0.8**	**1.3**	**0.7**
EP130A: Organophosphorus Pesticides (Ultra-trace)								
Bromophos-ethyl	4824-78-6	10	µg/kg	----	<10	<10	<10	<10
Carbophenothion	786-19-6	10	µg/kg	----	<10	<10	<10	<10
Chlorfenvinphos (E)	18708-86-6	10.0	µg/kg	----	<10.0	<10.0	<10.0	<10.0
Chlorfenvinphos (Z)	18708-87-7	10	µg/kg	----	<10	<10	<10	<10
Chlorpyrifos	2921-88-2	10	µg/kg	----	<10	<10	<10	<10
Chlorpyrifos-methyl	5598-13-0	10	µg/kg	----	<10	<10	<10	<10
Demeton-S-methyl	919-86-8	10	µg/kg	----	<10	<10	<10	<10
Diazinon	333-41-5	10	µg/kg	----	<10	<10	<10	<10
Dichlorvos	62-73-7	10	µg/kg	----	<10	<10	<10	<10
Dimethoate	60-51-5	10	µg/kg	----	<10	<10	<10	<10
Ethion	563-12-2	10	µg/kg	----	<10	<10	<10	<10
Fenamiphos	22224-92-6	10	µg/kg	----	<10	<10	<10	<10
Fenthion	55-38-9	10	µg/kg	----	<10	<10	<10	<10
Malathion	121-75-5	10	µg/kg	----	<10	<10	<10	<10
Azinphos Methyl	86-50-0	10	µg/kg	----	<10	<10	<10	<10
Monocrotophos	6923-22-4	10	µg/kg	----	<10	<10	<10	<10
Parathion	56-38-2	10	µg/kg	----	<10	<10	<10	<10
Parathion-methyl	298-00-0	10	µg/kg	----	<10	<10	<10	<10
Pirimphos-ethyl	23505-41-1	10	µg/kg	----	<10	<10	<10	<10
Prothiofos	34643-46-4	10	µg/kg	----	<10	<10	<10	<10
EP131A: Organochlorine Pesticides								
Aldrin	309-00-2	0.50	µg/kg	----	<0.50	<0.50	<0.50	<0.50
alpha-BHC	319-84-6	0.50	µg/kg	----	<0.50	<0.50	<0.50	<0.50
beta-BHC	319-85-7	0.50	µg/kg	----	<0.50	<0.50	<0.50	<0.50
delta-BHC	319-86-8	0.50	µg/kg	----	<0.50	<0.50	<0.50	<0.50
4.4`-DDD	72-54-8	0.50	µg/kg	----	<0.50	<0.50	<0.50	<0.50

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	B7-1	B8-3	B8-1	B6-2	B6-2b
			Sampling date / time	12-Sep-2023 00:00	12-Sep-2023 00:00	12-Sep-2023 00:00	12-Sep-2023 00:00	12-Sep-2023 00:00
Compound	CAS Number	LOR	Unit	EB2328877-027	EB2328877-028	EB2328877-029	EB2328877-030	EB2328877-031
				Result	Result	Result	Result	Result
EP131A: Organochlorine Pesticides - Continued								
4.4`-DDE	72-55-9	0.50	µg/kg	----	<0.50	<0.50	<0.50	<0.50
4.4`-DDT	50-29-3	0.50	µg/kg	----	<0.50	<0.50	<0.50	<0.50
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.50	µg/kg	----	<0.50	<0.50	<0.50	<0.50
Dieldrin	60-57-1	0.50	µg/kg	----	<0.50	<0.50	<0.50	<0.50
alpha-Endosulfan	959-98-8	0.50	µg/kg	----	<0.50	<0.50	<0.50	<0.50
beta-Endosulfan	33213-65-9	0.50	µg/kg	----	<0.50	<0.50	<0.50	<0.50
Endosulfan sulfate	1031-07-8	0.50	µg/kg	----	<0.50	<0.50	<0.50	<0.50
^ Endosulfan (sum)	115-29-7	0.50	µg/kg	----	<0.50	<0.50	<0.50	<0.50
Endrin	72-20-8	0.50	µg/kg	----	<0.50	<0.50	<0.50	<0.50
Endrin aldehyde	7421-93-4	0.50	µg/kg	----	<0.50	<0.50	<0.50	<0.50
Endrin ketone	53494-70-5	0.50	µg/kg	----	<0.50	<0.50	<0.50	<0.50
Heptachlor	76-44-8	0.50	µg/kg	----	<0.50	<0.50	<0.50	<0.50
Heptachlor epoxide	1024-57-3	0.50	µg/kg	----	<0.50	<0.50	<0.50	<0.50
Hexachlorobenzene (HCB)	118-74-1	0.50	µg/kg	----	<0.50	<0.50	<0.50	<0.50
gamma-BHC	58-89-9	0.25	µg/kg	----	<0.25	<0.25	<0.25	<0.25
Methoxychlor	72-43-5	0.50	µg/kg	----	<0.50	<0.50	<0.50	<0.50
cis-Chlordane	5103-71-9	0.50	µg/kg	----	<0.50	<0.50	<0.50	<0.50
trans-Chlordane	5103-74-2	0.50	µg/kg	----	<0.50	<0.50	<0.50	<0.50
^ Total Chlordane (sum)	----	0.50	µg/kg	----	<0.50	<0.50	<0.50	<0.50
Oxychlordane	27304-13-8	0.50	µg/kg	----	<0.50	<0.50	<0.50	<0.50
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.50	µg/kg	----	<0.50	<0.50	<0.50	<0.50
EP131B: Polychlorinated Biphenyls (as Aroclors)								
^ Total Polychlorinated biphenyls	----	5.0	µg/kg	<6.2	----	----	----	----
Aroclor 1016	12674-11-2	5.0	µg/kg	<6.2	----	----	----	----
Aroclor 1221	11104-28-2	5.0	µg/kg	<6.2	----	----	----	----
Aroclor 1232	11141-16-5	5.0	µg/kg	<6.2	----	----	----	----
Aroclor 1242	53469-21-9	5.0	µg/kg	<6.2	----	----	----	----
Aroclor 1248	12672-29-6	5.0	µg/kg	<6.2	----	----	----	----
Aroclor 1254	11097-69-1	5.0	µg/kg	<6.2	----	----	----	----
Aroclor 1260	11096-82-5	5.0	µg/kg	<6.2	----	----	----	----
EP132B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	5	µg/kg	**9**	----	----	----	----
2-Methylnaphthalene	91-57-6	5	µg/kg	<5	----	----	----	----

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	B7-1	B8-3	B8-1	B6-2	B6-2b
			Sampling date / time	12-Sep-2023 00:00	12-Sep-2023 00:00	12-Sep-2023 00:00	12-Sep-2023 00:00	12-Sep-2023 00:00
Compound	CAS Number	LOR	Unit	EB2328877-027	EB2328877-028	EB2328877-029	EB2328877-030	EB2328877-031
				Result	Result	Result	Result	Result
EP132B: Polynuclear Aromatic Hydrocarbons - Continued								
Acenaphthylene	208-96-8	4	µg/kg	9	----	----	----	----
Acenaphthene	83-32-9	4	µg/kg	<5	----	----	----	----
Fluorene	86-73-7	4	µg/kg	<5	----	----	----	----
Phenanthrene	85-01-8	4	µg/kg	12	----	----	----	----
Anthracene	120-12-7	4	µg/kg	10	----	----	----	----
Fluoranthene	206-44-0	4	µg/kg	39	----	----	----	----
Pyrene	129-00-0	4	µg/kg	43	----	----	----	----
Benz(a)anthracene	56-55-3	4	µg/kg	22	----	----	----	----
Chrysene	218-01-9	4	µg/kg	20	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	4	µg/kg	36	----	----	----	----
Benzo(k)fluoranthene	207-08-9	4	µg/kg	15	----	----	----	----
Benzo(e)pyrene	192-97-2	4	µg/kg	25	----	----	----	----
Benzo(a)pyrene	50-32-8	4	µg/kg	31	----	----	----	----
Perylene	198-55-0	4	µg/kg	72	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	4	µg/kg	27	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	4	µg/kg	5	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	4	µg/kg	21	----	----	----	----
Coronene	191-07-1	5	µg/kg	10	----	----	----	----
^ Sum of PAHs	----	4	µg/kg	406	----	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	4	µg/kg	46	----	----	----	----
^ Benzo(a)pyrene TEQ (half LOR)	----	4	µg/kg	46	----	----	----	----
^ Benzo(a)pyrene TEQ (LOR)	----	4	µg/kg	46	----	----	----	----
EP080-SD: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.2	%	91.2	----	----	----	----
Toluene-D8	2037-26-5	0.2	%	79.4	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.2	%	88.2	----	----	----	----
EP090S: Organotin Surrogate								
Tripropyltin	----	0.5	%	----	113	124	103	62.0
EP130S: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	10	%	----	69.9	89.1	71.9	93.2
EP131S: OC Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.50	%	----	64.6	60.4	72.9	61.0
EP131T: PCB Surrogate								
Decachlorobiphenyl	2051-24-3	0.5	%	65.0	----	----	----	----

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	B7-1	B8-3	B8-1	B6-2	B6-2b
				Sampling date / time	12-Sep-2023 00:00	12-Sep-2023 00:00	12-Sep-2023 00:00	12-Sep-2023 00:00	12-Sep-2023 00:00
Compound	CAS Number	LOR	Unit		EB2328877-027	EB2328877-028	EB2328877-029	EB2328877-030	EB2328877-031
					Result	Result	Result	Result	Result
EP132T: Base/Neutral Extractable Surrogates									
2-Fluorobiphenyl	321-60-8	10	%		**73.6**	----	----	----	----
Anthracene-d10	1719-06-8	10	%		**100**	----	----	----	----
4-Terphenyl-d14	1718-51-0	10	%		**101**	----	----	----	----

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	B9-1	B10-5	B11-9	B11-9b	B11-9c
			Sampling date / time	14-Sep-2023 00:00	14-Sep-2023 00:00	14-Sep-2023 00:00	14-Sep-2023 00:00	14-Sep-2023 00:00
Compound	CAS Number	LOR	Unit	EB2328877-033	EB2328877-034	EB2328877-035	EB2328877-036	EB2328877-037
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	52.1	----	----	----	----
EA150: Particle Sizing								
+75µm	----	1	%	62	27	14	11	17
+150µm	----	1	%	60	19	7	4	6
+300µm	----	1	%	54	9	3	1	2
+425µm	----	1	%	34	4	1	<1	1
+600µm	----	1	%	12	1	<1	<1	<1
+1180µm	----	1	%	5	<1	<1	<1	<1
+2.36mm	----	1	%	4	<1	<1	<1	<1
+4.75mm	----	1	%	2	<1	<1	<1	<1
+9.5mm	----	1	%	<1	<1	<1	<1	<1
+19.0mm	----	1	%	<1	<1	<1	<1	<1
+37.5mm	----	1	%	<1	<1	<1	<1	<1
+75.0mm	----	1	%	<1	<1	<1	<1	<1
EA150: Soil Classification based on Particle Size								
Clay (<2 µm)	----	1	%	25	44	49	49	47
Silt (2-60 µm)	----	1	%	11	27	35	38	32
Sand (0.06-2.00 mm)	----	1	%	60	29	16	13	21
Gravel (>2mm)	----	1	%	4	<1	<1	<1	<1
Cobbles (>6cm)	----	1	%	<1	<1	<1	<1	<1
EA152: Soil Particle Density								
Soil Particle Density (Clay/Silt/Sand)	----	0.01	g/cm3	2.53	2.38	2.48	2.46	2.56
EG005(ED093)T: Total Metals by ICP-AES								
Aluminium	7429-90-5	50	mg/kg	13200	13500	16400	16300	13000
Iron	7439-89-6	50	mg/kg	35300	33700	40300	40600	31100
EG020-SD: Total Metals in Sediments by ICPMS								
Arsenic	7440-38-2	1.00	mg/kg	5.83	6.70	8.39	9.50	7.51
Cadmium	7440-43-9	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chromium	7440-47-3	1.0	mg/kg	28.9	28.5	32.6	33.6	26.3
Copper	7440-50-8	1.0	mg/kg	21.8	20.8	25.8	27.1	21.4
Lead	7439-92-1	1.0	mg/kg	14.4	15.3	19.8	24.4	13.9
Nickel	7440-02-0	1.0	mg/kg	21.9	22.4	25.4	25.6	19.3
Silver	7440-22-4	0.1	mg/kg	<0.1	<0.1	0.1	0.1	<0.1
Zinc	7440-66-6	1.0	mg/kg	70.0	72.6	89.0	95.4	76.4

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	B9-1	B10-5	B11-9	B11-9b	B11-9c
			Sampling date / time	14-Sep-2023 00:00	14-Sep-2023 00:00	14-Sep-2023 00:00	14-Sep-2023 00:00	14-Sep-2023 00:00
Compound	CAS Number	LOR	Unit	EB2328877-033	EB2328877-034	EB2328877-035	EB2328877-036	EB2328877-037
				Result	Result	Result	Result	Result
EG035T: Total Recoverable Mercury by FIMS (Low Level)								
Mercury	7439-97-6	0.01	mg/kg	0.06	0.07	0.09	0.09	0.08
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	2.2	----	----	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	20	mg/kg	870	----	----	----	----
EK062: Total Nitrogen as N (TKN + NOx)								
^ Total Nitrogen as N	----	20	mg/kg	870	----	----	----	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	2	mg/kg	583	----	----	----	----
EP003: Total Organic Carbon (TOC) in Soil								
Total Organic Carbon	----	0.02	%	0.85	1.48	1.41	1.58	1.39
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	3	mg/kg	<3	----	----	----	----
C10 - C14 Fraction	----	3	mg/kg	6	----	----	----	----
C15 - C28 Fraction	----	3	mg/kg	31	----	----	----	----
C29 - C36 Fraction	----	5	mg/kg	25	----	----	----	----
^ C10 - C36 Fraction (sum)	----	3	mg/kg	62	----	----	----	----
EP080-SD / EP071-SD: Total Recoverable Hydrocarbons								
C6 - C10 Fraction	C6_C10	3	mg/kg	<3	----	----	----	----
>C10 - C16 Fraction	----	3	mg/kg	6	----	----	----	----
C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	3.0	mg/kg	<3.0	----	----	----	----
>C16 - C34 Fraction	----	3	mg/kg	46	----	----	----	----
>C34 - C40 Fraction	----	5	mg/kg	16	----	----	----	----
^ >C10 - C40 Fraction (sum)	----	3	mg/kg	68	----	----	----	----
EP080-SD: BTEXN								
Benzene	71-43-2	0.2	mg/kg	<0.2	----	----	----	----
Toluene	108-88-3	0.2	mg/kg	<0.2	----	----	----	----
Ethylbenzene	100-41-4	0.2	mg/kg	<0.2	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.2	mg/kg	<0.2	----	----	----	----
ortho-Xylene	95-47-6	0.2	mg/kg	<0.2	----	----	----	----
^ Total Xylenes	----	0.5	mg/kg	<0.5	----	----	----	----
^ Sum of BTEX	----	0.2	mg/kg	<0.2	----	----	----	----

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	B9-1	B10-5	B11-9	B11-9b	B11-9c
			Sampling date / time	14-Sep-2023 00:00	14-Sep-2023 00:00	14-Sep-2023 00:00	14-Sep-2023 00:00	14-Sep-2023 00:00
Compound	CAS Number	LOR	Unit	EB2328877-033	EB2328877-034	EB2328877-035	EB2328877-036	EB2328877-037
				Result	Result	Result	Result	Result
EP080-SD: BTEXN - Continued								
Naphthalene	91-20-3	0.2	mg/kg	<0.2	----	----	----	----
EP090: Organotin Compounds								
Monobutyltin	78763-54-9	1	µgSn/kg	<1	<1	<1	<1	<1
Dibutyltin	1002-53-5	1	µgSn/kg	**4**	<1	<1	<1	<1
Tributyltin	56573-85-4	0.5	µgSn/kg	**0.5**	**0.7**	<0.5	<0.5	<0.5
EP130A: Organophosphorus Pesticides (Ultra-trace)								
Bromophos-ethyl	4824-78-6	10	µg/kg	<10	<10	<10	<10	<10
Carbophenothion	786-19-6	10	µg/kg	<10	<10	<10	<10	<10
Chlorfenvinphos (E)	18708-86-6	10.0	µg/kg	<10.0	<10.0	<10.0	<10.0	<10.0
Chlorfenvinphos (Z)	18708-87-7	10	µg/kg	<10	<10	<10	<10	<10
Chlorpyrifos	2921-88-2	10	µg/kg	<10	<10	<10	<10	<10
Chlorpyrifos-methyl	5598-13-0	10	µg/kg	<10	<10	<10	<10	<10
Demeton-S-methyl	919-86-8	10	µg/kg	<10	<10	<10	<10	<10
Diazinon	333-41-5	10	µg/kg	<10	<10	<10	<10	<10
Dichlorvos	62-73-7	10	µg/kg	<10	<10	<10	<10	<10
Dimethoate	60-51-5	10	µg/kg	<10	<10	<10	<10	<10
Ethion	563-12-2	10	µg/kg	<10	<10	<10	<10	<10
Fenamiphos	22224-92-6	10	µg/kg	<10	<10	<10	<10	<10
Fenthion	55-38-9	10	µg/kg	<10	<10	<10	<10	<10
Malathion	121-75-5	10	µg/kg	<10	<10	<10	<10	<10
Azinphos Methyl	86-50-0	10	µg/kg	<10	<10	<10	<10	<10
Monocrotophos	6923-22-4	10	µg/kg	<10	<10	<10	<10	<10
Parathion	56-38-2	10	µg/kg	<10	<10	<10	<10	<10
Parathion-methyl	298-00-0	10	µg/kg	<10	<10	<10	<10	<10
Pirimphos-ethyl	23505-41-1	10	µg/kg	<10	<10	<10	<10	<10
Prothiofos	34643-46-4	10	µg/kg	<10	<10	<10	<10	<10
EP131A: Organochlorine Pesticides								
Aldrin	309-00-2	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
alpha-BHC	319-84-6	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
beta-BHC	319-85-7	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
delta-BHC	319-86-8	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
4.4`-DDD	72-54-8	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
4.4`-DDE	72-55-9	0.50	µg/kg	<0.50	**1.37**	<0.50	<0.50	<0.50
4.4`-DDT	50-29-3	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	B9-1	B10-5	B11-9	B11-9b	B11-9c
			Sampling date / time	14-Sep-2023 00:00	14-Sep-2023 00:00	14-Sep-2023 00:00	14-Sep-2023 00:00	14-Sep-2023 00:00
Compound	CAS Number	LOR	Unit	EB2328877-033	EB2328877-034	EB2328877-035	EB2328877-036	EB2328877-037
				Result	Result	Result	Result	Result
EP131A: Organochlorine Pesticides - Continued								
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.50	µg/kg	<0.50	**1.37**	<0.50	<0.50	<0.50
Dieldrin	60-57-1	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
alpha-Endosulfan	959-98-8	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
beta-Endosulfan	33213-65-9	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Endosulfan sulfate	1031-07-8	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
^ Endosulfan (sum)	115-29-7	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Endrin	72-20-8	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Endrin aldehyde	7421-93-4	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Endrin ketone	53494-70-5	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Heptachlor	76-44-8	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Heptachlor epoxide	1024-57-3	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Hexachlorobenzene (HCB)	118-74-1	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
gamma-BHC	58-89-9	0.25	µg/kg	<0.25	<0.25	<0.25	<0.25	<0.25
Methoxychlor	72-43-5	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
cis-Chlordane	5103-71-9	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
trans-Chlordane	5103-74-2	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
^ Total Chlordane (sum)	----	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Oxychlordane	27304-13-8	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
EP131B: Polychlorinated Biphenyls (as Aroclors)								
^ Total Polychlorinated biphenyls	----	5.0	µg/kg	<6.2	----	----	----	----
Aroclor 1016	12674-11-2	5.0	µg/kg	<6.2	----	----	----	----
Aroclor 1221	11104-28-2	5.0	µg/kg	<6.2	----	----	----	----
Aroclor 1232	11141-16-5	5.0	µg/kg	<6.2	----	----	----	----
Aroclor 1242	53469-21-9	5.0	µg/kg	<6.2	----	----	----	----
Aroclor 1248	12672-29-6	5.0	µg/kg	<6.2	----	----	----	----
Aroclor 1254	11097-69-1	5.0	µg/kg	<6.2	----	----	----	----
Aroclor 1260	11096-82-5	5.0	µg/kg	<6.2	----	----	----	----
EP132B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	5	µg/kg	<5	----	----	----	----
2-Methylnaphthalene	91-57-6	5	µg/kg	<5	----	----	----	----
Acenaphthylene	208-96-8	4	µg/kg	<5	----	----	----	----
Acenaphthene	83-32-9	4	µg/kg	<5	----	----	----	----

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	B9-1	B10-5	B11-9	B11-9b	B11-9c
			Sampling date / time	14-Sep-2023 00:00	14-Sep-2023 00:00	14-Sep-2023 00:00	14-Sep-2023 00:00	14-Sep-2023 00:00
Compound	CAS Number	LOR	Unit	EB2328877-033	EB2328877-034	EB2328877-035	EB2328877-036	EB2328877-037
				Result	Result	Result	Result	Result
EP132B: Polynuclear Aromatic Hydrocarbons - Continued								
Fluorene	86-73-7	4	µg/kg	<5	----	----	----	----
Phenanthrene	85-01-8	4	µg/kg	<5	----	----	----	----
Anthracene	120-12-7	4	µg/kg	<5	----	----	----	----
Fluoranthene	206-44-0	4	µg/kg	14	----	----	----	----
Pyrene	129-00-0	4	µg/kg	16	----	----	----	----
Benz(a)anthracene	56-55-3	4	µg/kg	8	----	----	----	----
Chrysene	218-01-9	4	µg/kg	7	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	4	µg/kg	13	----	----	----	----
Benzo(k)fluoranthene	207-08-9	4	µg/kg	<5	----	----	----	----
Benzo(e)pyrene	192-97-2	4	µg/kg	9	----	----	----	----
Benzo(a)pyrene	50-32-8	4	µg/kg	11	----	----	----	----
Perylene	198-55-0	4	µg/kg	41	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	4	µg/kg	10	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	4	µg/kg	<5	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	4	µg/kg	8	----	----	----	----
Coronene	191-07-1	5	µg/kg	<5	----	----	----	----
^ Sum of PAHs	----	4	µg/kg	137	----	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	4	µg/kg	14	----	----	----	----
^ Benzo(a)pyrene TEQ (half LOR)	----	4	µg/kg	16	----	----	----	----
^ Benzo(a)pyrene TEQ (LOR)	----	4	µg/kg	18	----	----	----	----
EP080-SD: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.2	%	87.9	----	----	----	----
Toluene-D8	2037-26-5	0.2	%	75.2	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.2	%	80.7	----	----	----	----
EP090S: Organotin Surrogate								
Tripropyltin	----	0.5	%	79.5	65.2	48.2	76.4	58.6
EP130S: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	10	%	70.7	47.9	84.7	70.1	69.3
EP131S: OC Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.50	%	65.7	46.3	57.8	57.3	51.2
EP131T: PCB Surrogate								
Decachlorobiphenyl	2051-24-3	0.5	%	57.5	----	----	----	----
EP132T: Base/Neutral Extractable Surrogates								
2-Fluorobiphenyl	321-60-8	10	%	78.3	----	----	----	----

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	B9-1	B10-5	B11-9	B11-9b	B11-9c
				Sampling date / time	14-Sep-2023 00:00	14-Sep-2023 00:00	14-Sep-2023 00:00	14-Sep-2023 00:00	14-Sep-2023 00:00
Compound	CAS Number	LOR	Unit		EB2328877-033	EB2328877-034	EB2328877-035	EB2328877-036	EB2328877-037
					Result	Result	Result	Result	Result
EP132T: Base/Neutral Extractable Surrogates - Continued									
Anthracene-d10	1719-06-8	10	%		**93.0**	----	----	----	----
4-Terphenyl-d14	1718-51-0	10	%		**93.5**	----	----	----	----

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	B11-8	B12-1	B12-2	B15-3	B15-2
			Sampling date / time	14-Sep-2023 00:00	14-Sep-2023 00:00	14-Sep-2023 00:00	14-Sep-2023 00:00	14-Sep-2023 00:00
Compound	CAS Number	LOR	Unit	EB2328877-038	EB2328877-039	EB2328877-040	EB2328877-041	EB2328877-042
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	60.0	56.2	----	29.7	43.1
EA150: Particle Sizing								
+75µm	----	1	%	19	19	29	88	64
+150µm	----	1	%	11	10	22	82	58
+300µm	----	1	%	7	5	14	22	38
+425µm	----	1	%	5	3	8	6	18
+600µm	----	1	%	3	2	3	2	10
+1180µm	----	1	%	2	<1	<1	1	6
+2.36mm	----	1	%	2	<1	<1	<1	3
+4.75mm	----	1	%	1	<1	<1	<1	<1
+9.5mm	----	1	%	<1	<1	<1	<1	<1
+19.0mm	----	1	%	<1	<1	<1	<1	<1
+37.5mm	----	1	%	<1	<1	<1	<1	<1
+75.0mm	----	1	%	<1	<1	<1	<1	<1
EA150: Soil Classification based on Particle Size								
Clay (<2 µm)	----	1	%	44	45	43	9	25
Silt (2-60 µm)	----	1	%	35	34	26	2	10
Sand (0.06-2.00 mm)	----	1	%	19	21	31	88	61
Gravel (>2mm)	----	1	%	2	<1	<1	1	4
Cobbles (>6cm)	----	1	%	<1	<1	<1	<1	<1
EA152: Soil Particle Density								
Soil Particle Density (Clay/Silt/Sand)	----	0.01	g/cm3	2.47	2.41	2.55	2.53	2.59
EG005(ED093)T: Total Metals by ICP-AES								
Aluminium	7429-90-5	50	mg/kg	15700	14600	16200	6340	7860
Iron	7439-89-6	50	mg/kg	38900	35300	39900	17000	20100
EG020-SD: Total Metals in Sediments by ICPMS								
Arsenic	7440-38-2	1.00	mg/kg	7.82	7.23	9.93	5.77	6.02
Cadmium	7440-43-9	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chromium	7440-47-3	1.0	mg/kg	32.5	29.9	32.7	13.5	16.5
Copper	7440-50-8	1.0	mg/kg	25.4	25.1	25.0	5.9	8.8
Lead	7439-92-1	1.0	mg/kg	19.5	16.3	17.1	5.4	7.0
Nickel	7440-02-0	1.0	mg/kg	24.5	23.4	26.0	10.4	13.0
Silver	7440-22-4	0.1	mg/kg	0.2	<0.1	0.1	<0.1	<0.1
Zinc	7440-66-6	1.0	mg/kg	91.4	84.2	86.7	30.3	40.4

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	B11-8	B12-1	B12-2	B15-3	B15-2
			Sampling date / time	14-Sep-2023 00:00	14-Sep-2023 00:00	14-Sep-2023 00:00	14-Sep-2023 00:00	14-Sep-2023 00:00
Compound	CAS Number	LOR	Unit	EB2328877-038	EB2328877-039	EB2328877-040	EB2328877-041	EB2328877-042
				Result	Result	Result	Result	Result
EG035T: Total Recoverable Mercury by FIMS (Low Level)								
Mercury	7439-97-6	0.01	mg/kg	0.12	0.09	0.15	0.03	0.03
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	0.4	0.1	----	0.3	0.5
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	20	mg/kg	1300	1590	----	290	580
EK062: Total Nitrogen as N (TKN + NOx)								
^ Total Nitrogen as N	----	20	mg/kg	1300	1590	----	290	580
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	2	mg/kg	718	811	----	325	429
EP003: Total Organic Carbon (TOC) in Soil								
Total Organic Carbon	----	0.02	%	1.44	1.62	1.28	0.20	0.67
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	3	mg/kg	<3	<3	----	<3	<3
C10 - C14 Fraction	----	3	mg/kg	6	7	----	<3	4
C15 - C28 Fraction	----	3	mg/kg	21	29	----	11	19
C29 - C36 Fraction	----	5	mg/kg	14	23	----	8	13
^ C10 - C36 Fraction (sum)	----	3	mg/kg	41	59	----	19	36
EP080-SD / EP071-SD: Total Recoverable Hydrocarbons								
C6 - C10 Fraction	C6_C10	3	mg/kg	<3	<3	----	<3	<3
>C10 - C16 Fraction	----	3	mg/kg	6	8	----	3	4
C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	3.0	mg/kg	<3.0	<3.0	----	<3.0	<3.0
>C16 - C34 Fraction	----	3	mg/kg	28	41	----	16	27
>C34 - C40 Fraction	----	5	mg/kg	9	14	----	6	9
^ >C10 - C40 Fraction (sum)	----	3	mg/kg	43	63	----	25	40
EP080-SD: BTEXN								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	----	<0.2	<0.2
Toluene	108-88-3	0.2	mg/kg	<0.2	<0.2	----	<0.2	<0.2
Ethylbenzene	100-41-4	0.2	mg/kg	<0.2	<0.2	----	<0.2	<0.2
meta- & para-Xylene	108-38-3 106-42-3	0.2	mg/kg	<0.2	<0.2	----	<0.2	<0.2
ortho-Xylene	95-47-6	0.2	mg/kg	<0.2	<0.2	----	<0.2	<0.2
^ Total Xylenes	----	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	----	<0.2	<0.2

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	B11-8	B12-1	B12-2	B15-3	B15-2
			Sampling date / time	14-Sep-2023 00:00	14-Sep-2023 00:00	14-Sep-2023 00:00	14-Sep-2023 00:00	14-Sep-2023 00:00
Compound	CAS Number	LOR	Unit	EB2328877-038	EB2328877-039	EB2328877-040	EB2328877-041	EB2328877-042
				Result	Result	Result	Result	Result
EP080-SD: BTEXN - Continued								
Naphthalene	91-20-3	0.2	mg/kg	<0.2	<0.2	----	<0.2	<0.2
EP090: Organotin Compounds								
Monobutyltin	78763-54-9	1	µgSn/kg	<1	<1	<1	<1	<1
Dibutyltin	1002-53-5	1	µgSn/kg	<1	<1	<1	<1	<1
Tributyltin	56573-85-4	0.5	µgSn/kg	<0.5	<0.5	<0.5	<0.5	<0.5
EP130A: Organophosphorus Pesticides (Ultra-trace)								
Bromophos-ethyl	4824-78-6	10	µg/kg	<10	<10	<10	<10	<10
Carbophenothion	786-19-6	10	µg/kg	<10	<10	<10	<10	<10
Chlorfenvinphos (E)	18708-86-6	10.0	µg/kg	<10.0	<10.0	<10.0	<10.0	<10.0
Chlorfenvinphos (Z)	18708-87-7	10	µg/kg	<10	<10	<10	<10	<10
Chlorpyrifos	2921-88-2	10	µg/kg	<10	<10	<10	<10	<10
Chlorpyrifos-methyl	5598-13-0	10	µg/kg	<10	<10	<10	<10	<10
Demeton-S-methyl	919-86-8	10	µg/kg	<10	<10	<10	<10	<10
Diazinon	333-41-5	10	µg/kg	<10	<10	<10	<10	<10
Dichlorvos	62-73-7	10	µg/kg	<10	<10	<10	<10	<10
Dimethoate	60-51-5	10	µg/kg	<10	<10	<10	<10	<10
Ethion	563-12-2	10	µg/kg	<10	<10	<10	<10	<10
Fenamiphos	22224-92-6	10	µg/kg	<10	<10	<10	<10	<10
Fenthion	55-38-9	10	µg/kg	<10	<10	<10	<10	<10
Malathion	121-75-5	10	µg/kg	<10	<10	<10	<10	<10
Azinphos Methyl	86-50-0	10	µg/kg	<10	<10	<10	<10	<10
Monocrotophos	6923-22-4	10	µg/kg	<10	<10	<10	<10	<10
Parathion	56-38-2	10	µg/kg	<10	<10	<10	<10	<10
Parathion-methyl	298-00-0	10	µg/kg	<10	<10	<10	<10	<10
Pirimphos-ethyl	23505-41-1	10	µg/kg	<10	<10	<10	<10	<10
Prothiofos	34643-46-4	10	µg/kg	<10	<10	<10	<10	<10
EP131A: Organochlorine Pesticides								
Aldrin	309-00-2	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
alpha-BHC	319-84-6	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
beta-BHC	319-85-7	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
delta-BHC	319-86-8	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
4.4`-DDD	72-54-8	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
4.4`-DDE	72-55-9	0.50	µg/kg	**1.12**	**1.64**	<0.50	<0.50	<0.50
4.4`-DDT	50-29-3	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	B11-8	B12-1	B12-2	B15-3	B15-2
			Sampling date / time	14-Sep-2023 00:00	14-Sep-2023 00:00	14-Sep-2023 00:00	14-Sep-2023 00:00	14-Sep-2023 00:00
Compound	CAS Number	LOR	Unit	EB2328877-038	EB2328877-039	EB2328877-040	EB2328877-041	EB2328877-042
				Result	Result	Result	Result	Result
EP131A: Organochlorine Pesticides - Continued								
^ **Sum of DDD + DDE + DDT**	72-54-8/72-55-9/50-2	0.50	µg/kg	**1.12**	**1.64**	<0.50	<0.50	<0.50
Dieldrin	60-57-1	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
alpha-Endosulfan	959-98-8	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
beta-Endosulfan	33213-65-9	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Endosulfan sulfate	1031-07-8	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
^ **Endosulfan (sum)**	115-29-7	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Endrin	72-20-8	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Endrin aldehyde	7421-93-4	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Endrin ketone	53494-70-5	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Heptachlor	76-44-8	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Heptachlor epoxide	1024-57-3	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Hexachlorobenzene (HCB)	118-74-1	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
gamma-BHC	58-89-9	0.25	µg/kg	<0.25	<0.25	<0.25	<0.25	<0.25
Methoxychlor	72-43-5	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
cis-Chlordane	5103-71-9	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
trans-Chlordane	5103-74-2	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
^ **Total Chlordane (sum)**	----	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Oxychlordane	27304-13-8	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
^ **Sum of Aldrin + Dieldrin**	309-00-2/60-57-1	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
EP131B: Polychlorinated Biphenyls (as Aroclors)								
^ **Total Polychlorinated biphenyls**	----	5.0	µg/kg	<6.2	<6.2	----	<5.0	<5.0
Aroclor 1016	12674-11-2	5.0	µg/kg	<6.2	<6.2	----	<5.0	<5.0
Aroclor 1221	11104-28-2	5.0	µg/kg	<6.2	<6.2	----	<5.0	<5.0
Aroclor 1232	11141-16-5	5.0	µg/kg	<6.2	<6.2	----	<5.0	<5.0
Aroclor 1242	53469-21-9	5.0	µg/kg	<6.2	<6.2	----	<5.0	<5.0
Aroclor 1248	12672-29-6	5.0	µg/kg	<6.2	<6.2	----	<5.0	<5.0
Aroclor 1254	11097-69-1	5.0	µg/kg	<6.2	<6.2	----	<5.0	<5.0
Aroclor 1260	11096-82-5	5.0	µg/kg	<6.2	<6.2	----	<5.0	<5.0
EP132B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	5	µg/kg	**8**	**10**	----	<5	<5
2-Methylnaphthalene	91-57-6	5	µg/kg	<5	<5	----	<5	<5
Acenaphthylene	208-96-8	4	µg/kg	**13**	**11**	----	<4	<4
Acenaphthene	83-32-9	4	µg/kg	<5	<5	----	<4	<4

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	B11-8	B12-1	B12-2	B15-3	B15-2
				Sampling date / time	14-Sep-2023 00:00	14-Sep-2023 00:00	14-Sep-2023 00:00	14-Sep-2023 00:00	14-Sep-2023 00:00
Compound	CAS Number	LOR	Unit		EB2328877-038	EB2328877-039	EB2328877-040	EB2328877-041	EB2328877-042
					Result	Result	Result	Result	Result
EP132B: Polynuclear Aromatic Hydrocarbons - Continued									
Fluorene	86-73-7	4	µg/kg		<5	<5	----	<4	<4
Phenanthrene	85-01-8	4	µg/kg		36	15	----	12	4
Anthracene	120-12-7	4	µg/kg		14	12	----	5	<4
Fluoranthene	206-44-0	4	µg/kg		93	59	----	24	13
Pyrene	129-00-0	4	µg/kg		90	65	----	22	15
Benz(a)anthracene	56-55-3	4	µg/kg		52	36	----	10	8
Chrysene	218-01-9	4	µg/kg		44	29	----	9	7
Benzo(b+j)fluoranthene	205-99-2 205-82-3	4	µg/kg		74	55	----	10	11
Benzo(k)fluoranthene	207-08-9	4	µg/kg		27	22	----	6	6
Benzo(e)pyrene	192-97-2	4	µg/kg		45	34	----	7	8
Benzo(a)pyrene	50-32-8	4	µg/kg		64	48	----	11	11
Perylene	198-55-0	4	µg/kg		68	112	----	12	34
Benzo(g.h.i)perylene	191-24-2	4	µg/kg		44	35	----	8	9
Dibenz(a.h)anthracene	53-70-3	4	µg/kg		10	10	----	<4	<4
Indeno(1.2.3.cd)pyrene	193-39-5	4	µg/kg		37	31	----	6	7
Coronene	191-07-1	5	µg/kg		10	8	----	<5	<5
^ Sum of PAHs	----	4	µg/kg		729	592	----	142	133
^ Benzo(a)pyrene TEQ (zero)	----	4	µg/kg		94	73	----	14	14
^ Benzo(a)pyrene TEQ (half LOR)	----	4	µg/kg		94	73	----	16	16
^ Benzo(a)pyrene TEQ (LOR)	----	4	µg/kg		94	73	----	18	18
EP080-SD: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		88.4	90.7	----	85.9	89.1
Toluene-D8	2037-26-5	0.2	%		74.3	78.9	----	71.4	74.4
4-Bromofluorobenzene	460-00-4	0.2	%		82.4	84.2	----	77.6	84.6
EP090S: Organotin Surrogate									
Tripropyltin	----	0.5	%		35.2	53.4	81.0	74.8	82.1
EP130S: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	10	%		56.2	74.7	69.3	49.9	67.7
EP131S: OC Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.50	%		49.0	66.6	67.8	45.1	47.3
EP131T: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	0.5	%		46.9	68.8	----	41.9	47.5
EP132T: Base/Neutral Extractable Surrogates									
2-Fluorobiphenyl	321-60-8	10	%		82.0	72.9	----	74.8	77.1

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	B11-8	B12-1	B12-2	B15-3	B15-2
				Sampling date / time	14-Sep-2023 00:00	14-Sep-2023 00:00	14-Sep-2023 00:00	14-Sep-2023 00:00	14-Sep-2023 00:00
Compound	CAS Number	LOR	Unit		EB2328877-038	EB2328877-039	EB2328877-040	EB2328877-041	EB2328877-042
					Result	Result	Result	Result	Result
EP132T: Base/Neutral Extractable Surrogates - Continued									
Anthracene-d10	1719-06-8	10	%		**97.3**	**97.0**	**----**	**85.2**	**88.6**
4-Terphenyl-d14	1718-51-0	10	%		**98.0**	**94.6**	**----**	**81.6**	**86.4**

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	B15-1	B11-5	B10-8	B10-6	B10 6b
			Sampling date / time	14-Sep-2023 00:00	14-Sep-2023 00:00	14-Sep-2023 00:00	14-Sep-2023 00:00	14-Sep-2023 00:00
Compound	CAS Number	LOR	Unit	EB2328877-043	EB2328877-044	EB2328877-045	EB2328877-046	EB2328877-047
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	----	----	----	55.6	55.2
EA150: Particle Sizing								
+75µm	----	1	%	31	16	7	24	24
+150µm	----	1	%	25	10	2	14	12
+300µm	----	1	%	10	4	<1	5	4
+425µm	----	1	%	5	1	<1	3	2
+600µm	----	1	%	3	<1	<1	2	1
+1180µm	----	1	%	2	<1	<1	1	<1
+2.36mm	----	1	%	1	<1	<1	<1	<1
+4.75mm	----	1	%	1	<1	<1	<1	<1
+9.5mm	----	1	%	<1	<1	<1	<1	<1
+19.0mm	----	1	%	<1	<1	<1	<1	<1
+37.5mm	----	1	%	<1	<1	<1	<1	<1
+75.0mm	----	1	%	<1	<1	<1	<1	<1
EA150: Soil Classification based on Particle Size								
Clay (<2 µm)	----	1	%	42	48	52	43	43
Silt (2-60 µm)	----	1	%	25	34	37	30	31
Sand (0.06-2.00 mm)	----	1	%	32	18	11	26	26
Gravel (>2mm)	----	1	%	1	<1	<1	1	<1
Cobbles (>6cm)	----	1	%	<1	<1	<1	<1	<1
EA152: Soil Particle Density								
Soil Particle Density (Clay/Silt/Sand)	----	0.01	g/cm3	2.50	2.42	2.51	2.49	2.62
EG005(ED093)T: Total Metals by ICP-AES								
Aluminium	7429-90-5	50	mg/kg	13700	15500	16500	13700	15000
Iron	7439-89-6	50	mg/kg	32500	38000	42100	33000	36200
EG020-SD: Total Metals in Sediments by ICPMS								
Arsenic	7440-38-2	1.00	mg/kg	6.49	8.24	8.32	6.98	8.10
Cadmium	7440-43-9	0.1	mg/kg	<0.1	<0.1	<0.1	0.1	0.2
Chromium	7440-47-3	1.0	mg/kg	26.7	31.1	33.4	30.2	34.5
Copper	7440-50-8	1.0	mg/kg	20.5	25.1	25.8	21.4	25.7
Lead	7439-92-1	1.0	mg/kg	14.8	17.7	16.6	14.7	16.8
Nickel	7440-02-0	1.0	mg/kg	20.3	23.9	28.4	18.8	20.5
Silver	7440-22-4	0.1	mg/kg	<0.1	0.1	0.1	0.3	0.5
Zinc	7440-66-6	1.0	mg/kg	75.0	90.8	89.4	74.1	81.1

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	B15-1	B11-5	B10-8	B10-6	B10 6b
			Sampling date / time	14-Sep-2023 00:00	14-Sep-2023 00:00	14-Sep-2023 00:00	14-Sep-2023 00:00	14-Sep-2023 00:00
Compound	CAS Number	LOR	Unit	EB2328877-043	EB2328877-044	EB2328877-045	EB2328877-046	EB2328877-047
				Result	Result	Result	Result	Result
EG035T: Total Recoverable Mercury by FIMS (Low Level)								
Mercury	7439-97-6	0.01	mg/kg	0.07	0.08	0.08	0.09	0.11
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	----	----	----	0.8	0.4
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	20	mg/kg	----	----	----	1070	970
EK062: Total Nitrogen as N (TKN + NOx)								
^ Total Nitrogen as N	----	20	mg/kg	----	----	----	1070	970
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	2	mg/kg	----	----	----	650	633
EP003: Total Organic Carbon (TOC) in Soil								
Total Organic Carbon	----	0.02	%	1.30	1.38	1.66	1.11	1.17
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	3	mg/kg	----	----	----	<3	<3
C10 - C14 Fraction	----	3	mg/kg	----	----	----	7	6
C15 - C28 Fraction	----	3	mg/kg	----	----	----	26	32
C29 - C36 Fraction	----	5	mg/kg	----	----	----	17	26
^ C10 - C36 Fraction (sum)	----	3	mg/kg	----	----	----	50	64
EP080-SD / EP071-SD: Total Recoverable Hydrocarbons								
C6 - C10 Fraction	C6_C10	3	mg/kg	----	----	----	<3	<3
>C10 - C16 Fraction	----	3	mg/kg	----	----	----	7	7
C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	3.0	mg/kg	----	----	----	<3.0	<3.0
>C16 - C34 Fraction	----	3	mg/kg	----	----	----	36	48
>C34 - C40 Fraction	----	5	mg/kg	----	----	----	12	16
^ >C10 - C40 Fraction (sum)	----	3	mg/kg	----	----	----	55	71
EP080-SD: BTEXN								
Benzene	71-43-2	0.2	mg/kg	----	----	----	<0.2	<0.2
Toluene	108-88-3	0.2	mg/kg	----	----	----	<0.2	<0.2
Ethylbenzene	100-41-4	0.2	mg/kg	----	----	----	<0.2	<0.2
meta- & para-Xylene	108-38-3 106-42-3	0.2	mg/kg	----	----	----	<0.2	<0.2
ortho-Xylene	95-47-6	0.2	mg/kg	----	----	----	<0.2	<0.2
^ Total Xylenes	----	0.5	mg/kg	----	----	----	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg	----	----	----	<0.2	<0.2

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	B15-1	B11-5	B10-8	B10-6	B10 6b
			Sampling date / time	14-Sep-2023 00:00	14-Sep-2023 00:00	14-Sep-2023 00:00	14-Sep-2023 00:00	14-Sep-2023 00:00
Compound	CAS Number	LOR	Unit	EB2328877-043	EB2328877-044	EB2328877-045	EB2328877-046	EB2328877-047
				Result	Result	Result	Result	Result
EP080-SD: BTEXN - Continued								
Naphthalene	91-20-3	0.2	mg/kg	----	----	----	<0.2	<0.2
EP090: Organotin Compounds								
Monobutyltin	78763-54-9	1	µgSn/kg	<1	<1	<1	<1	<1
Dibutyltin	1002-53-5	1	µgSn/kg	<1	<1	<1	<1	<1
Tributyltin	56573-85-4	0.5	µgSn/kg	<0.5	<0.5	<0.5	<0.5	<0.5
EP130A: Organophosphorus Pesticides (Ultra-trace)								
Bromophos-ethyl	4824-78-6	10	µg/kg	<10	<10	<10	<10	<10
Carbophenothion	786-19-6	10	µg/kg	<10	<10	<10	<10	<10
Chlorfenvinphos (E)	18708-86-6	10.0	µg/kg	<10.0	<10.0	<10.0	<10.0	<10.0
Chlorfenvinphos (Z)	18708-87-7	10	µg/kg	<10	<10	<10	<10	<10
Chlorpyrifos	2921-88-2	10	µg/kg	<10	<10	<10	<10	<10
Chlorpyrifos-methyl	5598-13-0	10	µg/kg	<10	<10	<10	<10	<10
Demeton-S-methyl	919-86-8	10	µg/kg	<10	<10	<10	<10	<10
Diazinon	333-41-5	10	µg/kg	<10	<10	<10	<10	<10
Dichlorvos	62-73-7	10	µg/kg	<10	<10	<10	<10	<10
Dimethoate	60-51-5	10	µg/kg	<10	<10	<10	<10	<10
Ethion	563-12-2	10	µg/kg	<10	<10	<10	<10	<10
Fenamiphos	22224-92-6	10	µg/kg	<10	<10	<10	<10	<10
Fenthion	55-38-9	10	µg/kg	<10	<10	<10	<10	<10
Malathion	121-75-5	10	µg/kg	<10	<10	<10	<10	<10
Azinphos Methyl	86-50-0	10	µg/kg	<10	<10	<10	<10	<10
Monocrotophos	6923-22-4	10	µg/kg	<10	<10	<10	<10	<10
Parathion	56-38-2	10	µg/kg	<10	<10	<10	<10	<10
Parathion-methyl	298-00-0	10	µg/kg	<10	<10	<10	<10	<10
Pirimphos-ethyl	23505-41-1	10	µg/kg	<10	<10	<10	<10	<10
Prothiofos	34643-46-4	10	µg/kg	<10	<10	<10	<10	<10
EP131A: Organochlorine Pesticides								
Aldrin	309-00-2	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
alpha-BHC	319-84-6	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
beta-BHC	319-85-7	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
delta-BHC	319-86-8	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
4.4`-DDD	72-54-8	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
4.4`-DDE	72-55-9	0.50	µg/kg	**1.68**	**1.36**	**1.40**	**1.65**	**1.24**
4.4`-DDT	50-29-3	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	B15-1	B11-5	B10-8	B10-6	B10 6b
			Sampling date / time	14-Sep-2023 00:00	14-Sep-2023 00:00	14-Sep-2023 00:00	14-Sep-2023 00:00	14-Sep-2023 00:00
Compound	CAS Number	LOR	Unit	EB2328877-043	EB2328877-044	EB2328877-045	EB2328877-046	EB2328877-047
				Result	Result	Result	Result	Result
EP131A: Organochlorine Pesticides - Continued								
^ **Sum of DDD + DDE + DDT**	72-54-8/72-55-9/50-2	0.50	µg/kg	**1.68**	**1.36**	**1.40**	**1.65**	**1.24**
Dieldrin	60-57-1	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
alpha-Endosulfan	959-98-8	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
beta-Endosulfan	33213-65-9	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Endosulfan sulfate	1031-07-8	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
^ **Endosulfan (sum)**	115-29-7	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Endrin	72-20-8	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Endrin aldehyde	7421-93-4	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Endrin ketone	53494-70-5	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Heptachlor	76-44-8	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Heptachlor epoxide	1024-57-3	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Hexachlorobenzene (HCB)	118-74-1	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
gamma-BHC	58-89-9	0.25	µg/kg	<0.25	<0.25	<0.25	<0.25	<0.25
Methoxychlor	72-43-5	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
cis-Chlordane	5103-71-9	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
trans-Chlordane	5103-74-2	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
^ **Total Chlordane (sum)**	----	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Oxychlordane	27304-13-8	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
^ **Sum of Aldrin + Dieldrin**	309-00-2/60-57-1	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
EP131B: Polychlorinated Biphenyls (as Aroclors)								
^ **Total Polychlorinated biphenyls**	----	5.0	µg/kg	----	----	----	<6.2	<6.2
Aroclor 1016	12674-11-2	5.0	µg/kg	----	----	----	<6.2	<6.2
Aroclor 1221	11104-28-2	5.0	µg/kg	----	----	----	<6.2	<6.2
Aroclor 1232	11141-16-5	5.0	µg/kg	----	----	----	<6.2	<6.2
Aroclor 1242	53469-21-9	5.0	µg/kg	----	----	----	<6.2	<6.2
Aroclor 1248	12672-29-6	5.0	µg/kg	----	----	----	<6.2	<6.2
Aroclor 1254	11097-69-1	5.0	µg/kg	----	----	----	<6.2	<6.2
Aroclor 1260	11096-82-5	5.0	µg/kg	----	----	----	<6.2	<6.2
EP132B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	5	µg/kg	----	----	----	**5**	<5
2-Methylnaphthalene	91-57-6	5	µg/kg	----	----	----	<5	<5
Acenaphthylene	208-96-8	4	µg/kg	----	----	----	**6**	**5**
Acenaphthene	83-32-9	4	µg/kg	----	----	----	<5	<5

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	B15-1	B11-5	B10-8	B10-6	B10 6b
			Sampling date / time	14-Sep-2023 00:00	14-Sep-2023 00:00	14-Sep-2023 00:00	14-Sep-2023 00:00	14-Sep-2023 00:00
Compound	CAS Number	LOR	Unit	EB2328877-043	EB2328877-044	EB2328877-045	EB2328877-046	EB2328877-047
				Result	Result	Result	Result	Result
EP132B: Polynuclear Aromatic Hydrocarbons - Continued								
Fluorene	86-73-7	4	µg/kg	----	----	----	<5	<5
Phenanthrene	85-01-8	4	µg/kg	----	----	----	9	8
Anthracene	120-12-7	4	µg/kg	----	----	----	7	6
Fluoranthene	206-44-0	4	µg/kg	----	----	----	29	25
Pyrene	129-00-0	4	µg/kg	----	----	----	32	32
Benz(a)anthracene	56-55-3	4	µg/kg	----	----	----	16	21
Chrysene	218-01-9	4	µg/kg	----	----	----	15	33
Benzo(b+j)fluoranthene	205-99-2 205-82-3	4	µg/kg	----	----	----	28	30
Benzo(k)fluoranthene	207-08-9	4	µg/kg	----	----	----	11	12
Benzo(e)pyrene	192-97-2	4	µg/kg	----	----	----	17	38
Benzo(a)pyrene	50-32-8	4	µg/kg	----	----	----	25	36
Perylene	198-55-0	4	µg/kg	----	----	----	61	89
Benzo(g.h.i)perylene	191-24-2	4	µg/kg	----	----	----	21	24
Dibenz(a.h)anthracene	53-70-3	4	µg/kg	----	----	----	<5	7
Indeno(1.2.3.cd)pyrene	193-39-5	4	µg/kg	----	----	----	16	16
Coronene	191-07-1	5	µg/kg	----	----	----	6	6
^ Sum of PAHs	----	4	µg/kg	----	----	----	304	388
^ Benzo(a)pyrene TEQ (zero)	----	4	µg/kg	----	----	----	32	51
^ Benzo(a)pyrene TEQ (half LOR)	----	4	µg/kg	----	----	----	34	51
^ Benzo(a)pyrene TEQ (LOR)	----	4	µg/kg	----	----	----	36	51
EP080-SD: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.2	%	----	----	----	82.6	83.3
Toluene-D8	2037-26-5	0.2	%	----	----	----	70.0	72.8
4-Bromofluorobenzene	460-00-4	0.2	%	----	----	----	79.1	79.3
EP090S: Organotin Surrogate								
Tripropyltin	----	0.5	%	83.9	89.3	60.3	80.9	80.8
EP130S: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	10	%	64.1	96.0	42.2	79.3	85.6
EP131S: OC Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.50	%	72.2	91.1	38.8	70.8	87.8
EP131T: PCB Surrogate								
Decachlorobiphenyl	2051-24-3	0.5	%	----	----	----	68.1	78.1
EP132T: Base/Neutral Extractable Surrogates								
2-Fluorobiphenyl	321-60-8	10	%	----	----	----	85.8	89.0

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	B15-1	B11-5	B10-8	B10-6	B10 6b
				Sampling date / time	14-Sep-2023 00:00	14-Sep-2023 00:00	14-Sep-2023 00:00	14-Sep-2023 00:00	14-Sep-2023 00:00
Compound	CAS Number	LOR	Unit		EB2328877-043	EB2328877-044	EB2328877-045	EB2328877-046	EB2328877-047
					Result	Result	Result	Result	Result
EP132T: Base/Neutral Extractable Surrogates - Continued									
Anthracene-d10	1719-06-8	10	%		**----**	**----**	**----**	**92.8**	**97.9**
4-Terphenyl-d14	1718-51-0	10	%		**----**	**----**	**----**	**89.4**	**94.3**

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	Trip Blank 070337	B16-0	----	----	----
			Sampling date / time	14-Sep-2023 00:00	13-Sep-2023 00:00	----	----	----
Compound	CAS Number	LOR	Unit	EB2328877-049	EB2328877-051	--------	--------	--------
				Result	Result	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	----	40.2	----	----	----
EA150: Particle Sizing								
+75µm	----	1	%	----	54	----	----	----
+150µm	----	1	%	----	43	----	----	----
+300µm	----	1	%	----	21	----	----	----
+425µm	----	1	%	----	12	----	----	----
+600µm	----	1	%	----	7	----	----	----
+1180µm	----	1	%	----	3	----	----	----
+2.36mm	----	1	%	----	2	----	----	----
+4.75mm	----	1	%	----	<1	----	----	----
+9.5mm	----	1	%	----	<1	----	----	----
+19.0mm	----	1	%	----	<1	----	----	----
+37.5mm	----	1	%	----	<1	----	----	----
+75.0mm	----	1	%	----	<1	----	----	----
EA150: Soil Classification based on Particle Size								
Clay (<2 µm)	----	1	%	----	28	----	----	----
Silt (2-60 µm)	----	1	%	----	16	----	----	----
Sand (0.06-2.00 mm)	----	1	%	----	54	----	----	----
Gravel (>2mm)	----	1	%	----	2	----	----	----
Cobbles (>6cm)	----	1	%	----	<1	----	----	----
EA152: Soil Particle Density								
Soil Particle Density (Clay/Silt/Sand)	----	0.01	g/cm3	----	2.59	----	----	----
EG005(ED093)T: Total Metals by ICP-AES								
Aluminium	7429-90-5	50	mg/kg	----	8430	----	----	----
Iron	7439-89-6	50	mg/kg	----	19900	----	----	----
EG020-SD: Total Metals in Sediments by ICPMS								
Arsenic	7440-38-2	1.00	mg/kg	----	4.44	----	----	----
Cadmium	7440-43-9	0.1	mg/kg	----	<0.1	----	----	----
Chromium	7440-47-3	1.0	mg/kg	----	19.2	----	----	----
Copper	7440-50-8	1.0	mg/kg	----	9.5	----	----	----
Lead	7439-92-1	1.0	mg/kg	----	8.2	----	----	----
Nickel	7440-02-0	1.0	mg/kg	----	12.2	----	----	----
Silver	7440-22-4	0.1	mg/kg	----	<0.1	----	----	----
Zinc	7440-66-6	1.0	mg/kg	----	40.0	----	----	----

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	Trip Blank 070337	B16-0	----	----	----
			Sampling date / time	14-Sep-2023 00:00	13-Sep-2023 00:00	----	----	----
Compound	CAS Number	LOR	Unit	EB2328877-049	EB2328877-051	--------	--------	--------
				Result	Result	----	----	----
EG020-SD: Total Metals in Sediments by ICPMS - Continued								
EG035T: Total Recoverable Mercury by FIMS (Low Level)								
Mercury	7439-97-6	0.01	mg/kg	----	**0.04**	----	----	----
EP003: Total Organic Carbon (TOC) in Soil								
Total Organic Carbon	----	0.02	%	----	**0.66**	----	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	----	----	----	----
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	10	mg/kg	<10	----	----	----	----
EP080: BTEXN								
Benzene	71-43-2	0.2	mg/kg	<0.2	----	----	----	----
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	----	----	----	----
EP090: Organotin Compounds								
Monobutyltin	78763-54-9	1	µgSn/kg	----	<1	----	----	----
Dibutyltin	1002-53-5	1	µgSn/kg	----	<1	----	----	----
Tributyltin	56573-85-4	0.5	µgSn/kg	----	<0.5	----	----	----
EP130A: Organophosphorus Pesticides (Ultra-trace)								
Bromophos-ethyl	4824-78-6	10	µg/kg	----	<10	----	----	----
Carbophenothion	786-19-6	10	µg/kg	----	<10	----	----	----
Chlorfenvinphos (E)	18708-86-6	10.0	µg/kg	----	<10.0	----	----	----
Chlorfenvinphos (Z)	18708-87-7	10	µg/kg	----	<10	----	----	----
Chlorpyrifos	2921-88-2	10	µg/kg	----	<10	----	----	----
Chlorpyrifos-methyl	5598-13-0	10	µg/kg	----	<10	----	----	----
Demeton-S-methyl	919-86-8	10	µg/kg	----	<10	----	----	----
Diazinon	333-41-5	10	µg/kg	----	<10	----	----	----
Dichlorvos	62-73-7	10	µg/kg	----	<10	----	----	----

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	Trip Blank 070337	B16-0	----	----	----
			Sampling date / time	14-Sep-2023 00:00	13-Sep-2023 00:00	----	----	----
Compound	CAS Number	LOR	Unit	EB2328877-049	EB2328877-051	--------	--------	--------
				Result	Result	----	----	----
EP130A: Organophosphorus Pesticides (Ultra-trace) - Continued								
Dimethoate	60-51-5	10	µg/kg	----	<10	----	----	----
Ethion	563-12-2	10	µg/kg	----	<10	----	----	----
Fenamiphos	22224-92-6	10	µg/kg	----	<10	----	----	----
Fenthion	55-38-9	10	µg/kg	----	<10	----	----	----
Malathion	121-75-5	10	µg/kg	----	<10	----	----	----
Azinphos Methyl	86-50-0	10	µg/kg	----	<10	----	----	----
Monocrotophos	6923-22-4	10	µg/kg	----	<10	----	----	----
Parathion	56-38-2	10	µg/kg	----	<10	----	----	----
Parathion-methyl	298-00-0	10	µg/kg	----	<10	----	----	----
Pirimphos-ethyl	23505-41-1	10	µg/kg	----	<10	----	----	----
Prothiofos	34643-46-4	10	µg/kg	----	<10	----	----	----
EP131A: Organochlorine Pesticides								
Aldrin	309-00-2	0.50	µg/kg	----	<0.50	----	----	----
alpha-BHC	319-84-6	0.50	µg/kg	----	<0.50	----	----	----
beta-BHC	319-85-7	0.50	µg/kg	----	<0.50	----	----	----
delta-BHC	319-86-8	0.50	µg/kg	----	<0.50	----	----	----
4.4`-DDD	72-54-8	0.50	µg/kg	----	<0.50	----	----	----
4.4`-DDE	72-55-9	0.50	µg/kg	----	**0.81**	----	----	----
4.4`-DDT	50-29-3	0.50	µg/kg	----	<0.50	----	----	----
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.50	µg/kg	----	**0.81**	----	----	----
Dieldrin	60-57-1	0.50	µg/kg	----	<0.50	----	----	----
alpha-Endosulfan	959-98-8	0.50	µg/kg	----	<0.50	----	----	----
beta-Endosulfan	33213-65-9	0.50	µg/kg	----	<0.50	----	----	----
Endosulfan sulfate	1031-07-8	0.50	µg/kg	----	<0.50	----	----	----
^ Endosulfan (sum)	115-29-7	0.50	µg/kg	----	<0.50	----	----	----
Endrin	72-20-8	0.50	µg/kg	----	<0.50	----	----	----
Endrin aldehyde	7421-93-4	0.50	µg/kg	----	<0.50	----	----	----
Endrin ketone	53494-70-5	0.50	µg/kg	----	<0.50	----	----	----
Heptachlor	76-44-8	0.50	µg/kg	----	<0.50	----	----	----
Heptachlor epoxide	1024-57-3	0.50	µg/kg	----	<0.50	----	----	----
Hexachlorobenzene (HCB)	118-74-1	0.50	µg/kg	----	<0.50	----	----	----
gamma-BHC	58-89-9	0.25	µg/kg	----	<0.25	----	----	----
Methoxychlor	72-43-5	0.50	µg/kg	----	<0.50	----	----	----

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	Trip Blank 070337	B16-0	----	----	----
			Sampling date / time	14-Sep-2023 00:00	13-Sep-2023 00:00	----	----	----
Compound	CAS Number	LOR	Unit	EB2328877-049	EB2328877-051	--------	--------	--------
				Result	Result	----	----	----
EP131A: Organochlorine Pesticides - Continued								
cis-Chlordane	5103-71-9	0.50	µg/kg	----	<0.50	----	----	----
trans-Chlordane	5103-74-2	0.50	µg/kg	----	<0.50	----	----	----
^ Total Chlordane (sum)	----	0.50	µg/kg	----	<0.50	----	----	----
Oxychlordane	27304-13-8	0.50	µg/kg	----	<0.50	----	----	----
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.50	µg/kg	----	<0.50	----	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.2	%	87.6	----	----	----	----
Toluene-D8	2037-26-5	0.2	%	75.2	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.2	%	81.0	----	----	----	----
EP090S: Organotin Surrogate								
Tripropyltin	----	0.5	%	----	94.2	----	----	----
EP130S: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	10	%	----	78.0	----	----	----
EP131S: OC Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.50	%	----	129	----	----	----

Surrogate Control Limits

Sub-Matrix: SEDIMENT		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	53	134
Toluene-D8	2037-26-5	60	131
4-Bromofluorobenzene	460-00-4	59	127
EP080-SD: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	51	145
Toluene-D8	2037-26-5	42	144
4-Bromofluorobenzene	460-00-4	58	142
EP090S: Organotin Surrogate			
Tripropyltin	----	35	130
EP130S: Organophosphorus Pesticide Surrogate			
DEF	78-48-8	14	102
EP131S: OC Pesticide Surrogate			
Dibromo-DDE	21655-73-2	10	119
EP131T: PCB Surrogate			
Decachlorobiphenyl	2051-24-3	10	106
EP132T: Base/Neutral Extractable Surrogates			
2-Fluorobiphenyl	321-60-8	55	135
Anthracene-d10	1719-06-8	70	136
4-Terphenyl-d14	1718-51-0	57	127

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(SOIL) EP130A: Organophosphorus Pesticides (Ultra-trace)

(SOIL) EP130S: Organophosphorus Pesticide Surrogate

(SOIL) EP131A: Organochlorine Pesticides

(SOIL) EP131S: OC Pesticide Surrogate

(SOIL) EP131B: Polychlorinated Biphenyls (as Aroclors)

(SOIL) EP131T: PCB Surrogate

(SOIL) EP132B: Polynuclear Aromatic Hydrocarbons

(SOIL) EP132T: Base/Neutral Extractable Surrogates

QUALITY CONTROL REPORT

Work Order	: **EB2328877**	Page	: 1 of 24
Client	: **BMT COMMERCIAL AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: MACKENZIE STACEY	Contact	: Nathan King
Address	: PO BOX 203 SPRING HILL BRISBANE QLD 4004	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: ----	Telephone	: +61-7-3243 7222
Project	: B23621 PoB Monitoring 2019-2025	Date Samples Received	: 14-Sep-2023
Order number	: ----	Date Analysis Commenced	: 19-Sep-2023
C-O-C number	: ----	Issue Date	: 04-Oct-2023
Sampler	: ANGUS WILLIAMS, CRAIG HEATHERINGTON, MACKENZIE STACEY		
Site	: ----		
Quote number	: BN/016/19		
No. of samples received	: 49		
No. of samples analysed	: 47		

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

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

This Quality Control Report contains the following information:

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Beatriz Llarinas	Senior Chemist - Inorganics	Brisbane Inorganics, Stafford, QLD
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Layla Hafner	Acid Sulphate Soils - Chemist	Brisbane Acid Sulphate Soils, Stafford, QLD
Layla Hafner	Acid Sulphate Soils - Chemist	Brisbane Soil Preparation, Stafford, QLD
Matt Frost	Assistant Laboratory Manager	Brisbane Organics, Stafford, QLD

General Comments

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

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

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

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 5305912)									
EB2328877-001	RF7	EG005T: Aluminium	7429-90-5	50	mg/kg	20800	20900	0.3	0% - 20%
		EG005T: Iron	7439-89-6	50	mg/kg	44100	43900	0.4	0% - 20%
EB2328877-011	B13-4b	EG005T: Aluminium	7429-90-5	50	mg/kg	7800	7190	8.1	0% - 20%
		EG005T: Iron	7439-89-6	50	mg/kg	20000	20500	2.5	0% - 20%
EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 5305913)									
EB2328877-031	B6-2b	EG005T: Aluminium	7429-90-5	50	mg/kg	13800	14300	3.7	0% - 20%
		EG005T: Iron	7439-89-6	50	mg/kg	34300	34400	0.0	0% - 20%
EB2328877-042	B15-2	EG005T: Aluminium	7429-90-5	50	mg/kg	7860	8050	2.4	0% - 20%
		EG005T: Iron	7439-89-6	50	mg/kg	20100	20600	2.7	0% - 20%
EG035T: Total Recoverable Mercury by FIMS (Low Level) (QC Lot: 5305910)									
EB2328877-001	RF7	EG035T-LL: Mercury	7439-97-6	0.01	mg/kg	0.10	0.10	0.0	No Limit
EB2328877-011	B13-4b	EG035T-LL: Mercury	7439-97-6	0.01	mg/kg	0.04	0.04	0.0	No Limit
EG035T: Total Recoverable Mercury by FIMS (Low Level) (QC Lot: 5305914)									
EB2328877-031	B6-2b	EG035T-LL: Mercury	7439-97-6	0.01	mg/kg	0.08	0.08	0.0	No Limit
EB2328877-042	B15-2	EG035T-LL: Mercury	7439-97-6	0.01	mg/kg	0.03	0.03	0.0	No Limit
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 5305916)									
EB2328877-001	RF7	EA055: Moisture Content	----	0.1	%	64.4	63.5	1.3	0% - 20%
EB2328877-011	B13-4b	EA055: Moisture Content	----	0.1	%	34.3	35.2	2.6	0% - 20%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 5305917)									
EB2328877-031	B6-2b	EA055: Moisture Content	----	0.1	%	54.4	55.4	1.9	0% - 20%
EB2328877-042	B15-2	EA055: Moisture Content	----	0.1	%	43.1	42.3	1.9	0% - 20%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 5305926)									
EB2328877-022	B5-0	EA055: Moisture Content	----	0.1	%	57.2	57.7	0.8	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 (%)*
EG020-SD: Total Metals in Sediments by ICPMS (QC Lot: 5305911)									
EB2328877-001	RF7	EG020-SD: Cadmium	7440-43-9	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
		EG020-SD: Silver	7440-22-4	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
		EG020-SD: Arsenic	7440-38-2	1	mg/kg	7.66	7.48	2.3	No Limit
		EG020-SD: Chromium	7440-47-3	1	mg/kg	41.8	40.2	4.0	0% - 20%
		EG020-SD: Copper	7440-50-8	1	mg/kg	23.4	21.7	7.4	0% - 20%
		EG020-SD: Lead	7439-92-1	1	mg/kg	20.2	19.0	6.0	0% - 20%
		EG020-SD: Nickel	7440-02-0	1	mg/kg	27.8	26.2	6.1	0% - 20%
		EG020-SD: Zinc	7440-66-6	1	mg/kg	92.1	89.4	3.0	0% - 20%
EB2328877-011	B13-4b	EG020-SD: Cadmium	7440-43-9	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
		EG020-SD: Silver	7440-22-4	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
		EG020-SD: Arsenic	7440-38-2	1	mg/kg	4.65	5.21	11.3	No Limit
		EG020-SD: Chromium	7440-47-3	1	mg/kg	16.2	15.4	5.0	0% - 50%
		EG020-SD: Copper	7440-50-8	1	mg/kg	8.3	8.0	3.5	No Limit
		EG020-SD: Lead	7439-92-1	1	mg/kg	9.2	9.1	1.3	No Limit
		EG020-SD: Nickel	7440-02-0	1	mg/kg	11.4	11.7	2.5	0% - 50%
		EG020-SD: Zinc	7440-66-6	1	mg/kg	40.3	43.8	8.3	0% - 20%
EG020-SD: Total Metals in Sediments by ICPMS (QC Lot: 5305915)									
EB2328877-031	B6-2b	EG020-SD: Cadmium	7440-43-9	0.1	mg/kg	<0.1	0.1	0.0	No Limit
		EG020-SD: Silver	7440-22-4	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
		EG020-SD: Arsenic	7440-38-2	1	mg/kg	5.79	5.54	4.4	No Limit
		EG020-SD: Chromium	7440-47-3	1	mg/kg	29.1	30.4	4.3	0% - 20%
		EG020-SD: Copper	7440-50-8	1	mg/kg	23.1	24.9	7.4	0% - 20%
		EG020-SD: Lead	7439-92-1	1	mg/kg	13.2	13.7	3.6	0% - 50%
		EG020-SD: Nickel	7440-02-0	1	mg/kg	23.9	24.5	2.3	0% - 20%
		EG020-SD: Zinc	7440-66-6	1	mg/kg	82.0	82.8	1.0	0% - 20%
EB2328877-042	B15-2	EG020-SD: Cadmium	7440-43-9	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
		EG020-SD: Silver	7440-22-4	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
		EG020-SD: Arsenic	7440-38-2	1	mg/kg	6.02	5.98	0.7	No Limit
		EG020-SD: Chromium	7440-47-3	1	mg/kg	16.5	16.6	0.8	0% - 50%
		EG020-SD: Copper	7440-50-8	1	mg/kg	8.8	9.2	4.2	No Limit
		EG020-SD: Lead	7439-92-1	1	mg/kg	7.0	7.4	5.7	No Limit
		EG020-SD: Nickel	7440-02-0	1	mg/kg	13.0	13.2	1.5	0% - 50%
		EG020-SD: Zinc	7440-66-6	1	mg/kg	40.4	40.6	0.6	0% - 20%
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 5305899)									
EB2328877-008	B13-8	EK059G: Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	0.3	0.3	0.0	No Limit
EB2328877-039	B12-1	EK059G: Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	0.1	0.1	0.0	No Limit
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 5305901)									
EB2328877-008	B13-8	EK061G: Total Kjeldahl Nitrogen as N	----	20	mg/kg	780	860	11.0	0% - 20%
EB2328877-039	B12-1	EK061G: Total Kjeldahl Nitrogen as N	----	20	mg/kg	1590	1460	8.2	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 (%)*
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 5305900)									
EB2328877-008	B13-8	EK067G: Total Phosphorus as P	----	2	mg/kg	463	532	14.0	0% - 20%
EB2328877-039	B12-1	EK067G: Total Phosphorus as P	----	2	mg/kg	811	799	1.5	0% - 20%
EP003: Total Organic Carbon (TOC) in Soil (QC Lot: 5319568)									
EB2328877-001	RF7	EP003: Total Organic Carbon	----	0.02	%	1.34	1.18	13.1	0% - 20%
EB2328877-011	B13-4b	EP003: Total Organic Carbon	----	0.02	%	0.52	0.46	10.7	0% - 20%
EP003: Total Organic Carbon (TOC) in Soil (QC Lot: 5319569)									
EB2328877-031	B6-2b	EP003: Total Organic Carbon	----	0.02	%	0.97	0.97	0.0	0% - 20%
EB2328877-042	B15-2	EP003: Total Organic Carbon	----	0.02	%	0.67	0.67	0.0	0% - 20%
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 5305886)									
EB2328877-015	Trip Blank 070339	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 5305886)									
EB2328877-015	Trip Blank 070339	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
EP080: BTEXN (QC Lot: 5305886)									
EB2328877-015	Trip Blank 070339	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-SD / EP071-SD: Total Petroleum Hydrocarbons (QC Lot: 5305884)									
EB2328877-008	B13-8	EP080-SD: C6 - C9 Fraction	----	3	mg/kg	<3	<3	0.0	No Limit
EB2328877-038	B11-8	EP080-SD: C6 - C9 Fraction	----	3	mg/kg	<3	<3	0.0	No Limit
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons (QC Lot: 5305896)									
EB2328877-008	B13-8	EP071-SD-SV: C10 - C14 Fraction	----	3	mg/kg	5	4	0.0	No Limit
		EP071-SD-SV: C15 - C28 Fraction	----	3	mg/kg	16	14	14.8	No Limit
		EP071-SD-SV: C10 - C36 Fraction (sum)	----	3	mg/kg	32	28	13.3	0% - 50%
		EP071-SD-SV: C29 - C36 Fraction	----	5	mg/kg	11	10	10.5	No Limit
EB2328877-039	B12-1	EP071-SD-SV: C10 - C14 Fraction	----	3	mg/kg	7	12	59.5	No Limit
		EP071-SD-SV: C15 - C28 Fraction	----	3	mg/kg	29	# 62	73.8	0% - 20%
		EP071-SD-SV: C10 - C36 Fraction (sum)	----	3	mg/kg	59	# 136	79.0	0% - 20%
		EP071-SD-SV: C29 - C36 Fraction	----	5	mg/kg	23	# 62	93.1	0% - 50%
EP080-SD / EP071-SD: Total Recoverable Hydrocarbons (QC Lot: 5305884)									
EB2328877-008	B13-8	EP080-SD: C6 - C10 Fraction	C6_C10	3	mg/kg	<3	<3	0.0	No Limit
EB2328877-038	B11-8	EP080-SD: C6 - C10 Fraction	C6_C10	3	mg/kg	<3	<3	0.0	No Limit
EP080-SD / EP071-SD: Total Recoverable Hydrocarbons (QC Lot: 5305896)									
EB2328877-008	B13-8	EP071-SD-SV: >C10 - C16 Fraction	----	3	mg/kg	4	4	0.0	No Limit
		EP071-SD-SV: >C16 - C34 Fraction	----	3	mg/kg	24	21	12.4	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-SD / EP071-SD: Total Recoverable Hydrocarbons (QC Lot: 5305896) - continued									
EB2328877-008	B13-8	EP071-SD-SV: >C10 - C40 Fraction (sum)	----	3	mg/kg	28	25	11.3	No Limit
		EP071-SD-SV: >C34 - C40 Fraction	----	5	mg/kg	<5	<5	0.0	No Limit
EB2328877-039	B12-1	EP071-SD-SV: >C10 - C16 Fraction	----	3	mg/kg	8	16	64.5	No Limit
		EP071-SD-SV: >C16 - C34 Fraction	----	3	mg/kg	41	# 100	83.5	0% - 20%
		EP071-SD-SV: >C10 - C40 Fraction (sum)	----	3	mg/kg	63	# 151	82.2	0% - 20%
		EP071-SD-SV: >C34 - C40 Fraction	----	5	mg/kg	14	35	83.1	No Limit
EP080-SD: BTEXN (QC Lot: 5305884)									
EB2328877-008	B13-8	EP080-SD: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080-SD: Toluene	108-88-3	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080-SD: Ethylbenzene	100-41-4	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080-SD: meta- & para-Xylene	108-38-3 106-42-3	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080-SD: ortho-Xylene	95-47-6	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080-SD: Total Xylenes	----	0.2	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080-SD: Naphthalene	91-20-3	0.2	mg/kg	<0.2	0.2	0.0	No Limit
EB2328877-038	B11-8	EP080-SD: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080-SD: Toluene	108-88-3	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080-SD: Ethylbenzene	100-41-4	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080-SD: meta- & para-Xylene	108-38-3 106-42-3	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080-SD: ortho-Xylene	95-47-6	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080-SD: Total Xylenes	----	0.2	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080-SD: Naphthalene	91-20-3	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
EP090: Organotin Compounds (QC Lot: 5305865)									
EB2328877-001	RF7	EP090: Tributyltin	56573-85-4	0.5	µgSn/kg	<0.5	<0.5	0.0	No Limit
		EP090: Monobutyltin	78763-54-9	1	µgSn/kg	<1	<1	0.0	No Limit
		EP090: Dibutyltin	1002-53-5	1	µgSn/kg	<2	<2	0.0	No Limit
EB2328877-011	B13-4b	EP090: Tributyltin	56573-85-4	0.5	µgSn/kg	<0.5	<0.5	0.0	No Limit
		EP090: Monobutyltin	78763-54-9	1	µgSn/kg	<1	<1	0.0	No Limit
		EP090: Dibutyltin	1002-53-5	1	µgSn/kg	<1	<1	0.0	No Limit
EP090: Organotin Compounds (QC Lot: 5305866)									
EB2328877-031	B6-2b	EP090: Tributyltin	56573-85-4	0.5	µgSn/kg	0.7	1.2	46.2	No Limit
		EP090: Monobutyltin	78763-54-9	1	µgSn/kg	<1	<1	0.0	No Limit
		EP090: Dibutyltin	1002-53-5	1	µgSn/kg	<1	<1	0.0	No Limit
EB2328877-042	B15-2	EP090: Tributyltin	56573-85-4	0.5	µgSn/kg	<0.5	<0.5	0.0	No Limit
		EP090: Monobutyltin	78763-54-9	1	µgSn/kg	<1	<1	0.0	No Limit
		EP090: Dibutyltin	1002-53-5	1	µgSn/kg	<1	<1	0.0	No Limit
EP130A: Organophosphorus Pesticides (Ultra-trace) (QC Lot: 5307797)									
EB2328877-011	B13-4b	EP130: Bromophos-ethyl	4824-78-6	10	µg/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 (%)*
EP130A: Organophosphorus Pesticides (Ultra-trace) (QC Lot: 5307797) - continued									
EB2328877-011	B13-4b	EP130: Carbophenothion	786-19-6	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Chlorfenvinphos (E)	18708-86-6	10	µg/kg	<10.0	<10.0	0.0	No Limit
		EP130: Chlorfenvinphos (Z)	18708-87-7	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Chlorpyrifos	2921-88-2	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Chlorpyrifos-methyl	5598-13-0	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Demeton-S-methyl	919-86-8	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Diazinon	333-41-5	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Dichlorvos	62-73-7	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Dimethoate	60-51-5	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Ethion	563-12-2	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Fenamiphos	22224-92-6	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Fenthion	55-38-9	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Malathion	121-75-5	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Azinphos Methyl	86-50-0	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Monocrotophos	6923-22-4	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Parathion	56-38-2	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Parathion-methyl	298-00-0	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Pirimphos-ethyl	23505-41-1	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Prothiofos	34643-46-4	10	µg/kg	<10	<10	0.0	No Limit
EB2328877-008	B13-8	EP130: Bromophos-ethyl	4824-78-6	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Carbophenothion	786-19-6	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Chlorfenvinphos (E)	18708-86-6	10	µg/kg	<10.0	<10.0	0.0	No Limit
		EP130: Chlorfenvinphos (Z)	18708-87-7	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Chlorpyrifos	2921-88-2	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Chlorpyrifos-methyl	5598-13-0	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Demeton-S-methyl	919-86-8	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Diazinon	333-41-5	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Dichlorvos	62-73-7	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Dimethoate	60-51-5	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Ethion	563-12-2	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Fenamiphos	22224-92-6	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Fenthion	55-38-9	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Malathion	121-75-5	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Azinphos Methyl	86-50-0	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Monocrotophos	6923-22-4	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Parathion	56-38-2	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Parathion-methyl	298-00-0	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Pirimphos-ethyl	23505-41-1	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Prothiofos	34643-46-4	10	µg/kg	<10	<10	0.0	No Limit
EP130A: Organophosphorus Pesticides (Ultra-trace) (QC Lot: 5307806)									

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 (%)*
EP130A: Organophosphorus Pesticides (Ultra-trace) (QC Lot: 5307806) - continued									
EB2328877-018	B2-0	EP130: Bromophos-ethyl	4824-78-6	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Carbophenothion	786-19-6	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Chlorfenvinphos (E)	18708-86-6	10	µg/kg	<10.0	<10.0	0.0	No Limit
		EP130: Chlorfenvinphos (Z)	18708-87-7	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Chlorpyrifos	2921-88-2	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Chlorpyrifos-methyl	5598-13-0	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Demeton-S-methyl	919-86-8	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Diazinon	333-41-5	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Dichlorvos	62-73-7	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Dimethoate	60-51-5	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Ethion	563-12-2	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Fenamiphos	22224-92-6	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Fenthion	55-38-9	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Malathion	121-75-5	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Azinphos Methyl	86-50-0	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Monocrotophos	6923-22-4	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Parathion	56-38-2	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Parathion-methyl	298-00-0	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Pirimphos-ethyl	23505-41-1	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Prothiofos	34643-46-4	10	µg/kg	<10	<10	0.0	No Limit
EB2328877-036	B11-9b	EP130: Bromophos-ethyl	4824-78-6	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Carbophenothion	786-19-6	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Chlorfenvinphos (E)	18708-86-6	10	µg/kg	<10.0	<10.0	0.0	No Limit
		EP130: Chlorfenvinphos (Z)	18708-87-7	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Chlorpyrifos	2921-88-2	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Chlorpyrifos-methyl	5598-13-0	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Demeton-S-methyl	919-86-8	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Diazinon	333-41-5	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Dichlorvos	62-73-7	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Dimethoate	60-51-5	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Ethion	563-12-2	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Fenamiphos	22224-92-6	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Fenthion	55-38-9	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Malathion	121-75-5	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Azinphos Methyl	86-50-0	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Monocrotophos	6923-22-4	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Parathion	56-38-2	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Parathion-methyl	298-00-0	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Pirimphos-ethyl	23505-41-1	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Prothiofos	34643-46-4	10	µg/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 (%)*
EP131A: Organochlorine Pesticides (QC Lot: 5307796)									
EB2328877-011	B13-4b	EP131A: gamma-BHC	58-89-9	0.25	µg/kg	<0.25	<0.25	0.0	No Limit
		EP131A: cis-Chlordane	5103-71-9	0.25	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: trans-Chlordane	5103-74-2	0.25	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Total Chlordane (sum)	----	0.25	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Aldrin	309-00-2	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: alpha-BHC	319-84-6	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: beta-BHC	319-85-7	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: delta-BHC	319-86-8	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: 4.4`-DDD	72-54-8	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: 4.4`-DDE	72-55-9	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: 4.4`-DDT	50-29-3	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Dieldrin	60-57-1	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: alpha-Endosulfan	959-98-8	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: beta-Endosulfan	33213-65-9	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Endosulfan sulfate	1031-07-8	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Endosulfan (sum)	115-29-7	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Endrin	72-20-8	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Endrin aldehyde	7421-93-4	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Endrin ketone	53494-70-5	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Heptachlor	76-44-8	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Heptachlor epoxide	1024-57-3	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Hexachlorobenzene (HCB)	118-74-1	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Methoxychlor	72-43-5	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
EB2328877-008	B13-8	EP131A: gamma-BHC	58-89-9	0.25	µg/kg	<0.25	<0.25	0.0	No Limit
		EP131A: cis-Chlordane	5103-71-9	0.25	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: trans-Chlordane	5103-74-2	0.25	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Total Chlordane (sum)	----	0.25	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Aldrin	309-00-2	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: alpha-BHC	319-84-6	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: beta-BHC	319-85-7	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: delta-BHC	319-86-8	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: 4.4`-DDD	72-54-8	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: 4.4`-DDE	72-55-9	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: 4.4`-DDT	50-29-3	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Dieldrin	60-57-1	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: alpha-Endosulfan	959-98-8	0.5	µg/kg	<0.50	<0.50	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 (%)*
EP131A: Organochlorine Pesticides (QC Lot: 5307796) - continued									
EB2328877-008	B13-8	EP131A: beta-Endosulfan	33213-65-9	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Endosulfan sulfate	1031-07-8	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Endosulfan (sum)	115-29-7	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Endrin	72-20-8	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Endrin aldehyde	7421-93-4	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Endrin ketone	53494-70-5	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Heptachlor	76-44-8	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Heptachlor epoxide	1024-57-3	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Hexachlorobenzene (HCB)	118-74-1	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Methoxychlor	72-43-5	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
EP131A: Organochlorine Pesticides (QC Lot: 5307807)									
EB2328877-018	B2-0	EP131A: gamma-BHC	58-89-9	0.25	µg/kg	<0.25	<0.25	0.0	No Limit
		EP131A: cis-Chlordane	5103-71-9	0.25	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: trans-Chlordane	5103-74-2	0.25	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Total Chlordane (sum)	----	0.25	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Aldrin	309-00-2	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: alpha-BHC	319-84-6	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: beta-BHC	319-85-7	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: delta-BHC	319-86-8	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: 4.4`-DDD	72-54-8	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: 4.4`-DDE	72-55-9	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: 4.4`-DDT	50-29-3	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Dieldrin	60-57-1	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: alpha-Endosulfan	959-98-8	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: beta-Endosulfan	33213-65-9	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Endosulfan sulfate	1031-07-8	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Endosulfan (sum)	115-29-7	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Endrin	72-20-8	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Endrin aldehyde	7421-93-4	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Endrin ketone	53494-70-5	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Heptachlor	76-44-8	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Heptachlor epoxide	1024-57-3	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Hexachlorobenzene (HCB)	118-74-1	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Methoxychlor	72-43-5	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
EB2328877-036	B11-9b	EP131A: gamma-BHC	58-89-9	0.25	µg/kg	<0.25	<0.25	0.0	No Limit
		EP131A: cis-Chlordane	5103-71-9	0.25	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: trans-Chlordane	5103-74-2	0.25	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Total Chlordane (sum)	----	0.25	µg/kg	<0.50	<0.50	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 (%)*
EP131A: Organochlorine Pesticides (QC Lot: 5307807) - continued									
EB2328877-036	B11-9b	EP131A: Aldrin	309-00-2	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: alpha-BHC	319-84-6	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: beta-BHC	319-85-7	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: delta-BHC	319-86-8	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: 4.4`-DDD	72-54-8	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: 4.4`-DDE	72-55-9	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: 4.4`-DDT	50-29-3	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Dieldrin	60-57-1	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: alpha-Endosulfan	959-98-8	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: beta-Endosulfan	33213-65-9	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Endosulfan sulfate	1031-07-8	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Endosulfan (sum)	115-29-7	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Endrin	72-20-8	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Endrin aldehyde	7421-93-4	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Endrin ketone	53494-70-5	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Heptachlor	76-44-8	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Heptachlor epoxide	1024-57-3	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Hexachlorobenzene (HCB)	118-74-1	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Methoxychlor	72-43-5	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
EP131B: Polychlorinated Biphenyls (as Aroclors) (QC Lot: 5307798)									
EB2328877-008	B13-8	EP131B: Total Polychlorinated biphenyls	----	5	µg/kg	<6.2	<6.2	0.0	No Limit
		EP131B: Aroclor 1016	12674-11-2	5	µg/kg	<6.2	<6.2	0.0	No Limit
		EP131B: Aroclor 1221	11104-28-2	5	µg/kg	<6.2	<6.2	0.0	No Limit
		EP131B: Aroclor 1232	11141-16-5	5	µg/kg	<6.2	<6.2	0.0	No Limit
		EP131B: Aroclor 1242	53469-21-9	5	µg/kg	<6.2	<6.2	0.0	No Limit
		EP131B: Aroclor 1248	12672-29-6	5	µg/kg	<6.2	<6.2	0.0	No Limit
		EP131B: Aroclor 1254	11097-69-1	5	µg/kg	<6.2	<6.2	0.0	No Limit
		EP131B: Aroclor 1260	11096-82-5	5	µg/kg	<6.2	<6.2	0.0	No Limit
EP131B: Polychlorinated Biphenyls (as Aroclors) (QC Lot: 5307805)									
EB2328877-022	B5-0	EP131B: Total Polychlorinated biphenyls	----	5	µg/kg	<6.2	<6.2	0.0	No Limit
		EP131B: Aroclor 1016	12674-11-2	5	µg/kg	<6.2	<6.2	0.0	No Limit
		EP131B: Aroclor 1221	11104-28-2	5	µg/kg	<6.2	<6.2	0.0	No Limit
		EP131B: Aroclor 1232	11141-16-5	5	µg/kg	<6.2	<6.2	0.0	No Limit
		EP131B: Aroclor 1242	53469-21-9	5	µg/kg	<6.2	<6.2	0.0	No Limit
		EP131B: Aroclor 1248	12672-29-6	5	µg/kg	<6.2	<6.2	0.0	No Limit
		EP131B: Aroclor 1254	11097-69-1	5	µg/kg	<6.2	<6.2	0.0	No Limit
		EP131B: Aroclor 1260	11096-82-5	5	µg/kg	<6.2	<6.2	0.0	No Limit
EP132B: Polynuclear Aromatic Hydrocarbons (QC Lot: 5307818)									

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 (%)*
EP132B: Polynuclear Aromatic Hydrocarbons (QC Lot: 5307818) - continued									
EB2328877-013	B13-1	EP132B-SD: Acenaphthylene	208-96-8	4	µg/kg	<4	<4	0.0	No Limit
		EP132B-SD: Acenaphthene	83-32-9	4	µg/kg	<4	<4	0.0	No Limit
		EP132B-SD: Fluorene	86-73-7	4	µg/kg	<4	<4	0.0	No Limit
		EP132B-SD: Phenanthrene	85-01-8	4	µg/kg	4	4	0.0	No Limit
		EP132B-SD: Anthracene	120-12-7	4	µg/kg	<4	<4	0.0	No Limit
		EP132B-SD: Fluoranthene	206-44-0	4	µg/kg	15	16	0.0	No Limit
		EP132B-SD: Pyrene	129-00-0	4	µg/kg	14	15	0.0	No Limit
		EP132B-SD: Benz(a)anthracene	56-55-3	4	µg/kg	7	7	0.0	No Limit
		EP132B-SD: Chrysene	218-01-9	4	µg/kg	7	7	0.0	No Limit
		EP132B-SD: Benzo(b+j)fluoranthene	205-99-2 205-82-3	4	µg/kg	11	10	10.3	No Limit
		EP132B-SD: Benzo(k)fluoranthene	207-08-9	4	µg/kg	<4	4	0.0	No Limit
		EP132B-SD: Benzo(e)pyrene	192-97-2	4	µg/kg	7	7	0.0	No Limit
		EP132B-SD: Benzo(a)pyrene	50-32-8	4	µg/kg	9	9	0.0	No Limit
		EP132B-SD: Perylene	198-55-0	4	µg/kg	14	14	0.0	No Limit
		EP132B-SD: Benzo(g.h.i)perylene	191-24-2	4	µg/kg	7	8	0.0	No Limit
		EP132B-SD: Dibenz(a.h)anthracene	53-70-3	4	µg/kg	<4	<4	0.0	No Limit
		EP132B-SD: Indeno(1.2.3.cd)pyrene	193-39-5	4	µg/kg	6	6	0.0	No Limit
		EP132B-SD: Sum of PAHs	----	4	µg/kg	101	107	5.8	0% - 20%
		EP132B-SD: Naphthalene	91-20-3	5	µg/kg	<5	<5	0.0	No Limit
		EP132B-SD: 2-Methylnaphthalene	91-57-6	5	µg/kg	<5	<5	0.0	No Limit
		EP132B-SD: Coronene	191-07-1	5	µg/kg	<5	<5	0.0	No Limit
EB2328877-039	B12-1	EP132B-SD: Acenaphthylene	208-96-8	4	µg/kg	11	12	0.0	No Limit
		EP132B-SD: Acenaphthene	83-32-9	4	µg/kg	<5	<5	0.0	No Limit
		EP132B-SD: Fluorene	86-73-7	4	µg/kg	<5	<5	0.0	No Limit
		EP132B-SD: Phenanthrene	85-01-8	4	µg/kg	15	15	0.0	No Limit
		EP132B-SD: Anthracene	120-12-7	4	µg/kg	12	13	10.1	No Limit
		EP132B-SD: Fluoranthene	206-44-0	4	µg/kg	59	58	0.0	0% - 50%
		EP132B-SD: Pyrene	129-00-0	4	µg/kg	65	64	2.0	0% - 50%
		EP132B-SD: Benz(a)anthracene	56-55-3	4	µg/kg	36	34	6.6	No Limit
		EP132B-SD: Chrysene	218-01-9	4	µg/kg	29	29	0.0	No Limit
		EP132B-SD: Benzo(b+j)fluoranthene	205-99-2 205-82-3	4	µg/kg	55	50	9.9	0% - 50%
		EP132B-SD: Benzo(k)fluoranthene	207-08-9	4	µg/kg	22	20	7.5	No Limit
		EP132B-SD: Benzo(e)pyrene	192-97-2	4	µg/kg	34	33	0.0	No Limit
		EP132B-SD: Benzo(a)pyrene	50-32-8	4	µg/kg	48	48	0.0	No Limit
		EP132B-SD: Perylene	198-55-0	4	µg/kg	112	111	0.0	0% - 20%
		EP132B-SD: Benzo(g.h.i)perylene	191-24-2	4	µg/kg	35	38	9.7	No Limit
		EP132B-SD: Dibenz(a.h)anthracene	53-70-3	4	µg/kg	10	11	0.0	No Limit
		EP132B-SD: Indeno(1.2.3.cd)pyrene	193-39-5	4	µg/kg	31	34	7.6	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 (%)*
EP132B: Polynuclear Aromatic Hydrocarbons (QC Lot: 5307818) - continued									
EB2328877-039	B12-1	EP132B-SD: Sum of PAHs	----	4	µg/kg	592	593	0.2	0% - 20%
		EP132B-SD: Naphthalene	91-20-3	5	µg/kg	10	10	0.0	No Limit
		EP132B-SD: 2-Methylnaphthalene	91-57-6	5	µg/kg	<5	<5	0.0	No Limit
		EP132B-SD: Coronene	191-07-1	5	µg/kg	8	13	47.7	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 Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 5305912)								
EG005T: Aluminium	7429-90-5	50	mg/kg	<50	12818 mg/kg	105	70.0	130
EG005T: Iron	7439-89-6	50	mg/kg	<50	26812 mg/kg	117	70.0	120
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 5305913)								
EG005T: Aluminium	7429-90-5	50	mg/kg	<50	12818 mg/kg	102	70.0	130
EG005T: Iron	7439-89-6	50	mg/kg	<50	26812 mg/kg	115	70.0	120
EG035T: Total Recoverable Mercury by FIMS (Low Level) (QCLot: 5305910)								
EG035T-LL: Mercury	7439-97-6	0.01	mg/kg	<0.01	0.087 mg/kg	109	70.0	130
EG035T: Total Recoverable Mercury by FIMS (Low Level) (QCLot: 5305914)								
EG035T-LL: Mercury	7439-97-6	0.01	mg/kg	<0.01	0.087 mg/kg	110	70.0	130
EA152: Soil Particle Density (QCLot: 5305537)								
EA152: Soil Particle Density (Clay/Silt/Sand)	----	----	g/cm3	----	2.68 g/cm3	98.9	80.0	120
EA152: Soil Particle Density (QCLot: 5305539)								
EA152: Soil Particle Density (Clay/Silt/Sand)	----	----	g/cm3	----	2.68 g/cm3	97.4	80.0	120
EG020-SD: Total Metals in Sediments by ICPMS (QCLot: 5305911)								
EG020-SD: Arsenic	7440-38-2	1	mg/kg	<1.00	53.2 mg/kg	122	80.0	124
EG020-SD: Cadmium	7440-43-9	0.1	mg/kg	<0.1	1.38 mg/kg	107	87.0	122
EG020-SD: Chromium	7440-47-3	1	mg/kg	<1.0	13.1 mg/kg	120	79.0	129
EG020-SD: Copper	7440-50-8	1	mg/kg	<1.0	33.4 mg/kg	117	85.0	118
EG020-SD: Lead	7439-92-1	1	mg/kg	<1.0	47.9 mg/kg	119	86.0	119
EG020-SD: Nickel	7440-02-0	1	mg/kg	<1.0	10.8 mg/kg	123	77.0	123
EG020-SD: Silver	7440-22-4	0.1	mg/kg	<0.1	2.43 mg/kg	104	70.0	130
EG020-SD: Zinc	7440-66-6	1	mg/kg	<1.0	148 mg/kg	115	71.0	127
EG020-SD: Total Metals in Sediments by ICPMS (QCLot: 5305915)								
EG020-SD: Arsenic	7440-38-2	1	mg/kg	<1.00	53.2 mg/kg	116	80.0	124
EG020-SD: Cadmium	7440-43-9	0.1	mg/kg	<0.1	1.38 mg/kg	114	87.0	122
EG020-SD: Chromium	7440-47-3	1	mg/kg	<1.0	13.1 mg/kg	115	79.0	129
EG020-SD: Copper	7440-50-8	1	mg/kg	<1.0	33.4 mg/kg	112	85.0	118
EG020-SD: Lead	7439-92-1	1	mg/kg	<1.0	47.9 mg/kg	114	86.0	119
EG020-SD: Nickel	7440-02-0	1	mg/kg	<1.0	10.8 mg/kg	118	77.0	123
EG020-SD: Silver	7440-22-4	0.1	mg/kg	<0.1	2.43 mg/kg	98.5	70.0	130

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EG020-SD: Total Metals in Sediments by ICPMS (QCLot: 5305915) - continued								
EG020-SD: Zinc	7440-66-6	1	mg/kg	<1.0	148 mg/kg	112	71.0	127
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 5305899)								
EK059G: Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	<0.1	2.5 mg/kg	106	83.2	111
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 5305901)								
EK061G: Total Kjeldahl Nitrogen as N	----	20	mg/kg	<20	306 mg/kg	98.8	70.0	130
				<20	2180 mg/kg	92.1	72.0	128
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 5305900)								
EK067G: Total Phosphorus as P	----	2	mg/kg	<2	142 mg/kg	99.7	70.0	130
				<2	1200 mg/kg	92.2	79.0	121
EP003: Total Organic Carbon (TOC) in Soil (QCLot: 5319568)								
EP003: Total Organic Carbon	----	0.02	%	<0.02	0.55 %	98.0	80.0	120
				<0.02	32.3 %	99.2	80.0	120
EP003: Total Organic Carbon (TOC) in Soil (QCLot: 5319569)								
EP003: Total Organic Carbon	----	0.02	%	<0.02	0.55 %	102	80.0	120
				<0.02	32.3 %	99.2	80.0	120
EP080/071: Total Petroleum Hydrocarbons (QCLot: 5305886)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	18 mg/kg	92.6	64.0	120
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5305886)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	22.5 mg/kg	87.0	58.1	124
EP080: BTEXN (QCLot: 5305886)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	78.8	68.0	107
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	80.2	69.0	108
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	75.8	68.0	109
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	82.7	70.0	114
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	84.8	74.0	116
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	78.0	74.0	109
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons (QCLot: 5305884)								
EP080-SD: C6 - C9 Fraction	----	3	mg/kg	<3	18 mg/kg	95.5	66.0	120
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons (QCLot: 5305896)								
EP071-SD-SV: C10 - C14 Fraction	----	3	mg/kg	<3	189 mg/kg	97.1	43.0	126
EP071-SD-SV: C15 - C28 Fraction	----	3	mg/kg	<3	203 mg/kg	94.7	66.0	140
EP071-SD-SV: C29 - C36 Fraction	----	5	mg/kg	<5	----	----	----	----
EP071-SD-SV: C10 - C36 Fraction (sum)	----	3	mg/kg	<3	----	----	----	----

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP080-SD / EP071-SD: Total Recoverable Hydrocarbons (QCLot: 5305884)								
EP080-SD: C6 - C10 Fraction	C6_C10	3	mg/kg	<3	22.5 mg/kg	90.0	66.0	119
EP080-SD / EP071-SD: Total Recoverable Hydrocarbons (QCLot: 5305896)								
EP071-SD-SV: >C10 - C16 Fraction	----	3	mg/kg	<3	251 mg/kg	95.0	40.0	134
EP071-SD-SV: >C16 - C34 Fraction	----	3	mg/kg	<3	133 mg/kg	98.8	66.0	136
EP071-SD-SV: >C34 - C40 Fraction	----	5	mg/kg	<5	----	----	----	----
EP071-SD-SV: >C10 - C40 Fraction (sum)	----	3	mg/kg	<3	----	----	----	----
EP080-SD: BTEXN (QCLot: 5305884)								
EP080-SD: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	80.2	73.0	105
EP080-SD: Toluene	108-88-3	0.2	mg/kg	<0.2	1 mg/kg	79.2	73.0	105
EP080-SD: Ethylbenzene	100-41-4	0.2	mg/kg	<0.2	1 mg/kg	79.4	67.0	104
EP080-SD: meta- & para-Xylene	108-38-3 106-42-3	0.2	mg/kg	<0.2	2 mg/kg	85.2	66.0	106
EP080-SD: ortho-Xylene	95-47-6	0.2	mg/kg	<0.2	1 mg/kg	86.2	68.0	105
EP080-SD: Total Xylenes	----	0.2	mg/kg	<0.2	----	----	----	----
EP080-SD: Sum of BTEX	----	0.2	mg/kg	<0.2	----	----	----	----
EP080-SD: Naphthalene	91-20-3	0.2	mg/kg	<0.2	1 mg/kg	77.7	72.0	115
EP090: Organotin Compounds (QCLot: 5305865)								
EP090: Monobutyltin	78763-54-9	1	µgSn/kg	<1	1.25 µgSn/kg	115	36.0	128
EP090: Dibutyltin	1002-53-5	1	µgSn/kg	<1	1.25 µgSn/kg	97.4	42.0	132
EP090: Tributyltin	56573-85-4	0.5	µgSn/kg	<0.5	1.25 µgSn/kg	87.4	52.0	139
EP090: Organotin Compounds (QCLot: 5305866)								
EP090: Monobutyltin	78763-54-9	1	µgSn/kg	<1	1.25 µgSn/kg	119	36.0	128
EP090: Dibutyltin	1002-53-5	1	µgSn/kg	<1	1.25 µgSn/kg	118	42.0	132
EP090: Tributyltin	56573-85-4	0.5	µgSn/kg	<0.5	1.25 µgSn/kg	69.3	52.0	139
EP130A: Organophosphorus Pesticides (Ultra-trace) (QCLot: 5307797)								
EP130: Bromophos-ethyl	4824-78-6	10	µg/kg	<10	50 µg/kg	76.4	49.0	117
EP130: Carbophenothion	786-19-6	10	µg/kg	<10	50 µg/kg	82.2	54.0	104
EP130: Chlorfenvinphos (E)	18708-86-6	10	µg/kg	<10.0	5 µg/kg	92.1	48.0	156
EP130: Chlorfenvinphos (Z)	18708-87-7	10	µg/kg	<10	50 µg/kg	102	53.0	119
EP130: Chlorpyrifos	2921-88-2	10	µg/kg	<10	50 µg/kg	77.5	54.0	112
EP130: Chlorpyrifos-methyl	5598-13-0	10	µg/kg	<10	50 µg/kg	77.7	52.0	108
EP130: Demeton-S-methyl	919-86-8	10	µg/kg	<10	50 µg/kg	83.5	51.0	109
EP130: Diazinon	333-41-5	10	µg/kg	<10	50 µg/kg	77.1	57.0	121
EP130: Dichlorvos	62-73-7	10	µg/kg	<10	50 µg/kg	90.6	48.0	104

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report		
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP130A: Organophosphorus Pesticides (Ultra-trace) (QCLot: 5307797) - continued								
EP130: Dimethoate	60-51-5	10	µg/kg	<10	50 µg/kg	91.8	52.0	120
EP130: Ethion	563-12-2	10	µg/kg	<10	50 µg/kg	76.0	51.0	121
EP130: Fenamiphos	22224-92-6	10	µg/kg	<10	50 µg/kg	84.3	50.0	120
EP130: Fenthion	55-38-9	10	µg/kg	<10	50 µg/kg	76.6	48.0	112
EP130: Malathion	121-75-5	10	µg/kg	<10	50 µg/kg	92.6	51.0	121
EP130: Azinphos Methyl	86-50-0	10	µg/kg	<10	50 µg/kg	82.3	45.0	127
EP130: Monocrotophos	6923-22-4	10	µg/kg	<10	50 µg/kg	76.6	48.0	128
EP130: Parathion	56-38-2	10	µg/kg	<10	50 µg/kg	78.8	49.0	125
EP130: Parathion-methyl	298-00-0	10	µg/kg	<10	50 µg/kg	85.8	51.0	119
EP130: Pirimphos-ethyl	23505-41-1	10	µg/kg	<10	50 µg/kg	76.9	48.0	120
EP130: Prothiofos	34643-46-4	10	µg/kg	<10	50 µg/kg	79.1	51.0	117
EP130A: Organophosphorus Pesticides (Ultra-trace) (QCLot: 5307806)								
EP130: Bromophos-ethyl	4824-78-6	10	µg/kg	<10	50 µg/kg	78.0	49.0	117
EP130: Carbophenothion	786-19-6	10	µg/kg	<10	50 µg/kg	81.9	54.0	104
EP130: Chlorfenvinphos (E)	18708-86-6	10	µg/kg	<10.0	5 µg/kg	76.8	48.0	156
EP130: Chlorfenvinphos (Z)	18708-87-7	10	µg/kg	<10	50 µg/kg	84.6	53.0	119
EP130: Chlorpyrifos	2921-88-2	10	µg/kg	<10	50 µg/kg	78.9	54.0	112
EP130: Chlorpyrifos-methyl	5598-13-0	10	µg/kg	<10	50 µg/kg	75.7	52.0	108
EP130: Demeton-S-methyl	919-86-8	10	µg/kg	<10	50 µg/kg	98.5	51.0	109
EP130: Diazinon	333-41-5	10	µg/kg	<10	50 µg/kg	82.0	57.0	121
EP130: Dichlorvos	62-73-7	10	µg/kg	<10	50 µg/kg	76.1	48.0	104
EP130: Dimethoate	60-51-5	10	µg/kg	<10	50 µg/kg	96.6	52.0	120
EP130: Ethion	563-12-2	10	µg/kg	<10	50 µg/kg	76.5	51.0	121
EP130: Fenamiphos	22224-92-6	10	µg/kg	<10	50 µg/kg	96.6	50.0	120
EP130: Fenthion	55-38-9	10	µg/kg	<10	50 µg/kg	78.4	48.0	112
EP130: Malathion	121-75-5	10	µg/kg	<10	50 µg/kg	78.4	51.0	121
EP130: Azinphos Methyl	86-50-0	10	µg/kg	<10	50 µg/kg	82.5	45.0	127
EP130: Monocrotophos	6923-22-4	10	µg/kg	<10	50 µg/kg	81.7	48.0	128
EP130: Parathion	56-38-2	10	µg/kg	<10	50 µg/kg	79.1	49.0	125
EP130: Parathion-methyl	298-00-0	10	µg/kg	<10	50 µg/kg	87.8	51.0	119
EP130: Pirimphos-ethyl	23505-41-1	10	µg/kg	<10	50 µg/kg	85.9	48.0	120
EP130: Prothiofos	34643-46-4	10	µg/kg	<10	50 µg/kg	80.3	51.0	117
EP131A: Organochlorine Pesticides (QCLot: 5307796)								
EP131A: Aldrin	309-00-2	0.5	µg/kg	<0.50	5 µg/kg	84.5	38.0	139

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report		
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP131A: Organochlorine Pesticides (QCLot: 5307796) - continued								
EP131A: alpha-BHC	319-84-6	0.5	µg/kg	<0.50	5 µg/kg	80.0	17.6	136
EP131A: beta-BHC	319-85-7	0.5	µg/kg	<0.50	5 µg/kg	83.9	30.5	131
EP131A: delta-BHC	319-86-8	0.5	µg/kg	<0.50	5 µg/kg	57.9	37.0	140
EP131A: 4.4`-DDD	72-54-8	0.5	µg/kg	<0.50	5 µg/kg	86.3	25.9	141
EP131A: 4.4`-DDE	72-55-9	0.5	µg/kg	<0.50	5 µg/kg	75.6	35.0	129
EP131A: 4.4`-DDT	50-29-3	0.5	µg/kg	<0.50	5 µg/kg	96.1	23.4	138
EP131A: Sum of DDD + DDE + DDT	72-54-8/72-5 5-9/50-2	0.5	µg/kg	<0.50	----	----	----	----
EP131A: Dieldrin	60-57-1	0.5	µg/kg	<0.50	5 µg/kg	83.3	30.2	140
EP131A: alpha-Endosulfan	959-98-8	0.5	µg/kg	<0.50	5 µg/kg	88.8	38.0	140
EP131A: beta-Endosulfan	33213-65-9	0.5	µg/kg	<0.50	5 µg/kg	86.4	32.0	152
EP131A: Endosulfan sulfate	1031-07-8	0.5	µg/kg	<0.50	5 µg/kg	73.8	36.0	155
EP131A: Endosulfan (sum)	115-29-7	0.5	µg/kg	<0.50	----	----	----	----
EP131A: Endrin	72-20-8	0.5	µg/kg	<0.50	5 µg/kg	123	25.8	158
EP131A: Endrin aldehyde	7421-93-4	0.5	µg/kg	<0.50	5 µg/kg	67.0	20.1	118
EP131A: Endrin ketone	53494-70-5	0.5	µg/kg	<0.50	5 µg/kg	85.0	13.4	135
EP131A: Heptachlor	76-44-8	0.5	µg/kg	<0.50	5 µg/kg	94.7	39.0	155
EP131A: Heptachlor epoxide	1024-57-3	0.5	µg/kg	<0.50	5 µg/kg	83.3	34.0	148
EP131A: Hexachlorobenzene (HCB)	118-74-1	0.5	µg/kg	<0.50	5 µg/kg	74.6	26.1	152
EP131A: gamma-BHC	58-89-9	0.25	µg/kg	<0.25	5 µg/kg	84.1	31.2	137
EP131A: Methoxychlor	72-43-5	0.5	µg/kg	<0.50	5 µg/kg	63.3	36.0	152
EP131A: cis-Chlordane	5103-71-9	0.25	µg/kg	<0.25	5 µg/kg	96.9	36.0	142
EP131A: trans-Chlordane	5103-74-2	0.25	µg/kg	<0.25	5 µg/kg	83.2	29.5	138
EP131A: Total Chlordane (sum)	----	0.25	µg/kg	<0.25	----	----	----	----
EP131A: Organochlorine Pesticides (QCLot: 5307807)								
EP131A: Aldrin	309-00-2	0.5	µg/kg	<0.50	5 µg/kg	78.5	38.0	139
EP131A: alpha-BHC	319-84-6	0.5	µg/kg	<0.50	5 µg/kg	78.8	17.6	136
EP131A: beta-BHC	319-85-7	0.5	µg/kg	<0.50	5 µg/kg	72.2	30.5	131
EP131A: delta-BHC	319-86-8	0.5	µg/kg	<0.50	5 µg/kg	54.9	37.0	140
EP131A: 4.4`-DDD	72-54-8	0.5	µg/kg	<0.50	5 µg/kg	94.2	25.9	141
EP131A: 4.4`-DDE	72-55-9	0.5	µg/kg	<0.50	5 µg/kg	80.8	35.0	129
EP131A: 4.4`-DDT	50-29-3	0.5	µg/kg	<0.50	5 µg/kg	84.8	23.4	138
EP131A: Sum of DDD + DDE + DDT	72-54-8/72-5 5-9/50-2	0.5	µg/kg	<0.50	----	----	----	----
EP131A: Dieldrin	60-57-1	0.5	µg/kg	<0.50	5 µg/kg	75.6	30.2	140

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report		
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP131A: Organochlorine Pesticides (QCLot: 5307807) - continued								
EP131A: alpha-Endosulfan	959-98-8	0.5	µg/kg	<0.50	5 µg/kg	99.6	38.0	140
EP131A: beta-Endosulfan	33213-65-9	0.5	µg/kg	<0.50	5 µg/kg	94.5	32.0	152
EP131A: Endosulfan sulfate	1031-07-8	0.5	µg/kg	<0.50	5 µg/kg	65.0	36.0	155
EP131A: Endosulfan (sum)	115-29-7	0.5	µg/kg	<0.50	----	----	----	----
EP131A: Endrin	72-20-8	0.5	µg/kg	<0.50	5 µg/kg	148	25.8	158
EP131A: Endrin aldehyde	7421-93-4	0.5	µg/kg	<0.50	5 µg/kg	66.9	20.1	118
EP131A: Endrin ketone	53494-70-5	0.5	µg/kg	<0.50	5 µg/kg	93.2	13.4	135
EP131A: Heptachlor	76-44-8	0.5	µg/kg	<0.50	5 µg/kg	91.3	39.0	155
EP131A: Heptachlor epoxide	1024-57-3	0.5	µg/kg	<0.50	5 µg/kg	84.1	34.0	148
EP131A: Hexachlorobenzene (HCB)	118-74-1	0.5	µg/kg	<0.50	5 µg/kg	70.6	26.1	152
EP131A: gamma-BHC	58-89-9	0.25	µg/kg	<0.25	5 µg/kg	84.4	31.2	137
EP131A: Methoxychlor	72-43-5	0.5	µg/kg	<0.50	5 µg/kg	105	36.0	152
EP131A: cis-Chlordane	5103-71-9	0.25	µg/kg	<0.25	5 µg/kg	94.6	36.0	142
EP131A: trans-Chlordane	5103-74-2	0.25	µg/kg	<0.25	5 µg/kg	85.5	29.5	138
EP131A: Total Chlordane (sum)	----	0.25	µg/kg	<0.25	----	----	----	----
EP131B: Polychlorinated Biphenyls (as Aroclors) (QCLot: 5307798)								
EP131B: Total Polychlorinated biphenyls	----	5	µg/kg	<5.0	50 µg/kg	52.9	45.0	115
EP131B: Aroclor 1016	12674-11-2	5	µg/kg	<5.0	----	----	----	----
EP131B: Aroclor 1221	11104-28-2	5	µg/kg	<5.0	----	----	----	----
EP131B: Aroclor 1232	11141-16-5	5	µg/kg	<5.0	----	----	----	----
EP131B: Aroclor 1242	53469-21-9	5	µg/kg	<5.0	----	----	----	----
EP131B: Aroclor 1248	12672-29-6	5	µg/kg	<5.0	----	----	----	----
EP131B: Aroclor 1254	11097-69-1	5	µg/kg	<5.0	50 µg/kg	52.9	45.0	115
EP131B: Aroclor 1260	11096-82-5	5	µg/kg	<5.0	----	----	----	----
EP131B: Polychlorinated Biphenyls (as Aroclors) (QCLot: 5307805)								
EP131B: Total Polychlorinated biphenyls	----	5	µg/kg	<5.0	50 µg/kg	60.6	45.0	115
EP131B: Aroclor 1016	12674-11-2	5	µg/kg	<5.0	----	----	----	----
EP131B: Aroclor 1221	11104-28-2	5	µg/kg	<5.0	----	----	----	----
EP131B: Aroclor 1232	11141-16-5	5	µg/kg	<5.0	----	----	----	----
EP131B: Aroclor 1242	53469-21-9	5	µg/kg	<5.0	----	----	----	----
EP131B: Aroclor 1248	12672-29-6	5	µg/kg	<5.0	----	----	----	----
EP131B: Aroclor 1254	11097-69-1	5	µg/kg	<5.0	50 µg/kg	60.6	45.0	115
EP131B: Aroclor 1260	11096-82-5	5	µg/kg	<5.0	----	----	----	----
EP132B: Polynuclear Aromatic Hydrocarbons (QCLot: 5307818)								

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP132B: Polynuclear Aromatic Hydrocarbons (QCLot: 5307818) - continued								
EP132B-SD: Naphthalene	91-20-3	5	µg/kg	<5	25 µg/kg	95.4	63.0	129
EP132B-SD: 2-Methylnaphthalene	91-57-6	5	µg/kg	<5	25 µg/kg	76.1	64.0	128
EP132B-SD: Acenaphthylene	208-96-8	4	µg/kg	<4	25 µg/kg	82.7	65.0	129
EP132B-SD: Acenaphthene	83-32-9	4	µg/kg	<4	25 µg/kg	83.3	68.0	132
EP132B-SD: Fluorene	86-73-7	4	µg/kg	<4	25 µg/kg	81.5	68.0	124
EP132B-SD: Phenanthrene	85-01-8	4	µg/kg	<4	25 µg/kg	84.5	64.0	134
EP132B-SD: Anthracene	120-12-7	4	µg/kg	<4	25 µg/kg	83.3	65.0	131
EP132B-SD: Fluoranthene	206-44-0	4	µg/kg	<4	25 µg/kg	82.7	64.0	130
EP132B-SD: Pyrene	129-00-0	4	µg/kg	<4	25 µg/kg	80.8	67.0	133
EP132B-SD: Benz(a)anthracene	56-55-3	4	µg/kg	<4	25 µg/kg	86.8	62.0	130
EP132B-SD: Chrysene	218-01-9	4	µg/kg	<4	25 µg/kg	81.1	65.0	133
EP132B-SD: Benzo(b+j)fluoranthene	205-99-2 205-82-3	4	µg/kg	<4	25 µg/kg	90.7	68.0	120
EP132B-SD: Benzo(k)fluoranthene	207-08-9	4	µg/kg	<4	25 µg/kg	83.6	61.0	133
EP132B-SD: Benzo(e)pyrene	192-97-2	4	µg/kg	<4	25 µg/kg	81.3	63.0	127
EP132B-SD: Benzo(a)pyrene	50-32-8	4	µg/kg	<4	25 µg/kg	81.5	66.0	118
EP132B-SD: Perylene	198-55-0	4	µg/kg	<4	25 µg/kg	80.1	69.0	119
EP132B-SD: Benzo(g.h.i)perylene	191-24-2	4	µg/kg	<4	25 µg/kg	80.8	66.0	120
EP132B-SD: Dibenz(a.h)anthracene	53-70-3	4	µg/kg	<4	25 µg/kg	80.1	64.0	122
EP132B-SD: Indeno(1.2.3.cd)pyrene	193-39-5	4	µg/kg	<4	25 µg/kg	79.8	64.0	120
EP132B-SD: Coronene	191-07-1	5	µg/kg	<5	25 µg/kg	83.2	68.0	136
EP132B-SD: Sum of PAHs	----	4	µg/kg	<4	----	----	----	----

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	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EG035T: Total Recoverable Mercury by FIMS (Low Level) (QCLot: 5305910)							
EB2328877-002	RF6	EG035T-LL: Mercury	7439-97-6	0.5 mg/kg	90.5	70.0	130
EG035T: Total Recoverable Mercury by FIMS (Low Level) (QCLot: 5305914)							
EB2328877-033	B9-1	EG035T-LL: Mercury	7439-97-6	0.5 mg/kg	92.4	70.0	130
EG020-SD: Total Metals in Sediments by ICPMS (QCLot: 5305911)							

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EG020-SD: Total Metals in Sediments by ICPMS (QCLot: 5305911) - continued							
EB2328877-002	RF6	EG020-SD: Arsenic	7440-38-2	50 mg/kg	85.8	70.0	130
		EG020-SD: Cadmium	7440-43-9	50 mg/kg	92.2	70.0	130
		EG020-SD: Chromium	7440-47-3	50 mg/kg	93.5	70.0	130
		EG020-SD: Copper	7440-50-8	250 mg/kg	89.6	70.0	130
		EG020-SD: Lead	7439-92-1	250 mg/kg	90.9	70.0	130
		EG020-SD: Nickel	7440-02-0	50 mg/kg	89.3	70.0	130
		EG020-SD: Zinc	7440-66-6	250 mg/kg	90.8	70.0	130
EG020-SD: Total Metals in Sediments by ICPMS (QCLot: 5305915)							
EB2328877-033	B9-1	EG020-SD: Arsenic	7440-38-2	50 mg/kg	85.4	70.0	130
		EG020-SD: Cadmium	7440-43-9	50 mg/kg	91.5	70.0	130
		EG020-SD: Chromium	7440-47-3	50 mg/kg	88.1	70.0	130
		EG020-SD: Copper	7440-50-8	250 mg/kg	88.8	70.0	130
		EG020-SD: Lead	7439-92-1	250 mg/kg	89.3	70.0	130
		EG020-SD: Nickel	7440-02-0	50 mg/kg	88.2	70.0	130
		EG020-SD: Zinc	7440-66-6	250 mg/kg	92.3	70.0	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 5305899)							
EB2328877-013	B13-1	EK059G: Nitrite + Nitrate as N (Sol.)	----	2 mg/kg	95.8	70.0	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 5305901)							
EB2328877-013	B13-1	EK061G: Total Kjeldahl Nitrogen as N	----	500 mg/kg	100	70.0	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 5305900)							
EB2328877-013	B13-1	EK067G: Total Phosphorus as P	----	100 mg/kg	# 69.8	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 5305886)							
EB2328877-016	Trip Blank 070338	EP080: C6 - C9 Fraction	----	8 mg/kg	98.7	70.0	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5305886)							
EB2328877-016	Trip Blank 070338	EP080: C6 - C10 Fraction	C6_C10	8 mg/kg	97.4	70.0	130
EP080: BTEXN (QCLot: 5305886)							
EB2328877-016	Trip Blank 070338	EP080: Benzene	71-43-2	2 mg/kg	85.6	70.0	130
		EP080: Toluene	108-88-3	2 mg/kg	84.6	70.0	130
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons (QCLot: 5305884)							
EB2328877-013	B13-1	EP080-SD: C6 - C9 Fraction	----	8 mg/kg	94.8	70.0	130
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons (QCLot: 5305896)							
EB2328877-013	B13-1	EP071-SD-SV: C10 - C14 Fraction	----	189 mg/kg	92.3	70.0	130
		EP071-SD-SV: C15 - C28 Fraction	----	203 mg/kg	89.1	70.0	130
EP080-SD / EP071-SD: Total Recoverable Hydrocarbons (QCLot: 5305884)							
EB2328877-013	B13-1	EP080-SD: C6 - C10 Fraction	C6_C10	8 mg/kg	92.2	70.0	130

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP080-SD / EP071-SD: Total Recoverable Hydrocarbons (QCLot: 5305896)							
EB2328877-013	B13-1	EP071-SD-SV: >C10 - C16 Fraction	----	251 mg/kg	90.5	70.0	130
		EP071-SD-SV: >C16 - C34 Fraction	----	133 mg/kg	91.0	70.0	130
EP080-SD: BTEXN (QCLot: 5305884)							
EB2328877-013	B13-1	EP080-SD: Benzene	71-43-2	2 mg/kg	79.2	70.0	130
		EP080-SD: Toluene	108-88-3	2 mg/kg	80.9	70.0	130
EP090: Organotin Compounds (QCLot: 5305865)							
EB2328877-002	RF6	EP090: Monobutyltin	78763-54-9	1.25 µgSn/kg	# 12.4	20.0	130
		EP090: Dibutyltin	1002-53-5	1.25 µgSn/kg	98.3	20.0	130
		EP090: Tributyltin	56573-85-4	1.25 µgSn/kg	91.6	20.0	130
EP090: Organotin Compounds (QCLot: 5305866)							
EB2328877-033	B9-1	EP090: Monobutyltin	78763-54-9	1.25 µgSn/kg	# Not Determined	20.0	130
		EP090: Dibutyltin	1002-53-5	1.25 µgSn/kg	# Not Determined	20.0	130
		EP090: Tributyltin	56573-85-4	1.25 µgSn/kg	# 14.7	20.0	130
EP130A: Organophosphorus Pesticides (Ultra-trace) (QCLot: 5307797)							
EB2328877-008	B13-8	EP130: Bromophos-ethyl	4824-78-6	50 µg/kg	57.9	36.0	144
		EP130: Carbophenothion	786-19-6	50 µg/kg	55.0	38.0	120
		EP130: Chlorfenvinphos (E)	18708-86-6	5 µg/kg	84.9	49.0	157
		EP130: Chlorfenvinphos (Z)	18708-87-7	50 µg/kg	82.6	53.0	145
		EP130: Chlorpyrifos	2921-88-2	50 µg/kg	63.4	60.0	140
		EP130: Chlorpyrifos-methyl	5598-13-0	50 µg/kg	64.9	56.0	126
		EP130: Demeton-S-methyl	919-86-8	50 µg/kg	56.0	9.70	148
		EP130: Diazinon	333-41-5	50 µg/kg	60.3	60.0	122
		EP130: Dichlorvos	62-73-7	50 µg/kg	72.4	33.0	123
		EP130: Dimethoate	60-51-5	50 µg/kg	55.0	36.0	142
		EP130: Ethion	563-12-2	50 µg/kg	61.6	48.0	136
		EP130: Fenamiphos	22224-92-6	50 µg/kg	78.4	42.0	136
		EP130: Fenthion	55-38-9	50 µg/kg	55.0	35.0	131
		EP130: Malathion	121-75-5	50 µg/kg	65.5	55.0	141
		EP130: Azinphos Methyl	86-50-0	50 µg/kg	60.1	23.5	132
		EP130: Monocrotophos	6923-22-4	50 µg/kg	60.5	35.0	153
		EP130: Parathion	56-38-2	50 µg/kg	63.1	57.0	147
		EP130: Parathion-methyl	298-00-0	50 µg/kg	63.6	48.0	140
		EP130: Pirimphos-ethyl	23505-41-1	50 µg/kg	57.5	45.0	137
		EP130: Prothiofos	34643-46-4	50 µg/kg	62.0	51.0	137
EP130A: Organophosphorus Pesticides (Ultra-trace) (QCLot: 5307806)							
EB2328877-018	B2-0	EP130: Bromophos-ethyl	4824-78-6	50 µg/kg	59.1	36.0	144

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP130A: Organophosphorus Pesticides (Ultra-trace) (QCLot: 5307806) - continued							
EB2328877-018	B2-0	EP130: Carbophenothion	786-19-6	50 µg/kg	52.1	38.0	120
		EP130: Chlorfenvinphos (E)	18708-86-6	5 µg/kg	67.2	49.0	157
		EP130: Chlorfenvinphos (Z)	18708-87-7	50 µg/kg	74.1	53.0	145
		EP130: Chlorpyrifos	2921-88-2	50 µg/kg	61.1	60.0	140
		EP130: Chlorpyrifos-methyl	5598-13-0	50 µg/kg	67.5	56.0	126
		EP130: Demeton-S-methyl	919-86-8	50 µg/kg	75.7	9.70	148
		EP130: Diazinon	333-41-5	50 µg/kg	65.0	60.0	122
		EP130: Dichlorvos	62-73-7	50 µg/kg	63.1	33.0	123
		EP130: Dimethoate	60-51-5	50 µg/kg	74.3	36.0	142
		EP130: Ethion	563-12-2	50 µg/kg	60.2	48.0	136
		EP130: Fenamiphos	22224-92-6	50 µg/kg	64.1	42.0	136
		EP130: Fenthion	55-38-9	50 µg/kg	59.6	35.0	131
		EP130: Malathion	121-75-5	50 µg/kg	61.8	55.0	141
		EP130: Azinphos Methyl	86-50-0	50 µg/kg	83.7	23.5	132
		EP130: Monocrotophos	6923-22-4	50 µg/kg	54.3	35.0	153
		EP130: Parathion	56-38-2	50 µg/kg	58.0	57.0	147
		EP130: Parathion-methyl	298-00-0	50 µg/kg	67.9	48.0	140
		EP130: Pirimphos-ethyl	23505-41-1	50 µg/kg	65.8	45.0	137
		EP130: Prothiofos	34643-46-4	50 µg/kg	63.2	51.0	137
EP131A: Organochlorine Pesticides (QCLot: 5307796)							
EB2328877-008	B13-8	EP131A: Aldrin	309-00-2	5 µg/kg	64.4	23.4	153
		EP131A: alpha-BHC	319-84-6	5 µg/kg	62.5	17.6	156
		EP131A: beta-BHC	319-85-7	5 µg/kg	59.3	24.9	153
		EP131A: delta-BHC	319-86-8	5 µg/kg	46.3	25.2	147
		EP131A: 4.4`-DDD	72-54-8	5 µg/kg	63.6	25.9	150
		EP131A: 4.4`-DDE	72-55-9	5 µg/kg	67.8	31.2	125
		EP131A: 4.4`-DDT	50-29-3	5 µg/kg	78.2	23.4	163
		EP131A: Dieldrin	60-57-1	5 µg/kg	65.0	30.2	140
		EP131A: alpha-Endosulfan	959-98-8	5 µg/kg	71.8	28.8	135
		EP131A: beta-Endosulfan	33213-65-9	5 µg/kg	69.4	22.6	141
		EP131A: Endosulfan sulfate	1031-07-8	5 µg/kg	72.5	16.1	156
		EP131A: Endrin	72-20-8	5 µg/kg	108	17.7	162
		EP131A: Endrin aldehyde	7421-93-4	5 µg/kg	60.7	20.1	116
		EP131A: Endrin ketone	53494-70-5	5 µg/kg	73.2	13.4	151
		EP131A: Heptachlor	76-44-8	5 µg/kg	70.5	23.8	170
		EP131A: Heptachlor epoxide	1024-57-3	5 µg/kg	63.7	28.3	140
		EP131A: Hexachlorobenzene (HCB)	118-74-1	5 µg/kg	47.0	17.7	144
		EP131A: gamma-BHC	58-89-9	5 µg/kg	57.3	21.8	158
		EP131A: Methoxychlor	72-43-5	5 µg/kg	55.6	24.4	158

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP131A: Organochlorine Pesticides (QCLot: 5307796) - continued							
EB2328877-008	B13-8	EP131A: cis-Chlordane	5103-71-9	5 µg/kg	61.2	27.3	139
		EP131A: trans-Chlordane	5103-74-2	5 µg/kg	70.4	29.5	138
EP131A: Organochlorine Pesticides (QCLot: 5307807)							
EB2328877-018	B2-0	EP131A: Aldrin	309-00-2	5 µg/kg	53.3	23.4	153
		EP131A: alpha-BHC	319-84-6	5 µg/kg	51.2	17.6	156
		EP131A: beta-BHC	319-85-7	5 µg/kg	50.8	24.9	153
		EP131A: delta-BHC	319-86-8	5 µg/kg	44.7	25.2	147
		EP131A: 4.4`-DDD	72-54-8	5 µg/kg	62.1	25.9	150
		EP131A: 4.4`-DDE	72-55-9	5 µg/kg	52.5	31.2	125
		EP131A: 4.4`-DDT	50-29-3	5 µg/kg	108	23.4	163
		EP131A: Dieldrin	60-57-1	5 µg/kg	60.4	30.2	140
		EP131A: alpha-Endosulfan	959-98-8	5 µg/kg	63.8	28.8	135
		EP131A: beta-Endosulfan	33213-65-9	5 µg/kg	66.5	22.6	141
		EP131A: Endosulfan sulfate	1031-07-8	5 µg/kg	42.6	16.1	156
		EP131A: Endrin	72-20-8	5 µg/kg	103	17.7	162
		EP131A: Endrin aldehyde	7421-93-4	5 µg/kg	64.5	20.1	116
		EP131A: Endrin ketone	53494-70-5	5 µg/kg	71.0	13.4	151
		EP131A: Heptachlor	76-44-8	5 µg/kg	59.6	23.8	170
		EP131A: Heptachlor epoxide	1024-57-3	5 µg/kg	57.4	28.3	140
		EP131A: Hexachlorobenzene (HCB)	118-74-1	5 µg/kg	42.6	17.7	144
		EP131A: gamma-BHC	58-89-9	5 µg/kg	53.5	21.8	158
		EP131A: Methoxychlor	72-43-5	5 µg/kg	77.2	24.4	158
		EP131A: cis-Chlordane	5103-71-9	5 µg/kg	52.0	27.3	139
		EP131A: trans-Chlordane	5103-74-2	5 µg/kg	53.3	29.5	138
EP131B: Polychlorinated Biphenyls (as Aroclors) (QCLot: 5307798)							
EB2328877-008	B13-8	EP131B: Total Polychlorinated biphenyls	----	50 µg/kg	71.5	44.0	136
		EP131B: Aroclor 1254	11097-69-1	50 µg/kg	71.5	44.0	136
EP131B: Polychlorinated Biphenyls (as Aroclors) (QCLot: 5307805)							
EB2328877-022	B5-0	EP131B: Total Polychlorinated biphenyls	----	50 µg/kg	70.4	44.0	136
		EP131B: Aroclor 1254	11097-69-1	50 µg/kg	70.4	44.0	136
EP132B: Polynuclear Aromatic Hydrocarbons (QCLot: 5307818)							
EB2328877-013	B13-1	EP132B-SD: Naphthalene	91-20-3	25 µg/kg	90.8	70.0	130
		EP132B-SD: 2-Methylnaphthalene	91-57-6	25 µg/kg	79.7	70.0	130
		EP132B-SD: Acenaphthylene	208-96-8	25 µg/kg	103	70.0	130
		EP132B-SD: Acenaphthene	83-32-9	25 µg/kg	86.3	70.0	130
		EP132B-SD: Fluorene	86-73-7	25 µg/kg	85.4	70.0	130
		EP132B-SD: Phenanthrene	85-01-8	25 µg/kg	84.1	70.0	130
		EP132B-SD: Anthracene	120-12-7	25 µg/kg	91.3	70.0	130

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP132B: Polynuclear Aromatic Hydrocarbons (QCLot: 5307818) - continued							
EB2328877-013	B13-1	EP132B-SD: Fluoranthene	206-44-0	25 µg/kg	76.3	70.0	130
		EP132B-SD: Pyrene	129-00-0	25 µg/kg	74.8	70.0	130
		EP132B-SD: Benz(a)anthracene	56-55-3	25 µg/kg	101	70.0	130
		EP132B-SD: Chrysene	218-01-9	25 µg/kg	86.6	70.0	130
		EP132B-SD: Benzo(b+j)fluoranthene	205-99-2 205-82-3	25 µg/kg	79.9	70.0	130
		EP132B-SD: Benzo(k)fluoranthene	207-08-9	25 µg/kg	82.6	70.0	130
		EP132B-SD: Benzo(e)pyrene	192-97-2	25 µg/kg	78.0	70.0	130
		EP132B-SD: Benzo(a)pyrene	50-32-8	25 µg/kg	96.2	70.0	130
		EP132B-SD: Perylene	198-55-0	25 µg/kg	83.4	70.0	130
		EP132B-SD: Benzo(g.h.i)perylene	191-24-2	25 µg/kg	85.3	70.0	130
		EP132B-SD: Dibenz(a.h)anthracene	53-70-3	25 µg/kg	89.6	70.0	130
		EP132B-SD: Indeno(1.2.3.cd)pyrene	193-39-5	25 µg/kg	91.6	70.0	130
		EP132B-SD: Coronene	191-07-1	25 µg/kg	87.7	70.0	130

CERTIFICATE OF ANALYSIS

Work Order	: **EB2328956**	Page	: 1 of 5
Client	: **BMT COMMERCIAL AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: MACKENZIE STACEY	Contact	: Nathan King
Address	: PO BOX 203 SPRING HILL BRISBANE QLD 4004	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: ----	Telephone	: +61-7-3243 7222
Project	: B23621 PoB Monitoring 2019-2025	Date Samples Received	: 14-Sep-2023 15:00
Order number	: ----	Date Analysis Commenced	: 09-Oct-2023
C-O-C number	: ----	Issue Date	: 11-Oct-2023 16:22
Sampler	: ANGUS WILLIAMS, CRAIG HEATHERINGTON, MACKENZIE STACEY		
Site	: ----		
Quote number	: BN/016/19		
No. of samples received	: 15		
No. of samples analysed	: 15		

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

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*
Kim McCabe	Senior Inorganic Chemist	Brisbane External Subcontracting, Stafford, QLD

General Comments

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

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

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

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

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

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

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- Radiological work undertaken by ALS Laboratory Group (Ceska Lipa) under CAI accreditation No. L1163. Report No. $$. NATA and CAI accreditations' are both recognised under ILAC.

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	B13-8	B13-1	B5-0	B5-1	B5-1b
			Sampling date / time	13-Sep-2023 00:00	13-Sep-2023 00:00	12-Sep-2023 00:00	12-Sep-2023 00:00	12-Sep-2023 00:00
Compound	CAS Number	LOR	Unit	EB2328956-008	EB2328956-013	EB2328956-022	EB2328956-023	EB2328956-024
				Result	Result	Result	Result	Result
Radionuclides / Activity								
Gross alpha	----	500	Bq/kg DW	<500	<500	**720**	**610**	**720**
Gross beta	----	500	Bq/kg DW	<500	<500	<500	**550**	**540**

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	B5-1c	B6-3	B7-1	B9-1	B11-8
			Sampling date / time	12-Sep-2023 00:00	12-Sep-2023 00:00	12-Sep-2023 00:00	14-Sep-2023 00:00	14-Sep-2023 00:00
Compound	CAS Number	LOR	Unit	EB2328956-025	EB2328956-026	EB2328956-027	EB2328956-033	EB2328956-038
				Result	Result	Result	Result	Result
Radionuclides / Activity								
Gross alpha	----	500	Bq/kg DW	**640**	<500	**540**	<500	**740**
Gross beta	----	500	Bq/kg DW	**620**	**630**	**550**	<500	**530**

Analytical Results

Sub-Matrix: **SEDIMENT** (Matrix: **SOIL**)			Sample ID	**B12-1**	**B15-3**	**B15-2**	**B10-6**	**B10-6 b**
			Sampling date / time	14-Sep-2023 00:00	14-Sep-2023 00:00	14-Sep-2023 00:00	14-Sep-2023 00:00	14-Sep-2023 00:00
Compound	*CAS Number*	*LOR*	*Unit*	**EB2328956-039**	**EB2328956-041**	**EB2328956-042**	**EB2328956-046**	**EB2328956-047**
				Result	Result	Result	Result	Result
Radionuclides / Activity								
Gross alpha	----	500	Bq/kg DW	**1040**	**640**	<500	<500	**640**
Gross beta	----	500	Bq/kg DW	**520**	<500	<500	**560**	**560**

QUALITY CONTROL REPORT

Work Order	: **EB2328956**	Page	: 1 of 3
Client	: **BMT COMMERCIAL AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: MACKENZIE STACEY	Contact	: Nathan King
Address	: PO BOX 203 SPRING HILL BRISBANE QLD 4004	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: ----	Telephone	: +61-7-3243 7222
Project	: B23621 PoB Monitoring 2019-2025	Date Samples Received	: 14-Sep-2023
Order number	: ----	Date Analysis Commenced	: 09-Oct-2023
C-O-C number	: ----	Issue Date	: 11-Oct-2023
Sampler	: ANGUS WILLIAMS, CRAIG HEATHERINGTON, MACKENZIE STACEY		
Site	: ----		
Quote number	: BN/016/19		
No. of samples received	: 15		
No. of samples analysed	: 15		

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

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

This Quality Control Report contains the following information:

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Kim McCabe	Senior Inorganic Chemist	Brisbane External Subcontracting, Stafford, QLD

General Comments

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

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

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

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

Laboratory Duplicate (DUP) Report

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

- **No Laboratory Duplicate (DUP) Results are required to be reported.**

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.

- **No Method Blank (MB) or Laboratory Control Spike (LCS) Results are required to be reported.**

Matrix Spike (MS) Report

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

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

CERTIFICATE OF ANALYSIS

Work Order	: **EB2329802**	Page	: 1 of 8
Client	: **BMT COMMERCIAL AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: MACKENZIE STACEY	Contact	: Nathan King
Address	: PO BOX 203 SPRING HILL BRISBANE QLD 4004	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: ----	Telephone	: +61-7-3243 7222
Project	: B23621 PoB Monitoring 2019-2025	Date Samples Received	: 27-Sep-2023 11:30
Order number	: ----	Date Analysis Commenced	: 29-Sep-2023
C-O-C number	: ----	Issue Date	: 29-Sep-2023 15:12
Sampler	: ANGUS WILLIAMS, CRAIG HEATHERINGTON, MACKENZIE STACEY		
Site	: ----		
Quote number	: BN/016/19		
No. of samples received	: 15		
No. of samples analysed	: 15		

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

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*
Ben Felgendrejeris	Senior Acid Sulfate Soil Chemist	Brisbane Acid Sulphate Soils, Stafford, QLD

General Comments

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

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

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

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

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

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

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- ASS: EA029 (SPOCAS): Analysis is performed as per the Acid Sulfate Soils Laboratory Methods Guidelines (2004) and the updated National Acid Sulfate Soils Guidance: National acid sulfate soils identification and laboratory methods manual, Department of Agriculture and Water Resources, Canberra, ACT (2018)
- ASS: EA033 (CRS Suite): Analysis is performed as per the Acid Sulfate Soils Laboratory Methods Guidelines (2004) and the updated National Acid Sulfate Soils Guidance: National acid sulfate soils identification and laboratory methods manual, Department of Agriculture and Water Resources, Canberra, ACT (2018)
- ASS: EA029 (SPOCAS): Retained Acidity not required because pH KCl greater than or equal to 4.5
- ASS: EA033 (CRS Suite):Retained Acidity not required because pH KCl greater than or equal to 4.5
- ASS: EA029 (SPOCAS): Laboratory determinations of ANC needs to be corroborated by effectiveness of the measured ANC in relation to incubation ANC. Unless corroborated, the results of ANC testing should be discounted when determining Net Acidity for comparison with action criteria, or for the determination of the acidity hazard and required liming amounts.
- ASS: EA033 (CRS Suite): Laboratory determinations of ANC needs to be corroborated by effectiveness of the measured ANC in relation to incubation ANC. Unless corroborated, the results of ANC testing should be discounted when determining Net Acidity for comparison with action criteria, or for the determination of the acidity hazard and required liming amounts.
- ASS: EA033 (CRS Suite): Liming rate is calculated and reported on a dry weight basis assuming use of fine agricultural lime (CaCO3) and using a safety factor of 1.5 to allow for non-homogeneous mixing and poor reactivity of lime. For conversion of Liming Rate from 'kg/t dry weight' to 'kg/m3 in-situ soil', multiply 'reported results' x 'wet bulk density of soil in t/m3'.
- ASS: EA029 (SPOCAS): Liming rate is calculated and reported on a dry weight basis assuming use of fine agricultural lime (CaCO3) and using a safety factor of 1.5 to allow for non-homogeneous mixing and poor reactivity of lime. For conversion of Liming Rate from kg/t dry weight to kg/m3 in-situ soil, multiply reported results x wet bulk density of soil in t/m3.

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	B5-0	B5-1	B5-1b	B5-1c	B6-3
			Sampling date / time	12-Sep-2023 00:00	12-Sep-2023 00:00	12-Sep-2023 00:00	12-Sep-2023 00:00	12-Sep-2023 00:00
Compound	CAS Number	LOR	Unit	EB2329802-001	EB2329802-002	EB2329802-003	EB2329802-004	EB2329802-005
				Result	Result	Result	Result	Result
EA029-A: pH Measurements								
pH KCl (23A)	----	0.1	pH Unit	7.8	8.4	8.2	8.3	8.3
pH OX (23B)	----	0.1	pH Unit	6.7	6.6	6.9	3.8	6.3
EA029-B: Acidity Trail								
Titratable Actual Acidity (23F)	----	2	mole H+ / t	<2	<2	<2	<2	<2
Titratable Peroxide Acidity (23G)	----	2	mole H+ / t	<2	<2	<2	132	6
Titratable Sulfidic Acidity (23H)	----	2	mole H+ / t	<2	<2	<2	132	6
sulfidic - Titratable Actual Acidity (s-23F)	----	0.020	% pyrite S	<0.020	<0.020	<0.020	<0.020	<0.020
sulfidic - Titratable Peroxide Acidity (s-23G)	----	0.020	% pyrite S	<0.020	<0.020	<0.020	0.212	<0.020
sulfidic - Titratable Sulfidic Acidity (s-23H)	----	0.020	% pyrite S	<0.020	<0.020	<0.020	0.212	<0.020
EA029-C: Sulfur Trail								
KCl Extractable Sulfur (23Ce)	----	0.020	% S	0.118	0.128	0.142	0.153	0.089
Peroxide Sulfur (23De)	----	0.020	% S	0.355	0.743	0.330	1.00	0.481
Peroxide Oxidisable Sulfur (23E)	----	0.020	% S	0.237	0.614	0.188	0.849	0.391
acidity - Peroxide Oxidisable Sulfur (a-23E)	----	10	mole H+ / t	148	383	118	530	244
EA029-D: Calcium Values								
KCl Extractable Calcium (23Vh)	----	0.020	% Ca	0.246	0.271	0.287	0.302	0.255
Peroxide Calcium (23Wh)	----	0.020	% Ca	0.337	0.863	0.385	0.617	0.347
Acid Reacted Calcium (23X)	----	0.020	% Ca	0.091	0.592	0.098	0.315	0.092
acidity - Acid Reacted Calcium (a-23X)	----	10	mole H+ / t	45	296	49	157	46
sulfidic - Acid Reacted Calcium (s-23X)	----	0.020	% S	0.072	0.474	0.078	0.252	0.073
EA029-E: Magnesium Values								
KCl Extractable Magnesium (23Sm)	----	0.020	% Mg	0.326	0.247	0.322	0.309	0.303
Peroxide Magnesium (23Tm)	----	0.020	% Mg	0.389	0.340	0.366	0.409	0.353
Acid Reacted Magnesium (23U)	----	0.020	% Mg	0.063	0.092	0.043	0.100	0.050
Acidity - Acid Reacted Magnesium (a-23U)	----	10	mole H+ / t	52	76	36	82	41
sulfidic - Acid Reacted Magnesium (s-23U)	----	0.020	% S	0.084	0.122	0.057	0.132	0.066
EA029-F: Excess Acid Neutralising Capacity								
Excess Acid Neutralising Capacity (23Q)	----	0.020	% CaCO3	0.713	0.813	0.798	----	----
acidity - Excess Acid Neutralising Capacity (a-23Q)	----	10	mole H+ / t	142	162	160	----	----

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	B5-0	B5-1	B5-1b	B5-1c	B6-3
			Sampling date / time	12-Sep-2023 00:00	12-Sep-2023 00:00	12-Sep-2023 00:00	12-Sep-2023 00:00	12-Sep-2023 00:00
Compound	CAS Number	LOR	Unit	EB2329802-001	EB2329802-002	EB2329802-003	EB2329802-004	EB2329802-005
				Result	Result	Result	Result	Result
EA029-F: Excess Acid Neutralising Capacity - Continued								
sulfidic - Excess Acid Neutralising Capacity (s-23Q)	----	0.020	% S	**0.228**	**0.260**	**0.256**	**----**	**----**
EA029-H: Acid Base Accounting								
ANC Fineness Factor	----	0.5	-	**1.5**	**1.5**	**1.5**	**1.5**	**1.5**
Net Acidity (sulfur units)	----	0.02	% S	<0.02	**0.03**	<0.02	**0.42**	**0.14**
Net Acidity (acidity units)	----	10	mole H+ / t	<10	**19**	<10	**265**	**85**
Liming Rate	----	1	kg CaCO3/t	<1	**1**	<1	**20**	**6**
Net Acidity excluding ANC (sulfur units)	----	0.02	% S	**0.24**	**0.61**	**0.19**	**0.85**	**0.39**
Net Acidity excluding ANC (acidity units)	----	10	mole H+ / t	**148**	**383**	**118**	**530**	**244**
Liming Rate excluding ANC	----	1	kg CaCO3/t	**11**	**29**	**9**	**40**	**18**
EA033-A: Actual Acidity								
pH KCl (23A)	----	0.1	pH Unit	**7.8**	**8.4**	**8.2**	**8.3**	**8.3**
Titratable Actual Acidity (23F)	----	2	mole H+ / t	<2	<2	<2	<2	<2
sulfidic - Titratable Actual Acidity (s-23F)	----	0.02	% pyrite S	<0.02	<0.02	<0.02	<0.02	<0.02
EA033-B: Potential Acidity								
Chromium Reducible Sulfur (22B)	----	0.005	% S	**0.205**	**0.595**	**0.156**	**0.590**	**0.392**
acidity - Chromium Reducible Sulfur (a-22B)	----	10	mole H+ / t	**128**	**371**	**97**	**368**	**244**
EA033-C: Acid Neutralising Capacity								
Acid Neutralising Capacity (19A2)	----	0.01	% CaCO3	**2.05**	**3.48**	**2.19**	**3.00**	**2.68**
acidity - Acid Neutralising Capacity (a-19A2)	----	10	mole H+ / t	**410**	**696**	**438**	**600**	**534**
sulfidic - Acid Neutralising Capacity (s-19A2)	----	0.01	% pyrite S	**0.66**	**1.12**	**0.70**	**0.96**	**0.86**
EA033-E: Acid Base Accounting								
ANC Fineness Factor	----	0.5	-	**1.5**	**1.5**	**1.5**	**1.5**	**1.5**
Net Acidity (sulfur units)	----	0.02	% S	<0.02	<0.02	<0.02	<0.02	<0.02
Net Acidity (acidity units)	----	10	mole H+ / t	<10	<10	<10	<10	<10
Liming Rate	----	1	kg CaCO3/t	<1	<1	<1	<1	<1
Net Acidity excluding ANC (sulfur units)	----	0.02	% S	**0.20**	**0.59**	**0.16**	**0.59**	**0.39**
Net Acidity excluding ANC (acidity units)	----	10	mole H+ / t	**128**	**371**	**97**	**368**	**244**
Liming Rate excluding ANC	----	1	kg CaCO3/t	**10**	**28**	**7**	**28**	**18**

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	B7-1	B9-1	B10-6	B10-6b	B11-8
			Sampling date / time	12-Sep-2023 00:00	27-Sep-2023 00:00	27-Sep-2023 00:00	27-Sep-2023 00:00	27-Sep-2023 00:00
Compound	CAS Number	LOR	Unit	EB2329802-006	EB2329802-007	EB2329802-008	EB2329802-009	EB2329802-010
				Result	Result	Result	Result	Result
EA029-A: pH Measurements								
pH KCl (23A)	----	0.1	pH Unit	**8.4**	**8.6**	**8.6**	**8.4**	**8.5**
pH OX (23B)	----	0.1	pH Unit	**6.9**	**8.6**	**6.7**	**6.7**	**7.4**
EA029-B: Acidity Trail								
Titratable Actual Acidity (23F)	----	2	mole H+ / t	<2	<2	<2	<2	<2
Titratable Peroxide Acidity (23G)	----	2	mole H+ / t	<2	<2	<2	<2	<2
Titratable Sulfidic Acidity (23H)	----	2	mole H+ / t	<2	<2	<2	<2	<2
sulfidic - Titratable Actual Acidity (s-23F)	----	0.020	% pyrite S	<0.020	<0.020	<0.020	<0.020	<0.020
sulfidic - Titratable Peroxide Acidity (s-23G)	----	0.020	% pyrite S	<0.020	<0.020	<0.020	<0.020	<0.020
sulfidic - Titratable Sulfidic Acidity (s-23H)	----	0.020	% pyrite S	<0.020	<0.020	<0.020	<0.020	<0.020
EA029-C: Sulfur Trail								
KCl Extractable Sulfur (23Ce)	----	0.020	% S	**0.109**	**0.065**	**0.174**	**0.158**	**0.114**
Peroxide Sulfur (23De)	----	0.020	% S	**0.427**	**0.124**	**0.687**	**0.628**	**0.339**
Peroxide Oxidisable Sulfur (23E)	----	0.020	% S	**0.318**	**0.059**	**0.512**	**0.470**	**0.226**
acidity - Peroxide Oxidisable Sulfur (a-23E)	----	10	mole H+ / t	**198**	**37**	**320**	**293**	**141**
EA029-D: Calcium Values								
KCl Extractable Calcium (23Vh)	----	0.020	% Ca	**0.345**	**0.265**	**0.308**	**0.256**	**0.262**
Peroxide Calcium (23Wh)	----	0.020	% Ca	**0.730**	**1.14**	**0.811**	**0.691**	**0.661**
Acid Reacted Calcium (23X)	----	0.020	% Ca	**0.385**	**0.874**	**0.502**	**0.435**	**0.398**
acidity - Acid Reacted Calcium (a-23X)	----	10	mole H+ / t	**192**	**436**	**251**	**217**	**199**
sulfidic - Acid Reacted Calcium (s-23X)	----	0.020	% S	**0.308**	**0.699**	**0.402**	**0.348**	**0.319**
EA029-E: Magnesium Values								
KCl Extractable Magnesium (23Sm)	----	0.020	% Mg	**0.314**	**0.207**	**0.295**	**0.280**	**0.236**
Peroxide Magnesium (23Tm)	----	0.020	% Mg	**0.393**	**0.234**	**0.435**	**0.436**	**0.334**
Acid Reacted Magnesium (23U)	----	0.020	% Mg	**0.079**	**0.027**	**0.141**	**0.155**	**0.098**
Acidity - Acid Reacted Magnesium (a-23U)	----	10	mole H+ / t	**65**	**22**	**116**	**128**	**80**
sulfidic - Acid Reacted Magnesium (s-23U)	----	0.020	% S	**0.104**	**0.035**	**0.186**	**0.205**	**0.129**
EA029-F: Excess Acid Neutralising Capacity								
Excess Acid Neutralising Capacity (23Q)	----	0.020	% CaCO3	**0.836**	**2.32**	**0.898**	**0.848**	**1.34**
acidity - Excess Acid Neutralising Capacity (a-23Q)	----	10	mole H+ / t	**167**	**465**	**179**	**169**	**267**

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	B7-1	B9-1	B10-6	B10-6b	B11-8
			Sampling date / time	12-Sep-2023 00:00	27-Sep-2023 00:00	27-Sep-2023 00:00	27-Sep-2023 00:00	27-Sep-2023 00:00
Compound	CAS Number	LOR	Unit	EB2329802-006	EB2329802-007	EB2329802-008	EB2329802-009	EB2329802-010
				Result	Result	Result	Result	Result
EA029-F: Excess Acid Neutralising Capacity - Continued								
sulfidic - Excess Acid Neutralising Capacity (s-23Q)	----	0.020	% S	**0.267**	**0.744**	**0.287**	**0.271**	**0.428**
EA029-H: Acid Base Accounting								
ANC Fineness Factor	----	0.5	-	**1.5**	**1.5**	**1.5**	**1.5**	**1.5**
Net Acidity (sulfur units)	----	0.02	% S	<0.02	<0.02	<0.02	<0.02	<0.02
Net Acidity (acidity units)	----	10	mole H+ / t	<10	<10	<10	<10	<10
Liming Rate	----	1	kg CaCO3/t	<1	<1	<1	<1	<1
Net Acidity excluding ANC (sulfur units)	----	0.02	% S	**0.32**	**0.06**	**0.51**	**0.47**	**0.22**
Net Acidity excluding ANC (acidity units)	----	10	mole H+ / t	**198**	**37**	**320**	**293**	**141**
Liming Rate excluding ANC	----	1	kg CaCO3/t	**15**	**3**	**24**	**22**	**10**
EA033-A: Actual Acidity								
pH KCl (23A)	----	0.1	pH Unit	**8.4**	**8.6**	**8.6**	**8.4**	**8.5**
Titratable Actual Acidity (23F)	----	2	mole H+ / t	<2	<2	<2	<2	<2
sulfidic - Titratable Actual Acidity (s-23F)	----	0.02	% pyrite S	<0.02	<0.02	<0.02	<0.02	<0.02
EA033-B: Potential Acidity								
Chromium Reducible Sulfur (22B)	----	0.005	% S	**0.272**	**0.047**	**0.447**	**0.421**	**0.189**
acidity - Chromium Reducible Sulfur (a-22B)	----	10	mole H+ / t	**169**	**30**	**279**	**262**	**118**
EA033-C: Acid Neutralising Capacity								
Acid Neutralising Capacity (19A2)	----	0.01	% CaCO3	**2.96**	**6.77**	**3.29**	**2.96**	**2.65**
acidity - Acid Neutralising Capacity (a-19A2)	----	10	mole H+ / t	**592**	**1350**	**657**	**591**	**530**
sulfidic - Acid Neutralising Capacity (s-19A2)	----	0.01	% pyrite S	**0.95**	**2.17**	**1.05**	**0.95**	**0.85**
EA033-E: Acid Base Accounting								
ANC Fineness Factor	----	0.5	-	**1.5**	**1.5**	**1.5**	**1.5**	**1.5**
Net Acidity (sulfur units)	----	0.02	% S	<0.02	<0.02	<0.02	<0.02	<0.02
Net Acidity (acidity units)	----	10	mole H+ / t	<10	<10	<10	<10	<10
Liming Rate	----	1	kg CaCO3/t	<1	<1	<1	<1	<1
Net Acidity excluding ANC (sulfur units)	----	0.02	% S	**0.27**	**0.05**	**0.45**	**0.42**	**0.19**
Net Acidity excluding ANC (acidity units)	----	10	mole H+ / t	**169**	**30**	**279**	**262**	**118**
Liming Rate excluding ANC	----	1	kg CaCO3/t	**13**	**2**	**21**	**20**	**9**

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	B12-1	B13-8	B13-1	B15-2	B15-3
			Sampling date / time	27-Sep-2023 00:00	27-Sep-2023 00:00	27-Sep-2023 00:00	27-Sep-2023 00:00	27-Sep-2023 00:00
Compound	CAS Number	LOR	Unit	EB2329802-011	EB2329802-012	EB2329802-013	EB2329802-014	EB2329802-015
				Result	Result	Result	Result	Result
EA029-A: pH Measurements								
pH KCl (23A)	----	0.1	pH Unit	**8.8**	**8.7**	**8.6**	**8.9**	**9.1**
pH OX (23B)	----	0.1	pH Unit	**8.0**	**7.9**	**7.7**	**8.3**	**8.3**
EA029-B: Acidity Trail								
Titratable Actual Acidity (23F)	----	2	mole H+ / t	<2	<2	<2	<2	<2
Titratable Peroxide Acidity (23G)	----	2	mole H+ / t	<2	<2	<2	<2	<2
Titratable Sulfidic Acidity (23H)	----	2	mole H+ / t	<2	<2	<2	<2	<2
sulfidic - Titratable Actual Acidity (s-23F)	----	0.020	% pyrite S	<0.020	<0.020	<0.020	<0.020	<0.020
sulfidic - Titratable Peroxide Acidity (s-23G)	----	0.020	% pyrite S	<0.020	<0.020	<0.020	<0.020	<0.020
sulfidic - Titratable Sulfidic Acidity (s-23H)	----	0.020	% pyrite S	<0.020	<0.020	<0.020	<0.020	<0.020
EA029-C: Sulfur Trail								
KCl Extractable Sulfur (23Ce)	----	0.020	% S	**0.177**	**0.161**	**0.142**	**0.079**	**0.047**
Peroxide Sulfur (23De)	----	0.020	% S	**0.260**	**0.362**	**0.566**	**0.252**	**0.101**
Peroxide Oxidisable Sulfur (23E)	----	0.020	% S	**0.083**	**0.200**	**0.424**	**0.173**	**0.053**
acidity - Peroxide Oxidisable Sulfur (a-23E)	----	10	mole H+ / t	**52**	**125**	**264**	**108**	**33**
EA029-D: Calcium Values								
KCl Extractable Calcium (23Vh)	----	0.020	% Ca	**0.306**	**0.314**	**0.289**	**0.218**	**0.157**
Peroxide Calcium (23Wh)	----	0.020	% Ca	**1.35**	**1.53**	**1.07**	**2.34**	**0.440**
Acid Reacted Calcium (23X)	----	0.020	% Ca	**1.04**	**1.22**	**0.778**	**2.13**	**0.283**
acidity - Acid Reacted Calcium (a-23X)	----	10	mole H+ / t	**520**	**609**	**388**	**1060**	**141**
sulfidic - Acid Reacted Calcium (s-23X)	----	0.020	% S	**0.833**	**0.976**	**0.622**	**1.70**	**0.226**
EA029-E: Magnesium Values								
KCl Extractable Magnesium (23Sm)	----	0.020	% Mg	**0.159**	**0.274**	**0.231**	**0.134**	**0.093**
Peroxide Magnesium (23Tm)	----	0.020	% Mg	**0.229**	**0.396**	**0.357**	**0.204**	**0.173**
Acid Reacted Magnesium (23U)	----	0.020	% Mg	**0.070**	**0.122**	**0.125**	**0.070**	**0.080**
Acidity - Acid Reacted Magnesium (a-23U)	----	10	mole H+ / t	**58**	**100**	**103**	**58**	**66**
sulfidic - Acid Reacted Magnesium (s-23U)	----	0.020	% S	**0.092**	**0.161**	**0.166**	**0.093**	**0.105**
EA029-F: Excess Acid Neutralising Capacity								
Excess Acid Neutralising Capacity (23Q)	----	0.020	% CaCO3	**2.76**	**3.39**	**1.57**	**5.52**	**1.24**
acidity - Excess Acid Neutralising Capacity (a-23Q)	----	10	mole H+ / t	**552**	**678**	**314**	**1100**	**249**

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	B12-1	B13-8	B13-1	B15-2	B15-3
			Sampling date / time	27-Sep-2023 00:00	27-Sep-2023 00:00	27-Sep-2023 00:00	27-Sep-2023 00:00	27-Sep-2023 00:00
Compound	CAS Number	LOR	Unit	EB2329802-011	EB2329802-012	EB2329802-013	EB2329802-014	EB2329802-015
				Result	Result	Result	Result	Result
EA029-F: Excess Acid Neutralising Capacity - Continued								
sulfidic - Excess Acid Neutralising Capacity (s-23Q)	----	0.020	% S	**0.885**	**1.09**	**0.503**	**1.76**	**0.398**
EA029-H: Acid Base Accounting								
ANC Fineness Factor	----	0.5	-	**1.5**	**1.5**	**1.5**	**1.5**	**1.5**
Net Acidity (sulfur units)	----	0.02	% S	<0.02	<0.02	<0.02	<0.02	<0.02
Net Acidity (acidity units)	----	10	mole H+ / t	<10	<10	<10	<10	<10
Liming Rate	----	1	kg CaCO3/t	<1	<1	<1	<1	<1
Net Acidity excluding ANC (sulfur units)	----	0.02	% S	**0.08**	**0.20**	**0.42**	**0.17**	**0.05**
Net Acidity excluding ANC (acidity units)	----	10	mole H+ / t	**52**	**125**	**264**	**108**	**33**
Liming Rate excluding ANC	----	1	kg CaCO3/t	**4**	**9**	**20**	**8**	**2**
EA033-A: Actual Acidity								
pH KCl (23A)	----	0.1	pH Unit	**8.8**	**8.7**	**8.6**	**8.9**	**9.1**
Titratable Actual Acidity (23F)	----	2	mole H+ / t	<2	<2	<2	<2	<2
sulfidic - Titratable Actual Acidity (s-23F)	----	0.02	% pyrite S	<0.02	<0.02	<0.02	<0.02	<0.02
EA033-B: Potential Acidity								
Chromium Reducible Sulfur (22B)	----	0.005	% S	**0.150**	**0.168**	**0.360**	**0.168**	**0.052**
acidity - Chromium Reducible Sulfur (a-22B)	----	10	mole H+ / t	**94**	**105**	**225**	**105**	**32**
EA033-C: Acid Neutralising Capacity								
Acid Neutralising Capacity (19A2)	----	0.01	% CaCO3	**6.72**	**5.28**	**4.56**	**9.07**	**1.99**
acidity - Acid Neutralising Capacity (a-19A2)	----	10	mole H+ / t	**1340**	**1060**	**911**	**1810**	**398**
sulfidic - Acid Neutralising Capacity (s-19A2)	----	0.01	% pyrite S	**2.15**	**1.69**	**1.46**	**2.90**	**0.64**
EA033-E: Acid Base Accounting								
ANC Fineness Factor	----	0.5	-	**1.5**	**1.5**	**1.5**	**1.5**	**1.5**
Net Acidity (sulfur units)	----	0.02	% S	<0.02	<0.02	<0.02	<0.02	<0.02
Net Acidity (acidity units)	----	10	mole H+ / t	<10	<10	<10	<10	<10
Liming Rate	----	1	kg CaCO3/t	<1	<1	<1	<1	<1
Net Acidity excluding ANC (sulfur units)	----	0.02	% S	**0.15**	**0.17**	**0.36**	**0.17**	**0.05**
Net Acidity excluding ANC (acidity units)	----	10	mole H+ / t	**94**	**105**	**225**	**105**	**32**
Liming Rate excluding ANC	----	1	kg CaCO3/t	**7**	**8**	**17**	**8**	**2**

QUALITY CONTROL REPORT

Work Order	: **EB2329802**	Page	: 1 of 7
Client	: **BMT COMMERCIAL AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: MACKENZIE STACEY	Contact	: Nathan King
Address	: PO BOX 203 SPRING HILL BRISBANE QLD 4004	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: ----	Telephone	: +61-7-3243 7222
Project	: B23621 PoB Monitoring 2019-2025	Date Samples Received	: 27-Sep-2023
Order number	: ----	Date Analysis Commenced	: 29-Sep-2023
C-O-C number	: ----	Issue Date	: 29-Sep-2023
Sampler	: ANGUS WILLIAMS, CRAIG HEATHERINGTON, MACKENZIE STACEY		
Site	: ----		
Quote number	: BN/016/19		
No. of samples received	: 15		
No. of samples analysed	: 15		

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

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

This Quality Control Report contains the following information:

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Ben Felgendrejeris	Senior Acid Sulfate Soil Chemist	Brisbane Acid Sulphate Soils, Stafford, QLD

General Comments

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

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

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

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA029-A: pH Measurements (QC Lot: 5327930)									
EB2329802-001	B5-0	EA029: pH KCl (23A)	----	0.1	pH Unit	7.8	7.9	1.7	0% - 20%
		EA029: pH OX (23B)	----	0.1	pH Unit	6.7	6.8	1.5	0% - 20%
EB2329802-011	B12-1	EA029: pH KCl (23A)	----	0.1	pH Unit	8.8	8.6	2.5	0% - 20%
		EA029: pH OX (23B)	----	0.1	pH Unit	8.0	7.9	1.3	0% - 20%
EA029-B: Acidity Trail (QC Lot: 5327930)									
EB2329802-001	B5-0	EA029: sulfidic - Titratable Actual Acidity (s-23F)	----	0.02	% pyrite S	<0.020	<0.020	0.0	No Limit
		EA029: sulfidic - Titratable Peroxide Acidity (s-23G)	----	0.02	% pyrite S	<0.020	<0.020	0.0	No Limit
		EA029: sulfidic - Titratable Sulfidic Acidity (s-23H)	----	0.02	% pyrite S	<0.020	<0.020	0.0	No Limit
		EA029: Titratable Actual Acidity (23F)	----	2	mole H+ / t	<2	<2	0.0	No Limit
		EA029: Titratable Peroxide Acidity (23G)	----	2	mole H+ / t	<2	<2	0.0	No Limit
		EA029: Titratable Sulfidic Acidity (23H)	----	2	mole H+ / t	<2	<2	0.0	No Limit
EB2329802-011	B12-1	EA029: sulfidic - Titratable Actual Acidity (s-23F)	----	0.02	% pyrite S	<0.020	<0.020	0.0	No Limit
		EA029: sulfidic - Titratable Peroxide Acidity (s-23G)	----	0.02	% pyrite S	<0.020	<0.020	0.0	No Limit
		EA029: sulfidic - Titratable Sulfidic Acidity (s-23H)	----	0.02	% pyrite S	<0.020	<0.020	0.0	No Limit
		EA029: Titratable Actual Acidity (23F)	----	2	mole H+ / t	<2	<2	0.0	No Limit
		EA029: Titratable Peroxide Acidity (23G)	----	2	mole H+ / t	<2	<2	0.0	No Limit
		EA029: Titratable Sulfidic Acidity (23H)	----	2	mole H+ / t	<2	<2	0.0	No Limit
EA029-C: Sulfur Trail (QC Lot: 5327930)									
EB2329802-001	B5-0	EA029: KCl Extractable Sulfur (23Ce)	----	0.02	% S	0.118	0.114	2.8	No Limit
		EA029: Peroxide Sulfur (23De)	----	0.02	% S	0.355	0.343	3.4	0% - 50%

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 (%)*
EA029-C: Sulfur Trail (QC Lot: 5327930) - continued									
EB2329802-001	B5-0	EA029: Peroxide Oxidisable Sulfur (23E)	----	0.02	% S	0.237	0.229	3.6	0% - 50%
		EA029: acidity - Peroxide Oxidisable Sulfur (a-23E)	----	10	mole H+ / t	148	143	3.6	0% - 50%
EB2329802-011	B12-1	EA029: KCl Extractable Sulfur (23Ce)	----	0.02	% S	0.177	0.172	3.1	No Limit
		EA029: Peroxide Sulfur (23De)	----	0.02	% S	0.260	0.270	3.6	0% - 50%
		EA029: Peroxide Oxidisable Sulfur (23E)	----	0.02	% S	0.083	0.098	16.4	No Limit
		EA029: acidity - Peroxide Oxidisable Sulfur (a-23E)	----	10	mole H+ / t	52	61	16.4	No Limit
EA029-D: Calcium Values (QC Lot: 5327930)									
EB2329802-001	B5-0	EA029: KCl Extractable Calcium (23Vh)	----	0.02	% Ca	0.246	0.238	3.3	0% - 50%
		EA029: Peroxide Calcium (23Wh)	----	0.02	% Ca	0.337	0.325	3.6	0% - 50%
		EA029: Acid Reacted Calcium (23X)	----	0.02	% Ca	0.091	0.087	4.5	No Limit
		EA029: sulfidic - Acid Reacted Calcium (s-23X)	----	0.02	% S	0.072	0.069	4.5	No Limit
		EA029: acidity - Acid Reacted Calcium (a-23X)	----	10	mole H+ / t	45	43	4.5	No Limit
EB2329802-011	B12-1	EA029: KCl Extractable Calcium (23Vh)	----	0.02	% Ca	0.306	0.296	3.6	0% - 50%
		EA029: Peroxide Calcium (23Wh)	----	0.02	% Ca	1.35	1.38	2.6	0% - 20%
		EA029: Acid Reacted Calcium (23X)	----	0.02	% Ca	1.04	1.09	4.4	0% - 20%
		EA029: sulfidic - Acid Reacted Calcium (s-23X)	----	0.02	% S	0.833	0.871	4.4	0% - 20%
		EA029: acidity - Acid Reacted Calcium (a-23X)	----	10	mole H+ / t	520	543	4.4	0% - 20%
EA029-E: Magnesium Values (QC Lot: 5327930)									
EB2329802-001	B5-0	EA029: KCl Extractable Magnesium (23Sm)	----	0.02	% Mg	0.326	0.315	3.3	0% - 50%
		EA029: Peroxide Magnesium (23Tm)	----	0.02	% Mg	0.389	0.373	4.1	0% - 50%
		EA029: Acid Reacted Magnesium (23U)	----	0.02	% Mg	0.063	0.058	8.2	No Limit
		EA029: sulfidic - Acid Reacted Magnesium (s-23U)	----	0.02	% S	0.084	0.077	8.2	No Limit
		EA029: Acidity - Acid Reacted Magnesium (a-23U)	----	10	mole H+ / t	52	48	8.2	No Limit
EB2329802-011	B12-1	EA029: KCl Extractable Magnesium (23Sm)	----	0.02	% Mg	0.159	0.163	2.8	No Limit
		EA029: Peroxide Magnesium (23Tm)	----	0.02	% Mg	0.229	0.236	3.1	0% - 50%
		EA029: Acid Reacted Magnesium (23U)	----	0.02	% Mg	0.070	0.073	3.8	No Limit
		EA029: sulfidic - Acid Reacted Magnesium (s-23U)	----	0.02	% S	0.092	0.096	3.8	No Limit
		EA029: Acidity - Acid Reacted Magnesium (a-23U)	----	10	mole H+ / t	58	60	3.8	No Limit
EA029-F: Excess Acid Neutralising Capacity (QC Lot: 5327930)									
EB2329802-001	B5-0	EA029: Excess Acid Neutralising Capacity (23Q)	----	0.02	% CaCO3	0.713	0.727	2.0	0% - 20%
		EA029: sulfidic - Excess Acid Neutralising Capacity (s-23Q)	----	0.02	% S	0.228	0.233	2.0	0% - 50%
		EA029: acidity - Excess Acid Neutralising Capacity (a-23Q)	----	10	mole H+ / t	142	145	2.0	0% - 50%

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 (%)*
EA029-F: Excess Acid Neutralising Capacity (QC Lot: 5327930) - continued									
EB2329802-011	B12-1	EA029: Excess Acid Neutralising Capacity (23Q)	----	0.02	% CaCO3	2.76	2.72	1.8	0% - 20%
		EA029: sulfidic - Excess Acid Neutralising Capacity (s-23Q)	----	0.02	% S	0.885	0.869	1.8	0% - 20%
		EA029: acidity - Excess Acid Neutralising Capacity (a-23Q)	----	10	mole H+ / t	552	542	1.8	0% - 20%
EA029-H: Acid Base Accounting (QC Lot: 5327930)									
EB2329802-001	B5-0	EA029: ANC Fineness Factor	----	0.5	-	1.5	1.5	0.0	No Limit
		EA029: Net Acidity (sulfur units)	----	0.02	% S	<0.02	<0.02	0.0	No Limit
		EA029: Net Acidity excluding ANC (sulfur units)	----	0.02	% S	0.24	0.23	0.0	0% - 50%
		EA029: Liming Rate	----	1	kg CaCO3/t	<1	<1	0.0	No Limit
		EA029: Liming Rate excluding ANC	----	1	kg CaCO3/t	11	11	0.0	0% - 50%
		EA029: Net Acidity (acidity units)	----	10	mole H+ / t	<10	<10	0.0	No Limit
		EA029: Net Acidity excluding ANC (acidity units)	----	10	mole H+ / t	148	143	3.6	0% - 50%
EB2329802-011	B12-1	EA029: ANC Fineness Factor	----	0.5	-	1.5	1.5	0.0	No Limit
		EA029: Net Acidity (sulfur units)	----	0.02	% S	<0.02	<0.02	0.0	No Limit
		EA029: Net Acidity excluding ANC (sulfur units)	----	0.02	% S	0.08	0.10	16.4	No Limit
		EA029: Liming Rate	----	1	kg CaCO3/t	<1	<1	0.0	No Limit
		EA029: Liming Rate excluding ANC	----	1	kg CaCO3/t	4	4	0.0	No Limit
		EA029: Net Acidity (acidity units)	----	10	mole H+ / t	<10	<10	0.0	No Limit
		EA029: Net Acidity excluding ANC (acidity units)	----	10	mole H+ / t	52	61	16.4	No Limit
EA033-A: Actual Acidity (QC Lot: 5327931)									
EB2329802-001	B5-0	EA033: sulfidic - Titratable Actual Acidity (s-23F)	----	0.02	% pyrite S	<0.02	<0.02	0.0	No Limit
		EA033: Titratable Actual Acidity (23F)	----	2	mole H+ / t	<2	<2	0.0	No Limit
		EA033: pH KCl (23A)	----	0.1	pH Unit	7.8	7.9	1.7	0% - 20%
EB2329802-011	B12-1	EA033: sulfidic - Titratable Actual Acidity (s-23F)	----	0.02	% pyrite S	<0.02	<0.02	0.0	No Limit
		EA033: Titratable Actual Acidity (23F)	----	2	mole H+ / t	<2	<2	0.0	No Limit
		EA033: pH KCl (23A)	----	0.1	pH Unit	8.8	8.6	2.5	0% - 20%
EA033-B: Potential Acidity (QC Lot: 5327931)									
EB2329802-001	B5-0	EA033: Chromium Reducible Sulfur (22B)	----	0.005	% S	0.205	0.208	1.6	0% - 20%
		EA033: acidity - Chromium Reducible Sulfur (a-22B)	----	10	mole H+ / t	128	130	1.6	0% - 50%
EB2329802-011	B12-1	EA033: Chromium Reducible Sulfur (22B)	----	0.005	% S	0.150	0.147	2.2	0% - 20%
		EA033: acidity - Chromium Reducible Sulfur (a-22B)	----	10	mole H+ / t	94	92	2.2	No Limit
EA033-C: Acid Neutralising Capacity (QC Lot: 5327931)									
EB2329802-001	B5-0	EA033: Acid Neutralising Capacity (19A2)	----	0.01	% CaCO3	2.05	2.20	7.0	0% - 20%
		EA033: sulfidic - Acid Neutralising Capacity (s-19A2)	----	0.01	% pyrite S	0.66	0.70	7.0	0% - 20%
		EA033: acidity - Acid Neutralising Capacity (a-19A2)	----	10	mole H+ / t	410	440	7.0	0% - 20%

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EA033-C: Acid Neutralising Capacity (QC Lot: 5327931) - continued									
EB2329802-011	B12-1	EA033: Acid Neutralising Capacity (19A2)	----	0.01	% CaCO3	6.72	6.69	0.5	0% - 20%
		EA033: sulfidic - Acid Neutralising Capacity (s-19A2)	----	0.01	% pyrite S	2.15	2.14	0.0	0% - 20%
		EA033: acidity - Acid Neutralising Capacity (a-19A2)	----	10	mole H+ / t	1340	1340	0.5	0% - 20%

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

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

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EA029-A: pH Measurements (QCLot: 5327930)								
EA029: pH KCl (23A)	----	0.1	pH Unit	<0.1	4.4 pH Unit	100	70.0	130
EA029: pH OX (23B)	----	0.1	pH Unit	<0.1	4.2 pH Unit	107	70.0	130
EA029-B: Acidity Trail (QCLot: 5327930)								
EA029: Titratable Actual Acidity (23F)	----	2	mole H+ / t	<2	16 mole H+ / t	92.8	70.0	130
EA029: Titratable Peroxide Acidity (23G)	----	2	mole H+ / t	<2	25 mole H+ / t	118	70.0	130
EA029: Titratable Sulfidic Acidity (23H)	----	2	mole H+ / t	<2	----	----	----	----
EA029: sulfidic - Titratable Actual Acidity (s-23F)	----	0.02	% pyrite S	<0.020	----	----	----	----
EA029: sulfidic - Titratable Peroxide Acidity (s-23G)	----	0.02	% pyrite S	<0.020	----	----	----	----
EA029: sulfidic - Titratable Sulfidic Acidity (s-23H)	----	0.02	% pyrite S	<0.020	----	----	----	----
EA029-C: Sulfur Trail (QCLot: 5327930)								
EA029: KCl Extractable Sulfur (23Ce)	----	0.02	% S	<0.020	0.055 % S	85.0	70.0	130
EA029: Peroxide Sulfur (23De)	----	0.02	% S	<0.020	0.152 % S	91.3	70.0	130
EA029: Peroxide Oxidisable Sulfur (23E)	----	0.02	% S	<0.020	----	----	----	----
EA029: acidity - Peroxide Oxidisable Sulfur (a-23E)	----	10	mole H+ / t	<10	----	----	----	----
EA029-D: Calcium Values (QCLot: 5327930)								
EA029: KCl Extractable Calcium (23Vh)	----	0.02	% Ca	<0.020	0.201 % Ca	70.6	70.0	130
EA029: Peroxide Calcium (23Wh)	----	0.02	% Ca	<0.020	0.191 % Ca	105	70.0	130
EA029: Acid Reacted Calcium (23X)	----	0.02	% Ca	<0.020	----	----	----	----
EA029: acidity - Acid Reacted Calcium (a-23X)	----	10	mole H+ / t	<10	----	----	----	----
EA029: sulfidic - Acid Reacted Calcium (s-23X)	----	0.02	% S	<0.020	----	----	----	----
EA029-E: Magnesium Values (QCLot: 5327930)								
EA029: KCl Extractable Magnesium (23Sm)	----	0.02	% Mg	<0.020	0.204 % Mg	118	70.0	130
EA029: Peroxide Magnesium (23Tm)	----	0.02	% Mg	<0.020	0.234 % Mg	97.9	70.0	130
EA029: Acid Reacted Magnesium (23U)	----	0.02	% Mg	<0.020	----	----	----	----
EA029: Acidity - Acid Reacted Magnesium (a-23U)	----	10	mole H+ / t	<10	----	----	----	----
EA029: sulfidic - Acid Reacted Magnesium (s-23U)	----	0.02	% S	<0.020	----	----	----	----
EA029-F: Excess Acid Neutralising Capacity (QCLot: 5327930)								
EA029: Excess Acid Neutralising Capacity (23Q)	----	0.02	% CaCO3	<0.020	----	----	----	----
EA029: acidity - Excess Acid Neutralising Capacity (a-23Q)	----	10	mole H+ / t	<10	----	----	----	----
EA029: sulfidic - Excess Acid Neutralising Capacity (s-23Q)	----	0.02	% S	<0.020	----	----	----	----

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EA029-H: Acid Base Accounting (QCLot: 5327930)								
EA029: ANC Fineness Factor	----	0.5	-	<0.5	----	----	----	----
EA029: Net Acidity (sulfur units)	----	0.02	% S	<0.02	----	----	----	----
EA029: Net Acidity (acidity units)	----	10	mole H+ / t	<10	----	----	----	----
EA029: Liming Rate	----	1	kg CaCO3/t	<1	----	----	----	----
EA029: Net Acidity excluding ANC (sulfur units)	----	0.02	% S	<0.02	----	----	----	----
EA029: Net Acidity excluding ANC (acidity units)	----	10	mole H+ / t	<10	----	----	----	----
EA029: Liming Rate excluding ANC	----	1	kg CaCO3/t	<1	----	----	----	----
EA033-A: Actual Acidity (QCLot: 5327931)								
EA033: pH KCl (23A)	----	----	pH Unit	----	4.4 pH Unit	100	91.0	107
EA033: Titratable Actual Acidity (23F)	----	2	mole H+ / t	<2	16 mole H+ / t	92.8	70.0	124
EA033: sulfidic - Titratable Actual Acidity (s-23F)	----	0.02	% pyrite S	<0.02	----	----	----	----
EA033-B: Potential Acidity (QCLot: 5327931)								
EA033: Chromium Reducible Sulfur (22B)	----	0.005	% S	<0.005	0.246 % S	104	77.0	121
EA033: acidity - Chromium Reducible Sulfur (a-22B)	----	10	mole H+ / t	<10	----	----	----	----
EA033-C: Acid Neutralising Capacity (QCLot: 5327931)								
EA033: Acid Neutralising Capacity (19A2)	----	0.01	% CaCO3	<0.01	10 % CaCO3	94.9	91.0	112
EA033: acidity - Acid Neutralising Capacity (a-19A2)	----	10	mole H+ / t	<10	----	----	----	----
EA033: sulfidic - Acid Neutralising Capacity (s-19A2)	----	0.01	% pyrite S	<0.01	----	----	----	----

Matrix Spike (MS) Report

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

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

CERTIFICATE OF ANALYSIS

Work Order	: **EB2331615**	Page	: 1 of 13
Client	: **BMT COMMERCIAL AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: MACKENZIE STACEY	Contact	: Nathan King
Address	: PO BOX 203 SPRING HILL BRISBANE QLD 4004	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: ----	Telephone	: +61-7-3243 7222
Project	: B23621 PoB Monitoring 2019-2025	Date Samples Received	: 05-Oct-2023 14:39
Order number	: ----	Date Analysis Commenced	: 12-Oct-2023
C-O-C number	: ----	Issue Date	: 24-Oct-2023 15:15
Sampler	: ----		
Site	: ----		
Quote number	: BN/016/19		
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 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*
Beatriz Llarinas	Senior Chemist - Inorganics	Brisbane Inorganics, Stafford, QLD
Beatriz Llarinas	Senior Chemist - Inorganics	Brisbane Soil Preparation, Stafford, QLD
Ben Felgendrejeris	Senior Acid Sulfate Soil Chemist	Brisbane Acid Sulphate Soils, Stafford, QLD
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Kirsty Watson	Senior Chemist - Organics	Brisbane Organics, Stafford, QLD
Layla Hafner	Acid Sulphate Soils - Chemist	Brisbane Acid Sulphate Soils, Stafford, QLD
Layla Hafner	Acid Sulphate Soils - Chemist	Brisbane Soil Preparation, Stafford, QLD

General Comments

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

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

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

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

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

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

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EA150H: Soil particle density results fell outside the scope of AS1289.3.6.3. Results should be scrutinised accordingly.
- EP131A: Where reported, Total Chlordane (sum) is the sum of the reported concentrations of cis-Chlordane and trans-Chlordane at or above the LOR.
- EP130: LOR for Sample raised due to the high amount of moisture present.
- **Pesticides analysis is conducted by ALS Environmental, Sydney, NATA accreditation no. 825, Site No. 10911 (Micro site no. 14913).**
- EP090-Organotin: Sample ‘B5-1’ (EB2331615-016) shows poor matrix spike recovery due to matrix interference.
- EG020-SD (Total Metals in Sediments by ICP-MS): Sample B5-1 (EB2331615-016) shows poor matrix spike recovery due to sample heterogeneity. Confirmed by visual inspection.
- EG093: Samples containing high levels of sulfate may precipitate barium under the acidic conditions of this method and may therefore bias results low.

Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)				Sample ID	B10-6	----	----	----	----
				Sampling date / time	14-Sep-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EB2331615-014	--------	--------	--------	--------
					Result	----	----	----	----
EG093T: Total Metals in Saline Water by ORC-ICPMS									
Nickel	7440-02-0	0.5	µg/L		**4.7**	----	----	----	----
EP131A: Organochlorine Pesticides									
Aldrin	309-00-2	0.010	µg/L		<0.010	----	----	----	----
alpha-BHC	319-84-6	0.010	µg/L		<0.010	----	----	----	----
beta-BHC	319-85-7	0.010	µg/L		<0.010	----	----	----	----
delta-BHC	319-86-8	0.010	µg/L		<0.010	----	----	----	----
4.4`-DDD	72-54-8	0.010	µg/L		<0.010	----	----	----	----
4.4`-DDE	72-55-9	0.010	µg/L		<0.010	----	----	----	----
4.4`-DDT	50-29-3	0.010	µg/L		<0.010	----	----	----	----
^ **Sum of DDD + DDE + DDT**	72-54-8/72-55-9/50-2	0.010	µg/L		<0.010	----	----	----	----
Dieldrin	60-57-1	0.010	µg/L		<0.010	----	----	----	----
alpha-Endosulfan	959-98-8	0.010	µg/L		<0.010	----	----	----	----
beta-Endosulfan	33213-65-9	0.010	µg/L		<0.010	----	----	----	----
Endosulfan sulfate	1031-07-8	0.010	µg/L		<0.010	----	----	----	----
^ **Endosulfan (sum)**	115-29-7	0.010	µg/L		<0.010	----	----	----	----
Endrin	72-20-8	0.010	µg/L		<0.010	----	----	----	----
Endrin aldehyde	7421-93-4	0.010	µg/L		<0.010	----	----	----	----
Endrin ketone	53494-70-5	0.010	µg/L		<0.010	----	----	----	----
Heptachlor	76-44-8	0.005	µg/L		<0.005	----	----	----	----
Heptachlor epoxide	1024-57-3	0.010	µg/L		<0.010	----	----	----	----
Hexachlorobenzene (HCB)	118-74-1	0.010	µg/L		<0.010	----	----	----	----
gamma-BHC	58-89-9	0.010	µg/L		<0.010	----	----	----	----
Methoxychlor	72-43-5	0.010	µg/L		<0.010	----	----	----	----
cis-Chlordane	5103-71-9	0.010	µg/L		<0.010	----	----	----	----
trans-Chlordane	5103-74-2	0.010	µg/L		<0.010	----	----	----	----
^ **Total Chlordane (sum)**	----	0.010	µg/L		<0.010	----	----	----	----
Oxychlordane	27304-13-8	0.010	µg/L		<0.010	----	----	----	----
^ **Sum of Aldrin + Dieldrin**	309-00-2/60-57-1	0.010	µg/L		<0.010	----	----	----	----
EP131S: OC Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.010	%		**79.2**	----	----	----	----

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	B4-4	B4-0	B8-1	B6-2b	B9-1
			Sampling date / time	12-Sep-2023 00:00	12-Sep-2023 00:00	12-Sep-2023 00:00	12-Sep-2023 00:00	14-Sep-2023 00:00
Compound	CAS Number	LOR	Unit	EB2331615-001	EB2331615-002	EB2331615-003	EB2331615-004	EB2331615-005
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	**60.6**	**57.1**	**61.5**	**41.7**	**36.0**
EG005(ED093)-SDH: 1M HCl-Extractable Metals by ICPAES								
Nickel	7440-02-0	1.0	mg/kg	**10.7**	**9.5**	**10.8**	**7.5**	**5.2**

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	B10-5	B11-9	B11-9b	B11-8	B12-1
			Sampling date / time	14-Sep-2023 00:00	14-Sep-2023 00:00	14-Sep-2023 00:00	14-Sep-2023 00:00	14-Sep-2023 00:00
Compound	CAS Number	LOR	Unit	EB2331615-006	EB2331615-007	EB2331615-008	EB2331615-009	EB2331615-010
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	**49.0**	**53.8**	**60.0**	**62.6**	**51.0**
EG005(ED093)-SDH: 1M HCl-Extractable Metals by ICPAES								
Nickel	7440-02-0	1.0	mg/kg	**7.4**	**8.5**	**7.4**	**8.4**	**8.6**

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	B12-2	B11-5	B10-8	B10-6	B5-0
			Sampling date / time	14-Sep-2023 00:00	14-Sep-2023 00:00	14-Sep-2023 00:00	14-Sep-2023 00:00	12-Sep-2023 00:00
Compound	CAS Number	LOR	Unit	EB2331615-011	EB2331615-012	EB2331615-013	EB2331615-014	EB2331615-015
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	60.9	56.5	56.6	----	58.1
EA150: Particle Sizing								
+75µm	----	1	%	----	----	----	----	9
+150µm	----	1	%	----	----	----	----	6
+300µm	----	1	%	----	----	----	----	4
+425µm	----	1	%	----	----	----	----	4
+600µm	----	1	%	----	----	----	----	4
+1180µm	----	1	%	----	----	----	----	3
+2.36mm	----	1	%	----	----	----	----	1
+4.75mm	----	1	%	----	----	----	----	<1
+9.5mm	----	1	%	----	----	----	----	<1
+19.0mm	----	1	%	----	----	----	----	<1
+37.5mm	----	1	%	----	----	----	----	<1
+75.0mm	----	1	%	----	----	----	----	<1
EA150: Soil Classification based on Particle Size								
Clay (<2 µm)	----	1	%	----	----	----	----	50
Silt (2-60 µm)	----	1	%	----	----	----	----	40
Sand (0.06-2.00 mm)	----	1	%	----	----	----	----	8
Gravel (>2mm)	----	1	%	----	----	----	----	2
Cobbles (>6cm)	----	1	%	----	----	----	----	<1
EA152: Soil Particle Density								
Soil Particle Density (Clay/Silt/Sand)	----	0.01	g/cm3	----	----	----	----	2.54
EG005(ED093)-SDH: 1M HCl-Extractable Metals by ICPAES								
Nickel	7440-02-0	1.0	mg/kg	7.8	8.6	9.4	----	----
EG005(ED093)T: Total Metals by ICP-AES								
Aluminium	7429-90-5	50	mg/kg	----	----	----	----	14000
Iron	7439-89-6	50	mg/kg	----	----	----	----	35100
EG020-SD: Total Metals in Sediments by ICPMS								
Arsenic	7440-38-2	1.00	mg/kg	----	----	----	----	5.60
Cadmium	7440-43-9	0.1	mg/kg	----	----	----	----	<0.1
Chromium	7440-47-3	1.0	mg/kg	----	----	----	----	27.9
Copper	7440-50-8	1.0	mg/kg	----	----	----	----	26.5
Lead	7439-92-1	1.0	mg/kg	----	----	----	----	12.8
Nickel	7440-02-0	1.0	mg/kg	----	----	----	----	25.0

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	B12-2	B11-5	B10-8	B10-6	B5-0
			Sampling date / time	14-Sep-2023 00:00	14-Sep-2023 00:00	14-Sep-2023 00:00	14-Sep-2023 00:00	12-Sep-2023 00:00
Compound	CAS Number	LOR	Unit	EB2331615-011	EB2331615-012	EB2331615-013	EB2331615-014	EB2331615-015
				Result	Result	Result	Result	Result
EG020-SD: Total Metals in Sediments by ICPMS - Continued								
Silver	7440-22-4	0.1	mg/kg	----	----	----	----	**0.1**
Zinc	7440-66-6	1.0	mg/kg	----	----	----	----	**85.5**
EG035-SDH: 1M HCl extractable Mercury by FIMS								
Mercury	7439-97-6	0.10	mg/kg	<0.10	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS (Low Level)								
Mercury	7439-97-6	0.01	mg/kg	----	----	----	----	**0.07**
EN82: Porewater Extraction								
Volume	----	1	mL	----	----	----	**661**	----
EP003: Total Organic Carbon (TOC) in Soil								
Total Organic Carbon	----	0.02	%	----	----	----	----	**1.51**
EP090: Organotin Compounds								
Monobutyltin	78763-54-9	1	µgSn/kg	----	----	----	----	<1
Dibutyltin	1002-53-5	1	µgSn/kg	----	----	----	----	<1
Tributyltin	56573-85-4	0.5	µgSn/kg	----	----	----	----	**2.4**
EP130A: Organophosphorus Pesticides (Ultra-trace)								
Bromophos-ethyl	4824-78-6	10	µg/kg	----	----	----	----	<12
Carbophenothion	786-19-6	10	µg/kg	----	----	----	----	<12
Chlorfenvinphos (E)	18708-86-6	10.0	µg/kg	----	----	----	----	<12.0
Chlorfenvinphos (Z)	18708-87-7	10	µg/kg	----	----	----	----	<12
Chlorpyrifos	2921-88-2	10	µg/kg	----	----	----	----	<12
Chlorpyrifos-methyl	5598-13-0	10	µg/kg	----	----	----	----	<12
Demeton-S-methyl	919-86-8	10	µg/kg	----	----	----	----	<12
Diazinon	333-41-5	10	µg/kg	----	----	----	----	<12
Dichlorvos	62-73-7	10	µg/kg	----	----	----	----	<12
Dimethoate	60-51-5	10	µg/kg	----	----	----	----	<12
Ethion	563-12-2	10	µg/kg	----	----	----	----	<12
Fenamiphos	22224-92-6	10	µg/kg	----	----	----	----	<12
Fenthion	55-38-9	10	µg/kg	----	----	----	----	<12
Malathion	121-75-5	10	µg/kg	----	----	----	----	<12
Azinphos Methyl	86-50-0	10	µg/kg	----	----	----	----	<12
Monocrotophos	6923-22-4	10	µg/kg	----	----	----	----	<12
Parathion	56-38-2	10	µg/kg	----	----	----	----	<12
Parathion-methyl	298-00-0	10	µg/kg	----	----	----	----	<12
Pirimphos-ethyl	23505-41-1	10	µg/kg	----	----	----	----	<12

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	B12-2	B11-5	B10-8	B10-6	B5-0
			Sampling date / time	14-Sep-2023 00:00	14-Sep-2023 00:00	14-Sep-2023 00:00	14-Sep-2023 00:00	12-Sep-2023 00:00
Compound	CAS Number	LOR	Unit	EB2331615-011	EB2331615-012	EB2331615-013	EB2331615-014	EB2331615-015
				Result	Result	Result	Result	Result
EP130A: Organophosphorus Pesticides (Ultra-trace) - Continued								
Prothiofos	34643-46-4	10	µg/kg	----	----	----	----	<12
EP131A: Organochlorine Pesticides								
Aldrin	309-00-2	0.50	µg/kg	----	----	----	----	<0.50
alpha-BHC	319-84-6	0.50	µg/kg	----	----	----	----	<0.50
beta-BHC	319-85-7	0.50	µg/kg	----	----	----	----	<0.50
delta-BHC	319-86-8	0.50	µg/kg	----	----	----	----	<0.50
4.4`-DDD	72-54-8	0.50	µg/kg	----	----	----	----	<0.50
4.4`-DDE	72-55-9	0.50	µg/kg	----	----	----	----	<0.50
4.4`-DDT	50-29-3	0.50	µg/kg	----	----	----	----	<0.50
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.50	µg/kg	----	----	----	----	<0.62
Dieldrin	60-57-1	0.50	µg/kg	----	----	----	----	<0.50
alpha-Endosulfan	959-98-8	0.50	µg/kg	----	----	----	----	<0.50
beta-Endosulfan	33213-65-9	0.50	µg/kg	----	----	----	----	<0.50
Endosulfan sulfate	1031-07-8	0.50	µg/kg	----	----	----	----	<0.50
^ Endosulfan (sum)	115-29-7	0.50	µg/kg	----	----	----	----	<0.62
Endrin	72-20-8	0.50	µg/kg	----	----	----	----	<0.50
Endrin aldehyde	7421-93-4	0.50	µg/kg	----	----	----	----	<0.50
Endrin ketone	53494-70-5	0.50	µg/kg	----	----	----	----	<0.50
Heptachlor	76-44-8	0.50	µg/kg	----	----	----	----	<0.50
Heptachlor epoxide	1024-57-3	0.50	µg/kg	----	----	----	----	<0.50
Hexachlorobenzene (HCB)	118-74-1	0.50	µg/kg	----	----	----	----	<0.50
gamma-BHC	58-89-9	0.25	µg/kg	----	----	----	----	<0.28
Methoxychlor	72-43-5	0.50	µg/kg	----	----	----	----	<0.50
cis-Chlordane	5103-71-9	0.50	µg/kg	----	----	----	----	<0.50
trans-Chlordane	5103-74-2	0.50	µg/kg	----	----	----	----	<0.50
^ Total Chlordane (sum)	----	0.50	µg/kg	----	----	----	----	<0.62
Oxychlordane	27304-13-8	0.50	µg/kg	----	----	----	----	<0.50
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.50	µg/kg	----	----	----	----	<0.62
EP090S: Organotin Surrogate								
Tripropyltin	----	0.5	%	----	----	----	----	**99.9**
EP130S: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	10	%	----	----	----	----	**77.7**
EP131S: OC Pesticide Surrogate								

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	B12-2	B11-5	B10-8	B10-6	B5-0
				Sampling date / time	14-Sep-2023 00:00	14-Sep-2023 00:00	14-Sep-2023 00:00	14-Sep-2023 00:00	12-Sep-2023 00:00
Compound	CAS Number	LOR	Unit		EB2331615-011	EB2331615-012	EB2331615-013	EB2331615-014	EB2331615-015
					Result	Result	Result	Result	Result
EP131S: OC Pesticide Surrogate - Continued									
Dibromo-DDE	21655-73-2	0.50	%		**----**	**----**	**----**	**----**	**47.0**

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	B5-1	B5-1b	B5-1c	B6-3	B7-1
			Sampling date / time	12-Sep-2023 00:00	12-Sep-2023 00:00	12-Sep-2023 00:00	12-Sep-2023 00:00	12-Sep-2023 00:00
Compound	CAS Number	LOR	Unit	EB2331615-016	EB2331615-017	EB2331615-018	EB2331615-019	EB2331615-020
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	52.7	56.9	56.0	58.4	51.7
EA150: Particle Sizing								
+75µm	----	1	%	28	10	22	9	40
+150µm	----	1	%	18	6	17	7	34
+300µm	----	1	%	12	3	11	5	16
+425µm	----	1	%	10	2	9	4	11
+600µm	----	1	%	8	2	8	4	9
+1180µm	----	1	%	4	1	6	2	4
+2.36mm	----	1	%	<1	<1	2	<1	<1
+4.75mm	----	1	%	<1	<1	<1	<1	<1
+9.5mm	----	1	%	<1	<1	<1	<1	<1
+19.0mm	----	1	%	<1	<1	<1	<1	<1
+37.5mm	----	1	%	<1	<1	<1	<1	<1
+75.0mm	----	1	%	<1	<1	<1	<1	<1
EA150: Soil Classification based on Particle Size								
Clay (<2 µm)	----	1	%	38	38	43	54	29
Silt (2-60 µm)	----	1	%	33	49	33	36	31
Sand (0.06-2.00 mm)	----	1	%	27	12	20	9	38
Gravel (>2mm)	----	1	%	2	1	4	1	2
Cobbles (>6cm)	----	1	%	<1	<1	<1	<1	<1
EA152: Soil Particle Density								
Soil Particle Density (Clay/Silt/Sand)	----	0.01	g/cm3	2.63	2.61	2.28	2.60	2.38
EG005(ED093)T: Total Metals by ICP-AES								
Aluminium	7429-90-5	50	mg/kg	14200	17200	16000	15800	12300
Iron	7439-89-6	50	mg/kg	34300	44300	35500	39100	31800
EG020-SD: Total Metals in Sediments by ICPMS								
Arsenic	7440-38-2	1.00	mg/kg	7.56	6.37	8.38	8.24	6.89
Cadmium	7440-43-9	0.1	mg/kg	0.2	<0.1	0.2	<0.1	<0.1
Chromium	7440-47-3	1.0	mg/kg	32.4	37.9	33.9	33.4	28.3
Copper	7440-50-8	1.0	mg/kg	29.5	27.2	29.0	34.6	27.4
Lead	7439-92-1	1.0	mg/kg	27.2	12.4	24.5	16.9	13.7
Nickel	7440-02-0	1.0	mg/kg	19.7	39.2	20.9	27.4	21.8
Silver	7440-22-4	0.1	mg/kg	0.3	<0.1	0.4	0.2	0.1
Zinc	7440-66-6	1.0	mg/kg	112	90.9	104	112	84.8

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	B5-1	B5-1b	B5-1c	B6-3	B7-1
			Sampling date / time	12-Sep-2023 00:00	12-Sep-2023 00:00	12-Sep-2023 00:00	12-Sep-2023 00:00	12-Sep-2023 00:00
Compound	CAS Number	LOR	Unit	EB2331615-016	EB2331615-017	EB2331615-018	EB2331615-019	EB2331615-020
				Result	Result	Result	Result	Result
EG035T: Total Recoverable Mercury by FIMS (Low Level)								
Mercury	7439-97-6	0.01	mg/kg	**0.13**	**0.06**	**0.23**	**0.09**	**0.08**
EP003: Total Organic Carbon (TOC) in Soil								
Total Organic Carbon	----	0.02	%	**1.31**	**1.63**	**1.59**	**1.75**	**1.80**
EP090: Organotin Compounds								
Monobutyltin	78763-54-9	1	µgSn/kg	<1	<1	<1	<1	<1
Dibutyltin	1002-53-5	1	µgSn/kg	**4**	<1	**4**	**1**	**1**
Tributyltin	56573-85-4	0.5	µgSn/kg	**1.8**	**0.6**	**1.7**	**1.3**	**1.1**
EP130A: Organophosphorus Pesticides (Ultra-trace)								
Bromophos-ethyl	4824-78-6	10	µg/kg	<12	<12	<12	<12	<12
Carbophenothion	786-19-6	10	µg/kg	<12	<12	<12	<12	<12
Chlorfenvinphos (E)	18708-86-6	10.0	µg/kg	<12.0	<12.0	<12.0	<12.0	<12.0
Chlorfenvinphos (Z)	18708-87-7	10	µg/kg	<12	<12	<12	<12	<12
Chlorpyrifos	2921-88-2	10	µg/kg	<12	<12	<12	<12	<12
Chlorpyrifos-methyl	5598-13-0	10	µg/kg	<12	<12	<12	<12	<12
Demeton-S-methyl	919-86-8	10	µg/kg	<12	<12	<12	<12	<12
Diazinon	333-41-5	10	µg/kg	<12	<12	<12	<12	<12
Dichlorvos	62-73-7	10	µg/kg	<12	<12	<12	<12	<12
Dimethoate	60-51-5	10	µg/kg	<12	<12	<12	<12	<12
Ethion	563-12-2	10	µg/kg	<12	<12	<12	<12	<12
Fenamiphos	22224-92-6	10	µg/kg	<12	<12	<12	<12	<12
Fenthion	55-38-9	10	µg/kg	<12	<12	<12	<12	<12
Malathion	121-75-5	10	µg/kg	<12	<12	<12	<12	<12
Azinphos Methyl	86-50-0	10	µg/kg	<12	<12	<12	<12	<12
Monocrotophos	6923-22-4	10	µg/kg	<12	<12	<12	<12	<12
Parathion	56-38-2	10	µg/kg	<12	<12	<12	<12	<12
Parathion-methyl	298-00-0	10	µg/kg	<12	<12	<12	<12	<12
Pirimphos-ethyl	23505-41-1	10	µg/kg	<12	<12	<12	<12	<12
Prothiofos	34643-46-4	10	µg/kg	<12	<12	<12	<12	<12
EP131A: Organochlorine Pesticides								
Aldrin	309-00-2	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
alpha-BHC	319-84-6	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
beta-BHC	319-85-7	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
delta-BHC	319-86-8	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
4.4`-DDD	72-54-8	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	B5-1	B5-1b	B5-1c	B6-3	B7-1
				Sampling date / time	12-Sep-2023 00:00	12-Sep-2023 00:00	12-Sep-2023 00:00	12-Sep-2023 00:00	12-Sep-2023 00:00
Compound	CAS Number	LOR	Unit		EB2331615-016	EB2331615-017	EB2331615-018	EB2331615-019	EB2331615-020
					Result	Result	Result	Result	Result
EP131A: Organochlorine Pesticides - Continued									
4.4`-DDE	72-55-9	0.50	µg/kg		<0.50	**2.04**	<0.50	**2.06**	**4.31**
4.4`-DDT	50-29-3	0.50	µg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.50	µg/kg		<0.62	**2.04**	<0.62	**2.06**	**4.31**
Dieldrin	60-57-1	0.50	µg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
alpha-Endosulfan	959-98-8	0.50	µg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
beta-Endosulfan	33213-65-9	0.50	µg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
Endosulfan sulfate	1031-07-8	0.50	µg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
^ Endosulfan (sum)	115-29-7	0.50	µg/kg		<0.62	<0.62	<0.62	<0.62	<0.62
Endrin	72-20-8	0.50	µg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
Endrin aldehyde	7421-93-4	0.50	µg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
Endrin ketone	53494-70-5	0.50	µg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
Heptachlor	76-44-8	0.50	µg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
Heptachlor epoxide	1024-57-3	0.50	µg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
Hexachlorobenzene (HCB)	118-74-1	0.50	µg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
gamma-BHC	58-89-9	0.25	µg/kg		<0.28	<0.28	<0.28	<0.28	<0.28
Methoxychlor	72-43-5	0.50	µg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
cis-Chlordane	5103-71-9	0.50	µg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
trans-Chlordane	5103-74-2	0.50	µg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
^ Total Chlordane (sum)	----	0.50	µg/kg		<0.62	<0.62	<0.62	<0.62	<0.62
Oxychlordane	27304-13-8	0.50	µg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.50	µg/kg		<0.62	<0.62	<0.62	<0.62	<0.62
EP090S: Organotin Surrogate									
Tripropyltin	----	0.5	%		**66.9**	**95.8**	**88.6**	**109**	**108**
EP130S: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	10	%		**74.6**	**76.9**	**64.5**	**68.9**	**76.5**
EP131S: OC Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.50	%		**46.5**	**53.1**	**43.7**	**73.5**	**68.4**

Surrogate Control Limits

Sub-Matrix: LEACHATE		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP131S: OC Pesticide Surrogate			
Dibromo-DDE	21655-73-2	14	166

Sub-Matrix: SEDIMENT		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP090S: Organotin Surrogate			
Tripropyltin	----	35	130
EP130S: Organophosphorus Pesticide Surrogate			
DEF	78-48-8	14	102
EP131S: OC Pesticide Surrogate			
Dibromo-DDE	21655-73-2	10	119

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(SOIL) EP130A: Organophosphorus Pesticides (Ultra-trace)

(SOIL) EP130S: Organophosphorus Pesticide Surrogate

(SOIL) EP131A: Organochlorine Pesticides

(SOIL) EP131S: OC Pesticide Surrogate

(WATER) EP131A: Organochlorine Pesticides

(WATER) EP131S: OC Pesticide Surrogate

QUALITY CONTROL REPORT

Work Order	: **EB2331615**	Page	: 1 of 9
Client	: **BMT COMMERCIAL AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: MACKENZIE STACEY	Contact	: Nathan King
Address	: PO BOX 203 SPRING HILL BRISBANE QLD 4004	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: ----	Telephone	: +61-7-3243 7222
Project	: B23621 PoB Monitoring 2019-2025	Date Samples Received	: 05-Oct-2023
Order number	: ----	Date Analysis Commenced	: 12-Oct-2023
C-O-C number	: ----	Issue Date	: 24-Oct-2023
Sampler	: ----		
Site	: ----		
Quote number	: BN/016/19		
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.

Signatories	*Position*	*Accreditation Category*
Beatriz Llarinas	Senior Chemist - Inorganics	Brisbane Inorganics, Stafford, QLD
Beatriz Llarinas	Senior Chemist - Inorganics	Brisbane Soil Preparation, Stafford, QLD
Ben Felgendrejeris	Senior Acid Sulfate Soil Chemist	Brisbane Acid Sulphate Soils, Stafford, QLD
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Kirsty Watson	Senior Chemist - Organics	Brisbane Organics, Stafford, QLD
Layla Hafner	Acid Sulphate Soils - Chemist	Brisbane Acid Sulphate Soils, Stafford, QLD
Layla Hafner	Acid Sulphate Soils - Chemist	Brisbane Soil Preparation, Stafford, QLD

General Comments

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

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

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

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EG005(ED093)-SDH: 1M HCl-Extractable Metals by ICPAES (QC Lot: 5364367)									
EB2331615-001	B4-4	EG005-SDH: Nickel	7440-02-0	1	mg/kg	10.7	11.6	7.5	0% - 50%
EB2331615-011	B12-2	EG005-SDH: Nickel	7440-02-0	1	mg/kg	7.8	7.2	8.2	No Limit
EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 5364371)									
EB2331615-015	B5-0	EG005T: Aluminium	7429-90-5	50	mg/kg	14000	14100	0.8	0% - 20%
		EG005T: Iron	7439-89-6	50	mg/kg	35100	34900	0.7	0% - 20%
EG035T: Total Recoverable Mercury by FIMS (Low Level) (QC Lot: 5364369)									
EB2331615-015	B5-0	EG035T-LL: Mercury	7439-97-6	0.01	mg/kg	0.07	0.07	0.0	No Limit
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 5364373)									
EB2331615-001	B4-4	EA055: Moisture Content	----	0.1	%	60.6	59.8	1.4	0% - 20%
EB2331615-011	B12-2	EA055: Moisture Content	----	0.1	%	60.9	56.2	7.9	0% - 20%
EG020-SD: Total Metals in Sediments by ICPMS (QC Lot: 5364370)									
EB2331615-015	B5-0	EG020-SD: Cadmium	7440-43-9	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
		EG020-SD: Silver	7440-22-4	0.1	mg/kg	0.1	0.1	0.0	No Limit
		EG020-SD: Arsenic	7440-38-2	1	mg/kg	5.60	5.60	0.0	No Limit
		EG020-SD: Chromium	7440-47-3	1	mg/kg	27.9	28.9	3.4	0% - 20%
		EG020-SD: Copper	7440-50-8	1	mg/kg	26.5	26.8	1.2	0% - 20%
		EG020-SD: Lead	7439-92-1	1	mg/kg	12.8	13.6	5.7	0% - 50%
		EG020-SD: Nickel	7440-02-0	1	mg/kg	25.0	25.1	0.0	0% - 20%
		EG020-SD: Zinc	7440-66-6	1	mg/kg	85.5	91.1	6.4	0% - 20%
EG035-SDH: 1M HCl extractable Mercury by FIMS (QC Lot: 5364368)									
EB2331615-011	B12-2	EG035-SDH: Mercury	7439-97-6	0.1	mg/kg	<0.10	<0.10	0.0	No Limit
EP003: Total Organic Carbon (TOC) in Soil (QC Lot: 5370841)									
EB2331615-015	B5-0	EP003: Total Organic Carbon	----	0.02	%	1.51	1.49	1.7	0% - 20%

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP003: Total Organic Carbon (TOC) in Soil (QC Lot: 5370841) - continued									
EB2332025-009	Anonymous	EP003: Total Organic Carbon	----	0.02	%	2.12	2.12	0.0	0% - 20%
EP090: Organotin Compounds (QC Lot: 5373915)									
EB2331615-015	B5-0	EP090: Tributyltin	56573-85-4	0.5	µgSn/kg	2.4	2.0	19.4	No Limit
		EP090: Monobutyltin	78763-54-9	1	µgSn/kg	<1	<1	0.0	No Limit
		EP090: Dibutyltin	1002-53-5	1	µgSn/kg	<1	<1	0.0	No Limit
EP130A: Organophosphorus Pesticides (Ultra-trace) (QC Lot: 5356312)									
EB2331615-015	B5-0	EP130: Bromophos-ethyl	4824-78-6	10	µg/kg	<12	<12	0.0	No Limit
		EP130: Carbophenothion	786-19-6	10	µg/kg	<12	<12	0.0	No Limit
		EP130: Chlorfenvinphos (E)	18708-86-6	10	µg/kg	<12.0	<12.0	0.0	No Limit
		EP130: Chlorfenvinphos (Z)	18708-87-7	10	µg/kg	<12	<12	0.0	No Limit
		EP130: Chlorpyrifos	2921-88-2	10	µg/kg	<12	<12	0.0	No Limit
		EP130: Chlorpyrifos-methyl	5598-13-0	10	µg/kg	<12	<12	0.0	No Limit
		EP130: Demeton-S-methyl	919-86-8	10	µg/kg	<12	<12	0.0	No Limit
		EP130: Diazinon	333-41-5	10	µg/kg	<12	<12	0.0	No Limit
		EP130: Dichlorvos	62-73-7	10	µg/kg	<12	<12	0.0	No Limit
		EP130: Dimethoate	60-51-5	10	µg/kg	<12	<12	0.0	No Limit
		EP130: Ethion	563-12-2	10	µg/kg	<12	<12	0.0	No Limit
		EP130: Fenamiphos	22224-92-6	10	µg/kg	<12	<12	0.0	No Limit
		EP130: Fenthion	55-38-9	10	µg/kg	<12	<12	0.0	No Limit
		EP130: Malathion	121-75-5	10	µg/kg	<12	<12	0.0	No Limit
		EP130: Azinphos Methyl	86-50-0	10	µg/kg	<12	<12	0.0	No Limit
		EP130: Monocrotophos	6923-22-4	10	µg/kg	<12	<12	0.0	No Limit
		EP130: Parathion	56-38-2	10	µg/kg	<12	<12	0.0	No Limit
		EP130: Parathion-methyl	298-00-0	10	µg/kg	<12	<12	0.0	No Limit
		EP130: Pirimphos-ethyl	23505-41-1	10	µg/kg	<12	<12	0.0	No Limit
		EP130: Prothiofos	34643-46-4	10	µg/kg	<12	<12	0.0	No Limit
EP131A: Organochlorine Pesticides (QC Lot: 5356311)									
EB2331615-015	B5-0	EP131A: gamma-BHC	58-89-9	0.25	µg/kg	<0.28	<0.28	0.0	No Limit
		EP131A: cis-Chlordane	5103-71-9	0.25	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: trans-Chlordane	5103-74-2	0.25	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Total Chlordane (sum)	----	0.25	µg/kg	<0.62	<0.62	0.0	No Limit
		EP131A: Aldrin	309-00-2	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: alpha-BHC	319-84-6	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: beta-BHC	319-85-7	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: delta-BHC	319-86-8	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: 4.4`-DDD	72-54-8	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: 4.4`-DDE	72-55-9	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: 4.4`-DDT	50-29-3	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.5	µg/kg	<0.62	<0.62	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 (%)*
EP131A: Organochlorine Pesticides (QC Lot: 5356311) - continued									
EB2331615-015	B5-0	EP131A: Dieldrin	60-57-1	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: alpha-Endosulfan	959-98-8	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: beta-Endosulfan	33213-65-9	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Endosulfan sulfate	1031-07-8	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Endosulfan (sum)	115-29-7	0.5	µg/kg	<0.62	<0.62	0.0	No Limit
		EP131A: Endrin	72-20-8	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Endrin aldehyde	7421-93-4	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Endrin ketone	53494-70-5	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Heptachlor	76-44-8	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Heptachlor epoxide	1024-57-3	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Hexachlorobenzene (HCB)	118-74-1	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Methoxychlor	72-43-5	0.5	µg/kg	<0.50	<0.50	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EG093T: Total Metals in Saline Water by ORC-ICPMS (QC Lot: 5370115)									
EB2331615-014	B10-6	EG093A-T: Nickel	7440-02-0	0.5	µg/L	4.7	5.0	5.2	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 Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EG005(ED093)-SDH: 1M HCl-Extractable Metals by ICPAES (QCLot: 5364367)								
EG005-SDH: Nickel	7440-02-0	1	mg/kg	<1.0	4.47 mg/kg	121	70.0	128
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 5364371)								
EG005T: Aluminium	7429-90-5	50	mg/kg	<50	12818 mg/kg	105	70.0	130
EG005T: Iron	7439-89-6	50	mg/kg	<50	26812 mg/kg	111	70.0	120
EG035T: Total Recoverable Mercury by FIMS (Low Level) (QCLot: 5364369)								
EG035T-LL: Mercury	7439-97-6	0.01	mg/kg	<0.01	0.087 mg/kg	107	70.0	130
EA152: Soil Particle Density (QCLot: 5354459)								
EA152: Soil Particle Density (Clay/Silt/Sand)	----	----	g/cm3	----	2.68 g/cm3	97.8	80.0	120
EG020-SD: Total Metals in Sediments by ICPMS (QCLot: 5364370)								
EG020-SD: Arsenic	7440-38-2	1	mg/kg	<1.00	53.2 mg/kg	114	80.0	124
EG020-SD: Cadmium	7440-43-9	0.1	mg/kg	<0.1	1.38 mg/kg	102	87.0	122
EG020-SD: Chromium	7440-47-3	1	mg/kg	<1.0	13.1 mg/kg	111	79.0	129
EG020-SD: Copper	7440-50-8	1	mg/kg	<1.0	33.4 mg/kg	112	85.0	118
EG020-SD: Lead	7439-92-1	1	mg/kg	<1.0	47.9 mg/kg	105	86.0	119
EG020-SD: Nickel	7440-02-0	1	mg/kg	<1.0	10.8 mg/kg	114	77.0	123
EG020-SD: Silver	7440-22-4	0.1	mg/kg	<0.1	2.43 mg/kg	89.2	70.0	130
EG020-SD: Zinc	7440-66-6	1	mg/kg	<1.0	148 mg/kg	113	71.0	127
EG035-SDH: 1M HCl extractable Mercury by FIMS (QCLot: 5364368)								
EG035-SDH: Mercury	7439-97-6	0.1	mg/kg	<0.10	0.25 mg/kg	84.9	70.0	130
EP003: Total Organic Carbon (TOC) in Soil (QCLot: 5370841)								
EP003: Total Organic Carbon	----	0.02	%	<0.02	0.55 %	92.4	80.0	120
				<0.02	32.3 %	98.3	80.0	120
EP090: Organotin Compounds (QCLot: 5373915)								
EP090: Monobutyltin	78763-54-9	1	µgSn/kg	<1	1.25 µgSn/kg	94.8	36.0	128
EP090: Dibutyltin	1002-53-5	1	µgSn/kg	<1	1.25 µgSn/kg	118	42.0	132
EP090: Tributyltin	56573-85-4	0.5	µgSn/kg	<0.5	1.25 µgSn/kg	80.5	52.0	139
EP130A: Organophosphorus Pesticides (Ultra-trace) (QCLot: 5356312)								
EP130: Bromophos-ethyl	4824-78-6	10	µg/kg	<10	50 µg/kg	77.3	49.0	117
EP130: Carbophenothion	786-19-6	10	µg/kg	<10	50 µg/kg	77.3	54.0	104
EP130: Chlorfenvinphos (E)	18708-86-6	10	µg/kg	<10.0	5 µg/kg	97.3	48.0	156

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP130A: Organophosphorus Pesticides (Ultra-trace) (QCLot: 5356312) - continued								
EP130: Chlorfenvinphos (Z)	18708-87-7	10	µg/kg	<10	50 µg/kg	107	53.0	119
EP130: Chlorpyrifos	2921-88-2	10	µg/kg	<10	50 µg/kg	76.1	54.0	112
EP130: Chlorpyrifos-methyl	5598-13-0	10	µg/kg	<10	50 µg/kg	76.8	52.0	108
EP130: Demeton-S-methyl	919-86-8	10	µg/kg	<10	50 µg/kg	81.0	51.0	109
EP130: Diazinon	333-41-5	10	µg/kg	<10	50 µg/kg	77.8	57.0	121
EP130: Dichlorvos	62-73-7	10	µg/kg	<10	50 µg/kg	80.4	48.0	104
EP130: Dimethoate	60-51-5	10	µg/kg	<10	50 µg/kg	78.0	52.0	120
EP130: Ethion	563-12-2	10	µg/kg	<10	50 µg/kg	78.5	51.0	121
EP130: Fenamiphos	22224-92-6	10	µg/kg	<10	50 µg/kg	90.0	50.0	120
EP130: Fenthion	55-38-9	10	µg/kg	<10	50 µg/kg	80.0	48.0	112
EP130: Malathion	121-75-5	10	µg/kg	<10	50 µg/kg	80.2	51.0	121
EP130: Azinphos Methyl	86-50-0	10	µg/kg	<10	50 µg/kg	89.2	45.0	127
EP130: Monocrotophos	6923-22-4	10	µg/kg	<10	50 µg/kg	90.9	48.0	128
EP130: Parathion	56-38-2	10	µg/kg	<10	50 µg/kg	77.3	49.0	125
EP130: Parathion-methyl	298-00-0	10	µg/kg	<10	50 µg/kg	75.6	51.0	119
EP130: Pirimphos-ethyl	23505-41-1	10	µg/kg	<10	50 µg/kg	77.5	48.0	120
EP130: Prothiofos	34643-46-4	10	µg/kg	<10	50 µg/kg	79.1	51.0	117
EP131A: Organochlorine Pesticides (QCLot: 5356311)								
EP131A: Aldrin	309-00-2	0.5	µg/kg	<0.50	5 µg/kg	95.7	38.0	139
EP131A: alpha-BHC	319-84-6	0.5	µg/kg	<0.50	5 µg/kg	70.2	17.6	136
EP131A: beta-BHC	319-85-7	0.5	µg/kg	<0.50	5 µg/kg	77.2	30.5	131
EP131A: delta-BHC	319-86-8	0.5	µg/kg	<0.50	5 µg/kg	69.9	37.0	140
EP131A: 4.4`-DDD	72-54-8	0.5	µg/kg	<0.50	5 µg/kg	83.9	25.9	141
EP131A: 4.4`-DDE	72-55-9	0.5	µg/kg	<0.50	5 µg/kg	63.4	35.0	129
EP131A: 4.4`-DDT	50-29-3	0.5	µg/kg	<0.50	5 µg/kg	93.4	23.4	138
EP131A: Sum of DDD + DDE + DDT	72-54-8/72-5 5-9/50-2	0.5	µg/kg	<0.50	----	----	----	----
EP131A: Dieldrin	60-57-1	0.5	µg/kg	<0.50	5 µg/kg	69.8	30.2	140
EP131A: alpha-Endosulfan	959-98-8	0.5	µg/kg	<0.50	5 µg/kg	86.0	38.0	140
EP131A: beta-Endosulfan	33213-65-9	0.5	µg/kg	<0.50	5 µg/kg	90.1	32.0	152
EP131A: Endosulfan sulfate	1031-07-8	0.5	µg/kg	<0.50	5 µg/kg	101	36.0	155
EP131A: Endosulfan (sum)	115-29-7	0.5	µg/kg	<0.50	----	----	----	----
EP131A: Endrin	72-20-8	0.5	µg/kg	<0.50	5 µg/kg	84.0	25.8	158
EP131A: Endrin aldehyde	7421-93-4	0.5	µg/kg	<0.50	5 µg/kg	71.0	20.1	118
EP131A: Endrin ketone	53494-70-5	0.5	µg/kg	<0.50	5 µg/kg	65.9	13.4	135

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP131A: Organochlorine Pesticides (QCLot: 5356311) - continued								
EP131A: Heptachlor	76-44-8	0.5	µg/kg	<0.50	5 µg/kg	77.8	39.0	155
EP131A: Heptachlor epoxide	1024-57-3	0.5	µg/kg	<0.50	5 µg/kg	78.4	34.0	148
EP131A: Hexachlorobenzene (HCB)	118-74-1	0.5	µg/kg	<0.50	5 µg/kg	73.2	26.1	152
EP131A: gamma-BHC	58-89-9	0.25	µg/kg	<0.25	5 µg/kg	77.3	31.2	137
EP131A: Methoxychlor	72-43-5	0.5	µg/kg	<0.50	5 µg/kg	96.0	36.0	152
EP131A: cis-Chlordane	5103-71-9	0.25	µg/kg	<0.25	5 µg/kg	76.9	36.0	142
EP131A: trans-Chlordane	5103-74-2	0.25	µg/kg	<0.25	5 µg/kg	78.6	29.5	138
EP131A: Total Chlordane (sum)	----	0.25	µg/kg	<0.25	----	----	----	----

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EG093T: Total Metals in Saline Water by ORC-ICPMS (QCLot: 5370115)								
EG093A-T: Nickel	7440-02-0	0.5	µg/L	<0.5	10 µg/L	98.0	80.0	120
EP131A: Organochlorine Pesticides (QCLot: 5367030)								
EP131A: Aldrin	309-00-2	0.01	µg/L	<0.010	1.1 µg/L	115	34.0	145
EP131A: alpha-BHC	319-84-6	0.01	µg/L	<0.010	1.1 µg/L	104	27.2	131
EP131A: beta-BHC	319-85-7	0.01	µg/L	<0.010	1.1 µg/L	90.4	28.6	133
EP131A: delta-BHC	319-86-8	0.01	µg/L	<0.010	1.1 µg/L	81.5	36.0	131
EP131A: 4.4`-DDD	72-54-8	0.01	µg/L	<0.010	1.1 µg/L	110	36.0	142
EP131A: 4.4`-DDE	72-55-9	0.01	µg/L	<0.010	1.1 µg/L	85.0	30.4	112
EP131A: 4.4`-DDT	50-29-3	0.01	µg/L	<0.010	1.1 µg/L	85.1	29.5	142
EP131A: Dieldrin	60-57-1	0.01	µg/L	<0.010	1.1 µg/L	84.6	28.1	122
EP131A: alpha-Endosulfan	959-98-8	0.01	µg/L	<0.010	1.1 µg/L	105	34.0	119
EP131A: beta-Endosulfan	33213-65-9	0.01	µg/L	<0.010	1.1 µg/L	107	31.6	128
EP131A: Endosulfan sulfate	1031-07-8	0.01	µg/L	<0.010	1.1 µg/L	94.9	35.0	159
EP131A: Endrin	72-20-8	0.01	µg/L	<0.010	1.1 µg/L	101	21.5	165
EP131A: Endosulfan (sum)	115-29-7	0.01	µg/L	<0.010	----	----	----	----
EP131A: Endrin aldehyde	7421-93-4	0.01	µg/L	<0.010	1.1 µg/L	86.0	22.7	123
EP131A: Endrin ketone	53494-70-5	0.01	µg/L	<0.010	1.1 µg/L	82.8	16.3	144
EP131A: Heptachlor	76-44-8	0.005	µg/L	<0.005	1.1 µg/L	91.4	33.0	160
EP131A: Heptachlor epoxide	1024-57-3	0.01	µg/L	<0.010	1.1 µg/L	108	33.0	117
EP131A: Hexachlorobenzene (HCB)	118-74-1	0.01	µg/L	<0.010	1.1 µg/L	105	23.6	126
EP131A: gamma-BHC	58-89-9	0.01	µg/L	<0.010	1.1 µg/L	97.4	28.7	134
EP131A: Methoxychlor	72-43-5	0.01	µg/L	<0.010	1.1 µg/L	103	29.5	150

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP131A: Organochlorine Pesticides (QCLot: 5367030) - continued								
EP131A: cis-Chlordane	5103-71-9	0.01	µg/L	<0.010	1.1 µg/L	98.5	27.0	116
EP131A: trans-Chlordane	5103-74-2	0.01	µg/L	<0.010	1.1 µg/L	97.7	31.2	119
EP131A: Total Chlordane (sum)	----	0.01	µg/L	<0.010	----	----	----	----
EP131A: Sum of DDD + DDE + DDT	72-54-8/72-5 5-9/50-2	0.01	µg/L	<0.010	----	----	----	----

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	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EG005(ED093)-SDH: 1M HCl-Extractable Metals by ICPAES (QCLot: 5364367)							
EB2331615-002	B4-0	EG005-SDH: Nickel	7440-02-0	25 mg/kg	101	70.0	130
EG035T: Total Recoverable Mercury by FIMS (Low Level) (QCLot: 5364369)							
EB2331615-016	B5-1	EG035T-LL: Mercury	7439-97-6	0.5 mg/kg	79.7	70.0	130
EG020-SD: Total Metals in Sediments by ICPMS (QCLot: 5364370)							
EB2331615-016	B5-1	EG020-SD: Arsenic	7440-38-2	50 mg/kg	86.4	70.0	130
		EG020-SD: Cadmium	7440-43-9	50 mg/kg	# 22.4	70.0	130
		EG020-SD: Chromium	7440-47-3	50 mg/kg	92.3	70.0	130
		EG020-SD: Copper	7440-50-8	250 mg/kg	# 17.6	70.0	130
		EG020-SD: Lead	7439-92-1	250 mg/kg	# 17.9	70.0	130
		EG020-SD: Nickel	7440-02-0	50 mg/kg	88.6	70.0	130
		EG020-SD: Zinc	7440-66-6	250 mg/kg	# 17.7	70.0	130
EP090: Organotin Compounds (QCLot: 5373915)							
EB2331615-016	B5-1	EP090: Monobutyltin	78763-54-9	1.25 µgSn/kg	# 6.9	20.0	130
		EP090: Dibutyltin	1002-53-5	1.25 µgSn/kg	45.2	20.0	130
		EP090: Tributyltin	56573-85-4	1.25 µgSn/kg	48.9	20.0	130
EP130A: Organophosphorus Pesticides (Ultra-trace) (QCLot: 5356312)							
EB2331615-015	B5-0	EP130: Bromophos-ethyl	4824-78-6	50 µg/kg	73.6	36.0	144
		EP130: Carbophenothion	786-19-6	50 µg/kg	83.2	38.0	120
		EP130: Chlorfenvinphos (E)	18708-86-6	5 µg/kg	94.7	49.0	157
		EP130: Chlorfenvinphos (Z)	18708-87-7	50 µg/kg	91.5	53.0	145
		EP130: Chlorpyrifos	2921-88-2	50 µg/kg	84.4	60.0	140
		EP130: Chlorpyrifos-methyl	5598-13-0	50 µg/kg	75.8	56.0	126
		EP130: Demeton-S-methyl	919-86-8	50 µg/kg	83.8	9.70	148

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP130A: Organophosphorus Pesticides (Ultra-trace) (QCLot: 5356312) - continued							
EB2331615-015	B5-0	EP130: Diazinon	333-41-5	50 µg/kg	81.9	60.0	122
		EP130: Dichlorvos	62-73-7	50 µg/kg	63.9	33.0	123
		EP130: Dimethoate	60-51-5	50 µg/kg	73.0	36.0	142
		EP130: Ethion	563-12-2	50 µg/kg	71.5	48.0	136
		EP130: Fenamiphos	22224-92-6	50 µg/kg	89.8	42.0	136
		EP130: Fenthion	55-38-9	50 µg/kg	81.4	35.0	131
		EP130: Malathion	121-75-5	50 µg/kg	88.8	55.0	141
		EP130: Azinphos Methyl	86-50-0	50 µg/kg	90.3	23.5	132
		EP130: Monocrotophos	6923-22-4	50 µg/kg	73.0	35.0	153
		EP130: Parathion	56-38-2	50 µg/kg	89.4	57.0	147
		EP130: Parathion-methyl	298-00-0	50 µg/kg	90.8	48.0	140
		EP130: Pirimphos-ethyl	23505-41-1	50 µg/kg	77.3	45.0	137
		EP130: Prothiofos	34643-46-4	50 µg/kg	81.8	51.0	137
EP131A: Organochlorine Pesticides (QCLot: 5356311)							
EB2331615-015	B5-0	EP131A: Aldrin	309-00-2	5 µg/kg	75.0	23.4	153
		EP131A: alpha-BHC	319-84-6	5 µg/kg	50.4	17.6	156
		EP131A: beta-BHC	319-85-7	5 µg/kg	54.0	24.9	153
		EP131A: delta-BHC	319-86-8	5 µg/kg	65.4	25.2	147
		EP131A: 4.4`-DDD	72-54-8	5 µg/kg	46.9	25.9	150
		EP131A: 4.4`-DDE	72-55-9	5 µg/kg	65.7	31.2	125
		EP131A: 4.4`-DDT	50-29-3	5 µg/kg	96.2	23.4	163
		EP131A: Dieldrin	60-57-1	5 µg/kg	67.6	30.2	140
		EP131A: alpha-Endosulfan	959-98-8	5 µg/kg	69.6	28.8	135
		EP131A: beta-Endosulfan	33213-65-9	5 µg/kg	53.6	22.6	141
		EP131A: Endosulfan sulfate	1031-07-8	5 µg/kg	100	16.1	156
		EP131A: Endrin	72-20-8	5 µg/kg	142	17.7	162
		EP131A: Endrin aldehyde	7421-93-4	5 µg/kg	39.4	20.1	116
		EP131A: Endrin ketone	53494-70-5	5 µg/kg	58.5	13.4	151
		EP131A: Heptachlor	76-44-8	5 µg/kg	48.7	23.8	170
		EP131A: Heptachlor epoxide	1024-57-3	5 µg/kg	57.1	28.3	140
		EP131A: Hexachlorobenzene (HCB)	118-74-1	5 µg/kg	49.7	17.7	144
		EP131A: gamma-BHC	58-89-9	5 µg/kg	61.6	21.8	158
		EP131A: Methoxychlor	72-43-5	5 µg/kg	109	24.4	158
		EP131A: cis-Chlordane	5103-71-9	5 µg/kg	102	27.3	139
		EP131A: trans-Chlordane	5103-74-2	5 µg/kg	78.1	29.5	138

CERTIFICATE OF ANALYSIS

Work Order	: **EB2335069**	Page	: 1 of 8
Client	: **BMT COMMERCIAL AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: MACKENZIE STACEY	Contact	: Nathan King
Address	: PO BOX 203 SPRING HILL BRISBANE QLD 4004	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: ----	Telephone	: +61-7-3243 7222
Project	: B23621 PoB Monitoring 2019-2025	Date Samples Received	: 06-Nov-2023 16:05
Order number	: ----	Date Analysis Commenced	: 10-Nov-2023
C-O-C number	: ----	Issue Date	: 20-Nov-2023 13:37
Sampler	: CRAIG HEATHERINGTON, MACKENZIE STACEY		
Site	: ----		
Quote number	: BN/016/19		
No. of samples received	: 6		
No. of samples analysed	: 6		

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*
Beatriz Llarinas	Senior Chemist - Inorganics	Brisbane Inorganics, Stafford, QLD
Beatriz Llarinas	Senior Chemist - Inorganics	Brisbane Soil Preparation, Stafford, QLD
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW

General Comments

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

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

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

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

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

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

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP131A: Where reported, Total Chlordane (sum) is the sum of the reported concentrations of cis-Chlordane and trans-Chlordane at or above the LOR.
- **Organics analysis is conducted by ALS Environmental, Sydney, NATA accreditation no. 825, Site No. 10911 (Micro site no. 14913).**
- EG035-SDH (1M HCl extractable Mercury by FIMS): B5-1 (EB2335069-002) shows poor matrix spike recovery due to sample heterogeneity. This has been confirmed by visual inspection.
- EN68: This analysis in accordance with National Ocean Disposal Guidelines, Commonwealth of Australia, 2002 - (modified). Results reported are those determined on a 1:4 sediment/seawater elutriate without blank correction.
- EG093: Samples containing high levels of sulfate may precipitate barium under the acidic conditions of this method and may therefore bias results low.

Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)			Sample ID	B5-0 Elutraite Leachate	B5-1 Elutraite Leachate	B6-3 Elutraite Leachate	B7-1 Elutraite Leachate	Elutraite Blank
			Sampling date / time	12-Sep-2023 00:00	12-Sep-2023 00:00	12-Sep-2023 00:00	12-Sep-2023 00:00	12-Sep-2023 00:00
Compound	CAS Number	LOR	Unit	EB2335069-001	EB2335069-002	EB2335069-003	EB2335069-004	EB2335069-006
				Result	Result	Result	Result	Result
EG093T: Total Metals in Saline Water by ORC-ICPMS								
Nickel	7440-02-0	0.5	µg/L	**2.7**	**1.0**	**2.2**	**2.0**	<0.5

Analytical Results

Sub-Matrix: PORE WATER LEACHATE (Matrix: WATER)				Sample ID	B7-1 Pore Water Leachate	----	----	----	----
				Sampling date / time	12-Sep-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	EB2335069-005	--------	--------	--------	--------	
				Result	----	----	----	----	
EP131A: Organochlorine Pesticides									
Aldrin	309-00-2	0.010	µg/L	<0.010	----	----	----	----	
alpha-BHC	319-84-6	0.010	µg/L	<0.010	----	----	----	----	
beta-BHC	319-85-7	0.010	µg/L	<0.010	----	----	----	----	
delta-BHC	319-86-8	0.010	µg/L	<0.010	----	----	----	----	
4.4`-DDD	72-54-8	0.010	µg/L	<0.010	----	----	----	----	
4.4`-DDE	72-55-9	0.010	µg/L	<0.010	----	----	----	----	
4.4`-DDT	50-29-3	0.010	µg/L	<0.010	----	----	----	----	
^ **Sum of DDD + DDE + DDT**	72-54-8/72-55-9/50-2	0.010	µg/L	<0.010	----	----	----	----	
Dieldrin	60-57-1	0.010	µg/L	<0.010	----	----	----	----	
alpha-Endosulfan	959-98-8	0.010	µg/L	<0.010	----	----	----	----	
beta-Endosulfan	33213-65-9	0.010	µg/L	<0.010	----	----	----	----	
Endosulfan sulfate	1031-07-8	0.010	µg/L	<0.010	----	----	----	----	
^ **Endosulfan (sum)**	115-29-7	0.010	µg/L	<0.010	----	----	----	----	
Endrin	72-20-8	0.010	µg/L	<0.010	----	----	----	----	
Endrin aldehyde	7421-93-4	0.010	µg/L	<0.010	----	----	----	----	
Endrin ketone	53494-70-5	0.010	µg/L	<0.010	----	----	----	----	
Heptachlor	76-44-8	0.005	µg/L	<0.005	----	----	----	----	
Heptachlor epoxide	1024-57-3	0.010	µg/L	<0.010	----	----	----	----	
Hexachlorobenzene (HCB)	118-74-1	0.010	µg/L	<0.010	----	----	----	----	
gamma-BHC	58-89-9	0.010	µg/L	<0.010	----	----	----	----	
Methoxychlor	72-43-5	0.010	µg/L	<0.010	----	----	----	----	
cis-Chlordane	5103-71-9	0.010	µg/L	<0.010	----	----	----	----	
trans-Chlordane	5103-74-2	0.010	µg/L	<0.010	----	----	----	----	
^ **Total Chlordane (sum)**	----	0.010	µg/L	<0.010	----	----	----	----	
Oxychlordane	27304-13-8	0.010	µg/L	<0.010	----	----	----	----	
^ **Sum of Aldrin + Dieldrin**	309-00-2/60-57-1	0.010	µg/L	<0.010	----	----	----	----	

Analytical Results

Sub-Matrix: PORE WATER LEACHATE (Matrix: WATER)				Sample ID	B7-1 Pore Water Leachate	----	----	----	----
				Sampling date / time	12-Sep-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EB2335069-005	--------	--------	--------	--------
					Result	----	----	----	----
EP131S: OC Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.010	%		**71.3**	**----**	**----**	**----**	**----**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	B5-0 Elutraite Leachate	B5-1 Elutraite Leachate	B6-3 Elutraite Leachate	B7-1 Elutraite Leachate	B7-1 Pore Water Leachate
			Sampling date / time	12-Sep-2023 00:00	12-Sep-2023 00:00	12-Sep-2023 00:00	12-Sep-2023 00:00	12-Sep-2023 00:00
Compound	CAS Number	LOR	Unit	EB2335069-001	EB2335069-002	EB2335069-003	EB2335069-004	EB2335069-005
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	**56.8**	**48.8**	**61.7**	**57.2**	**----**
EG005(ED093)-SDH: 1M HCl-Extractable Metals by ICPAES								
Nickel	7440-02-0	1.0	mg/kg	**11.5**	**7.4**	**11.5**	**7.6**	**----**
EG035-SDH: 1M HCl extractable Mercury by FIMS								
Mercury	7439-97-6	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	**----**
EN68: Seawater Elutriate Testing Procedure - Inorganics/Non-Volatile Organics (Glass Vessel)								
Seawater Sampling Date	----	-	-	**10/11/2023**	**10/11/2023**	**10/11/2023**	**10/11/2023**	**----**
EN82: Porewater Extraction								
Volume	----	1	mL	**----**	**----**	**----**	**----**	**83**

Analytical Results

Sub-Matrix: WATER (Matrix: SOIL)				Sample ID	Elutraite Blank	----	----	----	----
				Sampling date / time	12-Sep-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EB2335069-006	--------	--------	--------	--------
					Result	----	----	----	----
EN68: Seawater Elutriate Testing Procedure - Inorganics/Non-Volatile Organics (Glass Vessel)									
Seawater Sampling Date	----	-	-		**10/11/2023**	**----**	**----**	**----**	**----**

Surrogate Control Limits

Sub-Matrix: **PORE WATER LEACHATE**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP131S: OC Pesticide Surrogate			
Dibromo-DDE	21655-73-2	14	166

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(WATER) EP131A: Organochlorine Pesticides

(WATER) EP131S: OC Pesticide Surrogate

QUALITY CONTROL REPORT

Work Order	: **EB2335069**	Page	: 1 of 4
Client	: **BMT COMMERCIAL AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: MACKENZIE STACEY	Contact	: Nathan King
Address	: PO BOX 203 SPRING HILL BRISBANE QLD 4004	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: ----	Telephone	: +61-7-3243 7222
Project	: B23621 PoB Monitoring 2019-2025	Date Samples Received	: 06-Nov-2023
Order number	: ----	Date Analysis Commenced	: 10-Nov-2023
C-O-C number	: ----	Issue Date	: 20-Nov-2023
Sampler	: CRAIG HEATHERINGTON, MACKENZIE STACEY		
Site	: ----		
Quote number	: BN/016/19		
No. of samples received	: 6		
No. of samples analysed	: 6		

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

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

This Quality Control Report contains the following information:

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Beatriz Llarinas	Senior Chemist - Inorganics	Brisbane Inorganics, Stafford, QLD
Beatriz Llarinas	Senior Chemist - Inorganics	Brisbane Soil Preparation, Stafford, QLD
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW

General Comments

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

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

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

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC
* = The final LOR has been raised due to dilution or other sample specific cause; adjusted LOR is shown in brackets. The duplicate ranges for Acceptable RPD% are applied to the final LOR where applicable.

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EG005(ED093)-SDH: 1M HCl-Extractable Metals by ICPAES (QC Lot: 5416519)									
EB2335069-001	B5-0 Elutraite Leachate	EG005-SDH: Nickel	7440-02-0	1	mg/kg	11.5	10.2	11.3	0% - 50%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 5416526)									
EB2334708-003	Anonymous	EA055: Moisture Content	----	0.1 (1.0)*	%	6.6	6.7	0.0	No Limit
EG035-SDH: 1M HCl extractable Mercury by FIMS (QC Lot: 5416518)									
EB2335069-001	B5-0 Elutraite Leachate	EG035-SDH: Mercury	7439-97-6	0.1	mg/kg	<0.10	<0.10	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EG093T: Total Metals in Saline Water by ORC-ICPMS (QC Lot: 5420006)									
EB2335069-001	B5-0 Elutraite Leachate	EG093A-T: Nickel	7440-02-0	0.5	µg/L	2.7	2.7	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			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EG005(ED093)-SDH: 1M HCl-Extractable Metals by ICPAES (QCLot: 5416519)								
EG005-SDH: Nickel	7440-02-0	1	mg/kg	<1.0	4.47 mg/kg	113	70.0	128
EN68: Seawater Elutriate Testing Procedure - Inorganics/Non-Volatile Organics (Glass Vessel) (QCLot: 5415938)								
EN68a-G: Seawater Sampling Date	----	----	-	10/11/2023	----	----	----	----
EG035-SDH: 1M HCl extractable Mercury by FIMS (QCLot: 5416518)								
EG035-SDH: Mercury	7439-97-6	0.1	mg/kg	<0.10	0.25 mg/kg	95.6	70.0	130

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EG093T: Total Metals in Saline Water by ORC-ICPMS (QCLot: 5420006)								
EG093A-T: Nickel	7440-02-0	0.5	µg/L	<0.5	10 µg/L	100	80.0	120
EP131A: Organochlorine Pesticides (QCLot: 5432101)								
EP131A: Aldrin	309-00-2	0.01	µg/L	<0.010	1.1 µg/L	116	34.0	145
EP131A: alpha-BHC	319-84-6	0.01	µg/L	<0.010	1.1 µg/L	112	27.2	131
EP131A: beta-BHC	319-85-7	0.01	µg/L	<0.010	1.1 µg/L	87.0	28.6	133
EP131A: delta-BHC	319-86-8	0.01	µg/L	<0.010	1.1 µg/L	88.6	36.0	131
EP131A: 4.4`-DDD	72-54-8	0.01	µg/L	<0.010	1.1 µg/L	105	36.0	142
EP131A: 4.4`-DDE	72-55-9	0.01	µg/L	<0.010	1.1 µg/L	90.0	30.4	112
EP131A: 4.4`-DDT	50-29-3	0.01	µg/L	<0.010	1.1 µg/L	107	29.5	142
EP131A: Dieldrin	60-57-1	0.01	µg/L	<0.010	1.1 µg/L	102	28.1	122
EP131A: alpha-Endosulfan	959-98-8	0.01	µg/L	<0.010	1.1 µg/L	97.1	34.0	119
EP131A: beta-Endosulfan	33213-65-9	0.01	µg/L	<0.010	1.1 µg/L	95.4	31.6	128
EP131A: Endosulfan sulfate	1031-07-8	0.01	µg/L	<0.010	1.1 µg/L	56.4	35.0	159
EP131A: Endrin	72-20-8	0.01	µg/L	<0.010	1.1 µg/L	97.4	21.5	165
EP131A: Endosulfan (sum)	115-29-7	0.01	µg/L	<0.010	----	----	----	----
EP131A: Endrin aldehyde	7421-93-4	0.01	µg/L	<0.010	1.1 µg/L	65.0	22.7	123
EP131A: Endrin ketone	53494-70-5	0.01	µg/L	<0.010	1.1 µg/L	70.0	16.3	144
EP131A: Heptachlor	76-44-8	0.005	µg/L	<0.005	1.1 µg/L	80.6	33.0	160
EP131A: Heptachlor epoxide	1024-57-3	0.01	µg/L	<0.010	1.1 µg/L	97.5	33.0	117
EP131A: Hexachlorobenzene (HCB)	118-74-1	0.01	µg/L	<0.010	1.1 µg/L	114	23.6	126
EP131A: gamma-BHC	58-89-9	0.01	µg/L	<0.010	1.1 µg/L	104	28.7	134

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP131A: Organochlorine Pesticides (QCLot: 5432101) - continued								
EP131A: Methoxychlor	72-43-5	0.01	µg/L	<0.010	1.1 µg/L	65.1	29.5	150
EP131A: cis-Chlordane	5103-71-9	0.01	µg/L	<0.010	1.1 µg/L	99.4	27.0	116
EP131A: trans-Chlordane	5103-74-2	0.01	µg/L	<0.010	1.1 µg/L	93.8	31.2	119
EP131A: Total Chlordane (sum)	----	0.01	µg/L	<0.010	----	----	----	----
EP131A: Sum of DDD + DDE + DDT	72-54-8/72-5 5-9/50-2	0.01	µg/L	<0.010	----	----	----	----

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	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EG005(ED093)-SDH: 1M HCl-Extractable Metals by ICPAES (QCLot: 5416519)							
EB2335069-002	B5-1 Elutraite Leachate	EG005-SDH: Nickel	7440-02-0	25 mg/kg	100	70.0	130
EG035-SDH: 1M HCl extractable Mercury by FIMS (QCLot: 5416518)							
EB2335069-002	B5-1 Elutraite Leachate	EG035-SDH: Mercury	7439-97-6	0.25 mg/kg	# 30.5	70.0	130

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EG093T: Total Metals in Saline Water by ORC-ICPMS (QCLot: 5420006)							
EB2335069-002	B5-1 Elutraite Leachate	EG093A-T: Nickel	7440-02-0	500 µg/L	100	70.0	130

Annex D Secondary Lab—Symbio Chain of Custody

Symbio LABORATORIES

QUALITY CONTROL REPORT

Certificate Number	B1389792-A	**Page**	1 of 6
Client	BMT Commercial Australia Pty Ltd	**Laboratory**	Brisbane
Contact	Mackenzie Stacey	**Contact**	Customer Service Team
Address	Level 8 200 Creek Street Brisbane, QLD 4000	**Address**	52 Brandl Street, Eight Mile Plains, QLD 4113
		Email	admin@symbiolabs.com.au
Telephone	07 3831 6744	**Telephone**	1300 703 166
Order Number	BN/016/19 B	**Date Samples Received**	19/09/2023 18:43
Project ID	Soil- B23621- BN/016/19 B	**Date Analysis Commenced**	19/09/2023
Sampler	Customer	**Issue Date**	04/10/2023
Client Job Reference	---	**Receipt Temperature (°C)**	8°C
Number of Samples Received	2	**Storage Temperature (°C)**	4°C
Number of Samples Analysed	2	**Quote Number**	---

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

This Quality Control Report contains the following information:

1. Method Blank (MB) Report; Limit of Detection and QC Result
2. Method Laboratory Control Sample (LCS) Report; QC Result and Acceptance Criteria
3. Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits

General Comments

The analytical methods used by the Environmental Department have been developed from established internationally recognized methods such as those published by the USEPA, APHA, AS and NEPM. In-house developed analytical methods are employed in the absence of documented standards or by client request.

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

Abbreviation:

QC Sample = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CRM = Certified Referenced Material; Used to verify in-house LCS
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOD = Limit of detection
RPD = Relative Percentage Difference

Client	BMT Commercial Australia Pty Ltd
Contact	Mackenzie Stacey
Certificate Number	B1389792-A
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Method Blank 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.

Method:Compound / QC Sample ID	Analyte	LOD	Units	QC Result
Lab Method: EFF005_S (BatchID - 0129513)				
Method Blank - 0129513	Nitrogen - Nitrite	0.1	mg/kg	<0.1
Lab Method: ENV001_S (BatchID - 0129343)				
Method Blank - 0129343	Moisture	0.1	%	<0.1
Lab Method: ENV010_S (BatchID - 0129533)				
Method Blank - 0129533	Total Kjeldahl Nitrogen	20	mg/kg	<20
Lab Method: IND041 (BatchID - 0129697)				
Method Blank - 0129697	Aluminium	1	mg/kg	<1
Method Blank - 0129697	Arsenic	5	mg/kg	<5
Method Blank - 0129697	Boron	5	mg/kg	<5
Method Blank - 0129697	Cadmium	0.5	mg/kg	<0.5
Method Blank - 0129697	Calcium	10	mg/kg	<10
Method Blank - 0129697	Chromium	1	mg/kg	<1
Method Blank - 0129697	Copper	1	mg/kg	<1
Method Blank - 0129697	Iron	2	mg/kg	<2
Method Blank - 0129697	Magnesium	5	mg/kg	<5
Method Blank - 0129697	Manganese	1	mg/kg	<1
Method Blank - 0129697	Nickel	1	mg/kg	<1
Method Blank - 0129697	Phosphorus	5	mg/kg	<5
Method Blank - 0129697	Potassium	20	mg/kg	<20
Method Blank - 0129697	Silicon	5	mg/kg	<5
Method Blank - 0129697	Sodium	100	mg/kg	<100
Method Blank - 0129697	Sulphur	20	mg/kg	<20
Method Blank - 0129697	Zinc	5	mg/kg	<5
Lab Method: IND041 (BatchID - 0129719)				
Method Blank - 0129719	Aluminium	1	mg/kg	<1

Client	BMT Commercial Australia Pty Ltd
Contact	Mackenzie Stacey
Certificate Number	B1389792-A
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Method Blank Report - Continued

Method:Compound / QC Sample ID	Analyte	LOD	Units	QC Result
Lab Method: IND041 (BatchID - 0129719) - Continued				
Method Blank - 0129719	Arsenic	5	mg/kg	<5
Method Blank - 0129719	Cadmium	0.5	mg/kg	<0.5
Method Blank - 0129719	Chromium	1	mg/kg	<1
Method Blank - 0129719	Copper	1	mg/kg	<1
Method Blank - 0129719	Iron	2	mg/kg	<2
Method Blank - 0129719	Nickel	1	mg/kg	<1
Method Blank - 0129719	Zinc	5	mg/kg	<5
Lab Method: IND041 (BatchID - 0129781)				
Method Blank - 0129781	Lead	2	mg/kg	<2

Client	BMT Commercial Australia Pty Ltd
Contact	Mackenzie Stacey
Certificate Number	B1389792-A
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Method Laboratory Control Sample Report

The quality control term Laboratory Control Sample (LCS) refers to a certified reference material (CRM) or a sample with known parameters that have been verified against a CRM. The quality control term Spike (SPK) refers to a known interference free matrix spiked with target analytes. The purpose of these QC parameters is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Method : Compound / QC Sample ID	Analyte	LOD	Units	QC Test Results	Expected Value	QC Recovery	QC Criteria
Lab Method: EFF005_S (BatchID - 0129513 - SPK_EBNE00044)							
SPK_EBNE00044	Nitrogen - Nitrite	0.1	mg/kg	14.2	15.2	93%	80% - 120%
Lab Method: ENV001_S (BatchID - 0129343 - SPK_EBNE00035)							
SPK_EBNE00035	Moisture	0.1	%	100.3	100	100%	80% - 120%
Lab Method: ENV010_S (BatchID - 0129533 - SPK_EBNE00031)							
SPK_EBNE00031	Total Kjeldahl Nitrogen	20	mg/kg	8998	10000	89%	70% - 130%
Lab Method: IND041 (BatchID - 0129697 - CRM_CBNE00001)							
CRM_CBNE00001	Aluminium	1	mg/kg	9869	8920	110%	50% - 150%
CRM_CBNE00001	Arsenic	5	mg/kg	8.8	7.76	113%	60% - 140%
CRM_CBNE00001	Cadmium	0.5	mg/kg	0.63	0.5	126%	50% - 150%
CRM_CBNE00001	Chromium	1	mg/kg	18.8	14.5	129%	50% - 150%
CRM_CBNE00001	Copper	1	mg/kg	15.3	15.5	98%	80% - 120%
CRM_CBNE00001	Iron	2	mg/kg	19060	16800	113%	80% - 120%
CRM_CBNE00001	Nickel	1	mg/kg	17.3	16.7	103%	80% - 120%
CRM_CBNE00001	Zinc	5	mg/kg	77.3	69.7	110%	80% - 120%
Lab Method: IND041 (BatchID - 0129719 - CRM_CBNE00001)							
CRM_CBNE00001	Aluminium	1	mg/kg	9869	8920	110%	50% - 150%
CRM_CBNE00001	Arsenic	5	mg/kg	8.8	7.76	113%	60% - 140%
CRM_CBNE00001	Cadmium	0.5	mg/kg	0.63	0.5	126%	50% - 150%
CRM_CBNE00001	Chromium	1	mg/kg	18.8	14.5	129%	50% - 150%
CRM_CBNE00001	Copper	1	mg/kg	15.3	15.5	98%	80% - 120%
CRM_CBNE00001	Iron	2	mg/kg	19060	16800	113%	80% - 120%
CRM_CBNE00001	Nickel	1	mg/kg	17.3	16.7	103%	80% - 120%
CRM_CBNE00001	Zinc	5	mg/kg	77.3	69.7	110%	80% - 120%
Lab Method: IND041 (BatchID - 0129781 - CRM_CBNE00001)							
CRM_CBNE00001	Lead	2	mg/kg	17.2	14.1	121%	70% - 130%

Client	BMT Commercial Australia Pty Ltd
Contact	Mackenzie Stacey
Certificate Number	B1389792-A
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Laboratory Duplicate 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 the relavant technical method manuals and are dependent on the magnitude of results in comparison to the level of reporting.

Method : Compound / QC Sample ID	Analyte	LOD	Units	Original Result	Dup Result	RPD	RPD Acceptance Criteria
Lab Method: EFF005_S (BatchID - 0129513)							
Laboratory Duplicate Sample - 0129513	Nitrogen - Nitrite	0.1	mg/kg	<0.1	<0.1	-	N/A
Lab Method: ENV001_S (BatchID - 0129343)							
Laboratory Duplicate Sample - 0129343	Moisture	0.1	%	48.7	47.2	3.1%	<30%
Lab Method: ENV010_S (BatchID - 0129533)							
Laboratory Duplicate Sample - 0129533	Total Kjeldahl Nitrogen	20	mg/kg	869.4	849.8	2.3%	<30%
Lab Method: IND041 (BatchID - 0129697)							
Laboratory Duplicate Sample - 0129697	Aluminium	1	mg/kg	18510	18730	1.2%	<30%
Laboratory Duplicate Sample - 0129697	Arsenic	5	mg/kg	7.5	6.9	8.3%	No Limit
Laboratory Duplicate Sample - 0129697	Cadmium	0.5	mg/kg	0.66	0.82	21.6%	No Limit
Laboratory Duplicate Sample - 0129697	Chromium	1	mg/kg	1024	1032	0.8%	<30%
Laboratory Duplicate Sample - 0129697	Copper	1	mg/kg	29.2	29.0	0.7%	<30%
Laboratory Duplicate Sample - 0129697	Iron	2	mg/kg	33170	33600	1.3%	<30%
Laboratory Duplicate Sample - 0129697	Magnesium	5	mg/kg	7254	7241	0.2%	<30%
Laboratory Duplicate Sample - 0129697	Manganese	1	mg/kg	456.3	456.5	0.0%	<30%
Laboratory Duplicate Sample - 0129697	Nickel	1	mg/kg	30.0	30.3	1.0%	<30%
Laboratory Duplicate Sample - 0129697	Phosphorus	5	mg/kg	937.0	945.4	0.9%	<30%
Laboratory Duplicate Sample - 0129697	Potassium	20	mg/kg	3346	3342	0.1%	<30%
Laboratory Duplicate Sample - 0129697	Silicon	5	mg/kg	760.8	755.8	0.7%	<30%
Laboratory Duplicate Sample - 0129697	Sodium	100	mg/kg	13490	13220	2.0%	<30%
Laboratory Duplicate Sample - 0129697	Sulphur	20	mg/kg	4122	4112	0.2%	<30%
Laboratory Duplicate Sample - 0129697	Zinc	5	mg/kg	106.8	106.0	0.8%	<30%
Lab Method: IND041 (BatchID - 0129719)							
Laboratory Duplicate Sample - 0129719	Aluminium	1	mg/kg	18510	18730	1.2%	<30%
Laboratory Duplicate Sample - 0129719	Arsenic	5	mg/kg	7.5	6.9	8.3%	No Limit

Client	BMT Commercial Australia Pty Ltd
Contact	Mackenzie Stacey
Certificate Number	B1389792-A
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Laboratory Duplicate Report - Continued

Method:Compound / QC Sample ID	Analyte	LOD	Units	Original Result	DUP Result	RPD	RPD Acceptance Criteria
Lab Method: IND041 (BatchID - 0129719) - Continued							
Laboratory Duplicate Sample - 0129719	Cadmium	0.5	mg/kg	0.66	0.82	21.6%	No Limit
Laboratory Duplicate Sample - 0129719	Chromium	1	mg/kg	1024	1032	0.8%	<30%
Laboratory Duplicate Sample - 0129719	Copper	1	mg/kg	29.2	29.0	0.7%	<30%
Laboratory Duplicate Sample - 0129719	Iron	2	mg/kg	33170	33600	1.3%	<30%
Laboratory Duplicate Sample - 0129719	Nickel	1	mg/kg	30.0	30.3	1.0%	<30%
Laboratory Duplicate Sample - 0129719	Zinc	5	mg/kg	106.8	106.0	0.8%	<30%
Lab Method: IND041 (BatchID - 0129781)							
Laboratory Duplicate Sample - 0129781	Lead	2	mg/kg	13.7	15.9	14.9%	No Limit

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CERTIFICATE OF ANALYSIS

Certificate Number	B1389792-A [R00]	**Page**	1/3
Client	BMT Commercial Australia Pty Ltd	**Registering Laboratory**	Brisbane
Contact	Mackenzie Stacey	**Contact**	Customer Service Team
Address	Level 8 200 Creek Street Brisbane QLD 4000	**Address**	52 Brandl Street, Eight Mile Plains, QLD 4113
		Email	admin@symbiolabs.com.au
Telephone	07 3831 6744	**Telephone**	1300 703 166
Order Number	BN/016/19 B	**Date Samples Received**	19/09/2023
Project ID	Soil- B23621- BN/016/19 B	**Date Analysis Commenced**	19/09/2023
Sampler	Customer	**Issue Date**	04/10/2023
Client Job Reference	---	**Receipt Temperature (°C)**	8
No. of Samples Registered	2 | Sampler: Customer	**Storage Temperature (°C)**	4
Priority	Normal	**Quote Number**	---

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NATA
Accreditation No: 2455
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous revision with this reference. This document must not be reproduced, except in full. If samples were provided by the customer, results apply only to the samples 'as received' and responsibility for representative sampling rests with the customer. Water results are reported on an 'as is' basis. Soil and sediment results are reported on a 'dry weight' basis. For other matrices the basis of reporting will be confirmed in the 'Report Comments' section. Measurement Uncertainty is available upon request. If the laboratory was authorised to conduct testing on samples received outside of the specified conditions, all test results may be impacted. Details of samples received outside of the specified conditions are mentioned in the sample description section of this test report.

Definitions

| <: Less Than | >: Greater Than | RP: Result Pending | MPN: Most Probable Number | CFU: Colony Forming Units | ---: Not Received/Not Requested | NA: Not Applicable | ND: Not Detected | LOR: Limit of Reporting | [NT]: Not Tested |

| ~: Estimated | ^ Subcontracted Analysis | TBA: To Be Advised | + Client Specified Limit | ** Potential Holding Time Concern | * Test not covered by NATA scope of accreditation | # Result derived from a calculation and includes results equal to or greater than the LOR |

Authorised By

Name	Position	Accreditation Category
Glen Rangott	Environmental Laboratory Manager, Brisbane	Environmental Chemistry
Hongmei Kuang	Chemistry Laboratory Manager, Brisbane	Environmental and Food Chemistry

Sample Information - *Client/Sampler Supplied*

Sample ID	B1389792-A/1	B1389792-A/2
Sample Description	B6-2C	B10-6C
Sample Date/Time	2023-09-13 00:00	2023-09-13 00:00

Client	BMT Commercial Australia Pty Ltd	**Project ID**	Soil- B23621- BN/016/19 B
Certificate Number	B1389792-A [R00]	**Sampler**	Customer
Page	2/3	**Order Number**	BN/016/19 B

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Analytical Results

Compound/Analyte	LOR	Limit Range+	Units	B6-2C	B10-6C
Client Sample Description				B6-2C	B10-6C
Client Sampling date/time				13/09/2023 00:00	13/09/2023 00:00
				B1389792-A/1	B1389792-A/2
				Results	Results
IND041 Element AES IND High Lv					
IND041 - Metals in Soil - ICP-AES					
Phosphorus (P)	5	---	mg/kg	---	602
Arsenic (As)	5	---	mg/kg	7.5	7.3
Cadmium (Cd)	0.5	---	mg/kg	0.7	1
Chromium (Cr)	1	---	mg/kg	1020	110
Copper (Cu)	1	---	mg/kg	29.2	30.3
Lead (Pb)	2	---	mg/kg	13.7	22.7
Nickel (Ni)	1	---	mg/kg	30.0	26.1
Zinc (Zn)	5	---	mg/kg	107	325
Aluminium (Al)	1	---	mg/kg	18500	22500
Iron (Fe)	2	---	mg/kg	33200	36500
IND042 Elements ICP-MS Soil					
IND042 - Metals in Soil - ICP-MS					
Silver (Ag)	0.01	---	mg/kg	0.20	0.63
ENV016 Total Nitrogen in Soil					
EFF004.1 - Nitrate-Nitrogen in Soil FIA					
EFF004S.1 Nitrate-N in soil	0.1	---	mg/kg	---	0.11
EFF005.1 - Nitrite N in Soil by FIA					
EFF005S.1 Nitrite-N in soil	0.1	---	mg/kg	---	<0.10
ENV010_S - Total Kjeldahl Nitrogen in Soil					
Total Kjeldahl nitrogen*	20	---	mg/kg	---	870
ENV016 - Total nitrogen in soil by calculation					
Total Nitrogen (TKN + NOx)#*	0.1	---	mg/kg	---	870

Client	BMT Commercial Australia Pty Ltd	**Project ID**	Soil- B23621- BN/016/19 B
Certificate Number	B1389792-A [R00]	**Sampler**	Customer
Page	3/3	**Order Number**	BN/016/19 B

Analytical Results

Compound/Analyte	LOR	Limit Range+	Units	B6-2C	B10-6C
Client Sample Description				B6-2C	B10-6C
Client Sampling date/time				13/09/2023 00:00	13/09/2023 00:00
				B1389792-A/1	B1389792-A/2
				Results	Results
Water General Tests					
ENV001_S - Soil Moisture Content					
Moisture Content - Soil	0.1	---	%	48.7	57.8
ENV104 - Multi-pesticide screen - Soil					
Extended Residue in Soil	<LOR	---	mg/kg	<LOR	<LOR
ENV009 TotalOrganicMatter Soil					
ENV009_S - ENV009_S Total Organic Carbon in soil					
Total Organic Carbon (TOC)	0.02	---	% w/w	1.7	1.5
Total Organic Matter (TOM) #	0.04	---	% w/w	2.95	2.60

Analysis Location

All in-house analysis was completed by Symbio Laboratories - Brisbane.

Symbio LABORATORIES

CERTIFICATE OF ANALYSIS

Certificate Number	B1389792-B [R00]	**Page**	1/2
Client	BMT Commercial Australia Pty Ltd	**Registering Laboratory**	Brisbane
Contact	Mackenzie Stacey	**Contact**	Customer Service Team
Address	Level 8 200 Creek Street Brisbane QLD 4000	**Address**	52 Brandl Street, Eight Mile Plains, QLD 4113
		Email	admin@symbiolabs.com.au
Telephone	07 3831 6744	**Telephone**	1300 703 166
Order Number	BN/016/19 B	**Date Samples Received**	19/09/2023 18:43
Project ID	Soil-SUBCO- B23621- BN/016/19 B	**Date Analysis Commenced**	19/09/2023
Sampler	Customer	**Issue Date**	13/11/2023
Client Job Reference	---	**Receipt Temperature (°C)**	8
No. of Samples Registered	2 | Sampler: Customer	**Storage Temperature (°C)**	4
Priority	Normal	**Quote Number**	---

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ABN: 82 079 645 015

NATA

Accreditation No: 2455
Accredited for compliance with ISO/IEC 17025 - Testing

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Definitions

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| ~: Estimated | ^ Subcontracted Analysis | TBA: To Be Advised | + Client Specified Limit | ** Potential Holding Time Concern | * Test not covered by NATA scope of accreditation | # Result derived from a calculation and includes results equal to or greater than the LOR |

Authorised By

Name	Position	Accreditation Category
Glen Rangott	Environmental Laboratory Manager, Brisbane	Environmental Chemistry

Sample Information - *Client/Sampler Supplied*

Sample ID	B1389792-B/1	B1389792-B/2
Sample Description	B6-2C	B10-6C
Sample Date/Time	2023-09-13 00:00	2023-09-13 00:00

Client	BMT Commercial Australia Pty Ltd	**Project ID**	Soil-SUBCO- B23621- BN/016/19 B
Certificate Number	B1389792-B [R00]	**Sampler**	Customer
Page	2/2	**Order Number**	BN/016/19 B

Analytical Results

Compound/Analyte	LOR	Limit Range+	Units	B6-2C	B10-6C
Client Sample Description					
Client Sampling date/time				13/09/2023 00:00	13/09/2023 00:00
				B1389792-B/1	B1389792-B/2
				Results	Results
S023-03A Particle Size Dist					
S023.03 - Particle Size Distribution by Hydrometer					
Particle Size Distribution*	0.1	---	-	See attached	See attached

Analysis Location

All in-house analysis was completed by Symbio Laboratories - Subcontract Laboratory.

Symbio LABORATORIES

CERTIFICATE OF ANALYSIS

Certificate Number	B1389792-C [R00]	**Page**	1/2
Client	BMT Commercial Australia Pty Ltd	**Registering Laboratory**	Brisbane
Contact	Mackenzie Stacey	**Contact**	Customer Service Team
Address	Level 8 200 Creek Street Brisbane QLD 4000	**Address**	52 Brandl Street, Eight Mile Plains, QLD 4113
		Email	admin@symbiolabs.com.au
Telephone	07 3831 6744	**Telephone**	1300 703 166
Order Number	BN/016/19 B	**Date Samples Received**	19/09/2023 18:43
Project ID	Soil-SUBCO- B23621- BN/016/19 B	**Date Analysis Commenced**	19/09/2023
Sampler	Customer	**Issue Date**	10/11/2023
Client Job Reference	---	**Receipt Temperature (°C)**	8
No. of Samples Registered	1 | Sampler: Customer	**Storage Temperature (°C)**	4
Priority	Normal	**Quote Number**	---

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 If samples were provided by the customer, results apply only to the samples 'as received' and responsibility for representative sampling rests with the customer. Water results are reported on an 'as is' basis. Soil and sediment results are reported on a 'dry weight' basis. For other matrices the basis of reporting will be confirmed in the 'Report Comments' section. Measurement Uncertainty is available upon request. If the laboratory was authorised to conduct testing on samples received outside of the specified conditions, all test results may be impacted. Details of samples received outside of the specified conditions are mentioned in the sample description section of this test report.

Definitions

| <: Less Than | >: Greater Than | RP: Result Pending | MPN: Most Probable Number | CFU: Colony Forming Units | ---: Not Received/Not Requested | NA: Not Applicable | ND: Not Detected | LOR: Limit of Reporting | [NT]: Not Tested |

| ~: Estimated | ^ Subcontracted Analysis | TBA: To Be Advised | + Client Specified Limit | ** Potential Holding Time Concern | * Test not covered by NATA scope of accreditation | # Result derived from a calculation and includes results equal to or greater than the LOR |

Authorised By

Name	Position	Accreditation Category
Glen Rangott	Environmental Laboratory Manager, Brisbane	Environmental Chemistry

Sample Information - *Client/Sampler Supplied*

Sample ID	B1389792-C/2
Sample Description	B10-6C

Client	BMT Commercial Australia Pty Ltd	**Project ID**	Soil-SUBCO- B23621- BN/016/19 B
Certificate Number	B1389792-C [R00]	**Sampler**	Customer
Page	2/2	**Order Number**	BN/016/19 B

Analytical Results

			Client Sample Description	**B10-6C**
			Client Sampling date/time	---
Compound/Analyte	**LOR**	**Limit Range+**	**Units**	**B1389792-C/2**
				Results
S014-00A Radiation Analy Sed*				
S014.00 - Determination of Gross Alpha and Beta				
Gross Alpha* (including K-40 correction)*	**0.08**	**---**	**Bq/g**	**0.202 ±0.103**
Gross Beta* (including K-40 correction)*	**0.25**	**---**	**Bq/g**	**0.498 ±0.169**

Analysis Location

All in-house analysis was completed by Symbio Laboratories - Subcontract Laboratory.

Report Comments

Please note; Testing performed by an NATA accredited external subcontracted Laboratory.
Accreditation No.: 2562
Report no.: ME341243

Symbio LABORATORIES

QUALITY CONTROL REPORT

Certificate Number	B1389792-D	**Page**	1 of 4
Client	BMT Commercial Australia Pty Ltd	**Laboratory**	Brisbane
Contact	Mackenzie Stacey	**Contact**	Customer Service Team
Address	Level 8 200 Creek Street Brisbane, QLD 4000	**Address**	52 Brandl Street, Eight Mile Plains, QLD 4113
		Email	admin@symbiolabs.com.au
Telephone	07 3831 6744	**Telephone**	1300 703 166
Order Number	BN/016/19 B	**Date Samples Received**	22/09/2023 11:37
Project ID	Sediment- B23621- BN/016/19 B	**Date Analysis Commenced**	22/09/2023
Sampler	Customer	**Issue Date**	04/10/2023
Client Job Reference	---	**Receipt Temperature (°C)**	8°C
Number of Samples Received	2	**Storage Temperature (°C)**	4°C
Number of Samples Analysed	2	**Quote Number**	---

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

This Quality Control Report contains the following information:

1. Method Blank (MB) Report; Limit of Detection and QC Result
2. Method Laboratory Control Sample (LCS) Report; QC Result and Acceptance Criteria
3. Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits

General Comments

The analytical methods used by the Environmental Department have been developed from established internationally recognized methods such as those published by the USEPA, APHA, AS and NEPM. In-house developed analytical methods are employed in the absence of documented standards or by client request.

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

Abbreviation:

QC Sample = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CRM = Certified Referenced Material; Used to verify in-house LCS
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOD = Limit of detection
RPD = Relative Percentage Difference

Client	BMT Commercial Australia Pty Ltd
Contact	Mackenzie Stacey
Certificate Number	B1389792-D
Page	2 of 4

Method Blank 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.

Method:Compound / QC Sample ID	Analyte	LOD	Units	QC Result
NO RESULT				
NO RESULT	NO RESULT	NO RESULT	NO RESULT	NO RESULT

Method Laboratory Control Sample Report

The quality control term Laboratory Control Sample (LCS) refers to a certified reference material (CRM) or a sample with known parameters that have been verified against a CRM. The quality control term Spike (SPK) refers to a known interference free matrix spiked with target analytes. The purpose of these QC parameters is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Method : Compound / QC Sample ID	Analyte	LOD	Units	QC Test Results	Expected Value	QC Recovery	QC Criteria
NO RESULT							
NO RESULT	NO RESULT	NO RESULT	NO RESULT	NO RESULT	NO RESULT	NO RESULT	NO RESULT

Client	BMT Commercial Australia Pty Ltd
Contact	Mackenzie Stacey
Certificate Number	B1389792-D
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Laboratory Duplicate 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 the relavant technical method manuals and are dependent on the magnitude of results in comparison to the level of reporting.

Method : Compound / QC Sample ID	Analyte	LOD	Units	Original Result	Dup Result	RPD	RPD Acceptance Criteria
NO RESULT							
NO RESULT	NO RESULT	NO RESULT	NO RESULT	NO RESULT	NO RESULT	NO RESULT	NO RESULT

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CERTIFICATE OF ANALYSIS

Certificate Number	B1389792-D [R00]	**Page**	1/4
Client	BMT Commercial Australia Pty Ltd	**Registering Laboratory**	Brisbane
Contact	Mackenzie Stacey	**Contact**	Customer Service Team
Address	Level 8 200 Creek Street Brisbane QLD 4000	**Address**	52 Brandl Street, Eight Mile Plains, QLD 4113
		Email	admin@symbiolabs.com.au
Telephone	07 3831 6744	**Telephone**	1300 703 166
Order Number	BN/016/19 B	**Date Samples Received**	22/09/2023
Project ID	Sediment- B23621- BN/016/19 B	**Date Analysis Commenced**	22/09/2023
Sampler	Customer	**Issue Date**	04/10/2023
Client Job Reference	---	**Receipt Temperature (°C)**	8
No. of Samples Registered	2 | Sampler: Customer	**Storage Temperature (°C)**	4
Priority	Normal	**Quote Number**	---

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ABN: 82 079 645 015

NATA
Accreditation No: 2455
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous revision with this reference. This document must not be reproduced, except in full. If samples were provided by the customer, results apply only to the samples 'as received' and responsibility for representative sampling rests with the customer. Water results are reported on an 'as is' basis. Soil and sediment results are reported on a 'dry weight' basis. For other matrices the basis of reporting will be confirmed in the 'Report Comments' section. Measurement Uncertainty is available upon request. If the laboratory was authorised to conduct testing on samples received outside of the specified conditions, all test results may be impacted. Details of samples received outside of the specified conditions are mentioned in the sample description section of this test report.

Definitions

| <: Less Than | >: Greater Than | RP: Result Pending | MPN: Most Probable Number | CFU: Colony Forming Units | ---: Not Received/Not Requested | NA: Not Applicable | ND: Not Detected | LOR: Limit of Reporting | [NT]: Not Tested |

| ~: Estimated | ^ Subcontracted Analysis | TBA: To Be Advised | + Client Specified Limit | ** Potential Holding Time Concern | * Test not covered by NATA scope of accreditation | # Result derived from a calculation and includes results equal to or greater than the LOR |

Authorised By

Name	Position	Accreditation Category
Nimrod Eren	Chemistry Laboratory Manager, Sydney	Environmental and Food Chemistry

Sample Information - *Client/Sampler Supplied*

Sample ID	B1389792-D/1	B1389792-D/2
Sample Description	B6-2C	B10-6C

Client	BMT Commercial Australia Pty Ltd	**Project ID**	Sediment- B23621- BN/016/19 B
Certificate Number	B1389792-D [R00]	**Sampler**	Customer
Page	2/4	**Order Number**	BN/016/19 B

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Analytical Results

Compound/Analyte	LOR	Limit Range+	Units	B6-2C	B10-6C
Client Sample Description					
Client Sampling date/time				---	---
				B1389792-D/1	B1389792-D/2
				Results	Results
ENV131S Organotins in Soil&Se					
ENV131S - Determination of Organotins in Sediment/Soil by GCMS					
Monobutyltin (MBT as Sn)	4	---	µgSn/kg	<4.0	<4.0
Dibutyltin (DBT as Sn)	2	---	µgSn/kg	<2.0	<2.0
Tributyltin (TBT as Sn)	0.5	---	µgSn/kg	<0.5	<0.5
Tripropyltin (SUR) *	---	---	%	81.0	86.0
Monobutyltin (MBT)	0.007	---	µg/kg	<0.007	<0.007
Dibutyltin (DBT)	0.01	---	µg/kg	<0.01	<0.01
Tributyltin (TBT)	0.01	---	µg/kg	<0.01	<0.01
4024S-C OC Pesticides					
04-024 - OC & OP Pesticides in sediment by GCMS					
Aldrin*	1	---	µg/kg	<1	<1
BHC-alpha*	1	---	µg/kg	<1	<1
BHC-beta*	1	---	µg/kg	<1	<1
BHC-gamma*	1	---	µg/kg	<1	<1
BHC-delta*	1	---	µg/kg	<1	<1
Chlordane-cis*	1	---	µg/kg	<1	<1
Chlordane-trans*	1	---	µg/kg	<1	<1
DDD-p,p*	1	---	µg/kg	<1	<1
DDE-p,p*	1	---	µg/kg	<1	<1
DDT-p,p*	1	---	µg/kg	<1	<1
Dieldrin*	1	---	µg/kg	<1	<1
Endosulfan-alpha*	1	---	µg/kg	<1	<1
Endosulfan-beta*	1	---	µg/kg	<1	<1
Endosulfan-sulfate*	1	---	µg/kg	<1	<1

Client	BMT Commercial Australia Pty Ltd	**Project ID**	Sediment- B23621- BN/016/19 B
Certificate Number	B1389792-D [R00]	**Sampler**	Customer
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Analytical Results

Compound/Analyte	LOR	Limit Range+	Units	B6-2C	B10-6C
Client Sample Description					
Client Sampling date/time				---	---
				B1389792-D/1	B1389792-D/2
				Results	Results
4024S-C OC Pesticides - Continued					
04-024 - OC & OP Pesticides in sediment by GCMS - Continued					
Endrin*	1	---	µg/kg	<1	<1
Endrin-ketone*	1	---	µg/kg	<1	<1
Endrin-aldehyde*	1	---	µg/kg	<1	<1
Heptachlor*	1	---	µg/kg	<1	<1
Heptachlor-epoxide*	1	---	µg/kg	<1	<1
Hexachlorobenzene*	1	---	µg/kg	<1	<1
Methoxychlor*	1	---	µg/kg	<1	<1
Oxychlordane*	1	---	µg/kg	<1	<1
Surrogate Recovery*	-	---	%	98	99
4024S-D OP Pesticides					
04-024 - OC & OP Pesticides in sediment by GCMS					
Dichlorvos*	20	---	µg/kg	<20	<20
Demeton-S-methyl*	20	---	µg/kg	<20	<20
Dimethoate*	20	---	µg/kg	<20	<20
Diazinon*	20	---	µg/kg	<20	<20
Chlorpyrifos-methyl*	20	---	µg/kg	<20	<20
Parathion-methyl*	20	---	µg/kg	<20	<20
Pirimiphos-methyl*	20	---	µg/kg	<20	<20
Fenitrothion*	20	---	µg/kg	<20	<20
Malathion*	20	---	µg/kg	<20	<20
Chlorpyrifos*	20	---	µg/kg	<20	<20
Fenthion*	20	---	µg/kg	<20	<20
Parathion*	20	---	µg/kg	<20	<20

Client	BMT Commercial Australia Pty Ltd	**Project ID**	Sediment- B23621- BN/016/19 B
Certificate Number	B1389792-D [R00]	**Sampler**	Customer
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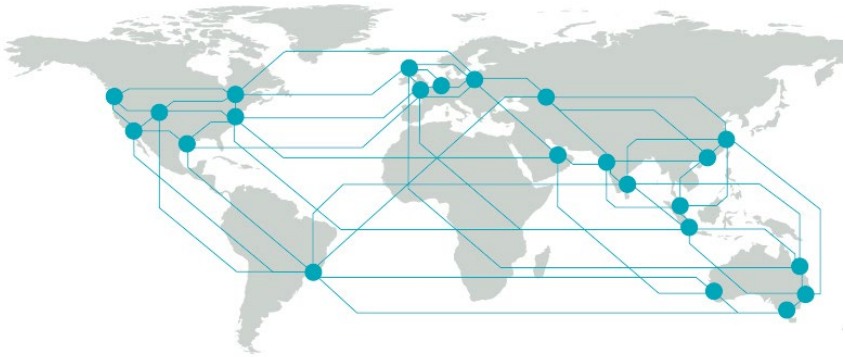
Analytical Results

Compound/Analyte	LOR	Limit Range+	Units	B6-2C	B10-6C
Client Sample Description					
Client Sampling date/time				---	---
				B1389792-D/1	B1389792-D/2
				Results	Results
4024S-D OP Pesticides - Continued					
04-024 - OC & OP Pesticides in sediment by GCMS - Continued					
Chlorfenvinphos*	20	---	µg/kg	<20	<20
Bromophos-ethyl*	20	---	µg/kg	<20	<20
Methidathion*	20	---	µg/kg	<20	<20
Fenamiphos*	20	---	µg/kg	<20	<20
Prothiofos*	20	---	µg/kg	<20	<20
Ethion*	20	---	µg/kg	<20	<20
Carbophenothion*	20	---	µg/kg	<20	<20
Phosalone*	20	---	µg/kg	<20	<20
Azinphos-methyl*	20	---	µg/kg	<20	<20
Surrogate Recovery*	-	---	%	95	92

Analysis Location

All in-house analysis was completed by Symbio Laboratories - Sydney.



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