Ports North

APPENDIX D.2

Draft : Environmental Impact Statement

Appendix D.2

Sediment Quality Report

Cairns Shipping Development Project - Sediment Quality Report

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Date: August 2014
Confidential

Cairns Shipping Development Project - Sediment Quality Report

Prepared for:	Ports North
Prepared by:	BMT WBM Pty Ltd (Member of the BMT group of companies)

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Executive Summary

Ports North is responsible for the development and management of port facilities vital to the development of Cairns and regional centres in Far North Queensland.

The Cairns Shipping Development Project (the Project) involves upgrading of the existing shipping channel and swing basin primarily to accommodate larger cruise ships into Trinity Wharves. Capital dredging and dredge material disposal will be required as part of the Project. Therefore, an assessment of suitability of the dredged material for unconfined offshore disposal was required.

The characterisation of the physical and chemical properties of proposed dredged sediment was undertaken in accordance with a Sampling and Analysis Plan (SAP) prepared in accordance with requirements set out in the National Assessment Guidelines for Dredging (NAGD) and approved by the Great Barrier Reef Marine Park Authority. The dredge area was subdivided into Inner Port and Outer Channel subareas based on known contaminant status. Sampling was undertaken using piston and vibrocoring with supporting grab sampling.

The Inner Port sediments were generally characterised by high proportions of silt (mean 46.8%) and clay (mean 36.9%). Relatively high proportions of coarser sediment were recorded at two locations. The Outer Channel sediments were also characterised by high proportions of silt (mean 54.8%) and clay (mean 33.9%). Sandy and gravelly sediments contributed 10.1% and 1.3% on average, respectively.

The sediments in both Inner Port and Outer Channel subareas were found to be suitable for ocean disposal in accordance with the NAGD, based on the following analyses:

- The 95% UCL of the mean concentrations were below their respective NAGD or local screening levels for most metals and metalloids within the Inner Port and Outer Channel dredge areas. The only exception was mercury detected at high concentrations in two samples of the Inner Port and one sample of the Outer Channel. The 95% UCL for mercury in the Inner Port was 0.196 mg/kg and exceeded the NAGD screening level of 0.15 mg/kg. The 95% UCL for mercury in Outer Channel remained well below the screening level (0.033 mg/kg) due to only low concentrations measured in all other Outer Channel samples.
- Re-analysis in triplicate of the three elevated mercury samples could not confirm the initial high concentrations with levels below or close to the Level of Reporting (LOR). Additional elutriate and bioavailability assessments undertaken for Inner Port sediments were below their respective LORs indicating low bioavailability for mercury and low potential for release into the water column during dredging and disposal.
- Organotin concentrations were either below the LOR or detected in low concentrations in Inner Port and Outer Channel sediments. The 95% UCL concentrations for tributyltin (TBT) were well below the NAGD screening level of 9 µgSn/kg with concentrations of 0.633 µgSn/kg and 0.411 µgSn/kg for the Inner Port and Outer Channel, respectively.
- The 95% UCL for Total Petroleum Hydrocarbons (TPHs) of 32.22 mg/kg was well below the NAGD screening level of 550 mg/kg. Similarly, the 95% UCL for Poly Aromatic Hydrocarbons (PAHs) of 65.2 µg/kg was well below the NAGD screening level of 10,000 µg/kg. BTEX, organochlorine and

organophosphate pesticides were below the LOR in all samples. Only two individual detections of perfluorinated compounds (PFCs) were noted at very low concentrations close to the LOR.

- The herbicide diuron was detected in six of sixteen samples within the Inner Port area in the initial core sampling. Additional grab sampling and core sampling of Inner Port and Outer Channel sediments was undertaken to further investigate potential diuron contamination. Based on the combined results of all sampling events, the 95% UCL for diuron was 1.24 µg/kg for the Inner Port and 0.52 µg/kg for the Outer Channel and therefore below the literature derived screening level of 2 µg/kg.
- Clay plug samples analysed as part of this study had concentrations below respective screening levels for all tested parameters, including diuron. It is therefore likely that deeper consolidated sediments are not contaminated.

Whilst the acid sulfate assessment of this study was undertaken in compliance with the approved SAP, it is noted that results are not representative of the full depth/volume of the proposed dredging given that core refusal was encountered at relatively shallow sediment depths. Incorporating results from this study and additional geotechnical boreholes down to 8.9m below bed level (Golder 2014), the following interpretation of available acid sulfate results is provided:

- The majority of samples tested in this study indicated self-neutralising PASS within the top 1m for the Inner Port and Outer Channel. Whilst these results suggest that no treatment would be required for the soft surface sediments, a nominal lime treatment of 3-5 kg $CaCO_3$/t would still be recommended should the material be placed on land;
- PASS materials that were not self-neutralising were typically detected from depths of more than 1m below the sediment surface. Calculated lime treatment rates ranged between 30 kg lime/m^3 to 270 kg lime/m^3 with an average liming rate of 90 kg lime/m^3.
- Firm, stiff and very stiff materials are unlikely to be PASS or require lime treatment.
- Whilst more data may be required for a comprehensive acid sulfate assessment, Golder (2014) suggest a nominal liming rate of 75 kg lime/m^3 for PASS treatment of the very soft to soft dredged material should the material be placed on land. This recommendation is based on the assumption that dredging processes cannot be conducted in a manner which segregates the top 1m of soft materials from underlying PASS materials.
- In case of ocean disposal of the dredged material, oxidation of the dredged material is considered unlikely as the sediments will stay saturated with seawater. Under normal operating conditions of the dredging vessel (PASS exposure timeframe of less than 24 hours) it is considered that the risk of oxidation is negligible. Therefore, treatment of the dredged material is not required assuming it is placed at sea.

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

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1 Introduction

1.1 Background

Ports North is responsible for the development and management of port facilities vital to the development of Cairns and regional centres in Far North Queensland.

Ports North is planning to improve shipping access to the Port of Cairns to secure Cairns' place as a premier cruise destination in Queensland.

The Cairns Shipping Development Project (the Project) involves upgrading of the following infrastructure for the Port of Cairns, essentially to accommodate larger cruise ships:

- Expansion of the existing shipping channel and shipping channel swing basin;
- Placement of the dredged material in a new dredge material placement area (DMPA)_adjacent to the existing, approved DMPA in the Great Barrier Reef Marine Park;
- Establishment of a new swing basin to support future expansion of the HMAS Cairns Navy base;
- Structural upgrade of the existing shipping wharves; and
- Provision and upgrade of services to the wharves.

Capital dredging and dredge material disposal will be required as part of the Project. Therefore, an assessment of suitability of the dredged material for unconfined offshore disposal was required.

The Project was determined to be a significant project requiring an Environmental Impact Statement (EIS) by the Queensland Government. A referral under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) determined that the Project would require Federal environmental assessment. Therefore, the sediment quality assessment as part of the EIS will be required to respond to both the State Government's Terms of Reference (TOR) prepared under the *State Development and Public Works Organisation Act 1971* and the federal EIS Guidelines prepared under the EPBC Act.

The 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).

The overall aim of this study is to assess the physical and chemical properties of sediments to be dredged for the Project, and on the basis of the approach set out in NAGD, assess the suitability of dredged material for unconfined ocean disposal. 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 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

A map showing the existing channel outline and the proposed upgrade is provided in Figure 1-1.

1.2.1 Channel Upgrade

The existing outer channel at the Port of Cairns is approximately 11.2 km in length, 90 m wide with a declared depth of -8.3 m Lowest Astronomical Tide (LAT). The inner channel extends for 2.4 km in length and has variable width due to requirements for bends and swing basins.

The upgraded channel design is based on widening the existing channel to 130 m and increasing the declared depth to -9.4 m LAT. It also includes an extension of the existing channel for approximately 1 km offshore.

The channel will extend outside of the nominated widths due to the channel batters, which will extend from the channel bed to the natural seabed level at a typical slope of 1 in 4. Furthermore, the channel will be dredged to depths greater than the declared depth in some areas (up to a maximum of 1.7 m) to allow for siltation between maintenance dredging campaigns.

1.2.2 Swing Basin Upgrade

The proposed dredging will also include an expansion of the existing Crystal swing basin adjacent to Wharves 1-3 for specific use by cruise ships. Furthermore, a relocation of the existing main swing basin to a location further south close to Tropical Reef Shipyard is proposed to provide future capacity for expansion of HMAS *Cairns* and to provide a wider and deeper inner channel for the full length of the Inner Port. The relocated main swing basin will be designated as the 'Smith's Creek swing basin'.

1.2.3 Capital Dredging

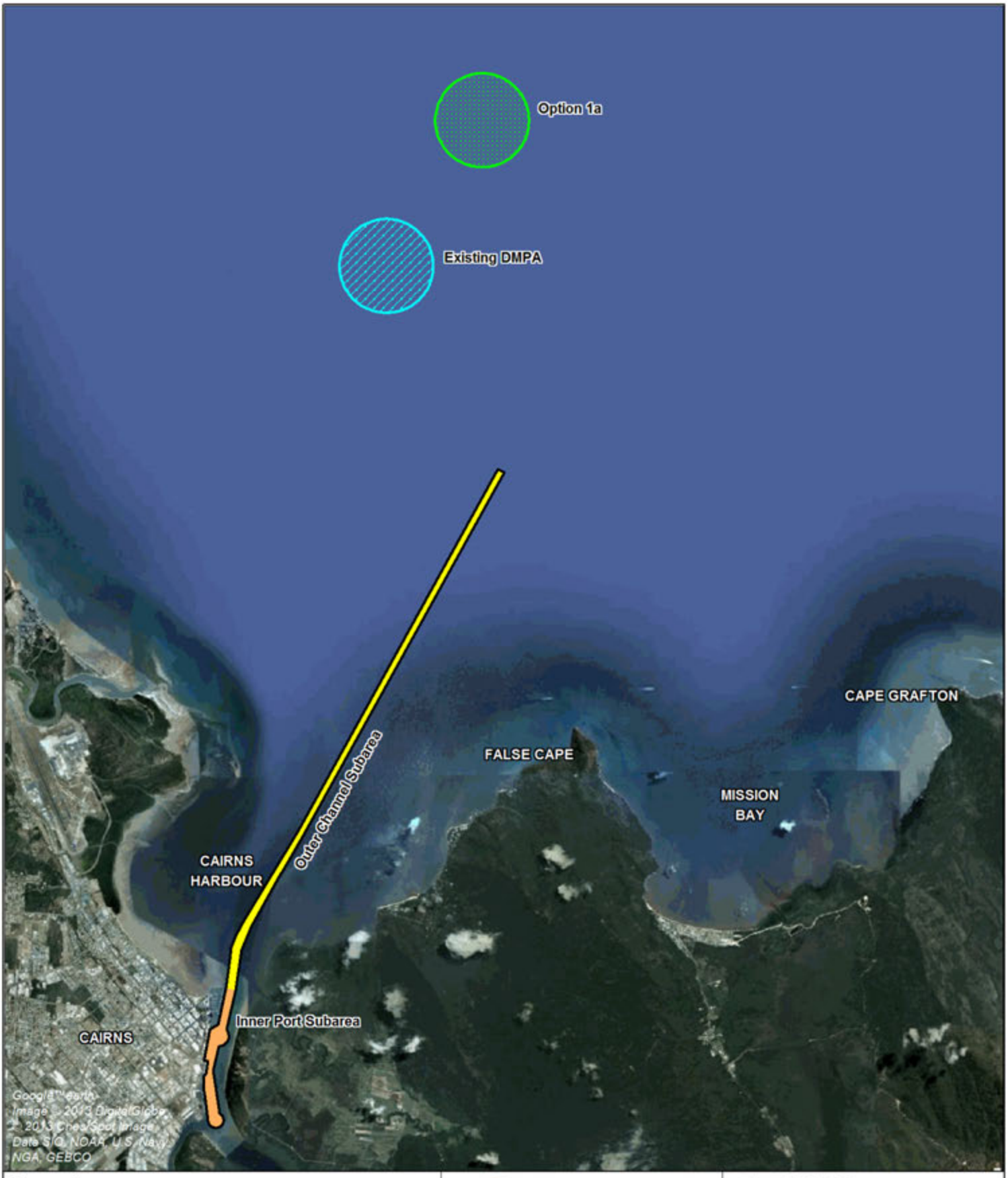
It is anticipated that a total capital dredge volume of approximately 4.4 million m^3 will be required for the channel and swing basin upgrades. The main component of the dredge volume is related to dredging of the Outer Channel.

A dredging production rate of around 130,000 m^3 per week is expected. Based on the estimated capital dredge volume alone, the dredging programme will require about 23 weeks.

1.2.4 Maintenance Dredging

The current maintenance dredging programme is undertaken predominantly by the Trailing Suction Hopper Dredger (TSHD) Brisbane and it is envisaged that future maintenance dredging will also be undertaken using a TSHD.

The future maintenance dredging quantity for the Outer Channel is estimated to increase to an annual 420,000 m^3 from an existing annual volume of approximately 320,000 m^3 *(in situ)*. This does not include maintenance dredging of Inner Port areas. The Inner Port maintenance dredging quantity is not expected to increase as a result of the Project.



Legend

- Dredged Material Placement Area (DMPA)
- Proposed Dredge Area
- Outer Channel Subarea
- Inner Port Subarea

Ports North

Job Title
Cairns Shipping Development Project

Map Title **Proposed Dredging and Dredge Material Disposal (Option 1a)**

Kilometers
0 2 4

Issue	Date	By	Chkd	Appd
1	17/06/2014	XX	XX	XX

ARUP

BMT WBM

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Scale at A4: **1 : 100,500**

Figure: **1-1**

Coordinate System: **GDA 1994 MGA Zone 55**

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1.3 Offshore Disposal

The proposed Dredged Material Placement Area (DMPA) option (Option 1A) for capital dredge material placement as part of the CSD proiect is a 1 nm circular area located near to the existing DMPA (Figure 1-1). Option 1A represents an optimisation of a preliminary option (i.e. Option 1) which was identified in the Initial Advice Statement for the CSD project.

Both the current DMPA and the proposed DMPA for the CSD project (Option 1A) are located within the Great Barrier Reef Marine Park. However, preliminary resuspension modelling determined that an almost fully retentive site could be found at the Option 1A site.

As such, if the new DMPA site is approved as part of the CSD project and on the basis of its more retentive properties, it is likely both the capital material and future maintenance material would be placed at this deeper site.

2 Methodology

As outlined in the approved Sampling and Analysis Plan (SAP), the dredge area was subdivided into two separate dredging subareas (Inner Port and Outer Channel dredge areas) based on expected contaminant status as inferred from a review of existing data.

2.1 Compliance with SAP and Guidelines

All sampling and analysis of sediments was undertaken in accordance with the National Assessment Guidelines for Dredging (NAGD 2009). With exceptions noted below, sampling and analysis procedures followed the approach outlined in the approved SAP (BMT WBM 2013). A copy of the approved SAP is provided in Appendix A. Sampling was undertaken by Geochemical Assessments (Dr Stuart Taylor).

2.1.1 Deviations from the SAP

The following deviations from the SAP are noted:

- The SAP required initial analysis of 20% of samples from the Inner Port (i.e. all subsamples from three locations from a total of 13 locations) for the 'low risk' contaminants (refer to Section 2.6.1 for details). More samples were analysed than required, i.e. subsamples from a total of nine locations were analysed;
- One additional location within the Inner Port close to the main wharf (refer Figure 2-7) was sampled and analysed for 'low risk' contaminants as agreed to between Ports North and Geochemical Assessments; and
- Holding times for organic contaminants (including diuron) could not be met. Consequently, additional sampling was undertaken to meet the requirements of the approved SAP (Section 2.2).

2.2 Timing of Sampling

2.2.1 Initial Sampling Campaign

The initial sampling was undertaken by Geochemical Assessments in a single campaign between 18th and 23rd October 2013. Sampling was undertaken during daytime hours.

Additional sampling was required given that the herbicide diuron was detected at some locations in the initial Inner Port at concentrations prompting the analysis of hold samples as per the SAP. Further details are provided in Section 3.2.8.

2.2.2 Additional Grab Sampling

Additional grab samples were obtained at the required locations in the Inner Port and an initial 20% of Outer Channel locations. The additional grab sampling was undertaken by BMT WBM on 26th November 2013.

2.2.3 Supplementary SAP Sampling

The detection of diuron in two samples of the Outer Channel grab samples prompted the development of a Supplementary SAP that was approved by the Great Barrier Marine Park Authority on 16 May 2014. A copy of the approved Supplementary SAP is provided in Appendix B. Additional core sampling from the Outer Channel and some Inner Port locations was undertaken by Geochemical Assessments between 2 and 4 June 2014.

2.3 Sample Locations

2.3.1 Field Samples

A total of 44 locations (14 Inner Port locations and 30 Outer Channel locations) were sampled using a combination of piston and vibrocoring in accordance with the SAP and NAGD requirements. Maps showing the sampling locations proposed in the SAP and the actual sampling locations are provided in Figure 2-1 to Figure 2-7.

The cores were sub-sampled in 0.5 m intervals in the upper one metre of the core down to dredge depth, followed by a composite subsample from 1.0 m to the end of the core if the depth of dredging exceeded 1.0 m at the sample location.

Due to the classification of Inner Port sediments as potentially contaminated, subsampling for the Inner Port cores was undertaken in 0.5 m intervals down to dredge depth or core refusal.

In some cases, subsampling was undertaken in accordance with sediment stratification, e.g. when distinct changes in sediment properties were observed along the core profile.

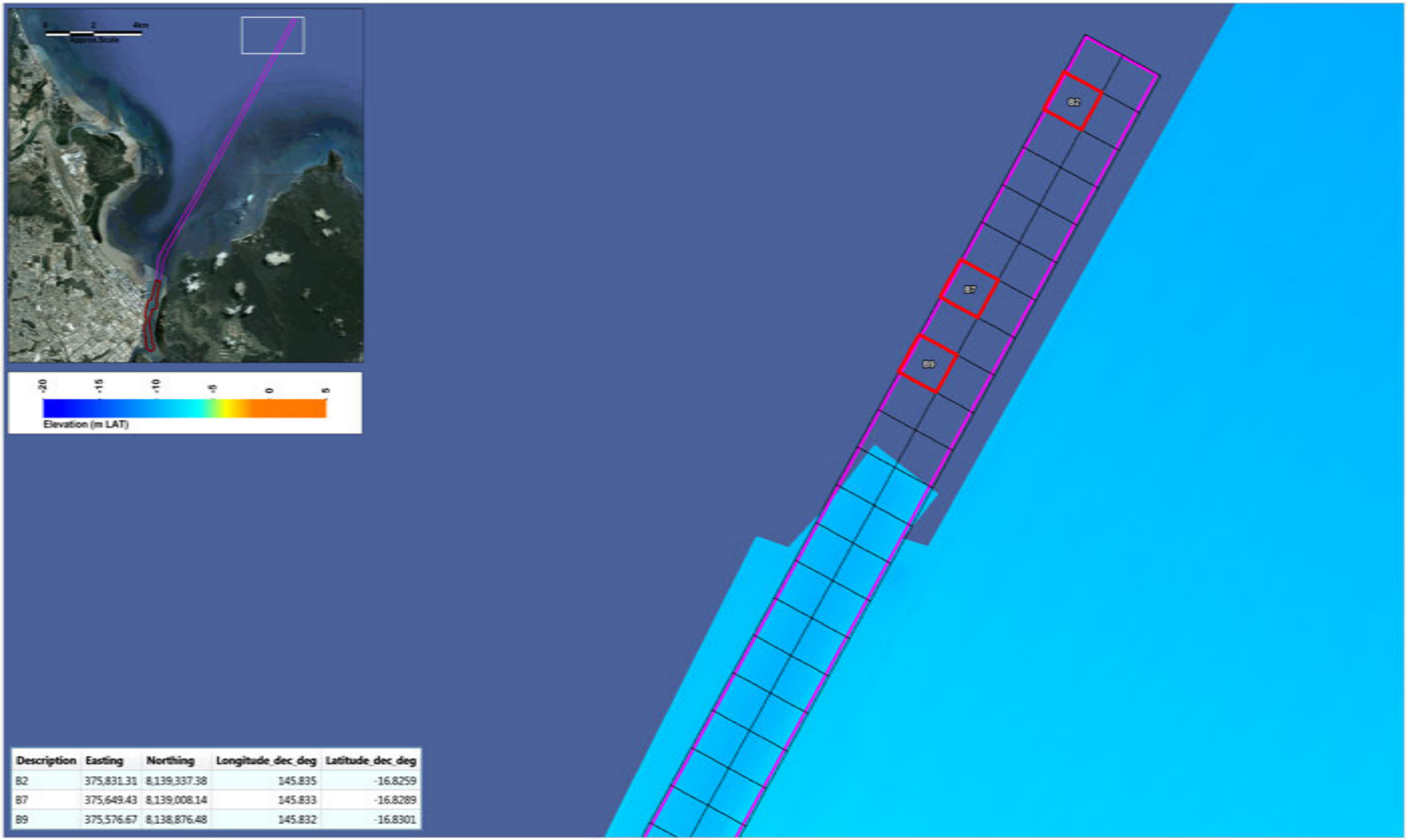
2.3.2 QA/QC Samples

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

- Three field triplicate samples (two additional samples at locations M180, H165 and U187) to determine the small scale (measured in metres) spatial variability of the sediment physical and chemical characteristics; and
- Three triplicate split samples (top layer sample of locations H167, U185 and medium layer sample of location U185 thoroughly mixed and split into three containers) to assess laboratory variation, with one of the three samples sent to a second (reference) laboratory for analysis.

All samples were submitted to the primary and secondary laboratories in one batch so no inter-batch samples were required.

The Relative Standard Deviation (RSD) or Relative Percent Difference (RPD) was calculated for field triplicate and laboratory split samples. Assessment followed NAGD guidelines which recommend that the RSD or RPD of replicate samples agree within ±50 %. NAGD also notes that they may not always agree within this limit where sediments are highly heterogeneous or vary greatly in grain size.



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B2	375,831.31	8,139,337.38	145.835	-16.8259
B7	375,649.43	8,139,008.14	145.833	-16.8289
B9	375,576.67	8,138,876.48	145.832	-16.8301

LEGEND

Outer Channel

Inner Port

Sampling Location

Grid Sampling Areas

Title:

Sampling Locations - Outer Channel

Figure: 2-1

Rev: A

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Approx Scale

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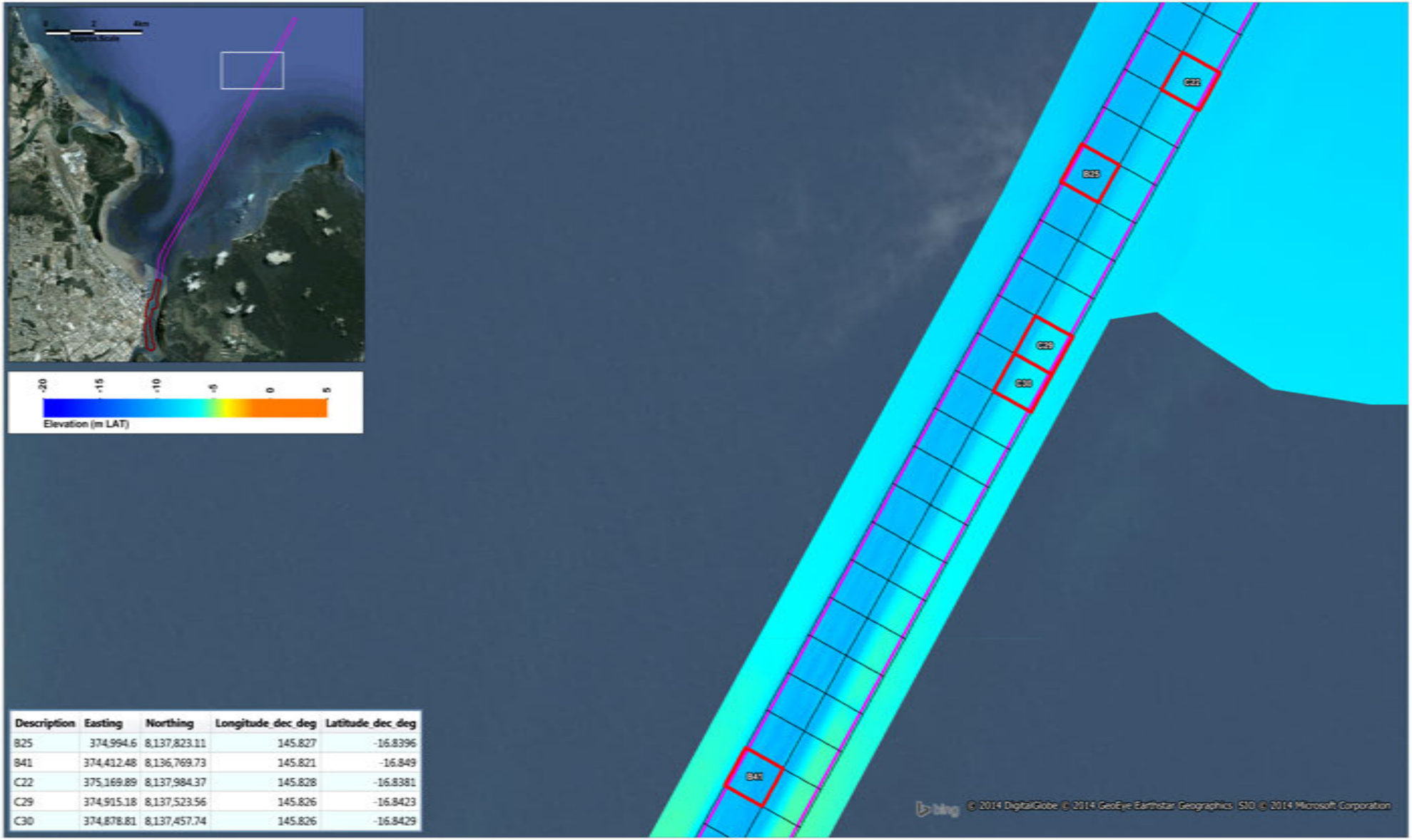

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B41	374,412.48	8,136,769.73	145.821	-16.849
C22	375,169.89	8,137,984.37	145.828	-16.8381
C29	374,915.18	8,137,523.56	145.826	-16.8423
C30	374,878.81	8,137,457.74	145.826	-16.8429

LEGEND

Outer Channel

Inner Port

Sampling Location

Grid Sampling Areas

Title:

Sampling Locations - Outer Channel

Figure: 2-2

Rev: A

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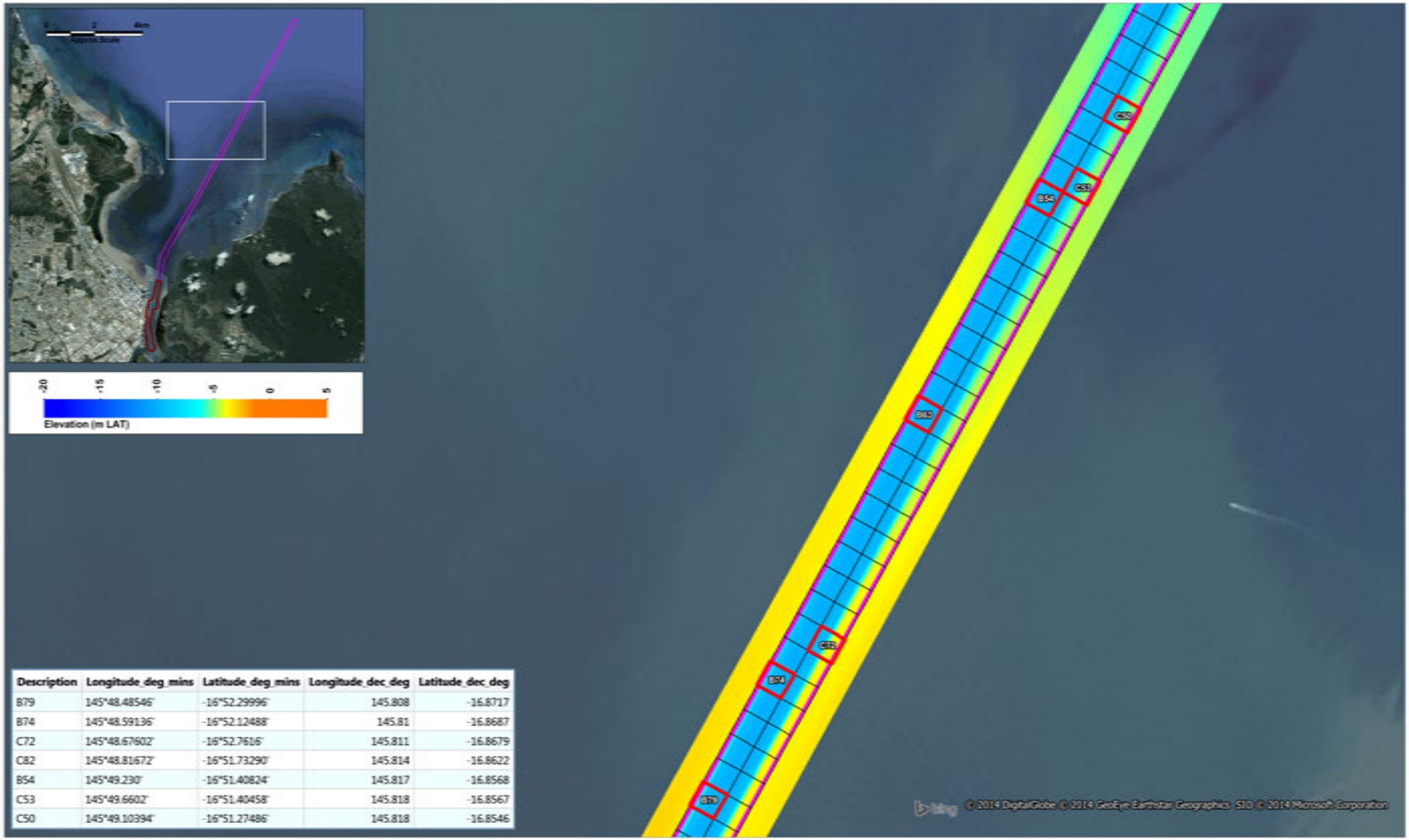

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B74	145°48.59136'	-16°52.12488'	145.81	-16.8687
C72	145°48.67602'	-16°52.7616'	145.811	-16.8679
C82	145°48.81672'	-16°51.73290'	145.814	-16.8622
B54	145°49.230'	-16°51.40824'	145.817	-16.8568
C53	145°49.6602'	-16°51.40458'	145.818	-16.8567
C50	145°49.10394'	-16°51.27486'	145.818	-16.8546

LEGEND

Outer Channel

Inner Port

Sampling Location

Grid Sampling Areas

Title:

Sampling Locations - Outer Channel

Figure: **2-3**

Rev: **A**

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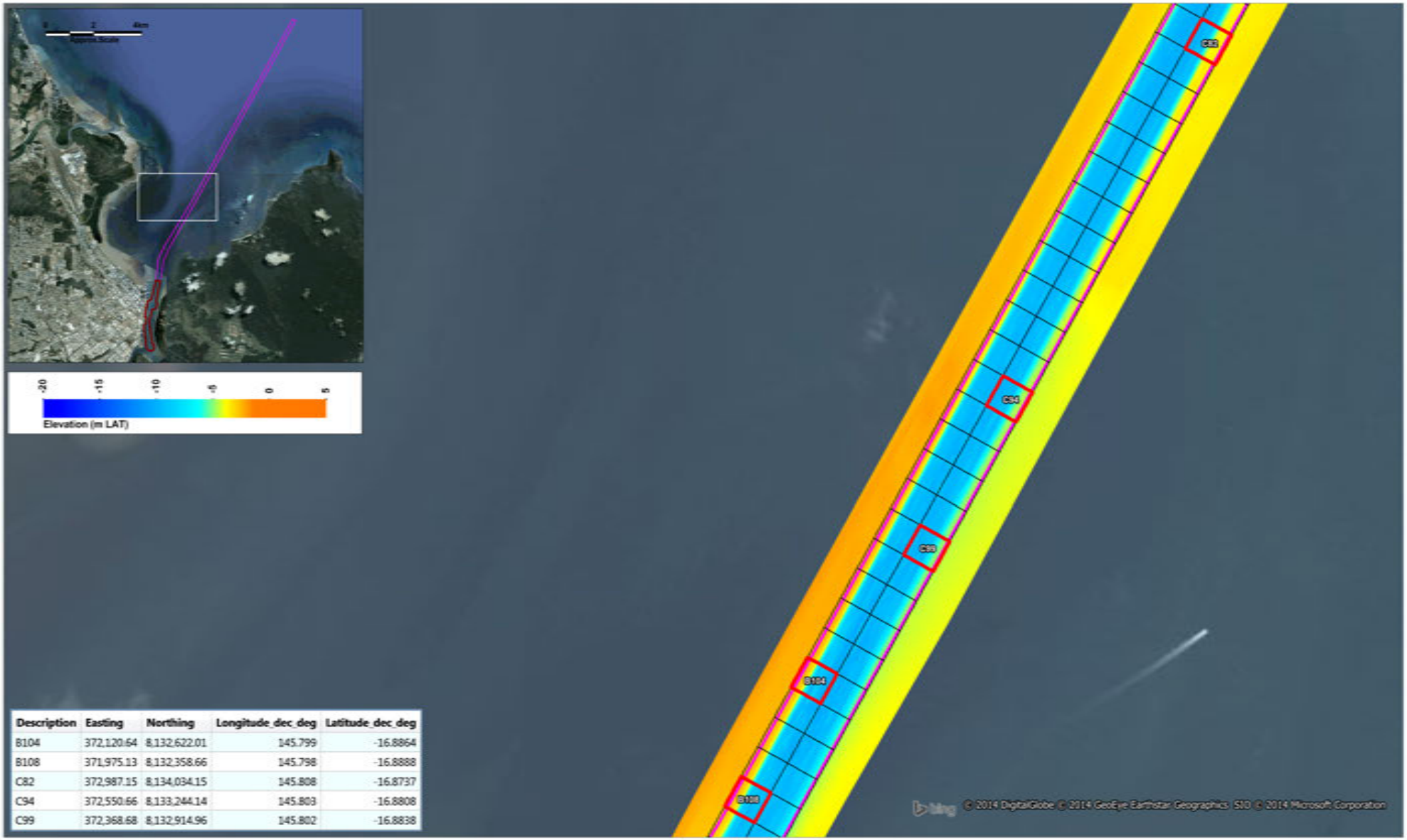
Filepath : I:\B20180_I_Port of Cairns EIS\DRG\ECO_016_Sediment Sampling Location_Outer_B79 to C50.wor



Description	Easting	Northing	Longitude_dec_deg	Latitude_dec_deg
B104	372,120.64	8,132,622.01	145.799	-16.8864
B108	371,975.13	8,132,358.66	145.798	-16.8888
C82	372,987.15	8,134,034.15	145.808	-16.8737
C94	372,550.66	8,133,244.14	145.803	-16.8808
C99	372,368.68	8,132,914.96	145.802	-16.8838

LEGEND

Outer Channel

Inner Port

Sampling Location

Grid Sampling Areas

Title:

Sampling Locations - Outer Channel

Figure: 2-4

Rev: A

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N

0 200 400m

Approx.Scale

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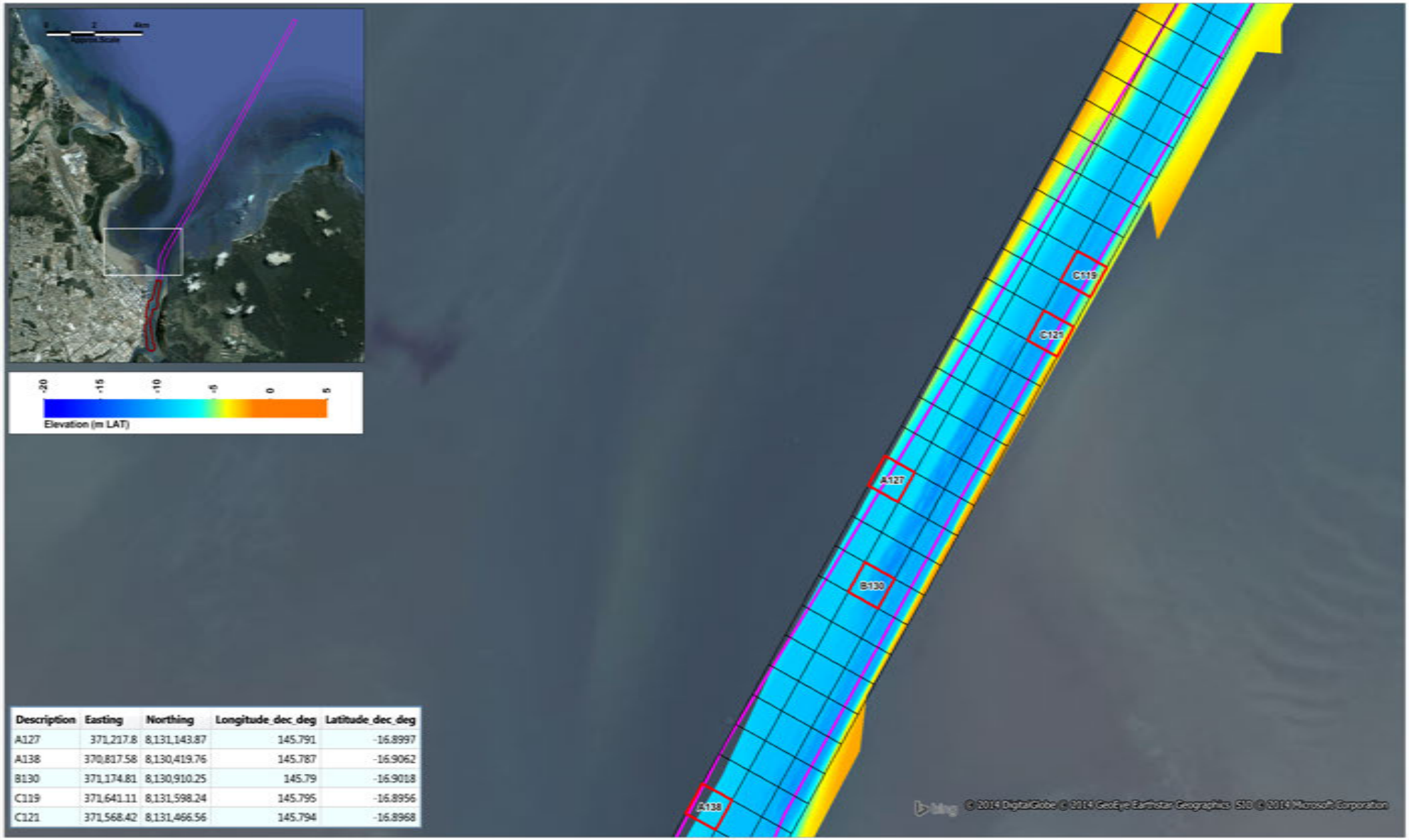
Filepath : I:\B20180_I_Port of Cairns EIS\DRG\ECO_015_Sediment Sampling Location_Outer_B108 to B63.wor



Description	Easting	Northing	Longitude_dec_deg	Latitude_dec_deg
A127	371,217.8	8,131,143.87	145.791	-16.8997
A138	370,817.58	8,130,419.76	145.787	-16.9062
B130	371,174.81	8,130,910.25	145.79	-16.9018
C119	371,641.11	8,131,598.24	145.795	-16.8956
C121	371,568.42	8,131,466.56	145.794	-16.8968

LEGEND

Outer Channel

Inner Port

Sampling Location

Grid Sampling Areas

Inner Base

Title:

Sampling Locations - Outer Channel

Figure: 2-5

Rev: A

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N

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Approx.Scale

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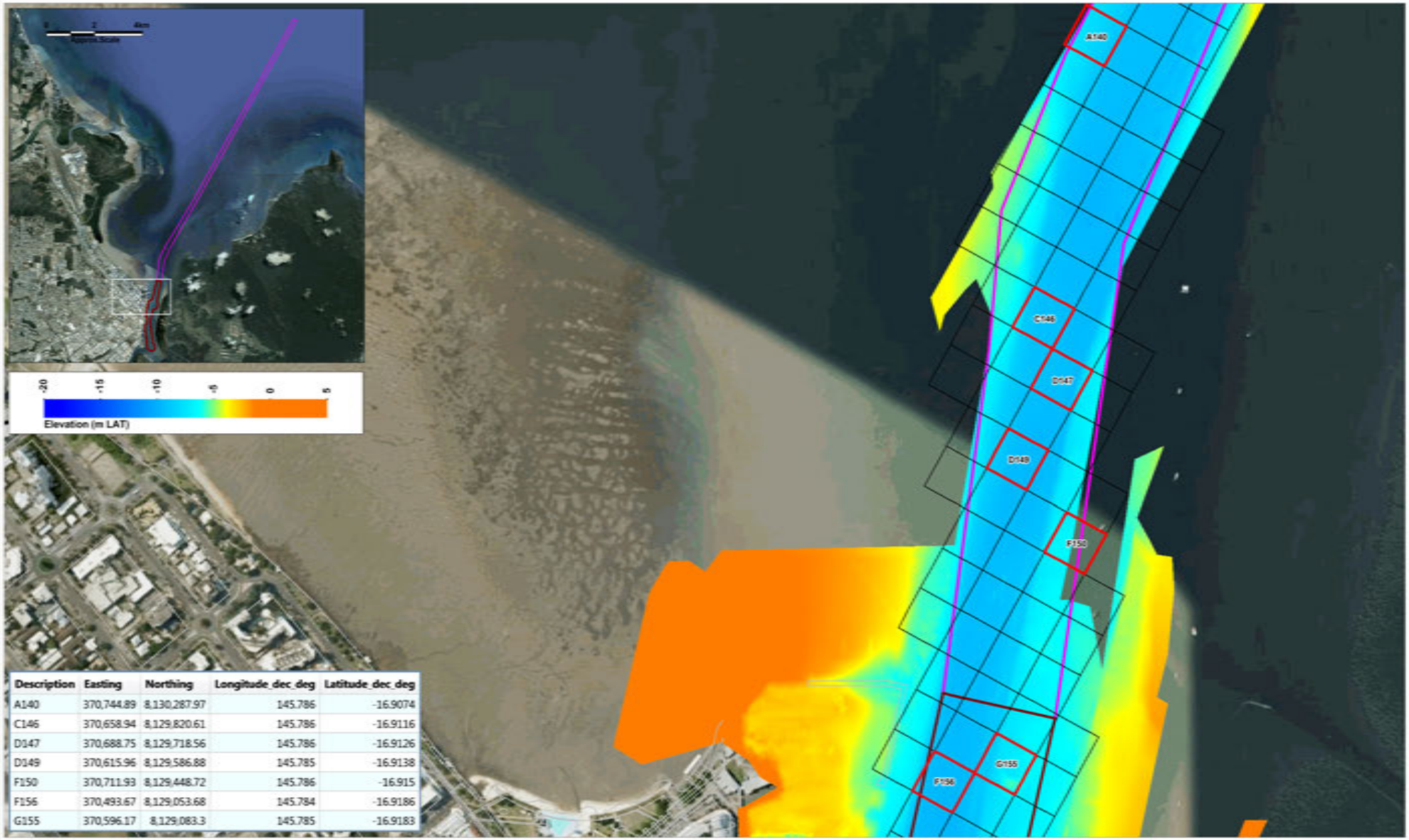
Filepath : I:\B20180_I_Port of Cairns EIS\DRG\ECO_014_Sediment Sampling Location_Outer_A138 to C119.wor



Description	Easting	Northing	Longitude_dec_deg	Latitude_dec_deg
A140	370,744.89	8,130,287.97	145.786	-16.9074
C146	370,658.94	8,129,820.61	145.786	-16.9116
D147	370,688.75	8,129,718.56	145.786	-16.9126
D149	370,615.96	8,129,586.88	145.785	-16.9138
F150	370,711.93	8,129,448.72	145.786	-16.915
F156	370,493.67	8,129,053.68	145.784	-16.9186
G155	370,596.17	8,129,083.3	145.785	-16.9183

LEGEND

- Outer Channel
- Inner Port
- Sampling Location
- Grid Sampling Areas
- Inner Base

Title:

Sampling Locations - Inner Port and Outer Channel

Figure: 2-6

Rev: A

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0 100 200m
Approx.Scale

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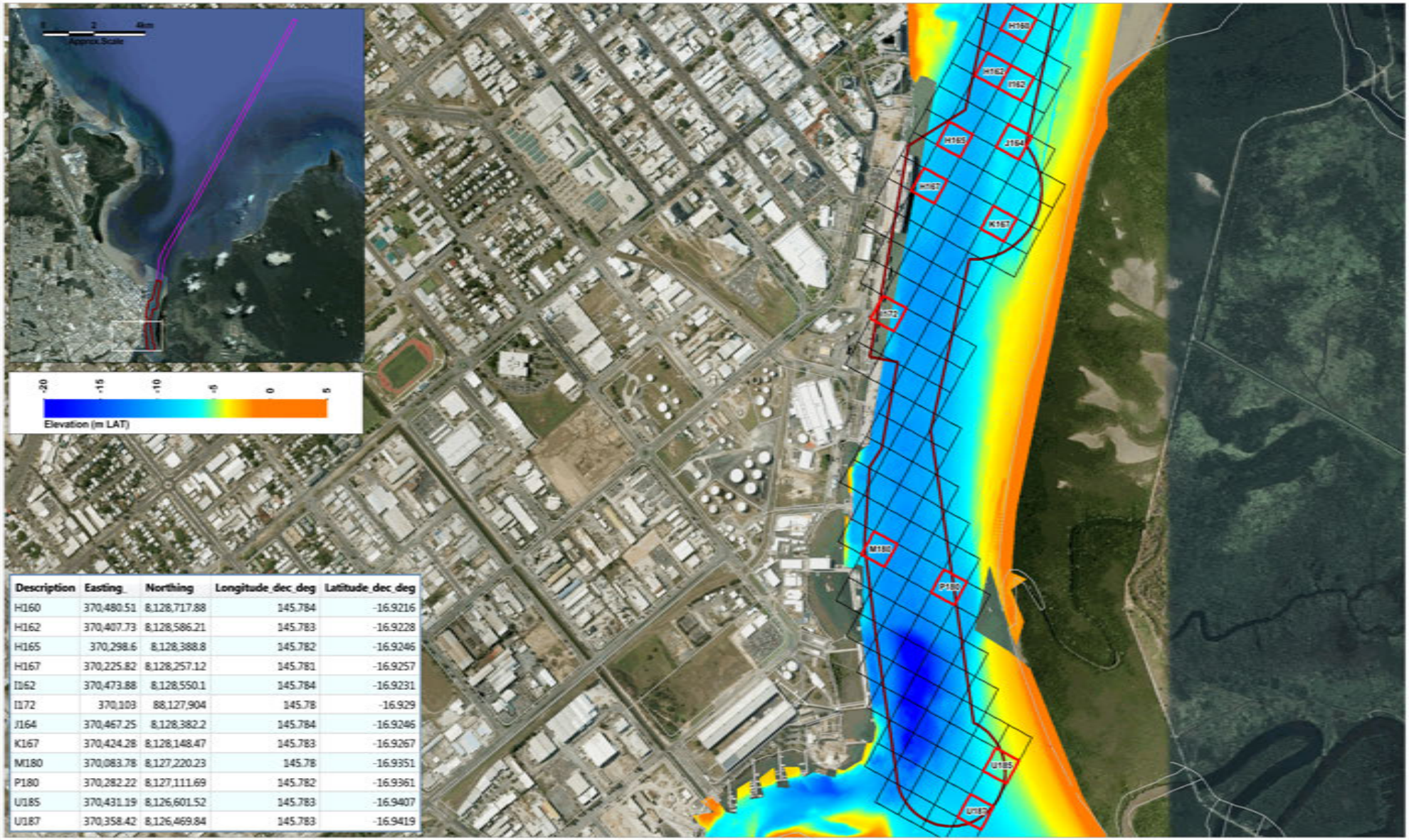
Filepath : I:\B20180_I_Port of Cairns EIS\DRG\ECO_013_Sediment Sampling Location_Inner_F156 to A140.wor



Description	Easting_	Northing	Longitude_dec_deg	Latitude_dec_deg
H160	370,480.51	8,128,717.88	145.784	-16.9216
H162	370,407.73	8,128,586.21	145.783	-16.9228
H165	370,298.6	8,128,388.8	145.782	-16.9246
H167	370,225.82	8,128,257.12	145.781	-16.9257
I162	370,473.88	8,128,550.1	145.784	-16.9231
I172	370,103	88,127,904	145.78	-16.929
J164	370,467.25	8,128,382.2	145.784	-16.9246
K167	370,424.28	8,128,148.47	145.783	-16.9267
M180	370,083.78	8,127,220.23	145.78	-16.9351
P180	370,282.22	8,127,111.69	145.782	-16.9361
U185	370,431.19	8,126,601.52	145.783	-16.9407
U187	370,358.42	8,126,469.84	145.783	-16.9419

LEGEND

Outer Channel

Inner Port

Sampling Location

Grid Sampling Areas

Inner Base

Title:

Sampling Locations - Inner Port

Figure: 2-7

Rev: A

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N

0 200 400m

Approx.Scale

BMT WBM

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Filepath : I:\B20180_I_Port of Cairns EIS\DRG\ECO_004_Sediment Sampling Location_Inner_L176 to U186.wor

2.4 Sample Collection

2.4.1 Core Sampling

Navigation to the sampling locations was undertaken using a differentially corrected global positioning system (GPS) with an accuracy of approximately ±2 m.

Sediment cores were collected using a combination of piston coring and vibrocoring. The choice of core barrel and coring methodology (i.e. vibrocoring or piston coring) depended on the volume of material required for analyses, the texture of the sediment encountered at each sample location and the required length of core. Generally, vibrocoring was undertaken in sandy substrates and shorter piston cores were collected in muddy sands and muds.

A medium weight vibrocorer with 50.8 mm (OD) stainless steel core tubes was used which is designed for collection of unconsolidated sediment samples in water depths to 34 m. The vibrocorer operates on 24V DC power and is highly efficient due to the energy-recovering weight system.

A piston corer using a clean polycarbonate (84 mm OD) or stainless steel (50.8 mm OD) barrels was used, where the sediments were fine grained and shorter cores were required. The piston corer can collect complete and undisturbed cores at water depths of up to 17 m, but penetration is limited in dense sand, clay or rocky sediments. A core barrel was manually pushed into the sediment with the piston remaining at bed level to create a partial vacuum and draw sediment into the barrel as the unit was raised. The core barrels were then lifted onto the barge and separated from the coring device.

The clay plugs were subsampled separately and five samples analysed for the contaminants of potential concern (metals/metalloids and organotins) to confirm the expected low concentrations of contaminants in this material.

The acceptability of each sediment core was determined immediately following collection, and the criteria for acceptance of the core included:

- No obvious loss of surficial sediment;
- The core had entered the profile vertically;
- No gaps in the stratigraphy;
- No disturbance of the sediment stratigraphy; and
- The core reached the depth of dredging, or core refusal in clay, dense sand or rock.

2.4.2 Grab Sampling

Grab sampling was undertaken at sampling locations where no core could be obtained, e.g. due to shallow core refusal on consolidated material.

A large stainless steel Van Veen grab sampler with a 0.145 m^2 gape was used, which is larger than the minimum gape size required by NAGD (0.02 m^2). The grab sampler is suitable for sampling

unconsolidated sediments down to approximately 15cm depth, depending on the type of material encountered.

As per NAGD, the grab sampler was thoroughly cleaned with DeCon 90 solution prior to sampling and washed clean between sampling locations.

Only grab samples with properly closed jaws and no apparent loss of fines were accepted.

2.4.3 Survey Vessel and Positioning

The 13 m barge MV *Hercules* was used to undertake the initial core sampling. The 12 m MV *Viking* (2C survey) was used for the additional grab sampling. For the supplementary SAP sampling, the 15m vessel MV *Tribulation* was used.

Navigation to the sampling locations was undertaken using a differentially corrected global positioning system (GPS) with an accuracy of approximately ±2 m.

2.5 Sample Handling

2.5.1 Sample Processing

Sample management procedures included the careful collection of sediment samples from the core tube, following the recovery of the sediment sample from the seabed. Grab samples were transferred to a clean tub for processing.

Photographs of the cores and grab samples were taken and field personnel logged each core profile for its physical characteristics and variations in sediment type and texture. The core length was measured and the appropriate sample interval subsampled and collected in a clean, stainless steel bowl for homogenization prior to the filling of analytical laboratory-supplied clean sampling jars.

Subsampling of cores was undertaken in accordance with NAGD requirements (refer to Section 2.3.1 for details). Sample identifiers included the location and depth interval, for example.

QA/QC samples were blind-labelled to ensure that the laboratories could not relate the QA sample back to the primary sample.

2.5.2 Core Log

All sediment cores were geotechnically logged upon collection on a standardised pro-forma. The following information was recorded:

- Project name;
- The name of the sample collector;
- Date of sampling;
- Type of sampler used (vibrocorer/piston corer, grab sampler);
- Field sample number;

- Northing and Easting of sample location (from onboard DGPS), if different from proposed location;
- Sediment texture, odour and colour;
- Sediment consistency; and
- Field records and comments.

Core logs are presented in Appendices C and D.

2.5.3 Sample Processing QA/QC

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

The workspace on the sampling 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.

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

Utmost care was maintained in ensuring that cross-contamination between samples did not occur. Samples collected from each interval were placed into appropriately cleaned and preserved containers (labelled prior to filling) provided by the analytical laboratory.

Following sample processing and filling of sample containers, all samples were immediately placed into an onboard freezer.

2.5.4 Sample Submission and Chain of Custody

All samples were traced using Chain of Custody (CoC) documentation submitted to the laboratory to ensure that sample possession and processing could be traced from sample collection to reporting of results.

Copies of the relevant CoC documents are provided together with the laboratory results in Appendices E, F, G and H.

At the conclusion of the sampling program the sediment samples were submitted to the analytical laboratories for processing and analysis in a single batch.

2.6 Laboratory Analysis

2.6.1 Analytical Tests

Primary analysis of sediment samples was conducted by Australian Laboratory Services (ALS). The analysis of the herbicide diuron was subcontracted to Advanced Analytical Australia (AAA) due to the required low limits of reporting. Envirolab Services was chosen as the secondary (reference) laboratory for inter-laboratory quality testing.

As per the approved SAP, a tiered pilot study approach was adopted for contaminants identified as 'low risk' based on a review of existing sediment quality data.

The tiered pilot study approach for 'low risk' contaminants can be summarised as:

- Initial analysis of 20% of locations (top, mid and lower subsamples) from the Inner Port; remaining 80% of samples stored as hold samples. No analysis proposed for Outer Channel, but hold samples to be stored;
- Significant detections (i.e. > 1/10th of screening level, or five times LOR where no screening level exists) in Inner Port triggered analysis of hold samples; no further analysis if concentrations were below the above thresholds;
- Significant detection in top horizon only – Analysis of hold samples for respective contaminant(s) in top horizon only;
- Significant detection down to mid horizon - Analysis of hold samples for respective contaminant(s) in top and mid horizon only;
- Significant detection down to lower horizon - Analysis of hold samples for respective contaminant(s) in top, middle and lower horizons; and
- If analysis of hold samples from the Inner Port was triggered, an initial analysis of 20% of samples for the respective parameter(s) and horizon(s) was to be undertaken for the Outer Channel with a focus on sampling locations close to the Inner Port.

A list of analytical parameters for the Inner Port and Outer Channel dredge areas is provided in Table 2-1.

Table 2-1 Comprehensive List of Parameters

	Inner Port		Outer Channel	
Analytical Parameter	**Analysed (Yes/No)**	**Analysis Frequency**	**Analysed (Yes/No)**	**Analysis Frequency**
Contaminants of Potential Concern				
Metals and Metalloids (Ag, As, Cd, Cr, Cu, Hg, Ni, Pb, Sb, Zn, Fe, Al)	Yes	All samples	Yes	All samples
Organotins (MBT, DBT, TBT)	Yes	All samples	Yes	All samples
'Low Risk' Contaminants				
BTEX	Yes	20%	No	-
Total Petroleum Hydrocarbons	Yes	20%	No	-
Polycyclic Aromatic Hydrocarbons (PAHs)	Yes	20%	No	-
Organochlorine and Organophosphate Pesticides	Yes	20%	No	-
Herbicide Diuron	Yes	20%	No	-

	Inner Port		Outer Channel	
Perfluorinated Compounds (PFCs)	Yes	20%	No	-
Other Analyses				
Particle Size distribution (sieve and sedigraph)	Yes	All surface samples, 10 samples per sediment class	Yes	All surface samples, 10 samples per sediment class
Nutrients (TN, TKN, TP, NH4, NOx)	Yes	20%	Yes	20%
Acid Sulfate Potential (Chromium Suite)	Yes	All samples	Yes	All samples
Moisture content	Yes	All samples	Yes	All samples
Total organic carbon	Yes	All samples	Yes	All samples

2.6.2 Laboratory Quality Control

Both laboratories followed laboratory QC procedures in accordance with requirements outlined in Appendix F of 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 Appendix A of NAGD to confirm suitable data quality for undertaking characterisation of the proposed dredged material.

2.6.2.1 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 less than or near the detection limit of the method used.

2.6.2.2 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 ALS used the following approach to assess duplicate RPD's:

- 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%.

The secondary laboratory Envirolabs adhered to the following approach:

- Results <5 times LOR – no limit to RPD; and

- Results >5 times LOR - RPD between 0% and 50%.

Refer to Appendices E and F for the acceptance criteria of subcontracted laboratories.

2.6.2.3 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 interested 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 ALS adopts specific recovery limits for individual compounds as outlined in Appendix E.

The secondary laboratory Envirolabs has the following acceptance criteria for matrix spikes, LCS and surrogate recoveries:

- Trace elements: 70-130%;
- Organic analyses: 60-140%; and
- SVOC & speciated phenols: 10-140%.

2.7 Data Analysis

2.7.1 Sediment Contaminants

Concentrations of chemicals measured in sediment samples were compared to screening levels listed in Table 2 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. This involved the following steps.

2.7.1.1 Data Pre-treatment

Analytical values below detection limit were set to one-half of the laboratory Limit of Reporting (LOR) as per NAGD recommendation to facilitate 95% UCL calculation. Organic contaminant

results were normalised to 1% Total Organic Carbon (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 detection limits 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 not included in the 95% UCL calculation.

2.7.1.2 Selection of Appropriate 95% UCL Calculation Method

The methodology for calculating the 95% UCL followed the approach recommended in Appendix A of NAGD. A Shapiro-Wilk test was used to determine whether data followed a normal distribution. The ProUCL (Version 5.0.00) software package was used for these calculations (Singh *et al.* 2010).

2.7.1.3 Calculation of 95% UCL and Comparison to Screening Levels

ProUCL Version 5.0.00 was used to calculate the 95% UCL. For normally distributed data, the arithmetic mean and standard deviation were calculated, and the 95% UCL was calculated using the one-tailed Student's *t* UCL test. For data that followed a log-normal (or other) distribution, the geomean was calculated, and the 95% UCL was analysed using non-parametric Jack-Knife analysis as per NAGD recommendation.

Where 95% UCL values for all analysed parameters fell below NAGD screening levels, the sediment was considered clean and suitable for unconfined disposal at sea. Further testing was undertaken for samples where the NAGD or literature derived screening level was exceeded, as described below.

2.7.2 Elutriate and Bioavailability Testing

Phase III testing included elutriate and bioavailability testing in accordance with NAGD.

Based on 418,723 m^3 of potentially contaminated sediment volume in the Inner Port (refer to SAP in Appendix A), seven samples were required as per Table 7 in NAGD.

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 sixty 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.

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.

2.7.3 Acid Sulfate Soils

The results of the Chromium Suite 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.

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

3 Results

3.1 Physical Sediment Characteristics

3.1.1 Inner Port

Table 3-1 presents the results of Particle Size Distribution (PSD) in the Inner Port dredge area. The Inner Port sediments were generally characterised by high proportions of silt (mean 46.8%) and clay (mean 36.9%). Relatively high proportions of coarser sediment were recorded at two locations (U185 and J164) with up to 50% sand and up to 11% gravel.

Table 3-1 Particle Size Distribution – Inner Port

Sample	Clay (<2 µm)	Silt (2-60 µm)	Sand (0.06-2.00 mm)	Gravel (>2mm)
	%	%	%	%
K167 0-0.25	47	45	7	1
M180 0-0.2	41	52	7	0
H167 0-0.2	42	56	2	0
H165 0-0.2	42	54	4	0
U187 0-0.1	39	58	3	0
U185 0-0.5	24	22	47	7
U185 0.5-1.0	22	20	50	8
U185 1.0-1.5	34	33	22	11
U185 2.5-2.9	42	55	3	0
I162 0.13-0.33	44	53	2	1
J164 0-0.5	24	34	35	7
J164 0.5-1.02	41	50	9	0
I172 0-0.5	31	68	1	0
I172 0.5-1.0	44	55	1	0
Mean	**36.9**	**46.8**	**13.8**	**2.5**
STDEV	**8.4**	**14.2**	**17.5**	**3.9**

3.1.2 Outer Channel

As demonstrated in Table 3-2, the Outer Channel sediments were also characterised by high proportions of silt (mean 54.8%) and clay (mean 33.9%). Sandy and gravelly sediments contributed 10.1% and 1.3% on average, respectively.

Table 3-2 Particle Size Distribution – Outer Channel

Sample	Clay (<2 µm)	Silt (2-60 µm)	Sand (0.06-2.00 mm)	Gravel (>2mm)
	%	%	%	%
C119 0-0.2	33	58	8	1
B130 0-0.5	31	64	5	0
A138 0-0.27	49	50	1	0
A140 0-0.26	48	50	2	0

Sample	Clay (<2 µm)	Silt (2-60 µm)	Sand (0.06-2.00 mm)	Gravel (>2mm)
C146 0-0.25	19	17	46	18
D147 0-0.05	24	24	31	21
B2 0-0.55	27	49	23	1
B7 0-0.50	25	51	22	2
B7 0.5-0.95	25	50	24	1
B9 0-0.5	26	54	20	0
B9 0.5-0.7	25	56	18	1
C22 0-0.5	39	54	7	0
C22 0.5-0.9	38	56	6	0
C29 0-0.5	34	58	8	0
C29 0.5-0.8	27	61	12	0
B25 0-0.2	33	51	16	0
C30 0-0.5	38	60	2	0
C30 0.5-1.0	41	55	4	0
C94 0-0.5	34	59	7	0
C94 0.5-1.0	37	59	4	0
C99 0-0.5	40	58	2	0
C121 0-0.5	27	67	6	0
B108 0-0.5	33	64	3	0
B108 0.5-1.0	36	56	6	2
B104 0-0.5	31	42	25	2
B104 0.5-0.95	36	54	9	1
C50 0-0.5	32	62	6	0
C50 1.0-1.2	27	62	11	0
C53 0-0.5	35	63	2	0
B54 0-0.5	33	62	5	0
B63 0-0.5	34	62	4	0
B41 0-0.5	36	56	8	0
B41 0.5-0.9	34	63	3	0
C72 0-0.5	33	53	14	0
B74 0-0.5	29	69	2	0
B74 1.0-1.9	39	57	4	0
B79 1.0-1.8	38	59	3	0
C82 1.0-1.53	34	59	7	0
A127 0-0.5	40	49	11	0
A127 1.0-1.7	48	44	8	0
F150 0-0.43	42	48	8	2
Mean	**33.9**	**54.8**	**10.1**	**1.3**
STDEV	**6.7**	**9.9**	**9.4**	**4.2**

3.2 Chemical Sediment Characteristics

Table 3-3 presents the summary statistics and calculation of 95% UCLs for chemical parameters with concentrations above the laboratory LOR.

Concentrations of chemical parameters for individual sub-samples are presented in Table 3-7 for the Inner Port dredge area and in Table 3-8 for the Outer Channel dredge area.

Table 3-3 Summary Statistics for Inner Port (n=23) and Outer Channel (n=64) Sediment Samples. Exceedances of Screening Levels are Highlighted in Orange. 'ND' denotes 'Not Determined' and ' – ' denotes 'Results below LOR'

			Inner Port				Outer Channel			
Analyte	Units	Screening Level (NAGD or local)	Normal (N), Lognormal (L), Neither (X)	Mean / Geo-mean	Standard Deviation	95% UCL	Normal (N), Lognormal (L), Neither (X)	Mean / Geo-mean	Standard Deviation	95% UCL
Moisture Content										
Moisture Content (dried @ 103°C)	%		N	40.1	15.1	45.5	X	45.5	9.5	48.7
Metals & Metalloids										
Aluminium	mg/kg		X	14069	5487	17606	N	17849	3125	18501
Antimony	mg/kg	2	-	-	-	-	-	-	-	-
Arsenic	mg/kg	30	N	17.8	7.3	20.4	X	17.8	3.6	19.0
Cadmium	mg/kg	1.5	-	-	-	-	-	-	-	-
Chromium	mg/kg	80	N	32.1	9.8	35.6	N	33.9	5.2	35.0
Copper	mg/kg	65	N	11.9	6.5	14.3	N	10.7	3.0	11.3
Cobalt	mg/kg		N	9.9	3.8	11.3	X	8.9	1.8	9.5
Iron	mg/kg		N	27506	7734	30275	N	28388	4246	29273
Lead	mg/kg	50	N	18.1	5.8	20.2	N	17.3	3.3	18.1
Manganese	mg/kg		N	583.1	340.9	705.2	X	580.7	209.9	672.4
Mercury	mg/kg	0.15	X	0.037	0.302	0.196	X	0.02	0.04	0.033
Nickel	mg/kg	21	N	14.3	5.4	16.2	X	15.3	3.0	16.3
Selenium	mg/kg		N	2.8	0.9	3.2	N	2.6	0.7	2.8
Silver	mg/kg	1	X	0.3	0.1	0.1	X	0.1	-	-
Vanadium	mg/kg		N	41.6	12.3	46.0	X	41.7	8.9	44.4
Zinc	mg/kg	200	N	40.4	21.5	48.1	X	39.4	12.0	44.8
Nutrients + Total Organic Carbon										
Ammonia as N	mg/kg		X	12.5	35.2	35.1	N	52.6	28.2	51.7
Nitrite + Nitrate as N (Sol.)	mg/kg		X	0.1	0.1	0.08	-	-	-	-
Total Kjeldahl Nitrogen as N	mg/kg		L	679.7	549.7	1169	N	916.5	370.7	1041
Total Nitrogen as N	mg/kg		L	679.7	549.7	1169	N	916.5	370.7	1041
Total Phosphorus as P	mg/kg		N	318.0	164.8	393	X	390.7	287.6	534.9
Total Organic Carbon	%		N	1.5	1.2	1.9	N	1.1	0.4	1.2
BTEX										
Benzene	mg/kg		-	-	-	-	ND	ND	ND	ND

			Inner Port				Outer Channel			
Analyte	Units	Screening Level (NAGD or local)	Normal (N), Lognormal (L), Neither (X)	Mean / Geo-mean	Standard Deviation	95% UCL	Normal (N), Lognormal (L), Neither (X)	Mean / Geo-mean	Standard Deviation	95% UCL
Toluene	mg/kg		-	-	-	-	ND	ND	ND	ND
Ethylbenzene	mg/kg		-	-	-	-	ND	ND	ND	ND
meta- & para-Xylene	mg/kg		-	-	-	-	ND	ND	ND	ND
ortho-Xylene	mg/kg		-	-	-	-	ND	ND	ND	ND
Total Xylenes	mg/kg		-	-	-	-	ND	ND	ND	ND
Sum of BTEX	mg/kg		-	-	-	-	ND	ND	ND	ND
Total Petroleum Hydrocarbons										
C6 - C9 Fraction	mg/kg		-	-	-	-	ND	ND	ND	ND
C10 - C14 Fraction	mg/kg		X	3.2	0.7	2.0	ND	ND	ND	ND
C15 - C28 Fraction	mg/kg		N	13.3	8.7	17.1	ND	ND	ND	ND
C29 - C36 Fraction	mg/kg		N	15.7	6.7	16.0	ND	ND	ND	ND
C10 - C36 Fraction (sum)	mg/kg	550	N	25.5	15.4	32.2	ND	ND	ND	ND
Organotin Compounds										
Monobutyltin	µgSn/kg		X	6.1	-	-	-	-	-	-
Dibutyltin	µgSn/kg		X	0.7	0.3	0.6	X	0.7	-	-
Tributyltin	µgSn/kg	9	X	0.9	0.5	0.7	X	0.6	0.3	0.4
Organophosphorus Pesticides										
Bromophos-ethyl	µg/kg		-	-	-	-	ND	ND	ND	ND
Carbophenothion	µg/kg		-	-	-	-	ND	ND	ND	ND
Chlorfenvinphos (E)	µg/kg		-	-	-	-	ND	ND	ND	ND
Chlorfenvinphos (Z)	µg/kg		-	-	-	-	ND	ND	ND	ND
Chlorpyrifos	µg/kg		-	-	-	-	ND	ND	ND	ND
Chlorpyrifos-methyl	µg/kg		-	-	-	-	ND	ND	ND	ND
Demeton-S-methyl	µg/kg		-	-	-	-	ND	ND	ND	ND
Diazinon	µg/kg		-	-	-	-	ND	ND	ND	ND
Dichlorvos	µg/kg		-	-	-	-	ND	ND	ND	ND
Dimethoate	µg/kg		-	-	-	-	ND	ND	ND	ND
Ethion	µg/kg		-	-	-	-	ND	ND	ND	ND
Fenamiphos	µg/kg		-	-	-	-	ND	ND	ND	ND
Fenthion	µg/kg		-	-	-	-	ND	ND	ND	ND
Malathion	µg/kg		-	-	-	-	ND	ND	ND	ND
Azinphos Methyl	µg/kg		-	-	-	-	ND	ND	ND	ND
Monocrotophos	µg/kg		-	-	-	-	ND	ND	ND	ND
Parathion	µg/kg		-	-	-	-	ND	ND	ND	ND
Parathion-methyl	µg/kg		-	-	-	-	ND	ND	ND	ND
Pirimphos-ethyl	µg/kg		-	-	-	-	ND	ND	ND	ND
Prothiofos	µg/kg		-	-	-	-	ND	ND	ND	ND

			Inner Port				Outer Channel			
Analyte	Units	Screening Level (NAGD or local)	Normal (N), Lognormal (L), Neither (X)	Mean / Geo-mean	Standard Deviation	95% UCL	Normal (N), Lognormal (L), Neither (X)	Mean / Geo-mean	Standard Deviation	95% UCL
Organochlorine Pesticides										
Aldrin	µg/kg		-	-	-	-	ND	ND	ND	ND
alpha-BHC	µg/kg		-	-	-	-	ND	ND	ND	ND
beta-BHC	µg/kg		-	-	-	-	ND	ND	ND	ND
delta-BHC	µg/kg		-	-	-	-	ND	ND	ND	ND
4.4`-DDD	µg/kg	2	-	-	-	-	ND	ND	ND	ND
4.4`-DDE	µg/kg	2.2	-	-	-	-	ND	ND	ND	ND
4.4`-DDT	µg/kg	1.6	-	-	-	-	ND	ND	ND	ND
Sum of DDD + DDE + DDT	µg/kg	1.6	-	-	-	-	ND	ND	ND	ND
Dieldrin	µg/kg	280	-	-	-	-	ND	ND	ND	ND
alpha-Endosulfan	µg/kg		-	-	-	-	ND	ND	ND	ND
beta-Endosulfan	µg/kg		-	-	-	-	ND	ND	ND	ND
Endosulfan sulfate	µg/kg		-	-	-	-	ND	ND	ND	ND
Endosulfan (sum)	µg/kg		-	-	-	-	ND	ND	ND	ND
Endrin	µg/kg	10	-	-	-	-	ND	ND	ND	ND
Endrin aldehyde	µg/kg		-	-	-	-	ND	ND	ND	ND
Endrin ketone	µg/kg		-	-	-	-	ND	ND	ND	ND
Heptachlor	µg/kg		-	-	-	-	ND	ND	ND	ND
Heptachlor epoxide	µg/kg		-	-	-	-	ND	ND	ND	ND
Hexachlorobenzene (HCB)	µg/kg		-	-	-	-	ND	ND	ND	ND
gamma-BHC	µg/kg	0.32	-	-	-	-	ND	ND	ND	ND
Methoxychlor	µg/kg		-	-	-	-	ND	ND	ND	ND
cis-Chlordane	µg/kg		-	-	-	-	ND	ND	ND	ND
trans-Chlordane	µg/kg		-	-	-	-	ND	ND	ND	ND
Total Chlordane (sum)	µg/kg	0.5	-	-	-	-	ND	ND	ND	ND
Oxychlordane	µg/kg		-	-	-	-	ND	ND	ND	ND
Polynuclear Aromatic Hydrocarbons										
Naphthalene	µg/kg		X	3.7	0.5	3.2	ND	ND	ND	ND
2-Methylnaphthalene	µg/kg		-	-	-	-	ND	ND	ND	ND
Acenaphthylene	µg/kg		X	5.4	1.6	3.1	ND	ND	ND	ND
Acenaphthene	µg/kg		X	7.7	0.4	3.7	ND	ND	ND	ND
Fluorene	µg/kg		-	-	-	-	ND	ND	ND	ND
Phenanthrene	µg/kg		-	-	-	-	ND	ND	ND	ND
Anthracene	µg/kg		X	3.8	-	2.5	ND	ND	ND	ND
Fluoranthene	µg/kg		X	4.3	1.6	3.3	ND	ND	ND	ND
Pyrene	µg/kg		X	5.6	2.6	5.0	ND	ND	ND	ND
Benz(a)anthracene	µg/kg		X	4.7	1.3	2.9	ND	ND	ND	ND

			Inner Port				Outer Channel			
Analyte	Units	Screening Level (NAGD or local)	Normal (N), Lognormal (L), Neither (X)	Mean / Geo-mean	Standard Deviation	95% UCL	Normal (N), Lognormal (L), Neither (X)	Mean / Geo-mean	Standard Deviation	95% UCL
Chrysene	µg/kg		X	4.4	0.8	2.8	ND	ND	ND	ND
Benzo(b)fluoranthene	µg/kg		X	4.7	1.3	2.9	ND	ND	ND	ND
Benzo(k)fluoranthene	µg/kg		-	-	-	-	ND	ND	ND	ND
Benzo(e)pyrene	µg/kg		X	3.3	0.6	2.5	ND	ND	ND	ND
Benzo(a)pyrene	µg/kg		X	5.0	0.9	3.0	ND	ND	ND	ND
Perylene	µg/kg		L	11.7	19.3	22.5	ND	ND	ND	ND
Benzo(g.h.i)perylene	µg/kg		X	2.8	0.5	2.4	ND	ND	ND	ND
Dibenz(a.h)anthracene	µg/kg		-	-	-	-	ND	ND	ND	ND
Indeno(1.2.3.cd)pyrene	µg/kg		-	-	-	-	ND	ND	ND	ND
Coronene	µg/kg		-	-	-	-	ND	ND	ND	ND
Sum of PAHs	µg/kg	10000	N	32.0	24.0	35.3	ND	ND	ND	ND
Perfluorinated Compounds										
PFOS	mg/kg		-	-	-	-	ND	ND	ND	ND
PFOA	mg/kg		-	-	-	-	ND	ND	ND	ND
6:2 Fluorotelomer sulfonate (6:2 FtS)	mg/kg		X	0.00255	-	-	ND	ND	ND	ND
8:2 Fluorotelomer sulfonate	mg/kg		-	-	-	-	ND	ND	ND	ND
PFOSA	mg/kg		-	-	-	-	ND	ND	ND	ND
N-Me-FOSA	mg/kg		-	-	-	-	ND	ND	ND	ND
N-Et-FOSA	mg/kg		-	-	-	-	ND	ND	ND	ND
N-Me-FOSE	mg/kg		-	-	-	-	ND	ND	ND	ND
N-Et-FOSE	mg/kg		-	-	-	-	ND	ND	ND	ND
PFBS	mg/kg		-	-	-	-	ND	ND	ND	ND
PFHxS	mg/kg		-	-	-	-	ND	ND	ND	ND
PFDcS	mg/kg		-	-	-	-	ND	ND	ND	ND
PFHxA	mg/kg		-	-	-	-	ND	ND	ND	ND
PFHpA	mg/kg		-	-	-	-	ND	ND	ND	ND
PFNA	mg/kg		X	0.00009	-	-	ND	ND	ND	ND
PFDcA	mg/kg		-	-	-	-	ND	ND	ND	ND
PFUnA	mg/kg		-	-	-	-	ND	ND	ND	ND
PFDoA	mg/kg		-	-	-	-	ND	ND	ND	ND
PFTriA	mg/kg		-	-	-	-	ND	ND	ND	ND
PFTeA	mg/kg		-	-	-	-	ND	ND	ND	ND
Herbicides										
Diuron	µg/kg	2	X	1.36	1.20	1.33	ND	ND	ND	ND

3.2.1 Clay Plugs

Clay plugs were sampled for the Inner Port (two samples) and the Outer Channel (four samples). Concentrations of all chemical parameters were below their respective screening levels or below the LOR in all clay samples.

The results of the clay plug analysis indicated that deeper sediment layers, which could not be sampled due to core refusal, are unlikely to be contaminated.

3.2.2 Trace Elements

3.2.2.1 Inner Port

The 95% UCL of the mean concentrations were below their respective NAGD or local screening levels for most metals and metalloids within the Inner Port dredge area.

The only exception was mercury with a 95% UCL concentration of 0.196 mg/kg which exceeded the NAGD screening level of 0.15 mg/kg (Table 3-3). Mercury concentrations were below the LOR or at concentrations well below the screening level for most locations in the Inner Port (Table 3-7). High concentrations of mercury were measured in samples H162 (1.2 mg/kg) and U185 1.0-1.5m (0.62 mg/kg). Additional elutriate and bioavailability testing was undertaken to further investigate potential mercury contamination in the Inner Port (refer to Section 3.2.2.3 for details).

The NAGD guidelines recognise that sediments in Australia can have high natural levels of arsenic and nickel. Naturally elevated arsenic levels were in particular noted for the Cairns Harbour area (Worley Parsons 2010). However, extensive elutriate and bioavailability testing for arsenic demonstrated an overall low risk and an increase of the local screening level within the Cairns Port dredge management areas to 30 mg/kg was agreed to by the Determining Authority.

Arsenic concentrations in almost all samples were well below the local screening level of 30 mg/kg. The only exception was location F156 where an arsenic concentration of 33.3 mg/kg was recorded. The 95% UCL concentration for arsenic was 20.4 mg/kg was well below the local screening level of 30 mg/kg.

Three marginal exceedances of the nickel screening level of 21 mg/kg were recorded at locations U187 (21.9 mg/kg) and I172 (22.3 mg/kg and 21.1 mg/kg). Nevertheless, the 95% UCL concentrations remained below the NAGD screening level with 16.21 mg/kg.

Antimony and cadmium were not detected in any of the samples of the Inner Port.

3.2.2.2 Outer Channel

The 95% UCL of the mean concentrations were below their respective NAGD or local screening levels for all metals and metalloids within the Outer Channel dredge area (Table 3-3).

One elevated mercury concentration was measured in the surface sediment at location C53 (0.29 mg/kg). Nevertheless, the 95% UCL concentration of mercury (0.033 mg/kg) remained well below the NAGD screening level of 0.15 mg/kg (Table 3-8).

Antimony and cadmium were not detected in any of the samples of the Outer Channel.

Based on these results, the Outer Channel sediments are considered suitable for ocean disposal in accordance with the NAGD guidelines.

3.2.2.3 Elutriate and Bioavailability Testing

Elevated mercury concentrations were measured in two samples of the Inner Port and one sample within the Outer Channel dredge area. For the Inner Port dredge area, this led to an exceedance of the NAGD screening level (Section 3.2.2.1). On the basis of these results, further testing was undertaken including:

- Re-analysis in triplicate of total mercury concentrations in the three samples with elevated concentrations;
- Elutriate analysis on six[1] samples from the Inner Port (plus two duplicates); and
- Dilute acid extraction on seven samples from the Inner Port (plus two duplicates).

Remaining sample volume was used for these tests and samples were analysed within the recommended holding time of 28 days. Elutriate and dilute acid extraction tests included the samples with the highest recorded mercury levels. The results of these tests are provided in Table 3-4.

Table 3-4 Mercury Totals, Elutriate and Bioavailability Results. Exceedances of the NAGD Screening Level Highlighted in Orange

Sample	Initial Analysis Total Hg (mg/kg)	Re-analysis Total Hg (mg/kg)	Elutriate Analysis (µg/L)	Recommended ANZECC guideline value (µg/L)[2]	Bioavailability Dilute Acid Extraction (mg/kg)	NAGD Screening Level (mg/kg)
H162	1.2	<0.01		0.1	<0.01	0.15
		<0.01				
		<0.01				
U185 1.0-1.5	0.62	0.01	<0.1		<0.01	
		0.01	<0.1		<0.01	
		0.01				
C53 0-0.5	0.29	0.02				
		0.02				
		0.02				
U185 0-0.5	0.05		<0.1		<0.01	
			<0.1		<0.01	
U187 0-0.1	0.04		<0.1		<0.01	
G155 0-0.15	0.03		<0.1		<0.01	
M180 0-0.2	0.03		<0.1		<0.01	
H165 0-0.2	0.03		<0.1		<0.01	

[1] One sample not analysed for elutriates due to insufficient sample volume.
[2] Marine water, 99% species protection level

Re-analysis in triplicate of the three samples with elevated mercury concentrations resulted in low mercury concentrations either below or close to the LOR and well below the NAGD screening level of 0.15 mg/kg.

Elutriate test results were below the LOR for all samples and therefore below the ANZECC trigger level of 0.1 µg/L. Dilute acid extraction results were below the LOR for all samples and therefore below the NAGD screening level of 0.15 mg/kg.

The results of the elutriate and bioavailability analyses demonstrate that no elevated mercury concentrations are expected during dredging and disposal. Bioavailability of mercury appears to be very low and marine organisms are not expected to be impacted after disposal of the sediments at sea. Given that the triplicate re-analysis of the three samples with elevated mercury concentrations could not confirm the initial results it appears to be likely that the initial results were erroneous.

Based on the combined Phase II and Phase III test results, the Inner Port sediments are considered to be suitable for ocean disposal with respect to all tested metals and metalloids in accordance with the NAGD guidelines.

3.2.3 BTEX and Total Petroleum Hydrocarbons

Concentrations of BTEX were below the LOR in all samples of the Inner Port. Total Petroleum Hydrocarbons (TPHs) were detected at low levels within the Inner Port with the maximum normalised concentration measured at location I172 (54.2 mg/kg). The 95% UCL for total TPHs was 32.22 mg/kg and therefore well below the NAGD screening level of 550 mg/kg (Table 3-3). As the maximum normalised concentration did not exceed 10% of the screening level, no further testing as per the SAP was required for TPHs.

Based on these results, the Inner Port sediments are considered suitable for ocean disposal with respect to BTEX and TPHs in accordance with the NAGD guidelines. In accordance with the SAP, no testing for BTEX and TPHs was undertaken for the Outer Channel dredge area.

3.2.4 Organotins

3.2.4.1 Inner Port

The 95% UCL concentration for the organotin Tributyltin (TBT) was 0.7 µgSn/kg for the Inner Port and therefore well below the NAGD screening level of 9 µgSn/kg (Table 3-3). Organotins were below the LOR in most samples and, where detected, measured at low concentrations.

The Inner Port sediments are therefore considered suitable for ocean disposal with respect to organotins in accordance with the NAGD guidelines.

3.2.4.2 Outer Channel

The 95% UCL concentration for TBT in the Outer Channel was 0.4 µgSn/kg and therefore well below the NAGD screening level. Organotin concentrations were mostly below the LOR or measured at low concentrations in the Outer Channel.

The Outer Channel sediments are therefore considered suitable for ocean disposal with respect to organotins in accordance with the NAGD guidelines.

3.2.5 Poly Aromatic Hydrocarbons (PAHs)

The 95% UCL concentration for normalised total PAHs was 35.3 µg/kg for the Inner Port and therefore well below the NAGD screening level of 10,000 µg/kg. As the maximum total PAHs concentration of 65.2 µg/kg was well below 10% of the screening level, no further testing was required.

The Inner Port sediments are therefore considered suitable for ocean disposal with respect to PAHs in accordance with the NAGD guidelines. As per the SAP, no testing for PAHs was undertaken for the Outer Channel dredge area.

3.2.6 Organochlorine and Organophosphate Pesticides

Concentrations of organochlorine pesticides (OCPs) and organophosphate pesticides (OPPs) were below the LOR in all samples from the Inner Port.

The Inner Port sediments are therefore considered suitable for ocean disposal with respect to OCPs and OPPs in accordance with the NAGD guidelines. As per the SAP, no testing for OCPs and OPPs was undertaken for the Outer Channel dredge area.

3.2.7 Perfluorinated Compounds

Concentrations of perfluorinated compounds (PFCs) were below the LOR in most samples. Individual PFC compounds were detected at very low concentrations close to LOR in two samples. The sample F156 0-0.05 had a normalised concentration of 0.0026 mg/kg of the compound 6:2 Fluorotelomer sulfonate (6:2 FtS). The sample I172 0.5-1.0 had a normalised concentration of 0.00009 mg/kg of the compound PFNA.

Given that PFCs were either not detected or measured at negligible concentrations in the Inner Port, the Inner Port sediments are considered suitable for ocean disposal with regards to PFCs. As per the SAP, no testing for PFCs was undertaken for the Outer Channel dredge area.

3.2.8 Herbicide Diuron

3.2.8.1 Initial Core Sampling

The herbicide diuron was detected in six of 16 samples within the Inner Port dredge area in the initial core sampling. Normalised concentrations ranged between 0.58 µg/kg and 3.84 µg/kg.

The detection of diuron triggered the need for further testing in accordance with the approved SAP. The additional testing involved re-sampling of the untested locations in the Inner Port and 20% of Outer Channel locations. Following detection of diuron in two Outer Channel samples, further sampling was undertaken at the remaining Outer Channel locations and some locations in the Inner Port in accordance with an approved Supplementary SAP (refer Appendix B).

Table 3-5 shows the summary statistics for all diuron data including the initial sampling, additional grab sampling and Supplementary SAP sampling. The diuron data for individual samples is presented in Table 3-6.

The results of the complete diuron dataset are discussed in the following sections.

Table 3-5 Diuron Summary Statistics

	Inner Port + grabs (µg/kg)	Inner Port Supplementary SAP (µg/kg)	Inner Port all samples (µg/kg)	Outer Channel Supplementary SAP (µg/kg)	Outer Channel all samples (µg/kg)
Normal (N), Lognormal (L), Neither (X)	X	X	X	-	X
Mean / Geomean	0.76	0.55	0.69	-	0.51
Standard Deviation	1.23	0.12	1.05	-	0.06
95% UCL	1.55	0.63	1.24	-	0.52

3.2.8.2 Inner Port Grab and Supplementary Sampling

Whilst diuron was detected at some locations within the Inner Port dredge area, the 95% UCL of 1.24 µg/kg for the Inner Port and grab, Supplementary SAP samples and combined Inner Port samples was below the literature derived screening level of 2 µg/kg (Table 3-5).

Diuron concentrations in the additional clay plugs analysed from the Inner Port were below the LOR in all clay samples indicating that the underlying clay layers are unlikely to be contaminated with diuron (Table 3-6).

Based on the combined results of all sampling events, the Inner Port sediments are therefore considered suitable for ocean disposal in accordance with NAGD procedures.

3.2.8.3 Outer Channel Grab and Supplementary Sampling

Diuron was detected at normalised concentrations of 0.57 µg/kg to 0.95 µg/kg at the two locations D149 and F150 in the additional grab sampling. The concentrations were therefore below the literature derived screening level of 2 µg/kg (Table 3-6). These two sampling locations are located in the vicinity of the Inner Port dredge area.

Diuron was not detected in any of the remaining sampling locations of the Outer Channel for both grab sampling and Supplementary SAP sampling. Location F150 was resampled during the Supplementary SAP coring and diuron was not detected.

The 95% UCL diuron concentration for all combined Outer Channel samples was 0.52 µg/kg and therefore well below the literature derived screening level of 2 µg/kg (Table 3-5)..

Based on the combined results of all sampling events, the Outer Channel sediments are therefore considered suitable for ocean disposal in accordance with the NAGD guideline procedures.

Table 3-6 Normalised Diuron Results for Initial Sampling, Additional Grab Samples and Supplementary SAP Sampling. Exceedances of the Screening Level Highlighted in Orange

Inner Port initial sampling (µg/kg)		Additional grab samples (µg/kg)		Supplementary SAP (µg/kg)	
Inner Port		**Inner Port**		**Inner Port**	
K167 0-0.25	<1	G155	5.00	H165 0.02-0.1 (clay plug)	<1
M180 0-0.2	1.04	F156	<1	G155 0-0.05 (clay plug)	<1
P180 0-0.05	<1	H160	<1	H167 0.05-0.11 (clay plug)	<1
H167 0-0.2	1.51	H162	<1	H167 0-0.08 Grab	0.78
H165 0-0.2	0.58	**Outer Channel**		k167 0-0.03 Grab	<1
U187 0-0.1	0.85	A138	<1	P180 0-0.04 Grab	<1
U185 0-0.5	<1	A140	<1	I172 1.05-1.10 (clay plug)	<1
U185 0.5-1.0	<1	C146	<1	M180 0-0.06 Grab	0.75
U185 1.0-1.5	<1	D147	<1	M180 0.06-0.12 (clay plug)	<1
U185 2.5-2.9	<1	D149	0.57	**Outer Channel**	
I162 0-0.13	<1	F150	0.95	C94 0-0.5	<1
I162 0.13-0.33	<1			C94 0.5-0.95	<1
J164 0-0.5	<1			B2 0-0.5	<1
J164 0.5-1.02	<1			B2 0.5-1.0	<1
I172 0-0.5	2.12			B7 0-0.5	<1
I172 0.5-1.0	3.84			B7 0.5-0.9	<1
				B9 0-0.5	<1
				B9 0.5-1.0	<1
				C22 0-0.5	<1
				C22 0.5-0.9	<1
				B25 0-0.5	<1
				B25 0.5-1.0	<1
				C29 0-0.5	<1
				C29 0.5-0.8	<1
				C30 0-0.5	<1
				C30 0.5-1.0	<1
				B41 0-0.5	<1

Inner Port initial sampling (µg/kg)		Additional grab samples (µg/kg)		Supplementary SAP (µg/kg)	
				B41 0.5-0.9	<1
				C50 0-0.5	<1
				C50 0.5-1.0	<1
				C50 1.0-1.2	<1
				C53 0-0.5	<1
				C53 0.5-0.9	<1
				B54 0-0.5	<1
				B54 0.5-1.0	<1
				B54 1.0-1.1	<1
				C99 0-0.5	<1
				C99 0.5-0.8	<1
				B63 0-0.5	<1
				B63 0.5-1.0	<1
				B63 1.0-1.8	<1
				C72 0-0.5	<1
				C72 0.5-1.0	<1
				C72 1.0-1.95	<1
				B74 0-0..5	<1
				B74 0.5-1.0	<1
				B74 1.0-2.0	<1
				B79 0-0.5	<1
				B79 0.5-1.0	<1
				B79 1.0-1.8	<1
				C82 0-0.5	<1
				C82 0.5-1.0	<1
				C82 1.0-1.8	<1
				B104 0-0.5	<1
				B104 0.5-1.0	<1
				B104 1.0-1.1	<1
				B108 0-0.5	<1
				B108 0.5-1.0	<1
				B108 1.0-1.3	<1
				C119 0-0.2	<1
				C121 0-0.5	<1

Inner Port initial sampling (µg/kg)		Additional grab samples (µg/kg)		Supplementary SAP (µg/kg)	
				C121 0.5-0.8	<1
				B130 0-0.5	<1
				A127 0-0.1	<1
				A127 0.1-0.55	<1
				F150 0.01-0.45	<1

3.2.9 Nutrients and Carbon Content

3.2.9.1 Inner Port

Total Nitrogen concentrations ranged between 140 mg/kg and 1540 mg/kg in the Inner Port. Averaged Total Phosphorus concentrations ranged between 139 mg/kg and 581 mg/kg.

Total Ammonia concentrations were below the LOR in about half of the Inner Port samples. Where detected, ammonia concentrations ranged between 1 mg/kg and 94 mg/kg. Nitrate and Nitrite concentrations were mostly below the LOR with a maximum concentration of 0.2 mg/kg. Total Organic Carbon content ranged between 0.06% and 2.75%.

No screening levels exist in NAGD for nutrients and carbon content in sediments. However, nutrient and carbon levels in the Inner Port were consistent with previous testing of sediments from the Inner Port and Navy Base area (BMT WBM 2013), which have been approved for marine placement under Ports North long term sea dumping permits. Nutrient concentrations were also consistent with those measured at the existing DMPA (Worley Parsons 2011, Worley Parsons 2012 and Worley Parsons 2013).

3.2.9.2 Outer Channel

Total Nitrogen concentrations ranged between 150 mg/kg and 1860 mg/kg in the Outer Channel. Averaged Total Phosphorus concentrations ranged between 126 mg/kg and 1770 mg/kg.

Total Ammonia concentrations were either below the LOR or ranged between 18 mg/kg and 124 mg/kg. Nitrate and Nitrite concentrations were below the LOR in all samples. Total Organic Carbon content ranged between 0.09% and 2.34%.

No screening levels exist in NAGD for nutrients and carbon content in sediments. Whilst the maximum concentrations were higher than previously recorded in the Outer Channel (BMT WBM 2013), it should be noted that previous sediment sampling was undertaken only for surface sediments (using a grab sampler). Higher nutrient concentrations are typically measured in deeper sediment layers that were sampled in this study using coring.

Nevertheless, the 95% UCL concentrations for nutrients in the Outer Channel (Table 3-3) appear to be consistent with previous test results for sediments from the Outer Channel (BMT WBM 2013), which have been approved for marine placement under Ports North long term sea dumping permits. Nutrient concentrations were also consistent with those measured at the existing DMPA (Worley Parsons 2011, Worley Parsons 2012 and Worley Parsons 2013).

Table 3-7 Inner Port Analytical Results. Exceedances of Screening Levels are Highlighted in Orange.

Analyte	Units	Screening Level (NAGD or local)	F156 0-0.05	H160 0-0.02 clay plug	H160 0.02-0.04	K167 0-0.25	M180 0-0.2	P180 0-0.05	H167 0-0.2	H165 0-0.2	U187 0-0.1	H162	U185 0-0.5	U185 0.5-1.0	U185 1.0-1.5	U185 1.5-2.0	U185 2.0-2.5	U185 2.5-2.9	G155 0-0.15	I162 0-0.13	I162 0.13-0.33 clay plug	J164 0-0.5	J164 0.5-1.02	I172 0-0.5	I172 0.5-1.0
Moisture Content																									
Moisture Content (dried @ 103°C)	%		34.1	19.2	24.9	43.4	58.7	31.1	61.9	61	65.4	26.7	41	44.3	45.4	46.8	38.3	37.8	23.8	20.1	19.6	34.7	26.6	61	56.7
Metals & Metalloids																									
Aluminium	mg/kg		10700	3620	15100	15800	17700	18900	19200	19000	24300	18700	11000	16000	18800	16600	17700	17500	17900	2430	19300	8500	9690	20400	20900
Antimony	mg/kg	2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Arsenic	mg/kg	30	33.3	10.2	7.48	24.6	18.9	22.4	19.8	20.9	19.4	18.8	14.5	16	18.5	26.5	17.5	18.4	5.34	10.1	3.46	17.7	13	26.9	25.2
Cadmium	mg/kg	1.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Chromium	mg/kg	80	29.8	9.3	30.3	29.4	35.1	33.3	37.1	37.9	43.5	37.4	23.7	30.9	35.5	35.9	32.5	31.9	50.8	7.6	30.3	23.1	28.1	42.5	41.6
Copper	mg/kg	65	8	2.7	3.8	14.6	23	11.3	17.4	18.2	19.7	6.2	9	8.4	10	11.6	14.4	15.1	9.4	1.9	5.4	10.1	8	24	22.5
Cobalt	mg/kg		12.1	2.7	5.6	15.3	10.4	18.2	10.9	11.1	12.4	7.2	7.1	8.6	10.3	10.9	14.6	11.8	7.4	3.5	4.4	8.6	8.8	13.1	12.8
Iron	mg/kg		41600	10500	26400	27500	31100	25600	32400	33300	38100	31800	20400	27000	30200	31500	21700	21800	24900	9630	22000	25600	29200	34900	35500
Lead	mg/kg	50	24.6	5	18.3	19.1	19.6	20.8	20.9	21.3	23.6	15.7	13.3	14.4	15.7	18	21.9	21.2	11.8	6.2	12.9	14.9	28.6	23.2	25
Manganese	mg/kg		959	238	428	269	709	1220	818	799	550	599	445	531	427	372	143	226	428	1330	442	336	124	1020	999
Mercury	mg/kg	0.15	<0.01	<0.01	0.02	0.02	0.03	<0.01	0.03	0.03	0.04	1.2	0.05	0.03	0.62	0.01	0.02	0.03	0.03	<0.01	<0.01	0.01	0.01	0.04	0.04
Nickel	mg/kg	21	12.3	3.8	9.6	15.1	17.5	18.2	18.2	18.4	21.9	15.3	11.3	14.6	17.6	15.7	16.8	15.5	14.8	3.2	11.3	8.2	5.8	22.3	21.1
Selenium	mg/kg		2.3	1	2.9	3.7	3.3	1.2	3.3	3.6	4.2	3	2.3	2.7	3.1	3.6	4.2	4	2	1.6	1.2	2.3	2.8	3.2	3.2
Silver	mg/kg	1	<0.1	<0.1	<0.1	<0.1	<0.1	0.4	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.3	<0.1	<0.1	<0.1	<0.1
Vanadium	mg/kg		49.1	14.6	38.6	43.8	45.5	36.3	49.1	48.1	56.1	36.5	31.8	38.2	40.2	61.8	52.1	47.8	28.7	16	26.3	41.3	42.7	56.2	55.3
Zinc	mg/kg	200	28.8	13.6	18.3	37.3	67.5	37.5	64.5	67.5	73.5	41.2	34.5	38	45	39.7	38.3	37.2	37.1	7	29	16.6	5.3	75.8	76.4
Nutrients + Total Organic Carbon																									
Ammonia as N	mg/kg					<1	34	<1	40	44	8		<1	2	1			1			<1	<1	<1	82	94
Nitrite + Nitrate as N (Sol.)	mg/kg					<0.1	<0.1	0.1	<0.1	<0.1	<0.1		<0.1	<0.1	<0.1			<0.1			0.2	<0.1	<0.1	<0.1	<0.1
Total Kjeldahl Nitrogen as N	mg/kg					600	1460	160	1470	1500	1540		960	850	900			660			90	470	140	1510	1480
Total Nitrogen as N	mg/kg					600	1460	160	1470	1500	1540		960	850	900			660			90	470	140	1510	1480
Total Phosphorus as P	mg/kg					186	581	217	497	500	499		232	252	288			225			80	143	139	493	438
Total Organic Carbon	%		0.67	0.35	0.19	2.75	2.11	0.33	1.59	2.07	1.65	0.06	1.46	0.97	1.54	2.56	1.67	1.41	0.05	4.88	0.05	2.33	0.43	2.12	2.16
BTEX																									
Benzene	mg/kg					<0.2	<0.2	<0.2	<0.2	<0.2	<0.2		<0.2	<0.2	<0.2			<0.2		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg					<0.2	<0.2	<0.2	<0.2	<0.2	<0.2		<0.2	<0.2	<0.2			<0.2		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Ethylbenzene	mg/kg					<0.2	<0.2	<0.2	<0.2	<0.2	<0.2		<0.2	<0.2	<0.2			<0.2		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
meta- & para-Xylene	mg/kg					<0.2	<0.2	<0.2	<0.2	<0.2	<0.2		<0.2	<0.2	<0.2			<0.2		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
ortho-Xylene	mg/kg					<0.2	<0.2	<0.2	<0.2	<0.2	<0.2		<0.2	<0.2	<0.2			<0.2		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Total Xylenes	mg/kg					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		<0.5	<0.5	<0.5			<0.5		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Sum of BTEX	mg/kg					<0.2	<0.2	<0.2	<0.2	<0.2	<0.2		<0.2	<0.2	<0.2			<0.2		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Total Petroleum Hydrocarbons																									
C6 - C9 Fraction	mg/kg					<3	<3	<3	<3	<3	<3		<3	<3	<3			<3		<3	<3	<3	<3	<3	<3
C10 - C14 Fraction	mg/kg					<3	<3	<3	<3	<3	<3		<3	<3	<3			<3		<3	<3	<3	<3	3.8	2.8
C15 - C28 Fraction	mg/kg					4.4	4.7	18.2	11.9	15.0	16.4		8.9	12.4	7.8			2.8		1.2	25.0	14.2	11.6	29.2	29.2
C29 - C36 Fraction	mg/kg					11.3	5.7	<5	16.4	15.0	19.4		9.6	20.6	8.4			10.6		<5	<5	28.3	<5	21.2	21.8
C10 - C36 Fraction (sum)	mg/kg	550				15.6	10.4	18.2	28.3	30.0	35.8		18.5	33.0	16.2			13.5		1.2	25.0	42.5	11.6	54.2	53.7

Results

Analyte	Units	Screening Level (NAGD or local)	F156 0-0.05	H160 0-0.02 clay plug	H160 0.02-0.04	K167 0-0.25	M180 0-0.2	P180 0-0.05	H167 0-0.2	H165 0-0.2	U187 0-0.1	H162	U185 0-0.5	U185 0.5-1.0	U185 1.0-1.5	U185 1.5-2.0	U185 2.0-2.5	U185 2.5-2.9	G155 0-0.15	I162 0-0.13	I162 0.13-0.33 clay plug	J164 0-0.5	J164 0.5-1.02	I172 0-0.5	I172 0.5-1.0
Organotin Compounds																									
Monobutyltin	µgSn/kg		<1	<1	<1	<1	<1	6.1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Dibutyltin	µgSn/kg		<1	<1	<1	<1	0.9	<1	<1	0.5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Tributyltin	µgSn/kg	9	<0.5	<0.5	<0.5	<0.5	1.9	<0.5	0.6	0.8	0.5	<0.5	0.8	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.3	<0.5	1.3	0.6
Organophosphorus Pesticides																									
Bromophos-ethyl	µg/kg					<10	<10	<10	<10	<10	<10		<10	<10	<10			<10		<10	<10	<10	<10	<10	<10
Carbophenothion	µg/kg					<10	<10	<10	<10	<10	<10		<10	<10	<10			<10		<10	<10	<10	<10	<10	<10
Chlorfenvinphos (E)	µg/kg					<10	<10	<10	<10	<10	<10		<10	<10	<10			<10		<10	<10	<10	<10	<10	<10
Chlorfenvinphos (Z)	µg/kg					<10	<10	<10	<10	<10	<10		<10	<10	<10			<10		<10	<10	<10	<10	<10	<10
Chlorpyrifos	µg/kg					<10	<10	<10	<10	<10	<10		<10	<10	<10			<10		<10	<10	<10	<10	<10	<10
Chlorpyrifos-methyl	µg/kg					<10	<10	<10	<10	<10	<10		<10	<10	<10			<10		<10	<10	<10	<10	<10	<10
Demeton-S-methyl	µg/kg					<10	<10	<10	<10	<10	<10		<10	<10	<10			<10		<10	<10	<10	<10	<10	<10
Diazinon	µg/kg					<10	<10	<10	<10	<10	<10		<10	<10	<10			<10		<10	<10	<10	<10	<10	<10
Dichlorvos	µg/kg					<10	<10	<10	<10	<10	<10		<10	<10	<10			<10		<10	<10	<10	<10	<10	<10
Dimethoate	µg/kg					<10	<10	<10	<10	<10	<10		<10	<10	<10			<10		<10	<10	<10	<10	<10	<10
Ethion	µg/kg					<10	<10	<10	<10	<10	<10		<10	<10	<10			<10		<10	<10	<10	<10	<10	<10
Fenamiphos	µg/kg					<10	<10	<10	<10	<10	<10		<10	<10	<10			<10		<10	<10	<10	<10	<10	<10
Fenthion	µg/kg					<10	<10	<10	<10	<10	<10		<10	<10	<10			<10		<10	<10	<10	<10	<10	<10
Malathion	µg/kg					<10	<10	<10	<10	<10	<10		<10	<10	<10			<10		<10	<10	<10	<10	<10	<10
Azinphos Methyl	µg/kg					<10	<10	<10	<10	<10	<10		<10	<10	<10			<10		<10	<10	<10	<10	<10	<10
Monocrotophos	µg/kg					<10	<10	<10	<10	<10	<10		<10	<10	<10			<10		<10	<10	<10	<10	<10	<10
Parathion	µg/kg					<10	<10	<10	<10	<10	<10		<10	<10	<10			<10		<10	<10	<10	<10	<10	<10
Parathion-methyl	µg/kg					<10	<10	<10	<10	<10	<10		<10	<10	<10			<10		<10	<10	<10	<10	<10	<10
Pirimphos-ethyl	µg/kg					<10	<10	<10	<10	<10	<10		<10	<10	<10			<10		<10	<10	<10	<10	<10	<10
Prothiofos	µg/kg					<10	<10	<10	<10	<10	<10		<10	<10	<10			<10		<10	<10	<10	<10	<10	<10
Organochlorine Pesticides																									
Aldrin	µg/kg					<0.50	<0.50	<0.50	<0.50	<0.50	<0.50		<0.50	<0.50	<0.50			<0.50		<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
alpha-BHC	µg/kg					<0.50	<0.50	<0.50	<0.50	<0.50	<0.50		<0.50	<0.50	<0.50			<0.50		<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
beta-BHC	µg/kg					<0.50	<0.50	<0.50	<0.50	<0.50	<0.50		<0.50	<0.50	<0.50			<0.50		<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
delta-BHC	µg/kg					<0.50	<0.50	<0.50	<0.50	<0.50	<0.50		<0.50	<0.50	<0.50			<0.50		<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
4.4`-DDD	µg/kg	2				<0.50	<0.50	<0.50	<0.50	<0.50	<0.50		<0.50	<0.50	<0.50			<0.50		<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
4.4`-DDE	µg/kg	2.2				<0.50	<0.50	<0.50	<0.50	<0.50	<0.50		<0.50	<0.50	<0.50			<0.50		<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
4.4`-DDT	µg/kg	1.6				<0.50	<0.50	<0.50	<0.50	<0.50	<0.50		<0.50	<0.50	<0.50			<0.50		<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Sum of DDD + DDE + DDT	µg/kg	1.6				<0.50	<0.50	<0.50	<0.50	<0.50	<0.50		<0.50	<0.50	<0.50			<0.50		<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Dieldrin	µg/kg	280				<0.50	<0.50	<0.50	<0.50	<0.50	<0.50		<0.50	<0.50	<0.50			<0.50		<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
alpha-Endosulfan	µg/kg					<0.50	<0.50	<0.50	<0.50	<0.50	<0.50		<0.50	<0.50	<0.50			<0.50		<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
beta-Endosulfan	µg/kg					<0.50	<0.50	<0.50	<0.50	<0.50	<0.50		<0.50	<0.50	<0.50			<0.50		<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Endosulfan sulfate	µg/kg					<0.50	<0.50	<0.50	<0.50	<0.50	<0.50		<0.50	<0.50	<0.50			<0.50		<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Endosulfan (sum)	µg/kg					<0.50	<0.50	<0.50	<0.50	<0.50	<0.50		<0.50	<0.50	<0.50			<0.50		<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Endrin	µg/kg	10				<0.50	<0.50	<0.50	<0.50	<0.50	<0.50		<0.50	<0.50	<0.50			<0.50		<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Endrin aldehyde	µg/kg					<0.50	<0.50	<0.50	<0.50	<0.50	<0.50		<0.50	<0.50	<0.50			<0.50		<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Endrin ketone	µg/kg					<0.50	<0.50	<0.50	<0.50	<0.50	<0.50		<0.50	<0.50	<0.50			<0.50		<0.50	<0.50	<0.50	<0.50	<0.50	<0.50

Results

Analyte	Units	Screening Level (NAGD or local)	F156 0-0.05	H160 0-0.02 clay plug	H160 0.02-0.04	K167 0-0.25	M180 0-0.2	P180 0-0.05	H167 0-0.2	H165 0-0.2	U187 0-0.1	H162	U185 0-0.5	U185 0.5-1.0	U185 1.0-1.5	U185 1.5-2.0	U185 2.0-2.5	U185 2.5-2.9	G155 0-0.15	I162 0-0.13	I162 0.13-0.33 clay plug	J164 0-0.5	J164 0.5-1.02	I172 0-0.5	I172 0.5-1.0
Heptachlor	µg/kg					<0.50	<0.50	<0.50	<0.50	<0.50	<0.50		<0.50	<0.50	<0.50			<0.50		<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Heptachlor epoxide	µg/kg					<0.50	<0.50	<0.50	<0.50	<0.50	<0.50		<0.50	<0.50	<0.50			<0.50		<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Hexachlorobenzene (HCB)	µg/kg					<0.50	<0.50	<0.50	<0.50	<0.50	<0.50		<0.50	<0.50	<0.50			<0.50		<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
gamma-BHC	µg/kg	0.32				<0.25	<0.25	<0.25	<0.25	<0.25	<0.25		<0.25	<0.25	<0.25			<0.25		<0.25	<0.25	<0.25	<0.25	<0.25	<0.25
Methoxychlor	µg/kg					<0.50	<0.50	<0.50	<0.50	<0.50	<0.50		<0.50	<0.50	<0.50			<0.50		<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
cis-Chlordane	µg/kg					<0.25	<0.25	<0.25	<0.25	<0.25	<0.25		<0.25	<0.25	<0.25			<0.25		<0.25	<0.25	<0.25	<0.25	<0.25	<0.25
trans-Chlordane	µg/kg					<0.25	<0.25	<0.25	<0.25	<0.25	<0.25		<0.25	<0.25	<0.25			<0.25		<0.25	<0.25	<0.25	<0.25	<0.25	<0.25
Total Chlordane (sum)	µg/kg	0.5				<0.25	<0.25	<0.25	<0.25	<0.25	<0.25		<0.25	<0.25	<0.25			<0.25		<0.25	<0.25	<0.25	<0.25	<0.25	<0.25
Oxychlordane	µg/kg					<0.50	<0.50	<0.50	<0.50	<0.50	<0.50		<0.50	<0.50	<0.50			<0.50		<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Polynuclear Aromatic Hydrocarbons																									
Naphthalene	µg/kg					<5	4.3	<5	<5	2.9	3.6		<5	<5	<5			<5		<5	<5	<5	<5	3.8	4.2
2-Methylnaphthalene	µg/kg					<5	<5	<5	<5	<5	<5		<5	<5	<5			<5		<5	<5	<5	<5	<5	<5
Acenaphthylene	µg/kg					<4	6.6	<4	<5	4.3	<5		<4	<4	<4			<4		<4	<4	<4	<4	<5	<5
Acenaphthene	µg/kg					8.0	<5	<4	<5	<5	<5		<4	<4	<4			<4		<4	<4	<4	<4	<5	7.4
Fluorene	µg/kg					<4	<5	<4	<5	<5	<5		<4	<4	<4			<4		<4	<4	<4	<4	<5	<5
Phenanthrene	µg/kg					<4	<5	<4	<5	<5	<5		<4	<4	<4			<4		<4	<4	<4	<4	<5	<5
Anthracene	µg/kg					<4	<5	<4	3.8	<5	<5		<4	<4	<4			<4		<4	<4	<4	<4	<5	<5
Fluoranthene	µg/kg					<4	<5	<4	6.3	5.3	3.0		<4	<4	<4			<4		<4	<4	<4	<4	3.3	<5
Pyrene	µg/kg					9.1	2.8	<4	7.5	6.3	4.2		<4	<4	<4			<4		<4	<4	<4	<4	3.8	9.3
Benz(a)anthracene	µg/kg					<4	<5	<4	5.7	3.9	<5		<4	<4	<4			<4		<4	<4	<4	<4	<5	<5
Chrysene	µg/kg					<4	<5	<4	5.0	3.9	<5		<4	<4	<4			<4		<4	<4	<4	<4	<5	<5
Benzo(b)fluoranthene	µg/kg					<4	<5	<4	5.7	3.9	<5		<4	<4	<4			<4		<4	<4	<4	<4	<5	<5
Benzo(k)fluoranthene	µg/kg					<4	<5	<4	<5	<5	<5		<4	<4	<4			<4		<4	<4	<4	<4	<5	<5
Benzo(e)pyrene	µg/kg					<4	<5	<4	3.8	2.9	<5		<4	<4	<4			<4		<4	<4	<4	<4	<5	<5
Benzo(a)pyrene	µg/kg					<4	<5	<4	5.7	4.3	<5		<4	<4	<4			<4		<4	<4	<4	<4	<5	<5
Perylene	µg/kg					44.0	7.1	<4	17.6	18.4	6.7		4.8	6.2	3.9			65.2		<4	<4	31.3	<4	17.0	2.3
Benzo(g.h.i)perylene	µg/kg					<4	<5	<4	3.1	2.4	<5		<4	<4	<4			<4		<4	<4	<4	<4	<5	<5
Dibenz(a.h)anthracene	µg/kg					<4	<5	<4	<5	<5	<5		<4	<4	<4			<4		<4	<4	<4	<4	<5	<5
Indeno(1.2.3.cd)pyrene	µg/kg					<4	<5	<4	<5	<5	<5		<4	<4	<4			<4		<4	<4	<4	<4	<5	<5
Coronene	µg/kg					<5	<5	<5	<5	<5	<5		<5	<5	<5			<5		<5	<5	<5	<5	<5	<5
Sum of PAHs	µg/kg	10000				61.1	20.9	<4	64.2	58.5	17.6		4.8	6.2	3.9			65.2		<4	<4	31.3	<4	27.8	23.1
Perfluorinated Compounds																									
PFOS	mg/kg					<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005		<0.0005	<0.0005	<0.0005			<0.0005		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
PFOA	mg/kg					<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005		<0.0005	<0.0005	<0.0005			<0.0005		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonate (6:2 FtS)	mg/kg					0.00255	<0.005	<0.005	<0.005	<0.005	<0.005		<0.005	<0.005	<0.005			<0.005		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
8:2 Fluorotelomer sulfonate	mg/kg					<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		<0.001	<0.001	<0.001			<0.001		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
PFOSA	mg/kg					<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002		<0.0002	<0.0002	<0.0002			<0.0002		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Me-FOSA	mg/kg					<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		<0.001	<0.001	<0.001			<0.001		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
N-Et-FOSA	mg/kg					<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		<0.001	<0.001	<0.001			<0.001		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
N-Me-FOSE	mg/kg					<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		<0.001	<0.001	<0.001			<0.001		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
N-Et-FOSE	mg/kg					<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		<0.001	<0.001	<0.001			<0.001		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Results

Analyte	Units	Screening Level (NAGD or local)	F156 0-0.05	H160 0-0.02 clay plug	H160 0.02-0.04	K167 0-0.25	M180 0-0.2	P180 0-0.05	H167 0-0.2	H165 0-0.2	U187 0-0.1	H162	U185 0-0.5	U185 0.5-1.0	U185 1.0-1.5	U185 1.5-2.0	U185 2.0-2.5	U185 2.5-2.9	G155 0-0.15	I162 0-0.13	I162 0.13-0.33 clay plug	J164 0-0.5	J164 0.5-1.02	I172 0-0.5	I172 0.5-1.0
PFBS	mg/kg					<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002		<0.0002	<0.0002	<0.0002			<0.0002		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
PFHxS	mg/kg					<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002		<0.0002	<0.0002	<0.0002			<0.0002		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
PFDcS	mg/kg					<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002		<0.0002	<0.0002	<0.0002			<0.0002		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
PFHxA	mg/kg					<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002		<0.0002	<0.0002	<0.0002			<0.0002		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
PFHpA	mg/kg					<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002		<0.0002	<0.0002	<0.0002			<0.0002		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
PFNA	mg/kg					<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002		<0.0002	<0.0002	<0.0002			<0.0002		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.000093
PFDcA	mg/kg					<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002		<0.0002	<0.0002	<0.0002			<0.0002		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
PFUnA	mg/kg					<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002		<0.0002	<0.0002	<0.0002			<0.0002		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
PFDoA	mg/kg					<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002		<0.0002	<0.0002	<0.0002			<0.0002		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
PFTriA	mg/kg					<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002		<0.0002	<0.0002	<0.0002			<0.0002		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
PFTeA	mg/kg					<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		<0.001	<0.001	<0.001			<0.001		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Herbicides																									
Diuron	µg/kg	2				<1	1.04	<1	1.51	0.58	0.85		<1	<1	<1			<1		<1	<1	<1	<1	2.12	3.84

Table 3-8 Outer Channel Analytical Results. Exceedances of Screening Levels are Highlighted in Orange

Analyte	Units	Screening Level (NAGD or local)	C119 0-0.2	B130 0-0.5	A138 0-0.27	A140 0-0.26	D149 0-0.15	C146 0-0.25	D147 0-0.05	B2 0-0.55	B7 0-0.50	B7 0.5-0.95	B9 0-0.5	B9 0.5-0.7	C22 0-0.5	C22 0.5-0.9	C29 0-0.5	C29 0.5-0.8	B25 0-0.2	B25 0.2-0.3 clay plug	C30 0-0.5	C30 0.5-1.0	C94 0-0.5	C94 0.5-1.0	C99 0-0.5	C99 0.5-0.8
Moisture Content																										
Moisture Content (dried @ 103°C)	%		51.6	53.4	38.5	42.1	27.5	21.9	24.6	36.1	34.8	35.7	37.4	33.4	53.6	45.5	42.6	47.4	49.8	23.8	57.3	55.1	53.5	54.1	56.1	54.8
Metals & Metalloids																										
Aluminium	mg/kg		17900	15400	20700	22100	13200	7310	12400	16200	15300	15900	17200	15200	19600	23700	19700	17600	16900	16400	23300	23100	19600	19500	19600	16900
Antimony	mg/kg	2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Arsenic	mg/kg	30	18.6	16.2	24.5	16.3	10.1	16.4	16.9	13.2	13.9	14.4	12.9	13	16	19.8	18.6	18.2	17	9.61	19	20.3	20.9	21.8	20.8	18.6
Cadmium	mg/kg	1.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Chromium	mg/kg	80	32.6	29.1	33.6	35.6	32	24.4	26	29.3	28.6	29.2	30.9	28	34.1	40	36.1	33.1	31.3	29.2	38.5	40.2	35.9	36.9	37.6	32.8
Copper	mg/kg	65	10.5	9	13.5	14.4	5.1	4.8	5.4	6.7	6.4	6.7	7.3	6.3	9.3	10.5	10	9.4	9	3.1	10.8	11.4	12.9	15.2	13.5	13
Cobalt	mg/kg		8.7	7.7	12.8	10.9	5.5	5	6.2	8	8	8	8.5	7.6	9	10.3	9.3	9	8.2	3.2	10	10.3	9.5	10.1	10	8.8
Iron	mg/kg		27500	24500	25900	26200	25700	20200	23200	23700	23400	24600	24200	22500	28300	31600	28500	28000	26100	30100	32300	31400	29800	31900	31800	27800
Lead	mg/kg	50	15.8	14	21.1	22.1	16.2	9.5	15.4	12	11.8	11.7	13	11.2	15.7	19.2	16.7	16.2	14.9	20.4	17.8	17.8	17.5	18.9	19.4	17
Manganese	mg/kg		711	624	261	231	503	408	411	342	340	322	360	330	599	699	576	576	521	114	822	785	698	756	757	589
Mercury	mg/kg	0.15	0.02	0.02	0.02	0.02	0.02	<0.01	<0.01	<0.01	0.01	<0.01	0.01	<0.01	0.02	0.02	0.02	0.02	0.02	0.01	0.02	0.02	0.03	0.03	0.03	0.02
Nickel	mg/kg	21	15.7	13.8	15.7	16.3	9.1	6.6	10.4	14	13.8	14.2	14.7	13.6	16.9	19.6	17.6	16	15.1	7.5	19.9	19.8	17.2	17.6	18.2	15
Selenium	mg/kg		1.9	2	3	3.3	2.8	1.2	1.8	2	1.8	2	2.2	1.9	2	2.4	2.2	2.2	1.9	2.8	2.2	2.3	2.7	2.6	2.6	2.1
Silver	mg/kg	1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Vanadium	mg/kg		38.7	34.7	47.9	50	34	26.6	28	33	33.1	32	35.6	31.4	40.5	47.5	44.3	40.3	36.9	44.4	46.3	46.4	42	44.4	45.3	38.2
Zinc	mg/kg	200	43.2	38.3	39.1	37	17.6	18.5	28.1	35.1	33.8	34.5	37.5	32.8	42.6	48.6	44.1	42.2	39.5	4.9	48.5	49.4	48.7	52.4	51.4	46.2
Nutrients + Total Organic Carbon																										
Ammonia as N	mg/kg		51	19		<1	<1			<1	<1		<1			64	22		39			124		80		
Nitrite + Nitrate as N (Sol.)	mg/kg		<0.1	<0.1		<0.1	<0.1			<0.1	<0.1		<0.1			<0.1	<0.1		<0.1			<0.1		<0.1		
Total Kjeldahl Nitrogen as N	mg/kg		1020	970		560	150			370	450		390			760	780		890			1000		1180		
Total Nitrogen as N	mg/kg		1020	970		560	150			370	450		390			760	780		890			1000		1180		
Total Phosphorus as P	mg/kg		370	406		233	139			301	338		326			457	419		461			478		417		
Total Organic Carbon	%		1.19	0.97	0.9	1.31	0.34	0.3	0.09	0.45	0.4	0.47	0.46	0.42	0.79	0.8	0.83	0.83	0.8	0.23	0.86	0.9	1.23	1.41	1.3	1.67
Organotin Compounds																										
Monobutyltin	µgSn/kg		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Dibutyltin	µgSn/kg		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	0.7	<1	<1
Tributyltin	µgSn/kg	9	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	0.6	<0.5	0.4

Results

Analyte	Units	Screening Level (NAGD or local)	C121 0-0.5	C121 0.5-0.8	B108 0-0.5	B108 0.5-1.0	B108 1.0-1.2	B104 0-0.5	B104 0.5-0.95	C50 0-0.5	C50 0.5-1.0	C50 1.0-1.2	C53 0-0.5	C53 0.5-0.9	B54 0-0.5	B54 0.5-1.0	B54 1.0-1.1	B63 0-0.5	B63 0.5-1.0	B63 1.0-1.45	B41 0-0.5	B41 0.5-0.9	C72 0-0.5	C72 0.5-1.0	C72 1.0-2.1	B74 0-0.5
Moisture Content																										
Moisture Content (dried @ 103°C)	%		52.2	52.6	55.9	55	57.8	49.8	51.9	52.3	47.8	45	55.1	50.4	54	46.7	47.4	55	51.2	48.1	58.3	51.6	48.6	49.6	47.8	53.4
Metals & Metalloids																										
Aluminium	mg/kg		15100	16100	21000	20000	21300	14400	17700	18300	17700	15500	16800	15400	15500	17300	17100	16600	17300	19400	23600	18700	8820	18000	16200	20200
Antimony	mg/kg	2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Arsenic	mg/kg	30	18.8	20.8	22.2	22.4	24	21.2	20.8	20.8	19.6	17.7	19.5	16.8	18.1	19.7	20.2	18.2	19.7	19.1	18.9	19.6	8.19	21	14.7	20
Cadmium	mg/kg	1.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Chromium	mg/kg	80	32.2	33.1	39	37.7	40.9	29.4	34.6	35.3	33.8	31	32.3	29.3	30	33.8	34.3	32.4	32.6	36	38.1	35.2	14.6	33.7	26.8	36.5
Copper	mg/kg	65	10.2	10.7	14.4	15	16.8	11.4	13.1	11.8	11	9.1	11.4	9.7	10.2	10.8	11.4	10.9	10.6	12.1	11.3	11.4	5.1	10.5	9.3	12.4
Cobalt	mg/kg		8.8	9.3	11	10.5	11.1	8.4	9.7	9.7	9.3	8.5	8.8	8.1	8.3	9.3	10.1	9	9.2	9.9	10.2	9.9	3.9	9.2	7.1	9.6
Iron	mg/kg		25600	27900	35400	33500	35300	26500	30000	29800	29400	25700	28200	25800	26200	29200	29700	27900	27900	30000	31800	30000	11600	28200	22800	30100
Lead	mg/kg	50	15.7	16.8	20	20	23.3	17.4	18.1	18.1	16.9	15.4	16.3	15	15.6	17.2	18.3	16.6	16.6	18.8	18.3	19.4	7	16.8	13.1	18.3
Manganese	mg/kg		690	754	732	774	790	613	710	752	745	640	710	616	641	711	774	755	727	781	835	756	320	787	557	806
Mercury	mg/kg	0.15	0.02	0.02	0.03	0.02	0.03	0.02	0.02	0.02	0.02	0.02	0.29	0.02	0.02	0.02	0.02	0.04	0.05	0.03	0.03	0.03	0.01	0.03	0.02	0.02
Nickel	mg/kg	21	14.9	15.6	18.3	17.9	18.6	13.5	16.2	16.7	16.2	14.6	15.1	14	14.4	15.7	16.9	16.4	16	18	20.2	17.5	7.8	17	13.7	18.4
Selenium	mg/kg		2.2	2.4	2.8	2.5	2.8	2.2	2.3	2.5	2.3	2.1	2	2	2.2	3	3.2	2.8	2.9	2.9	3.2	3.1	1.2	3.1	2.5	3.1
Silver	mg/kg	1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Vanadium	mg/kg		39	39.9	47.4	45.5	49.4	37.2	42.7	41.8	40.8	37.4	38.9	35.8	37.1	43	43.6	41.7	41.9	45.9	48.3	45.3	18.1	43.5	33.4	45.5
Zinc	mg/kg	200	42.8	44.2	54.8	55	60	41.5	50.7	47.4	45.1	40	44.1	39.7	40.5	47.8	51	47.1	46.7	52.5	52.9	50.7	21.8	48.1	39.5	54.2
Nutrients + Total Organic Carbon																										
Ammonia as N	mg/kg		32		35	81			80	48				18	44				24				55			18
Nitrite + Nitrate as N (Sol.)	mg/kg		<0.1		<0.1	<0.1			<0.1	<0.1				<0.1	<0.1				<0.1				<0.1			<0.1
Total Kjeldahl Nitrogen as N	mg/kg		970		1300	1220			1120	1040				1000	1190				1860				990			1180
Total Nitrogen as N	mg/kg		970		1300	1220			1120	1040				1000	1190				1860				990			1180
Total Phosphorus as P	mg/kg		394		439	446			1770	503				388	469				386				396			448
Total Organic Carbon	%		1.09	1.26	1.43	1.48	1.73	1.6	1.64	0.97	0.99	0.85	1.22	1.08	1.14	0.98	1.02	1.33	1.24	1.35	0.97	1.22	1.32	1.18	1.35	1.4
Organotin Compounds																										
Monobutyltin	µgSn/kg		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Dibutyltin	µgSn/kg		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Tributyltin	µgSn/kg	9	<0.5	<0.5	0.4	0.7	1.6	0.8	0.7	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	0.4	0.5	<0.5	<0.5	<0.5	0.5	0.8	0.4	<0.5

Results

Analyte	Units	Screening Level (NAGD or local)	B74 0.5-1.0	B74 1.0-1.9	B74 1.9-2.0 clay plug	B79 0-0.5	B79 0.5-1.0	B79 1.0-1.8	C82 0-0.5	C82 0.5-1.0	C82 1.0-1.53	C82 1.53-1.67 clay plug	A127 0-0.5	A127 0.5-1.0	A127 1.0-1.7	F150 0-0.43	F150 0.43-0.62	F150 0.62-0.80 clay plug
Moisture Content																		
Moisture Content (dried @ 103°C)	%		55.4	51.1	44	53.6	54.2	53.1	54.7	53.2	49.7	40.7	42.1	38.3	40.4	37.7	28.1	23.6
Metals & Metalloids																		
Aluminium	mg/kg		19200	21500	22900	19500	20900	16400	16200	18600	17300	20000	15900	17200	20000	15000	17500	21500
Antimony	mg/kg	2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Arsenic	mg/kg	30	18.6	21.3	19.3	22	21.8	19.3	20.4	22.4	20.4	20.7	17.5	20.2	17.3	16.6	16.6	6.85
Cadmium	mg/kg	1.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Chromium	mg/kg	80	34.9	39	41.6	36.5	37.8	31.9	32.4	37.2	34.3	33.2	29.4	34	35	34.8	50.6	49
Copper	mg/kg	65	11.9	14.2	13.8	12.1	12.9	13	12.4	14.6	13.8	13	10.4	12.7	13	8.8	7.1	4.2
Cobalt	mg/kg		9.4	10.3	9.3	10.3	10.5	9.5	9.6	11	10	11.7	10.6	12.1	12.9	9.4	9.2	5.7
Iron	mg/kg		29200	31900	28500	30700	31800	28600	27900	31600	29000	25500	25400	29200	29700	30500	38300	41300
Lead	mg/kg	50	17.5	21.3	21.8	18.2	20.2	16.7	16.4	19.5	17.9	22.1	17.1	21.4	23.6	17.7	25.9	18.7
Manganese	mg/kg		725	730	433	818	849	724	804	845	741	273	860	1130	999	406	455	127
Mercury	mg/kg	0.15	0.03	0.03	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.02	0.02	0.02	0.02	0.02	0.01	0.04
Nickel	mg/kg	21	17.2	18.3	17.2	18.4	19.3	16.6	16.9	18.7	17.4	15.9	15.2	17.4	17.9	11.7	12.4	11
Selenium	mg/kg		3	3.3	3.9	3.2	3.3	2.3	2.3	2.8	2.3	3.6	2.8	3.3	3.8	3.8	4.3	4.2
Silver	mg/kg	1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Vanadium	mg/kg		44	50	82	46.2	47.9	42.1	43.9	49	44.4	50.8	35.3	45.6	44.9	48	63	62.4
Zinc	mg/kg	200	50.4	55.5	49.9	54.9	55.7	50	49.6	58.6	52	40.4	36.9	40.4	42.2	21.1	9.1	9
Nutrients + Total Organic Carbon																		
Ammonia as N	mg/kg			75				77			65					<1		
Nitrite + Nitrate as N (Sol.)	mg/kg			<0.1				<0.1			<0.1					<0.1		
Total Kjeldahl Nitrogen as N	mg/kg			1060				1020			1070					290		
Total Nitrogen as N	mg/kg			1060				1020			1070					290		
Total Phosphorus as P	mg/kg			413				452			427					126		
Total Organic Carbon	%		1.42	1.34	1.23		1.31	1.6	1.44	1.51	1.51	1.28	1.2	0.74	1.25	2.34	0.23	0.21
Organotin Compounds																		
Monobutyltin	µgSn/kg		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Dibutyltin	µgSn/kg		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Tributyltin	µgSn/kg	9	0.4	0.4	<0.5	0.6	0.4	0.5	0.6	0.5	0.8	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5

3.2.10 Acid Sulfate Soils

3.2.10.1 Inner Port

Predominantly surface sediments were sampled and tested for the Inner Port with most samples obtained from less than 1m sediment depth. The acid sulfate test results for these samples indicated that management would be required at three out of ten[3] tested locations should the material be placed on land or exposed to air (Table 3-9). The locations requiring potential management were K176, J164 and the deeper sediment layers of U185. Liming rates ranging between 17 kg $CaCO_3$/t and 166 kg $CaCO_3$/t were calculated for these samples corresponding to net acidity ranging between 226 moles H^+/t and 2210 moles H^+/t.

Potential sulfidic acidity was detected in all samples, indicating that the sediments have the potential to generate sulfidic acidity. While most samples had sufficient acid neutralising capacity for neutralising acids upon oxidation, a nominal lime treatment of 3-5 kg $CaCO_3$/t would still likely be required if the material is placed on land.

Actual acidity (TAA) was below the LOR at all locations indicating that the sediments were not actual acid sulfate soils.

3.2.10.2 Outer Channel

The acid sulfate test results for the Outer Channel sediments (most samples less than 1m sediment depth) indicated that management would only be potentially required at four out of 30 sampling locations should the material be placed on land (Table 3-10). The locations requiring potential management were A127, A138, A140 and F150, all located towards the southern end of the Outer Channel. Liming rates ranging between 2 kg $CaCO_3$/t and 95 kg $CaCO_3$/t were calculated for these samples corresponding to net acidity ranging between 25 moles H^+/t and 1270 moles H^+/t.

Potential sulfidic acidity was detected in all samples, indicating that the sediments have the potential to generate sulfidic acidity. However, most samples (predominantly surface sediments) had sufficient acid neutralising capacity for neutralising acids upon oxidation.

Actual acidity (TAA) was below the LOR at all locations indicating that the sediments were not actual acid sulfate soils.

3.2.10.3 Discussion of Acid Sulfate Results

As outlined in Section 3.5.2.11 of the approved SAP (Appendix A), the sampling frequency prescribed in NAGD does not strictly meet requirements of the Acid Sulfate Soils guidelines (Ahern *et al.* 1998) or the *State Planning Policy 2/02 – Guideline Acid sulfate soil* and more detailed assessment of acid sulfate potential may be required for a comprehensive assessment.

Whilst the acid sulfate assessment of this study was undertaken in compliance with the approved SAP, it is noted that results are not representative of the full depth/volume of the proposed dredging given that core refusal was encountered at relatively shallow sediment depths.

[3] Insufficient sample volume for the remaining four sample locations (total of 14 sampling locations in Inner Port)

Incorporating results from this study and additional geotechnical boreholes down to 8.9m below bed level (Golder 2014), the following interpretation of available acid sulfate results is provided:

- The majority of samples tested in this study indicated self-neutralising PASS within the top 1m along most of the proposed dredge area, i.e. these samples had shell or other neutralising material. Whilst these results suggest that no treatment would be required for these surface sediments, a nominal lime treatment of 3-5 kg $CaCO_3$/t would still be recommended should the material be placed on land;
- PASS materials that were not self-neutralising were typically detected from depths of more than 1m below the existing surface. Calculated lime treatment rates ranged between 30 kg lime/m^3 to 270 kg lime/m^3 with an average liming rate of 90 kg lime/m^3. Addition of lime slurry into pumped dredged material is not considered feasible at these liming rates and physical blending of lime into the material post placement would be required.
- Firm, stiff and very stiff materials are unlikely to be PASS or require lime treatment.
- Whilst it is acknowledged that more data may be required for a comprehensive acid sulfate assessment, Golder (2014) suggest a nominal liming rate of 75 kg lime/m^3 for PASS treatment of the very soft to soft dredged material, assuming that dredging processes cannot be conducted in a manner which segregates the top 1m of soft materials from underlying PASS materials.
- In case of ocean disposal of the dredged material, oxidation of the dredged material is considered unlikely as the sediments will stay saturated with seawater. Under normal operating conditions of the dredging vessel (PASS exposure timeframe of less than 24 hours) it is considered that the risk of oxidation is low. Therefore, treatment of the dredged material is not required assuming it is placed at sea.

Table 3-9 Inner Port Acid Sulfate Results. Orange Shading Indicates Potential Need for Treatment

Analyte	Units	F156 0-0.05	K167 0-0.25	M180 0-0.2	H167 0-0.2	H165 0-0.2	U187 0-0.1	U185 0-0.5	U185 0.5-1.0	U185 1.0-1.5	U185 1.5-2.0	U185 2.0-2.5	U185 2.5-2.9	I162 0.13-0.33	J164 0-0.5	J164 0.5-1.02	I172 0-0.5	I172 0.5-1.0
Actual Acidity																		
pH KCl (23A)	pH Unit	8.9	8.3	8.6	8.6	8.6	8.6	8.7	8.9	8.8	7.8	6.9	6	9.1	8.4	6.8	8.7	8.7
Titratable Actual Acidity (23F)	mole H+ / t	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	5	<2	<2	<2	<2	<2
sulfidic - Titratable Actual Acidity (s-23F)	% 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	<0.02	<0.02	<0.02	<0.02
Potential Acidity																		
Chromium Reducible Sulfur (22B)	% S	0.186	1.65	0.428	0.338	0.415	0.338	0.618	0.69	1.05	1.2	1.3	1.56	0.006	1.77	3.64	0.451	0.466
acidity - Chromium Reducible Sulfur (a-22B)	mole H+ / t	116	1030	267	211	259	211	385	430	658	750	813	974	<10	1100	2270	282	290
Acid Neutralising Capacity																		
Acid Neutralising Capacity (19A2)	% CaCO3	22.1	2.64	6.74	7.43	7.48	5.82	6.68	9	8.01	1.35	1.2		27.2	6.59	0.44	7.43	6.97
acidity - Acid Neutralising Capacity (a-19A2)	mole H+ / t	4420	528	1350	1480	1500	1160	1330	1800	1600	269	240		5430	1320	87	1480	1390
sulfidic - Acid Neutralising Capacity (s-19A2)	% pyrite S	7.09	0.85	2.16	2.38	2.4	1.86	2.14	2.88	2.57	0.43	0.38		8.7	2.11	0.14	2.38	2.23
Acid Base Accounting																		
ANC Fineness Factor	-	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Net Acidity (sulfur units)	% S	<0.02	1.09	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.91	1.05	1.57	<0.02	0.36	3.55	<0.02	<0.02
Net Acidity (acidity units)	mole H+ / t	<10	680	<10	<10	<10	<10	<10	<10	<10	570	652	979	<10	226	2210	<10	<10
Liming Rate	kg CaCO3 /t	<1	51	<1	<1	<1	<1	<1	<1	<1	43	49	73	<1	17	166	<1	<1

Table 3-10 Outer Channel Acid Sulfate Results. Orange Shading Indicates Potential Need for Treatment

Analyte	Units	C119 0-0.2	B130 0-0.5	A138 0-0.27	A140 0-0.26	D149 0-0.15	C146 0-0.25	D147 0-0.05	B2 0-0.55	B7 0-0.50	B7 0.5-0.95	B9 0-0.5	B9 0.5-0.7	C22 0-0.5	C22 0.5-0.9	C29 0-0.5	C29 0.5-0.8	B25 0-0.2	B25 0.2-0.3	C30 0-0.5	C30 0.5-1.0
Actual Acidity																					
pH KCl (23A)	pH Unit	8.9	8.9	7.1	6.6	9	9.2	9.1	9.2	9.2	9.1	9.2	9.2	9	9	9	9	9	8.9	8.9	8.9
Titratable Actual Acidity (23F)	mole H+ / t	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
sulfidic - Titratable Actual Acidity (s-23F)	% 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	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Potential Acidity																					
Chromium Reducible Sulfur (22B)	% S	0.308	0.23	1.18	1.22	0.039	0.059	0.025	0.195	0.193	0.306	0.204	0.238	0.164	0.208	0.19	0.276	0.234	0.159	0.197	0.208
acidity - Chromium Reducible Sulfur (a-22B)	mole H+ / t	192	143	734	758	24	37	15	122	120	191	127	149	102	130	119	172	146	99	123	130
Acid Neutralising Capacity																					
Acid Neutralising Capacity (19A2)	% CaCO3	11.7	12.3	0.85	0.87	20.9	22.6	29.9	20.6	22.8	19.2	19.9	21.2	13.8	14.3	13.8	14.4	13.8	1.66	12.4	12.2
acidity - Acid Neutralising Capacity (a-19A2)	mole H+ / t	2330	2450	170	174	4170	4510	5980	4120	4550	3840	3980	4230	2770	2850	2760	2880	2750	333	2480	2440
sulfidic - Acid Neutralising Capacity (s-19A2)	% pyrite S	3.74	3.93	0.27	0.28	6.69	7.23	9.58	6.61	7.29	6.16	6.38	6.78	4.44	4.57	4.42	4.61	4.4	0.53	3.97	3.91
Acid Base Accounting																					
ANC Fineness Factor	-	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Net Acidity (sulfur units)	% S	<0.02	<0.02	1	1.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Net Acidity (acidity units)	mole H+ / t	<10	<10	621	642	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Liming Rate	kg CaCO3/t	<1	<1	46	48	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1

Results

Analyte	Units	C94 0-0.5	C94 0.5-1.0	C99 0-0.5	C99 0.5-0.8	C121 0-0.5	C121 0.5-0.8	B108 0-0.5	B108 0.5-1.0	B108 1.0-1.2	B104 0-0.5	B104 0.5-0.95	C50 0-0.5	C50 0.5-1.0	C50 1.0-1.2	C53 0-0.5	C53 0.5-0.9	B54 0-0.5	B54 0.5-1.0	B54 1.0-1.1	B63 0-0.5
Actual Acidity																					
pH KCl (23A)	pH Unit	8.9	8.8	8.8	8.7	8.9	8.9	8.9	8.8	8.7	8.9	8.7	8.9	8.9	8.9	8.8	8.9	8.9	8.9	8.8	8.8
Titratable Actual Acidity (23F)	mole H+ / t	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
sulfidic - Titratable Actual Acidity (s-23F)	% 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	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Potential Acidity																					
Chromium Reducible Sulfur (22B)	% S	0.29	0.348	0.268	0.438	0.266	0.311	0.343	0.412	0.4	0.304	0.416	0.204	0.229	0.225	0.232	0.204	0.218	0.246	0.297	0.248
acidity - Chromium Reducible Sulfur (a-22B)	mole H+ / t	181	217	167	273	166	194	214	257	250	189	259	127	143	140	145	127	136	154	185	155
Acid Neutralising Capacity																					
Acid Neutralising Capacity (19A2)	% CaCO3	10.5	9.47	9.42	8.38	12.3	12.1	10.5	10.2	8.4	15.1	9.94	12.4	12.4	14.3	10.3	12.2	11.4	12.1	11.4	10.1
acidity - Acid Neutralising Capacity (a-19A2)	mole H+ / t	2100	1890	1880	1670	2460	2420	2100	2030	1680	3020	1990	2480	2480	2860	2060	2450	2280	2420	2280	2020
sulfidic - Acid Neutralising Capacity (s-19A2)	% pyrite S	3.37	3.03	3.02	2.68	3.95	3.89	3.36	3.26	2.69	4.84	3.18	3.97	3.97	4.58	3.3	3.92	3.65	3.87	3.66	3.24
Acid Base Accounting																					
ANC Fineness Factor	-	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	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	<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	<10	<10	<10	<10	<10	<10	<10
Liming Rate	kg CaCO3/t	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1

Results

Analyte	Units	B63 0.5-1.0	B63 1.0-1.45	B41 0-0.5	B41 0.5-0.9	C72 0-0.5	C72 0.5-1.0	C72 1.0-2.1	B74 0-0.5	B74 0.5-1.0	B74 1.0-1.9	B79 0.5-1.0	B79 1.0-1.8	C82 0-0.5	C82 0.5-1.0	C82 1.0-1.53	A127 0-0.5	A127 0.5-1.0	A127 1.0-1.7	F150 0-0.43
Actual Acidity																				
pH KCl (23A)	pH Unit	8.8	8.8	8.9	8.8	8.9	8.9	8.8	8.7	8.8	8.8	8.8	8.8	8.8	8.8	8.9	8.8	9	8.9	8.3
Titratable Actual Acidity (23F)	mole H+ / t	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
sulfidic - Titratable Actual Acidity (s-23F)	% 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	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Potential Acidity																				
Chromium Reducible Sulfur (22B)	% S	0.226	0.283	0.168	0.251	0.217	0.267	0.348	0.235	0.256	0.445	0.3	0.338	0.274	0.367	0.455	1.13	1.04	1.37	2.6
acidity - Chromium Reducible Sulfur (a-22B)	mole H+ / t	141	176	105	156	135	167	217	147	160	278	187	211	171	229	284	704	649	854	1620
Acid Neutralising Capacity																				
Acid Neutralising Capacity (19A2)	% CaCO3	11.5	10.1	12.9	11.4	11.8	12.7	11.2	10.3	10.5	8.32	9.77	10.1	10.6	10	10.5	6.07	6.22	6.22	2.61
acidity - Acid Neutralising Capacity (a-19A2)	mole H+ / t	2310	2010	2580	2280	2360	2540	2230	2060	2100	1660	1950	2020	2110	2000	2100	1210	1240	1240	522
sulfidic - Acid Neutralising Capacity (s-19A2)	% pyrite S	3.7	3.23	4.13	3.65	3.79	4.06	3.58	3.31	3.36	2.66	3.13	3.23	3.39	3.2	3.37	1.94	1.99	1.99	0.84
Acid Base Accounting																				
ANC Fineness Factor	-	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	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	<0.02	<0.02	<0.02	<0.02	0.04	2.04
Net Acidity (acidity units)	mole H+ / t	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	25	1270
Liming Rate	kg CaCO3/t	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	2	95

4 Data Validation

This Section provides an assessment of data validation including evaluation of QA/QC assessment of laboratory and field replicates and laboratory QA/QC procedures in order to provide scientific confidence that the presented results are valid.

4.1 Sediment Sampling Compliance

Details for the initial core sampling, additional grab sampling and Supplementary SAP sampling are provided in Table 4-1, including target coring depths, achieved coring depths and reason for core refusal (if any). The reasons for core refusal were the presence of stiff clays or hard material such as rocky or gravelly substrate. As outlined in the approved SAP (Section 3.3.2) one of the acceptance criteria for a sediment core is that 'the core must reach the depth of dredging, or core refusal in clay, dense sand or rock'.

The National Assessment Guidelines for Dredging 2009 (NAGD) note that natural geological materials such as rocky substrate or stiff clays are generally not considered contaminated (pg. 58 of NAGD). It is also noted that current coring techniques are generally not capable of penetrating such materials. Furthermore, multiple coring attempts were undertaken at most locations were core refusal was encountered.

The core sampling is therefore considered adequate and in full compliance with the approved SAP and the NAGD.

The additional grab sampling was undertaken with core penetration depths between 0m and 0.27m at nine out of ten locations. The only exception was location F150 where a core sample down to 0.8m depth was collected in the initial core sampling. For all other nine locations the grab sampling is considered appropriate for an adequate characterisation of shallow surface sediments in accordance with the NAGD guidelines. Location F150 was resampled using a corer as part of the Supplementary SAP sampling.

Core logs of the sampled sediments are shown in Appendices C and D. Detailed laboratory results are provided in Appendices E (primary laboratory), F (secondary laboratory), G (additional grab analyses) and H (Supplementary SAP analyses).

Table 4-1 Initial Core Sampling, Additional Grab Sampling and Supplementary SAP Sampling

#	Borehole	Easting (m)	Northing (m)	Depth (m LAT)	Dredge Depth (m LAT)	Target Coring Depth (m)	Achieved Coring Depth (m)	Unsampled (m)	Reason for Core Refusal	Additional Grab Sampling	Supplementary SAP Sampling	Achieved Coring Depth (m)
Outer Channel												
1	B2	375831.31	8139337.38	-8.9	-9.9	1	0.55	0.45	multiple core attempts, refusal at 'sandier (gravel) mud layer	-	Core	1.30
2	B7	375649.43	8139008.14	-8.9	-9.9	1	0.95	0.05	N/A	-	Core	0.9
3	B9	375576.67	8138876.48	-8.9	-9.9	1	0.7	0.3	Gravelly sandy mud	-	Core	1.1
4	B25	374994.6	8137823.11	-8.9	-9.9	1	0.3	0.7	stiff clay	-	Core	1.47
5	B41	374412.48	8136769.73	-9	-9.9	0.9	0.9	0	N/A	-	Core	1.4
6	B54	373939.62	8135913.81	-9.2	-10.3	1.1	1.1	0	N/A	-	Core	1.55
7	B74	373212.06	8134597.05	-9.1	-11.1	2	2	0	N/A	-	Core	2.0
8	B79	373030.16	8134267.87	-9.3	-11.1	1.8	1.8	0	N/A	-	Core	1.8
9	B104	372120.64	8132622.01	-9	-10.1	1.1	0.95	0.15	Multiple core attempts	-	Core	1.55
10	B108	371975.13	8132358.66	-8.8	-10.1	1.3	1.2	0.1	N/A	-	Core	2.05
11	C22	375169.89	8137984.37	-9	-9.9	0.9	0.9	0	N/A	-	Core	1.5
12	C29	374915.18	8137523.56	-9.1	-9.9	0.8	0.8	0	N/A	-	Core	1.6
13	C30	374878.81	8137457.74	-8.9	-9.9	1	1	0	N/A	-	Core	1.3
14	C50	374151.25	8136141.01	-8.7	-9.9	1.2	1.2	0	N/A	-	Core	1.6
15	C53	374042.16	8135943.52	-9.4	-10.3	0.9	0.9	0	N/A	-	Core	1.58
16	C72	373350.95	8134692.6	-8.9	-11.1	2.2	2.1	0.1	N/A	-	Core	1.95
17	C82	372987.15	8134034.15	-9.3	-11.1	1.8	1.67	0.13	stiff silty clay	-	Core	1.90
18	C94	372550.66	8133244.14	-9.1	-10.1	1	1	0	N/A	-	Core	0.95
19	C99	372368.68	8132914.96	-9.3	-10.1	0.8	0.8	0	N/A	-	Core	1.75
20	B63	373612.13	8135321.32	-9.1	-11.1	2	1.5	0.5	stiff clay	-	Core	1.8
21	A140	370744.89	8130287.97	-8	-9.7	1.7	0.26	1.44	stiff clay	Grab	-	-

#	Borehole	Easting (m)	Northing (m)	Depth (m LAT)	Dredge Depth (m LAT)	Target Coring Depth (m)	Achieved Coring Depth (m)	Unsampled (m)	Reason for Core Refusal	Additional Grab Sampling	Supplementary SAP Sampling	Achieved Coring Depth (m)
22	C146	370658.94	8129820.61	-9	-9.7	0.7	0.25	0.45	multiple core attempts, sandy (muddy) gravel	Grab	-	-
23	D147	370688.75	8129718.56	-9.1	-9.7	0.6	0.05	0.55	multiple failed core attempts, weathered rock, grab sample taken	Grab	-	-
24	D149	370615.96	8129586.88	-9.3	-9.7	0.4	0.15	0.25	multiple core attempts, gravelly clay	Grab	-	-
25	F150	370711.93	8129448.72	-6.6	-9.7	3.1	0.8	2.3	stiff clay	Grab	Core	0.45
26	A127	371217.8	8131143.87	-8.2	-10.6	2.4	1.7	0.7	stiff silty clay	-	Core	0.55
27	A138	370817.58	8130419.76	-8.4	-9.7	1.3	0.27	1.03	stiff clay	Grab	-	-
28	B130	371174.81	8130910.25	-10.1	-10.6	0.5	0.5	0	N/A	-	Core	1.57
29	C119	371641.11	8131598.24	-9.9	-10.1	0.2	0.2	0	N/A	-	Core	0.97
30	C121	371568.42	8131466.56	-9.8	-10.6	0.8	0.8	0	N/A	-	Core	1.16
Inner Port												
31	F156	370493.67	8129053.68	-9.3	-9.7	0.4	0.05	0.35	multiple failed coring attempts, stiff orange clay underlying gravel, grab sample taken	Grab	-	-
32	G155	370596.17	8129083.3	-7.5	-9.7	2.2	0.15	2.05	several coring attempts, stiff clay, possibly weathered rock	Grab	Core	0.05
33	H160	370480.5117	8128717.884	-9	-9.7	0.7	0.04	0.66	stiff clay	Grab	-	-
34	H162	370407.7256	8128586.211	-9.3	-9.7	0.4	0	0.4	stiff clay, corer no penetration, fragments on core barrel used for analysis	Grab	-	-
35	H165	370298.6001	8128388.801	-9.4	-9.7	0.3	0.2	0.1	rocks and clay (grab sample taken)	-	Core	0.1
36	H167	370225.8223	8128257.118	-9.1	-9.7	0.6	0.2	0.4	stiff clay	-	Core and grab	0.11

#	Borehole	Easting (m)	Northing (m)	Depth (m LAT)	Dredge Depth (m LAT)	Target Coring Depth (m)	Achieved Coring Depth (m)	Unsampled (m)	Reason for Core Refusal	Additional Grab Sampling	Supplementary SAP Sampling	Achieved Coring Depth (m)
37	I162	370473.882	8128550.098	-7.3	-9.7	2.4	0.33	2.07	multiple coring attempts, stiff clay	-	-	-
38	J164	370467.2523	8128382.202	-7.5	-9.7	2.2	1.02	1.18	stiff silty clay	-	-	-
39	K167	370424.2832	8128148.47	-7.6	-8.3	0.7	0.25	0.45	stiff silty clay	-	Grab	0.03
40	M180	370083.7793	8127220.229	-9.3	-9.7	0.4	0.2	0.2	hard substrate	-	Core	0.12
41	P180	370282.2238	8127111.691	-9.4	-9.7	0.3	0.05	0.25	stiff clay	-	Grab	0.04
42	U185	370431.185	8126601.525	-5.4	-8.3	2.9	2.9	0	N/A	-	-	-
43	U187	370358.4154	8126469.842	-8.2	-8.3	0.1	0.1	0	N/A (grab sample taken)	-	-	-
44	I172 (additional)	370103	8127904	-8.4	-9.6	1.2	1.06	0.14	stiff clay	-	Core	1.1

4.2 Laboratory QA/QC

Details of the laboratory QA/QC for the primary and secondary laboratories are provided in Appendices E and F. A summary of this assessment is provided in the following sections. Refer to Section 2.6.2 for a description of laboratory QA/QC procedures.

4.2.1 Sample Holding Times and Storage Conditions

All samples were received by the laboratories in appropriately pre-treated and preserved containers. Samples were kept frozen whilst in the field and chilled during delivery (ice packs). Acid sulfate samples were delivered frozen to the laboratory. All analyses were undertaken by the laboratories within recommended holding times except for diuron. Therefore, additional sampling and analysis was undertaken for assessing diuron (Section 2.1.1).

4.2.2 Laboratory Blanks

The laboratory blank assessment was satisfactory.

Measurements of laboratory blanks for the chemical analyses were below the LOR of the specific analysis method in the primary and secondary laboratories, including Supplementary SAP analyses. This indicates that samples were not contaminated during laboratory analysis.

4.2.3 Laboratory Duplicates

The assessment of laboratory duplicates was acceptable.

For chemical analyses conducted by the primary laboratory, RPDs for most measured components were within the laboratories acceptance criteria, including Supplementary SAP analyses.

The only exception was sample K167 0-0.25 with poor duplicate precision for TPHs due to sample heterogeneity as confirmed by re-extraction and re-analysis. This is not considered problematic given the overall low TPHs concentrations across the Inner Port dredge area.

No duplicate outliers were noted for the analysis undertaken by the secondary laboratory.

4.2.4 Surrogate and Matrix Spikes

The assessment of surrogate and matrix spike recoveries was satisfactory including the Supplementary SAP analyses.

The primary laboratory ALS recorded matrix spike recoveries outside the laboratory limits for:

- Monobutyltin and dibutyltin due to matrix interference; and
- Perfluorinated Compounds (PFCs) due to matrix interference.

The surrogate and spike recoveries reported by the secondary laboratory were within prescribed limits.

The above matrix spike outliers are not considered problematic given the overall very low concentrations of organotins and PFCs within the study area.

4.3 Field QA/QC

4.3.1 Field Triplicates

The assessment of field triplicate samples taken at the Inner Port (Table 4-2) and the Outer Channel (Table 4-3) indicated relatively low spatial heterogeneity with the RSD/RPD below the 50% NAGD criterion for most parameters.

The only exception was for individual PAH species at the Inner Port, where a higher variability between triplicate cores was observed. This was mainly due to the overall low PAH concentrations in the Inner Port sediments. Small differences in PAH concentrations between replicates can lead to relatively large changes in the RSD or RPD.

4.3.2 Field Triplicate Splits

Most analyses of field triplicate splits for the Inner Port were within the ±50 % NAGD criterion for RSDs or RPDs (Table 4-4).

Exceedances were noted for the trace metals mercury and selenium, TPH C29-C36 fraction, several PAHs species and diuron. For all of these parameters the exceedances are due to the relatively low concentrations (near detection limits) measured for these parameters. In such cases, small differences in concentrations between split samples can lead to relatively large changes in the RSD or RPD.

Most triplicate split analyses for the Outer Channel were within the ±50 % NAGD criterion for RSDs or RPDs (Table 4-5). The marginal exceedance noted for chromium reducible sulfur in one triplicate split was due to the very low potential acidity measured in these split samples.

The subsample analysis generally agreed well between the primary and secondary laboratories.

It is therefore considered that laboratory variation was within acceptable limits.

4.4 Summary of Data Validation

The evaluation of laboratory and field QA/QC procedures and assessments indicates 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 guidelines.

Table 4-2 Inner Port Triplicate Field Core Analysis for Sediment Contaminants. Orange Shading Indicates Exceedance of 50% Criterion for Relative Standard Deviation (RSD) or Relative Percent Difference (RPD)

Analyte	Units	M180 0-0.2	M180A 0-0.2	M180B 0-0.2	RSD/RPD (%)	H165 0-0.2	H165A 0-0.2	H165B 0-0.2	RSD/RPD (%)	U187 0-0.1	U187A 0-0.2	U187B 0-0.2	RSD/RPD (%)
Moisture Content													
Moisture Content (dried @ 103°C)	%	58.7	57	60.2	2.7	61	61.1	61.7	0.6	65.4	65	62.8	2.2
Metals & Metalloids													
Aluminium	mg/kg	17700	16200	19500	9.3	19000	20200	20700	4.4	24300	22400	22900	4.2
Antimony	mg/kg	<0.50	<0.50	<0.50	-	<0.50	<0.50	<0.50	-	<0.50	<0.50	<0.50	-
Arsenic	mg/kg	18.9	20.4	21.2	5.8	20.9	21.4	21.2	1.2	19.4	16.3	17.6	8.8
Cadmium	mg/kg	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	-
Chromium	mg/kg	35.1	33.2	38.1	7.0	37.9	38.4	38.6	0.9	43.5	39.8	40.1	5.0
Copper	mg/kg	23	19	23.3	11.0	18.2	19.2	18	3.5	19.7	16.3	17.1	10.0
Cobalt	mg/kg	10.4	9.8	11.8	9.6	11.1	11.4	11	1.9	12.4	11.2	11.3	5.7
Iron	mg/kg	31100	31300	33600	4.3	33300	35500	34700	3.2	38100	33100	34100	7.5
Lead	mg/kg	19.6	20.8	21.7	5.1	21.3	21.8	21.2	1.5	23.6	21	20.9	7.0
Manganese	mg/kg	709	570	739	13.4	799	796	814	1.2	550	522	503	4.5
Mercury	mg/kg	0.03	0.03	0.03	0.0	0.03	0.03	0.03	0.0	0.04	0.04	0.04	0.0
Nickel	mg/kg	17.5	15.6	18.2	7.9	18.4	18.7	19.3	2.4	21.9	19.6	20.4	5.7
Selenium	mg/kg	3.3	3.1	3.4	4.7	3.6	3.4	3.2	5.9	4.2	3.6	3.7	8.4
Silver	mg/kg	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	-
Vanadium	mg/kg	45.5	46.4	50.3	5.4	48.1	49.7	49.4	1.7	56.1	50.8	51.6	5.4
Zinc	mg/kg	67.5	59.9	73	9.8	67.5	68.3	67.1	0.9	73.5	63.9	65.3	7.7
Nutrients + Total Organic Carbon													
Ammonia as N	mg/kg	34	18	30	30.5	44	42	31	17.9	8	6	7	14.3
Nitrite + Nitrate as N (Sol.)	mg/kg	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	-
Total Kjeldahl Nitrogen as N	mg/kg	1460	1300	1380	5.8	1500	1490	1520	1.0	1540	1720	1640	5.5
Total Nitrogen as N	mg/kg	1460	1300	1380	5.8	1500	1490	1520	1.0	1540	1720	1640	5.5
Total Phosphorus as P	mg/kg	581	440	633	18.1	500	563	580	7.7	499	517	524	2.5

Data Validation

Analyte	Units	M180 0-0.2	M180A 0-0.2	M180B 0-0.2	RSD/RPD (%)	H165 0-0.2	H165A 0-0.2	H165B 0-0.2	RSD/RPD (%)	U187 0-0.1	U187A 0-0.2	U187B 0-0.2	RSD/RPD (%)
Total Organic Carbon	%	2.11	2.11	2.18	1.9	2.07	2.07	2.05	0.6	1.65	1.59	2.14	16.8
Total Petroleum Hydrocarbons													
C6 - C9 Fraction	mg/kg	<3	<3	<3	-	<3	<3	<3	-	<3	<3	<3	-
C10 - C14 Fraction	mg/kg	<3	<3	<3	-	<3	<3	<3	-	<3	4.0	<3	-
C15 - C28 Fraction	mg/kg	4.7	6.2	6.4	15.7	15.0	14.5	13.7	4.6	16.4	15.7	12.1	15.4
C29 - C36 Fraction	mg/kg	5.7	6.2	7.3	13.3	15.0	15.9	12.7	11.5	19.4	19.5	11.7	26.6
C10 - C36 Fraction (sum)	mg/kg	10.4	12.3	13.8	13.7	30.0	30.4	26.3	7.7	35.8	37.7	23.8	23.2
Organotin Compounds													
Monobutyltin	µgSn/kg	<1	<1	<1	-	<1	<1	<1	-	<1	<1	<1	-
Dibutyltin	µgSn/kg	0.9	0.5	0.5	44.4	0.5	0.5	<1	0.0	<1	<1	<1	-
Tributyltin	µgSn/kg	1.9	1.4	1.3	23.3	0.8	0.8	0.7	6.5	0.5	0.5	0.4	18.9
Polynuclear Aromatic Hydrocarbons													
Naphthalene	µg/kg	4.3	3.8	3.7	8.1	2.9	2.9	<5	0.0	3.6	<5	4.7	24.9
2-Methylnaphthalene	µg/kg	<5	<5	<5	-	<5	<5	<5	-	<5	<5	<5	-
Acenaphthylene	µg/kg	6.6	2.8	2.8	54.3	4.3	2.9	6.3	38.2	<5	<5	<5	-
Acenaphthene	µg/kg	<5	<5	<5	-	<5	<5	<5	-	<5	<5	19.2	-
Fluorene	µg/kg	<5	<5	<5	-	<5	<5	<5	-	<5	<5	<5	-
Phenanthrene	µg/kg	<5	<5	<5	-	<5	<5	<5	-	<5	<5	<5	-
Anthracene	µg/kg	<5	<5	<5	-	<5	<5	<5	-	<5	<5	<5	-
Fluoranthene	µg/kg	<5	2.8	2.3	21.4	5.3	2.4	2.9	43.6	3.0	<5	2.3	18.3
Pyrene	µg/kg	2.8	3.8	3.2	14.6	6.3	3.4	3.9	34.2	4.2	<5	20.1	130.3
Benz(a)anthracene	µg/kg	<5	<5	<5	-	3.9	2.9	<5	28.6	<5	<5	<5	-
Chrysene	µg/kg	<5	<5	<5	-	3.9	14.5	<5	115.8	<5	<5	<5	-
Benzo(b)fluoranthene	µg/kg	<5	2.8	<5	-	3.9	3.4	<5	13.3	<5	<5	<5	-
Benzo(k)fluoranthene	µg/kg	<5	<5	<5	-	<5	<5	<5	-	<5	<5	<5	-
Benzo(e)pyrene	µg/kg	<5	<5	<5	-	2.9	<5	<5	-	<5	<5	<5	-
Benzo(a)pyrene	µg/kg	<5	<5	<5	-	4.3	2.9	<5	40.0	<5	<5	<5	-

Data Validation

Analyte	Units	M180 0-0.2	M180A 0-0.2	M180B 0-0.2	RSD/RPD (%)	H165 0-0.2	H165A 0-0.2	H165B 0-0.2	RSD/RPD (%)	U187 0-0.1	U187A 0-0.2	U187B 0-0.2	RSD/RPD (%)
Perylene	µg/kg	7.1	21.8	16.5	49.1	18.4	26.1	19.5	19.6	6.7	4.4	25.2	116.4
Benzo(g.h.i)perylene	µg/kg	<5	2.8	2.3	21.4	2.4	<5	<5	-	<5	<5	2.3	-
Dibenz(a.h)anthracene	µg/kg	<5	<5	<5	-	<5	<5	<5	-	<5	<5	<5	-
Indeno(1.2.3.cd)pyrene	µg/kg	<5	<5	<5	-	<5	<5	<5	-	<5	<5	<5	-
Coronene	µg/kg	<5	<5	<5	-	<5	<5	<5	-	<5	<5	<5	-
Sum of PAHs	µg/kg	20.9	40.8	30.7	32.3	58.5	61.4	32.7	31.0	17.6	4.4	73.8	115.5
Herbicides													
Diuron	µg/kg	1.04	1.14	1.01	6.3	0.58	0.77	0.63	15.0	0.85	1.01	0.70	17.9
Actual Acidity													
pH KCl (23A)	pH Unit	8.6	8.6	8.6	0.0	8.6	8.6	8.6	0.0	8.6	8.8	8.7	1.1
Titratable Actual Acidity (23F)	mole H+ / t	<2	<2	<2	-	<2	<2	<2	-	<2	<2	<2	-
sulfidic - Titratable Actual Acidity (s-23F)	% pyrite S	<0.02	<0.02	<0.02	-	<0.02	<0.02	<0.02	-	<0.02	<0.02	<0.02	-
Potential Acidity													
Chromium Reducible Sulfur (22B)	% S	0.428	0.421	0.447	3.1	0.415	0.434	0.393	5.0	0.338	0.319	0.326	2.9
acidity - Chromium Reducible Sulfur (a-22B)	mole H+ / t	267	262	279	3.2	259	271	245	5.0	211	199	204	2.9
Acid Neutralising Capacity													
Acid Neutralising Capacity (19A2)	% CaCO3	6.74	5.92	6.32	6.5	7.48	8.04	7.23	5.5	5.82	6.9	5.98	9.4
acidity - Acid Neutralising Capacity (a-19A2)	mole H+ / t	1350	1180	1260	6.7	1500	1610	1440	5.7	1160	1380	1200	9.4
sulfidic - Acid Neutralising Capacity (s-19A2)	% pyrite S	2.16	1.9	2.02	6.4	2.4	2.58	2.32	5.5	1.86	2.21	1.92	9.4
Acid Base Accounting													
Net Acidity (sulfur units)	% S	<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	-
Liming Rate	kg CaCO3/t	<1	<1	<1	-	<1	<1	<1	-	<1	<1	<1	-

Table 4-3 Outer Channel Triplicate Field Core Analysis for Sediment Contaminants. Orange Shading Indicates Exceedance of 50% Criterion for Relative Standard Deviation (RSD) or Relative Percent Difference (RPD)

Analyte	Units	C119 0-0.2	C119A 0-0.2	C119B 0-0.2	RSD/RPD (%)	B41 0-0.5	B41A 0-0.5	B41B 0-0.5	RSD/RPD (%)	B41 0.5-0.9	B41A 0.5-0.9	B41B 0.5-0.9	RSD/RPD (%)
Moisture Content													
Moisture Content (dried @ 103°C)	%	51.6	52.6	51.6	1.1	58.3	52.5	54.5	5.3	51.6	47.6	45.5	6.4
Metals & Metalloids													
Aluminium	mg/kg	17900	16800	15500	7.2	23600	16000	17600	21.0	18700	15700	15100	11.7
Antimony	mg/kg	<0.50	<0.50	<0.50	-	<0.50	<0.50	<0.50	-	<0.50	<0.50	<0.50	-
Arsenic	mg/kg	18.6	20.3	16.4	10.6	18.9	20.3	20.7	4.7	19.6	20.1	19.5	1.6
Cadmium	mg/kg	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	-
Chromium	mg/kg	32.6	35.7	29.3	9.8	38.1	33.2	35.7	6.9	35.2	32.9	32.1	4.8
Copper	mg/kg	10.5	12	9.1	13.8	11.3	11.3	12.3	5.0	11.4	11	10.6	3.6
Cobalt	mg/kg	8.7	10.2	7.8	13.6	10.2	10	10.7	3.5	9.9	10	9.6	2.1
Iron	mg/kg	27500	27400	25000	5.3	31800	27100	30000	8.0	30000	27300	26200	7.0
Lead	mg/kg	15.8	16.4	13.9	8.5	18.3	16.7	18.1	4.9	19.4	16.8	16.6	8.9
Manganese	mg/kg	711	874	641	16.1	835	821	809	1.6	756	780	762	1.6
Mercury	mg/kg	0.02	0.02	0.02	0.0	0.03	0.03	0.03	0.0	0.03	0.03	0.02	21.7
Nickel	mg/kg	15.7	16.4	13.9	8.4	20.2	16.9	18.5	8.9	17.5	16.7	16.3	3.6
Selenium	mg/kg	1.9	2.6	1.9	18.9	3.2	2.5	2.6	13.7	3.1	2.4	2.4	15.3
Silver	mg/kg	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	-
Vanadium	mg/kg	38.7	43.7	35.2	10.9	48.3	44.9	47.8	3.9	45.3	44	42.6	3.1
Zinc	mg/kg	43.2	48.4	38.3	11.7	52.9	48.6	52.5	4.6	50.7	48	45.7	5.2
Nutrients + Total Organic Carbon													
Ammonia as N	mg/kg	51	40	44	12.4								
Nitrite + Nitrate as N (Sol.)	mg/kg	<0.1	<0.1	<0.1	-								
Total Kjeldahl Nitrogen as N	mg/kg	1020	550	1020	31.4								
Total Nitrogen as N	mg/kg	1020	550	1020	31.4								
Total Phosphorus as P	mg/kg	370	244	393	23.9								

Analyte	Units	C119 0-0.2	C119A 0-0.2	C119B 0-0.2	RSD/RPD (%)	B41 0-0.5	B41A 0-0.5	B41B 0-0.5	RSD/RPD (%)	B41 0.5-0.9	B41A 0.5-0.9	B41B 0.5-0.9	RSD/RPD (%)
Total Organic Carbon	%	1.19	1.11	1.17	3.6	0.97	1.12	1.09	7.5	1.22	0.95	1.12	12.4
Organotin Compounds													
Monobutyltin	µgSn/kg	<1	<1	<1	-	<1	<1	<1	-	<1	<1	<1	-
Dibutyltin	µgSn/kg	<1	<1	<1	-	<1	<1	<1	-	<1	<1	<1	-
Tributyltin	µgSn/kg	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	-
Actual Acidity													
pH KCl (23A)	pH Unit	8.9	8.9	8.9	0.0	8.9	8.9	8.9	0.0	8.8	9	8.9	1.1
Titratable Actual Acidity (23F)	mole H+ / t	<2	<2	<2	-	<2	<2	<2	-	<2	<2	<2	-
sulfidic - Titratable Actual Acidity (s-23F)	% pyrite S	<0.02	<0.02	<0.02	-	<0.02	<0.02	<0.02	-	<0.02	<0.02	<0.02	-
Potential Acidity													
Chromium Reducible Sulfur (22B)	% S	0.308	0.251	0.298	10.7	0.168	0.221	0.209	13.9	0.251	0.21	0.244	9.3
acidity - Chromium Reducible Sulfur (a-22B)	mole H+ / t	192	156	186	10.8	105	138	130	13.8	156	131	152	9.2
Acid Neutralising Capacity													
Acid Neutralising Capacity (19A2)	% CaCO3	11.7	11.9	11.9	1.0	12.9	12.3	11.7	4.9	11.4	12.2	12.2	3.9
acidity - Acid Neutralising Capacity (a-19A2)	mole H+ / t	2330	2370	2380	1.1	2580	2460	2340	4.9	2280	2430	2450	3.9
sulfidic - Acid Neutralising Capacity (s-19A2)	% pyrite S	3.74	3.8	3.81	1.0	4.13	3.94	3.76	4.7	3.65	3.9	3.92	3.9
Acid Base Accounting													
ANC Fineness Factor	-	1.5	1.5	1.5	0.0	1.5	1.5	1.5	0.0	1.5	1.5	1.5	0.0
Net Acidity (sulfur units)	% S	<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	-
Liming Rate	kg CaCO3/t	<1	<1	<1	-	<1	<1	<1	-	<1	<1	<1	-

Table 4-4 Inner Port Triplicate Laboratory Split Analysis. Orange Shading Indicates Exceedance of 50% Criterion for Relative Standard Deviation (RSD) or Relative Percent Difference (RPD)

Analyte	Units	H167 0-0.2	QAQC3	H167 0-0.2	RSD/RPD (%)	U185 0-0.5	QAQC4	U185 0-0.5	RSD/RPD (%)	U185 0.5-1.0	QAQC5	U185 0.5-1.0	RSD/RPD (%)
Moisture Content													
Moisture Content (dried @ 103°C)	%	61.9	57.9	56	5.1	41	38.3	39	3.6	44.3	35.1	47	14.8
Metals & Metalloids													
Aluminium	mg/kg	19200	23000	21000	9.0	11000	11800	10000	8.2	16000	13000	15000	10.4
Antimony	mg/kg	<0.50	<0.50	<7	-	<0.50	<0.50	<7	-	<0.50	<0.50	<7	-
Arsenic	mg/kg	19.8	20.7	16	13.2	14.5	18.6	12	22.2	16	21.8	13	26.4
Cadmium	mg/kg	<0.1	<0.1	<0.4	-	<0.1	<0.1	<0.4	-	<0.1	<0.1	<0.4	-
Chromium	mg/kg	37.1	41.3	34	9.8	23.7	43.1	17	48.5	30.9	25.7	25	11.9
Copper	mg/kg	17.4	20.3	17	9.9	9	12.1	8	22.0	8.4	6.2	8	15.6
Cobalt	mg/kg	10.9	11.6		6.2	7.1	6.5		8.8	8.6	6.6		26.3
Iron	mg/kg	32400	33500	29000	7.4	20400	34200	18000	36.1	27000	22500	24000	9.4
Lead	mg/kg	20.9	21	16	14.8	13.3	12	9	19.3	14.4	11.6	15	13.3
Manganese	mg/kg	818	902		9.8	445	358		21.7	531	374		34.7
Mercury	mg/kg	0.03	<0.01	<0.1	-	0.05	0.02	<0.1	85.7	0.03	0.01	<0.1	100.0
Nickel	mg/kg	18.2	21.4	16	14.7	11.3	10.9	8	17.9	14.6	11.1	12	14.5
Selenium	mg/kg	3.3	1.6		69.4	2.3	2.4		4.3	2.7	2		29.8
Silver	mg/kg	<0.1	1.5	<1	-	<0.1	<0.1	<1	-	<0.1	<0.1	<1	-
Vanadium	mg/kg	49.1	46.2		6.1	31.8	47.9		40.4	38.2	30		24.0
Zinc	mg/kg	64.5	67.5	53	12.4	34.5	34	29	9.4	38	29.4	29	15.8
Nutrients + Total Organic Carbon													
Ammonia as N	mg/kg	40	15	24	48.1	<1	<1	1.6	-	2	<1	3.1	43.1
Nitrite + Nitrate as N (Sol.)	mg/kg	<0.1	0.1	<0.5	-	<0.1	<0.1	<0.5	-	<0.1	<0.1	<0.5	-
Total Kjeldahl Nitrogen as N	mg/kg	1470	1300	1500	7.6	960	660	730	20.0	850	640	910	17.7
Total Nitrogen as N	mg/kg	1470	1300	1500	7.6	960	660	730	20.0	850	640	910	17.7
Total Phosphorus as P	mg/kg	497	367	370	18.0	232	213	190	9.9	252	281	200	16.8

Analyte	Units	H167 0-0.2	QAQC3	H167 0-0.2	RSD/RPD (%)	U185 0-0.5	QAQC4	U185 0-0.5	RSD/RPD (%)	U185 0.5-1.0	QAQC5	U185 0.5-1.0	RSD/RPD (%)
Total Organic Carbon	%	1.59	2.14	2.1	15.8	1.46	1.9	1.5	15.0	0.97	0.98	1.3	17.3
Total Petroleum Hydrocarbons													
C6 - C9 Fraction	mg/kg	<3	<3	<25	-	<3	<3	<25	-	<3	<3	<25	-
C10 - C14 Fraction	mg/kg	<3	<3	<50	-	<3	<3	<50	-	<3	<3	<50	-
C15 - C28 Fraction	mg/kg	11.9	9.3	<100	24.5	8.9	6.3	<100	34.0	12.4	10.2	<100	19.2
C29 - C36 Fraction	mg/kg	16.4	12.6	<100	25.8	9.6	7.9	<100	19.4	20.6	11.2	<100	59.0
C10 - C36 Fraction (sum)	mg/kg	28.3	22.0		25.2	18.5	14.2		26.2	33.0	21.4		42.5
Organotin Compounds													
Monobutyltin	µgSn/kg	<1	<1	<0.5	-	<1	<1	0.4	-	<1	<1	<0.5	-
Dibutyltin	µgSn/kg	<1	<1	0.6	-	<1	<1	0.7	-	<1	<1	<0.5	-
Tributyltin	µgSn/kg	0.6	0.6	0.4	17.3	0.8	0.7	<0.5	9.6	<0.5	<0.5	<0.5	-
Polynuclear Aromatic Hydrocarbons													
Naphthalene	µg/kg	<5	3.3	<100	-	<5	<5	<100	-	<5	<5	<100	-
2-Methylnaphthalene	µg/kg	<5	<5		-	<5	<5		-	<5	<5		-
Acenaphthylene	µg/kg	<5	<5	<100	-	<4	<4	<100	-	<4	<4	<100	-
Acenaphthene	µg/kg	<5	<5	<100	-	<4	<4	<100	-	<4	<4	<100	-
Fluorene	µg/kg	<5	<5	<100	-	<4	<4	<100	-	<4	<4	<100	-
Phenanthrene	µg/kg	<5	<5	<100	-	<4	<4	<100	-	<4	<4	<100	-
Anthracene	µg/kg	3.8	<5	<100	-	<4	<4	<100	-	<4	<4	<100	-
Fluoranthene	µg/kg	6.3	3.3	<100	63.1	<4	<4	<100	-	<4	<4	<100	-
Pyrene	µg/kg	7.5	3.7	<100	67.5	<4	<4	<100	-	<4	<4	<100	-
Benz(a)anthracene	µg/kg	5.7	<5	<100	-	<4	<4	<100	-	<4	<4	<100	-
Chrysene	µg/kg	5.0	<5	<100	-	<4	<4	<100	-	<4	<4	<100	-
Benzo(b)fluoranthene	µg/kg	5.7	<5	<200	-	<4	<4	<200	-	<4	<4	<200	-
Benzo(k)fluoranthene	µg/kg	<5	<5		-	<4	<4		-	<4	<4		-
Benzo(e)pyrene	µg/kg	3.8	<5		-	<4	<4		-	<4	<4		-
Benzo(a)pyrene	µg/kg	5.7	<5	<50	-	<4	<4	<50	-	<4	<4	<50	-

Analyte	Units	H167 0-0.2	QAQC3	H167 0-0.2	RSD/RPD (%)	U185 0-0.5	QAQC4	U185 0-0.5	RSD/RPD (%)	U185 0.5-1.0	QAQC5	U185 0.5-1.0	RSD/RPD (%)
Perylene	µg/kg	17.6	15.0		16.3	4.8	8.9		60.4	6.2	19.4		103.2
Benzo(g.h.i)perylene	µg/kg	3.1	<5	<100	-	<4	<4	<100	-	<4	<4	<100	-
Dibenz(a.h)anthracene	µg/kg	<5	<5	<100	-	<4	<4	<100	-	<4	<4	<100	-
Indeno(1.2.3.cd)pyrene	µg/kg	<5	<5	<100	-	<4	<4	<100	-	<4	<4	<100	-
Coronene	µg/kg	<5	<5		-	<5	<5		-	<5	<5		-
Sum of PAHs	µg/kg	64.2	25.2		87.1	4.8	8.9		60.4	6.2	19.4		103.2
Herbicides													
Diuron	µg/kg	1.51	0.75	<100	67.5	<1	<1	<100	-	<1	<1	<100	-
Actual Acidity													
pH KCl (23A)	pH Unit	8.6	8.7	8.1	3.8	8.7	8.5	8.4	1.8	8.9	8.9	8.4	3.3
Titratable Actual Acidity (23F)	mole H+ / t	<2	<2	<5	-	<2	<2	<5	-	<2	<2	<5	-
sulfidic - Titratable Actual Acidity (s-23F)	% pyrite S	<0.02	<0.02	<0.01	-	<0.02	<0.02	<0.01	-	<0.02	<0.02	<0.01	-
Potential Acidity													
Chromium Reducible Sulfur (22B)	% S	0.338	0.36	0.2	29.0	0.618	0.72	0.29	41.4	0.69	0.583	0.44	22.0
acidity - Chromium Reducible Sulfur (a-22B)	mole H+ / t	211	225	130	27.2	385	449	180	41.6	430	364	280	21.0
Acid Neutralising Capacity													
Acid Neutralising Capacity (19A2)	% CaCO3	7.43	7.06	6.5	6.7	6.68	6.99	4.2	25.7	9	10	5.6	28.1
acidity - Acid Neutralising Capacity (a-19A2)	mole H+ / t	1480	1410		4.8	1330	1400		5.1	1800	2000		10.5
sulfidic - Acid Neutralising Capacity (s-19A2)	% pyrite S	2.38	2.26	2.1	6.3	2.14	2.24	1.3	27.3	2.88	3.21	1.8	28.0
Acid Base Accounting													
Net Acidity (sulfur units)	% S	<0.02	<0.02	<0.01	-	<0.02	<0.02	<0.01	-	<0.02	<0.02	<0.01	-
Net Acidity (acidity units)	mole H+ / t	<10	<10	<10	-	<10	<10	<10	-	<10	<10	<10	-
Liming Rate	kg CaCO3/t	<1	<1	<0.75	-	<1	<1	<0.75	-	<1	<1	<0.75	-

Table 4-5 Outer Channel Triplicate Laboratory Split Analysis. Orange Shading Indicates Exceedance of 50% Criterion for Relative Standard Deviation (RSD) or Relative Percent Difference (RPD)

Analyte	Units	B41 0-0.5	QAQC6	B41 0-0.5	RSD/RPD (%)	B41 0.5-0.9	QAQC7	B41 0.5-0.9	RSD/RPD (%)
Moisture Content									
Moisture Content (dried @ 103°C)	%	58.3	58.9	57	1.7	51.6	52.5	51	1.5
Metals & Metalloids									
Aluminium	mg/kg	23600	19800	21000	9.0	18700	18600	19000	1.1
Antimony	mg/kg	<0.50	<0.50	<7	-	<0.50	<0.50	<7	-
Arsenic	mg/kg	18.9	20.7	16	12.8	19.6	21	17	10.6
Cadmium	mg/kg	<0.1	<0.1	<0.4	-	<0.1	<0.1	<0.4	-
Chromium	mg/kg	38.1	37.7	34	6.2	35.2	35.1	33	3.6
Copper	mg/kg	11.3	12.3	12	4.3	11.4	12.5	12	4.6
Cobalt	mg/kg	10.2	11		7.5	9.9	10.3		4.0
Iron	mg/kg	31800	31400	28000	6.9	30000	30400	28000	4.4
Lead	mg/kg	18.3	18.7	15	11.7	19.4	18	15	12.9
Manganese	mg/kg	835	928		10.6	756	829		9.2
Mercury	mg/kg	0.03	0.03	<0.1	0.0	0.03	0.03	<0.1	0.0
Nickel	mg/kg	20.2	20.7	17	10.4	17.5	18.4	16	7.0
Selenium	mg/kg	3.2	2.3		32.7	3.1	2.3		29.6
Silver	mg/kg	<0.1	<0.1	<1	-	<0.1	<0.1	<1	-
Vanadium	mg/kg	48.3	50.6		4.7	45.3	46.2		2.0
Zinc	mg/kg	52.9	53.7	43	12.0	50.7	53	44	9.5
Total Organic Carbon									
Total Organic Carbon	%	0.97	1.14	1.4	18.5	1.22	1.16	1.4	9.9
Organotin Compounds									
Monobutyltin	µgSn/kg	<1	<1	<0.5	-	<1	<1	0.6	-
Dibutyltin	µgSn/kg	<1	<1	<0.5	-	<1	<1	0.6	-
Tributyltin	µgSn/kg	<0.5	<0.5	<0.5	-	<0.5	0.8	<0.5	-

Data Validation

Analyte	Units	B41 0-0.5	QAQC6	B41 0-0.5	RSD/RPD (%)	B41 0.5-0.9	QAQC7	B41 0.5-0.9	RSD/RPD (%)
Actual Acidity									
pH KCl (23A)	pH Unit	8.9	8.8	8.7	1.1	8.8	8.9	8.7	1.1
Titratable Actual Acidity (23F)	mole H+ / t	<2	<2	<5	-	<2	<2	<5	-
sulfidic - Titratable Actual Acidity (s-23F)	% pyrite S	<0.02	<0.02	<0.01	-	<0.02	<0.02	<0.01	-
Potential Acidity									
Chromium Reducible Sulfur (22B)	% S	0.168	0.158	0.03	64.8	0.251	0.245	0.15	26.3
acidity - Chromium Reducible Sulfur (a-22B)	mole H+ / t	105	99	21	62.5	156	153	97	24.6
Acid Neutralising Capacity									
Acid Neutralising Capacity (19A2)	% CaCO3	12.9	12.2	11	8.0	11.4	11.8	10	8.5
acidity - Acid Neutralising Capacity (a-19A2)	mole H+ / t	2580	2440		5.6	2280	2360		3.4
sulfidic - Acid Neutralising Capacity (s-19A2)	% pyrite S	4.13	3.92	3.4	9.8	3.65	3.78	3.2	8.6
Acid Base Accounting									
ANC Fineness Factor	-	1.5	1.5			1.5	1.5		
Net Acidity (sulfur units)	% S	<0.02	<0.02	<0.01	-	<0.02	<0.02	<0.01	-
Net Acidity (acidity units)	mole H+ / t	<10	<10	<10	-	<10	<10	<10	-
Liming Rate	kg CaCO3/t	<1	<1	<0.75	-	<1	<1	<0.75	-

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Appendix A Sampling and Analysis Plan

Australian Government
Great Barrier Reef
Marine Park Authority

Mr Alan Vico
General Manager Planning and Projects
Ports North
PO Box 594
CAIRNS QLD 4870

REF: 17/2396.1

Dear Mr Vico

RE: Amended Sample and Analysis Plan - Cairns Shipping Development Project

The Great Barrier Reef Marine Park Authority has reviewed the response letter dated 9 September 2013 outlining proposed amendments to the report titled; Cairns Shipping Development Project – Sediment Sampling and Analysis Plan, August 2013 (SAP) which describes a proposed sediment sampling and analysis methodology for capital dredging in the Port of Cairns.

The amended SAP dated 9 September 2013 is approved for implementation.

Should you have any questions, please do not hesitate to contact Kevin Edison on (07) 47500 779 or via email kevin.edison@gbrmpa.gov.au

Yours Sincerely

Rean Gilbert
Manager, Ports and Shipping
Environmental Assessment and Management

cc. Dr Markus Billerback, Senior Environmental Scientist, BMT WBM Pty Ltd
Mr Chris Murphy, Department of Sustainability, Environment, Population and Communities

16 SEP 2013

A part of BMT in Energy and Environment

Cairns Shipping Development Project - Sediment Sampling and Analysis Plan

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August 2013

Cairns Shipping Development Project - Sediment Sampling and Analysis Plan

Prepared For:	Ports North
Prepared By:	BMT WBM Pty Ltd (Member of the BMT group of companies)

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Client Contact:	Jeff Bunt
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Title :	Cairns Shipping Development Project - Sediment Sampling and Analysis Plan.
Author :	Markus Billerbeck
Synopsis :	A sediment sampling and analysis plan for the assessment of physical and chemical sediment properties associated with proposed capital dredging in the Port of Cairns

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1 INTRODUCTION

Ports North is responsible for the development and management of port facilities vital to the development of Cairns and regional centres in Far North Queensland. The Corporation has extensive property, marina, tourism and cargo facilities in Cairns and its regional ports.

Ports North is planning to improve shipping access to the Port of Cairns to secure Cairns' place as a premier cruise destination in Queensland.

The Cairns Shipping Development Project (the Project) involves upgrading of the following infrastructure for the Port of Cairns, essentially to accommodate larger cruise ships:

- Expansion of the existing shipping channel and shipping channel swing basin;
- Expansion of the existing dredge material placement area;
- Establishment of a new swing basin to support future expansion of the HMAS Cairns Navy base;
- Structural upgrade of the existing shipping wharves; and
- Provision and upgrade of services to the wharves.

Capital dredging and dredge material disposal will be required as part of the Project. Therefore, an assessment of suitability of the dredged material for unconfined offshore disposal will be required.

The Project was determined to be a significant project requiring an Environmental Impact Statement (EIS) by the Queensland Government. A referral under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) determined that the Project would require Federal environmental assessment. Therefore, the sediment quality assessment as part of the EIS will be required to respond to both the State Government's Terms of Reference (TOR) prepared under the State Development and Public Works Organisation Act 1971 and the federal EIS Guidelines prepared under the EPBC Act.

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;
- Evaluate the history of the dredge area and its catchment together with land-use activities that may potentially impact on dredged material quality;

- 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, the State TOR and the federal EIS guidelines.

1.2 Proposed Dredging

A map showing the existing channel outline and the proposed upgrade is provided in Figure 1-1. Appendix A provides a detailed map with the proposed channel design and swing basins including declared and dredged depths for each channel section.

1.2.1 Channel Upgrade

The existing outer channel at the Port of Cairns is approximately 11.2 km in length, 90 m wide with a declared depth of -8.3 m LAT. The inner channel extends for 2.4 km in length and has variable width due to requirements for bends and swing basins.

The upgraded channel design is based on widening the existing channel to 140 m and increasing the declared depth to -9.4 m LAT. It also includes an extension of the existing channel for approximately 1 km offshore.

The channel will extend outside of the nominated widths due to the channel batters, which will extend from the channel bed to the natural seabed level at a typical slope of 1 in 5. Furthermore, the channel will be dredged to depths greater than the declared depth in some areas (up to a maximum of 1.7 m) to allow for siltation between maintenance dredging campaigns.

1.2.2 Swing Basin Upgrade

The proposed dredging will also include an expansion of the existing Crystal swing basin adjacent to Wharves 1-3 for specific use by cruise ships. Furthermore, a relocation of the existing main swing basin to a location further south close to Tropical Reef Shipyard is proposed to provide future capacity for expansion of HMAS Cairns and to provide a wider and deeper inner channel for the full length of the Inner Port. The relocated main swing basin will be designated as the ‘Smith’s Creek swing basin).

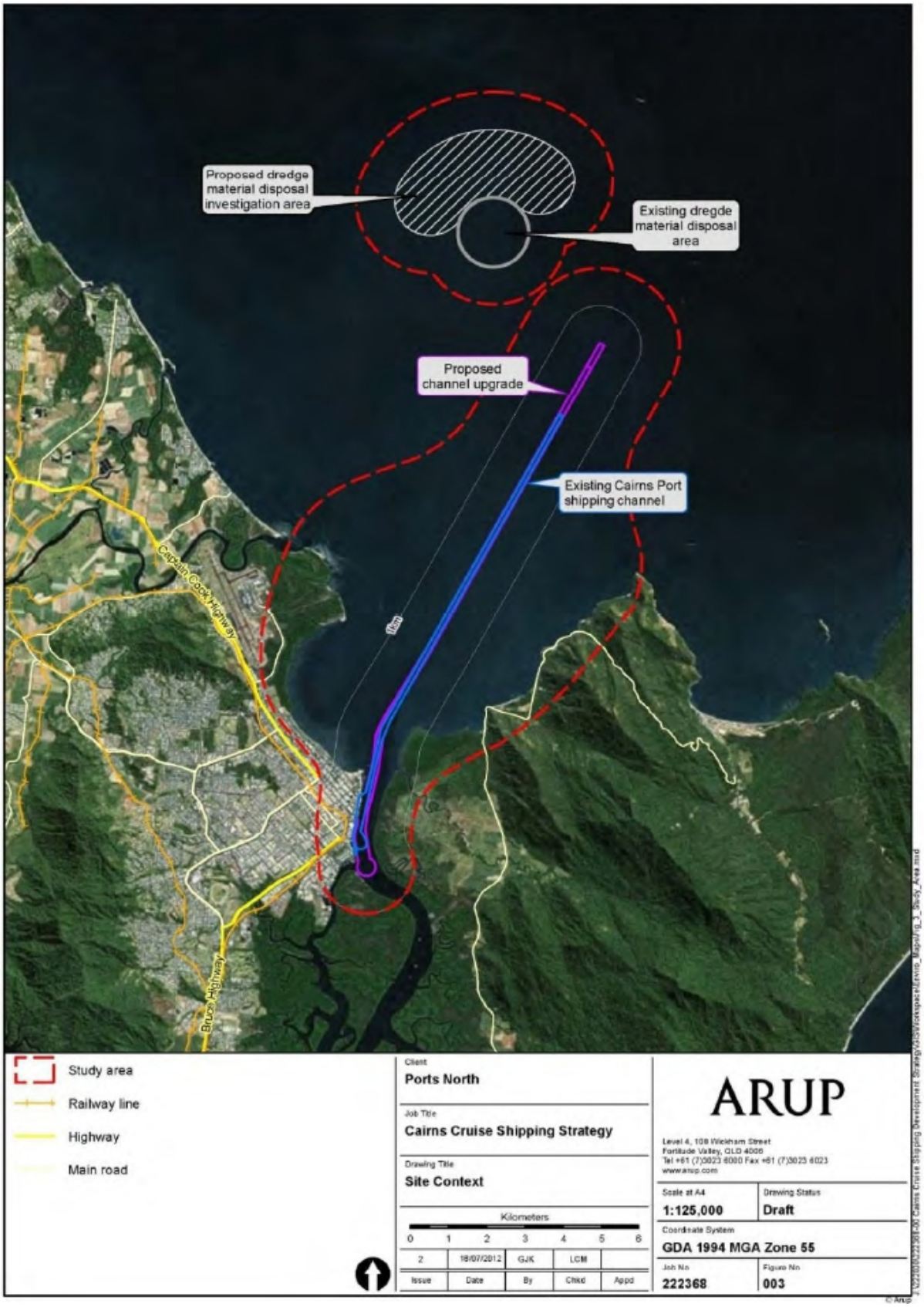


Figure 1-1 Proposed Dredging and Dredge Material Disposal

1.2.3 Capital Dredging

It is anticipated that the following dredging plant will be required:

- At least one medium size trailing suction hopper dredge (TSHD) with hopper capacity of about 3,000 m^3 to 5,000 m^3;
- Small grab dredger; and
- Work boats / survey boat.

It is anticipated that a total capital dredge volume of 5 million m^3 will be required for the channel and swing basin upgrades. The main component of the dredge volume is related to dredging of the Outer Channel.

A dredging production rate of around 180,000 m^3 per week is expected. Based on the estimated capital dredge volume alone, the dredging programme will require about 28 weeks.

1.2.4 Maintenance Dredging

The current maintenance dredging programme is undertaken predominantly by the TSHD *Brisbane* and it is envisaged that future maintenance dredging will also be undertaken using a TSHD.

The future maintenance dredging quantity is estimated to increase to an annual 580,000 m^3 from an existing annual volume of approximately 320,000 m^3.

1.3 Offshore Disposal

Whilst a variety of Dredge Material Placement Area (DMPA) options (both terrestrial and marine) will be assessed in detail as part of the project EIS, a preliminary DMPA options assessment identified an extension of the existing DMPA as the preferred option. This DMPA options assessment considered environmental, social, legislative/planning and economic factors.

Given that the proposed offshore DMPA would adjoin the existing DMPA, the effects of dredged material disposal at this location have been extensively studied. Previous investigations showed that the existing DMPA is performing satisfactorily and not resulting in ongoing impacts to nearby sensitive areas (Carter et al. 2002, Environment North 2005, Worley Parsons 2010).

Figure 1-1 shows the kidney shaped investigation area adjacent to the existing DMPA. The currently preferred DMPA option for capital dredge material is a 1 nm circular area located within the eastern boundary of the investigation area.

2 REVIEW OF EXISTING INFORMATION

2.1 History of Dredge Area and Catchment

2.1.1 Capital Dredging

The first capital dredging works at the Port of Cairns were undertaken within the access channel and berths by *The Platypus* dredge in 1887. By 1929 the channel was deepened and its width increased to 45m using the *Trinity Bay* dredge. The channel had been widened progressively to 60m by the early 1940s. A further widening of the channel to 75m and deepening of the entrance to 8.2, was undertaken in the early 1970s.

The most recent capital dredging was undertaken by the *Sir Thomas Hiley* dredge in 1990, widening the channel to 90m with a design depth of 8.3m.

2.1.2 Maintenance Dredging

Since development of the Port of Cairns over 100 years ago, maintenance dredging has been an ongoing annual requirement to maintain navigable depths within the port navigation areas. Maintenance dredging is typically undertaken using a trailing suction hopper dredge (*TSHD Brisbane* in recent years) for the 11.2 km long Outer Channel and also for the Inner Port shipping channel and swing basins extending another 2.4 km in length. The clam shell dredger *Willunga* is typically used to dredge areas in the Inner Port that are inaccessible to the *TSHD Brisbane*.

Sediments in the outer and inner shipping channel and swing basin areas are predominantly fine clayey silts. Some areas in the Outer Channel (near the bend) are subject to scour and characterised by stiff clay substrates.

The Inner Port maintenance dredging includes the main wharves 1-12, Marlin Marina and Commercial Fishing Bases 1 and 2. Accumulated sediments in these areas are typically fine silty clays due to low energy conditions in these areas favouring settling of fine sediments. The HMAS Cairns Nay base is dredged on a contractual basis alternating between inner and outer berth areas on an annual rotation.

Figure 2-1 provides maintenance dredging volumes for the Outer Channel and Inner Port areas between 1989 and 2009.

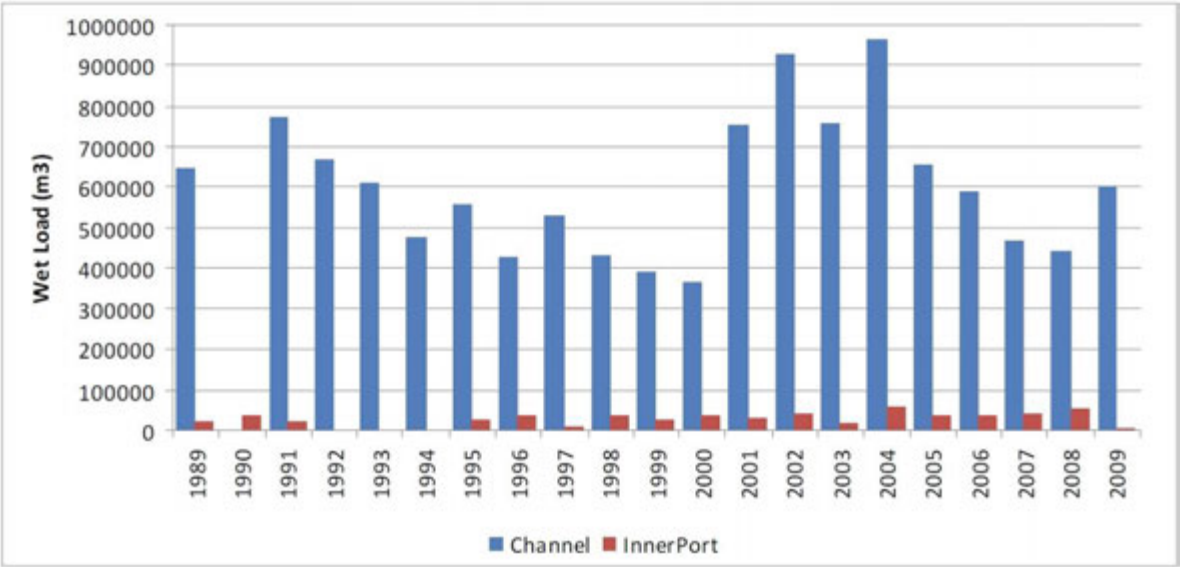


Figure 2-1 Dredging Volumes for Outer Channel and Inner Port Areas. Worley Parsons (2010)

2.1.3 Catchment

The existing environment was described by Worley Parsons (2010) as part of the Cairns Port Long Term Management Plan for dredging and dredge spoil management.

The catchments immediately adjacent to Trinity Inlet and the wider Cairns Harbour area are largely developed with the exception of broad mangrove areas to the eastern boundary. While mangroves within Trinity Inlet provide a substantial buffer between a mixed urban and agricultural land use spectrum to the south, the Port itself is bounded by mixed industrial, commercial and recreational land uses to the north and west.

Being located within a heavily urbanised catchment, the system is likely exposed to a broad range of nutrient and pollutant inputs associated with adjacent and upstream agricultural, residential, commercial and industrial land uses as well as waste water treatment plant inputs.

2.2 Existing Data 1995 - 2013

Detailed sediment quality studies have been undertaken within the Port of Cairns since 1995. A comprehensive review of all sediment data collected between 1995 and 2009 is provided in Worley Parsons (2010). Further sediment testing results are provided in Worley Parsons (2010, 2011, 2012 and 2013) for more recent sampling events.

Sediment testing was usually undertaken using a grab sampler for the Outer Channel and a piston corer (to 1.2m depth) for the Inner Port dredge management areas.

Previous sampling and analysis included the Outer Channel, Inner Port (wharf area), HMAS Navy Base, Marlin Marina and Commercial Fishing Bases 1 and 2. The review of historic sediment quality results was restricted to the dredge areas relevant for this project, i.e. Outer Channel, Inner Port and Navy Base.

Table 2-1 provides a summary of sediment quality data measured to date. In recent years, nutrients, the herbicide diuron, TPHs and PAHs were only measured at 20% of sample locations for each dredge area.

Table 2-1 Summary of Existing Sediment Quality 1995 - 2013

Analyte	Measurement Events – Inner Port, Navy Base	Measurement Events – Outer Channel
Physical parameters		
Particle Size Distribution	2008-2013	2008-2013
Inorganics		
Metals & Metalloids	1995-2013	1995-2000, 2002-2013
Nutrients	2007-2013	2007-2013
Cyanide	1998, 1999, 2006, 2007	1998,1999
Organics		
Organotins	1995-2013	1995-2000, 2002-2013
Diuron	2007-2013	2006-2008, 2010-2013
Total Petroleum Hydrocarbons (TPHs)	1995-2009, 2012	1995-2001, 2003, 2004, 2008, 2012
Benzene, Toluene, Ethylbenzene, Xylene (BTEX)	2000, 2003-2007	2000, 2003, 2004
Polycyclic Aromatic Hydrocarbons (PAHs)	1995, 1996, 2000, 2003-2008, 2012	1995, 2000, 2003, 2004, 2008, 2012
Organophosphate and Organochlorine Pesticides (OPPs and OCPs)	2000, 2003-2007	2000, 2003, 2004
Volatile Chlorinated Hydrocarbons	2006	-
Polychlorinated Biphenyls (PCBs)	2000, 2003-2008	2000, 2003, 2004, 2008
Phenols	Not specified	Not specified
Perfluorinated Compounds (PFCs)	2013	-

2.2.1 Particle Size Distribution

Results of particle size distribution analysis were relatively consistent across all studies undertaken between 1995 and 2009 and can be summarised as follows:

- Particle size distributions across dredge areas and the spoil ground were relatively similar on average;
- All dredge areas and the DMPA were dominated by silt and clay fractions;
- Sands were most abundant within inner port (wharf area) sediments; and
- Outer channel and inner port sediments varied considerably in sand and gravel fractions between sampling locations. Sands and gravels were most prevalent at sites near the mouth of Trinity Inlet, but were not a dominant fraction of the sediments to be dredged.

Particle size distribution results were very similar between 2010 and 2013 and consistent with the results of earlier sampling events. Sediments in the Outer Channel and Inner Port including the Navy Base were dominated by silts and clays. Outer Channel and Inner Port sediments were typically characterised by 80-90% silts and clays and about 10-20% sands. Gravel sediments were uncommon. Generally, the Navy base sediments had the highest content of fine sediments with clay and silt proportions of up to 96%. Silt and clay proportions were highest in 2012 ranging between 97% and 99% across the Outer Channel and Inner Port dredge areas.

2.2.2 Metals and Metalloids

Being part of the annual routine sediment testing, metals and metalloids generally showed the highest degree of variation of all contaminants, largely attributable to local geology, catchment land use, industries and port operations (CPA 2007). However, metal and metalloid contaminants were typically below NAGD screening levels (or screening levels in National Ocean Disposal Guidelines for Dredged Material – NODGDM prior to 2009).

Arsenic has consistently exceeded the screening level at the 95% Upper Confidence Limit (95% UCL) in most dredge areas. However, exceedances tended to be marginal over the 20 mg/kg screening level with a maximum 95% UCL of 31.8 mg/kg. Additional elutriate and dilute acid extraction (DAE) analyses were undertaken to assess bioavailability of arsenic and potential impacts on water quality during dredging and spoil disposal.

DAE analyses indicated a low level of bioavailability of arsenic with concentrations consistently below the 20 mg/kg screening level (maximum recorded DAE concentration was 12.9 mg/kg or 44% of total arsenic).

Elutriate testing undertaken with a 1:4 ratio of sediment to seawater returned a maximum concentration of 71.9 µg/L, which exceeded the low-reliability ANZECC/ARMCANZ (2000) limits of 2.3 µg/L for As(III) and 4.5 µg/L for As(V). However, with allowable dilution of at least 100 times at the spoil ground, arsenic concentrations were found to be acceptable and unconfined disposal was permitted.

It is recognised that arsenic is naturally elevated in the Cairns region due to the presence of natural mineralisation in metamorphic rocks of catchments discharging to Trinity Inlet (e.g. NAGD 2009, Preda & Cox 2002, Munksgaard & Parry 2002).

Given that arsenic analysis results demonstrated an overall low risk to water quality and benthic communities, an increase of the local screening level within the Cairns Port dredge management areas to 30 mg/kg was agreed to by the Determining Authority. Whilst the 95% UCL for arsenic sometimes exceeded the NAGD screening level (up to 25 mg/kg) in recent years, it always remained below the agreed local screening level of 30 mg/kg.

Cadmium and silver concentrations were mostly below detection limits across all dredge areas. However, the 95% UCL for silver exceeded the NAGD screening level of 1 mg/kg with a concentration of 3.37 mg/kg in 2011. Nevertheless, elutriate and DAE results for silver were below the LOR in all analysed samples. Cadmium exceeded the screening level in one sample in 2007. Given that the 95% UCL remained below screening level, no further testing was required.

For all studies undertaken between 1995 and 2013, concentrations of all metals/metalloids and their 95% UCL were below the NAGD or agreed local screening level. Therefore, metals and metalloids were classified as suitable for unconfined sea disposal.

2.2.3 Cyanide

Analysis for cyanide was undertaken in 1998 and 1999 (Outer Channel and Inner Port) as well as in 2006 and 2007 (Inner Port and Navy Base). No detections of cyanide were noted in these sampling events.

2.2.4 Nutrients

Nutrients were tested between 2007 and 2013 and generally showed consistent trends between years. Total Nitrogen (TN) and Total Kjeldahl Nitrogen (TKN) concentrations generally increased from the offshore DMPA towards the Inner Port area including the Navy Base. Except for the DMPA, TN consisted mainly of TKN, indicating a high proportion of organically bound nitrogen.

Highest ammonia concentrations were recorded in the Navy Base dredge area with concentrations up to four times higher compared to the Inner Port and Outer Channel dredge areas. Oxidised nitrogen concentrations (nitrite and nitrate) were mostly below the LOR or measured at very low concentrations. Total Phosphorus concentrations did not show a clear concentration gradient and concentrations were similar across all dredge areas.

It is noted that NAGD does not specify screening levels for sediment nutrients. Table 2-2 provides a summary of nutrient concentrations measured between 2010 and 2013 at the Outer Channel, Inner Port and Navy Base dredge areas.

Table 2-2 Ranges of Sediment Nutrient Concentrations Observed Between 2010 and 2013

Nutrient (mg/kg)	Outer Channel	Inner Port	Navy Base
Total Nitrogen / Total Kjeldahl Nitrogen	410 - 1500	1100 - 2230	1410 - 2290
Ammonia	2 - 18	6 - 65	16 - 223
Oxidised Nitrogen (NOx)	<0.1 to 0.2	<0.1 to 0.3	<0.1 to 0.1
Total Phosphorus	286 - 548	328 - 478	408 - 784

2.2.5 Organic Compounds

2.2.5.1 Organotins

Organotin compounds (including TBT) are derivatives of antifouling paints and have been routinely detected in the marina areas, Navy Base, Inner Port and Outer Channel dredge area at or above screening guideline levels for individual samples. It is, however, noted that exceedances of the screening level at the 95% UCL for TBT only occurred for the Inner Port dredge areas, whereas the 95% UCL was always below the screening level for the Outer Channel.

In terms of spatial distribution of TBT detections in the Inner Port area, the Navy Base and wharf areas typically had the highest concentrations of TBT. Given the exceedances of the TBT screening level within the Inner Port area, further testing was required with elutriate testing undertaken prior to 2008 and porewater analysis since then. Of the more than 70 elutriate samples analysed for TBT since 2005, none have returned levels above 2 ngSn/L, which is below the 6 ngSn/L ANZECC/ARMCANZ trigger level (95% species protection level). While the 2008 porewater testing failed to meet the required laboratory limit of reporting (LOR), the 2009 porewater analyses returned no detections above the required LOR even when total TBT concentrations were up to 92 µgSn/kg, i.e. more than 10 times the NAGD screening level.

In 2011, a 95% UCL for TBT of 26.5 µgSn/kg was recorded for the Inner Port dredge area, exceeding the NAGD screening level of 9 µgSn/kg. Despite this relatively high exceedance, further elutriate and porewater analysis resulted in TBT concentrations below the LOR.

Organotin concentrations were below the LOR in all samples of the Outer Channel, Inner Port and Navy Base in 2012.

On the basis of elutriate and porewater testing for TBT it was concluded that the material was suitable for unconfined ocean disposal as per NAGD.

2.2.5.2 Diuron

Testing for diuron was requested by the Determining Authority from 2007 onwards. Diuron is a broad spectrum herbicide, primarily used in agriculture but also as an active ingredient on some antifouling paints. Although no human health risk for diuron has been identified to date, the herbicide is thought to have potential impact on aquatic plants such as seagrass and mangrove environments and has been banned in Europe and the United Kingdom.

Diuron was always below the LOR for the Outer Channel area.

In 2008, diuron was found to be above the literature derived screening level in the sediments of the Inner Port. Subsequent elutriate analysis resulted in concentrations less than one-tenth the literature derived guideline level of 1 µg/L without any additional dilution. Porewater testing for diuron did not result in any detections even when tested at ultra-trace levels of 0.005 µg/L.

Between 2009 and 2013, normalised (to 1% Total Organic Carbon) diuron results and their 95% UCL were always below the literature derived screening level of 2 µg/kg for the Inner Port and Navy Base.

On the basis of relatively low diuron concentrations at the Inner Port and Navy Base dredge areas and no detections noted for the Outer Channel, the sediments were always classified as suitable for ocean disposal.

2.2.5.3 Polycyclic Aromatic Hydrocarbons (PAHs)

PAHs were always below detection in the Outer Channel for all measurements undertaken between 2000 and 2012. Detections of PAHs were noted for the Inner Port and Navy Base from 2004 onwards with naphthalene exceeding the screening level in one sample in 2008. In 2012, some individual detections of PAHs at relatively low concentrations were noted for the Inner Port and Navy Base dredge areas. The total PAHs concentration remained well below the NAGD screening level.

Therefore, sediments for the Outer Channel and Inner Port were always characterised as suitable for unconfined ocean disposal with respect to PAHs.

2.2.5.4 Total Petroleum Hydrocarbons (TPHs)

TPHs have been consistently detected in the Inner Port and Outer Channel dredge areas. Although concentrations remained below screening level, total TPH concentrations of greater than 1/10th of the screening level were detected for both the Inner Harbour and Outer Channel dredge areas.

In 2012, TPH concentrations were mostly below the LOR and therefore below the screening level for the Outer Channel and Inner Port dredge areas.

Sediments of all dredge areas were therefore always characterised as suitable for ocean disposal as per NAGD.

2.2.5.5 Benzene, Toluene, Ethylbenzene and Xylene (BTEX)

Concentrations of BTEX were always below detection for both the Inner Port, Navy Base and Outer Channel dredge areas between 2000 and 2007.

2.2.5.6 Polychlorinated Biphenyls (PCBs)

Concentrations of PCBs were always below detection for both the Inner Port, Navy Base and Outer Channel dredge areas between 1995 and 2008.

2.2.5.7 Organophosphate and Organochlorine Pesticides

Concentrations of organochlorine and organophosphate pesticides were always below detection for both the Inner Port, Navy Base and Outer Channel dredge areas between 2000 and 2007.

2.2.5.8 Volatile Chlorinated Hydrocarbons and Phenols

As described in Worley Parsons (2010) no detections of phenols or volatile chlorinated hydrocarbons were noted within the Port of Cairns area.

2.2.5.9 Perfluorinated Compounds (PFCs)

Perfluorinated compounds (PFCs) are chemical compounds often used as a component of aqueous film-forming foams (AFFFs) used for fire fighting. These compounds are characterised as persistent in the environment with the potential to bio-accumulate or biomagnify. A spill of AFFFs (Tridol S3) occurred on 28 January 2013 from the BP Australia Pty Ltd depot on Draper Street in Cairns. The spill consisted of approximately 1000 L of Tridol S3 concentrate and 60,000 L of water that was discharged to the onsite stormwater system draining to Trinity Inlet close to Wharf 11/Navy Base. Approximately 21,000 L of the total volume was pumped and disposed via a trade waste contractor, resulting in an estimated 40,000 L of diluted foam being potentially discharged to Trinity Inlet.

Monitoring was undertaken by QLD EHP, and PFCs were detected at the discharge site just after the event. Subsequent modelling and validation sampling in April 2013 recorded PFCs at low levels, although it was noted that some of the PFCs could have originated from other sources (southern sewage treatment plant, based on chemical fingerprinting). Based on this monitoring, it was concluded that PFCs occurred at levels that represented a low risk to human health and recreational fishing, but had the potential for low level bioaccumulation and biomagnification.

Ports North undertook testing for PFCs in 39 sediment samples in April 2013. PFC residues were only detected in two samples at the shoreline near Wharf 10, potentially caused by historical contamination. The initial advice from the Department of Environment and Heritage Protection indicated that the spill presented a low risk to the Ports North maintenance dredging areas. The sampling confirmed a low probability of a broad scale contamination issue with regards to PFCs and approval of the maintenance dredging for 2013 was granted. Analysis for PFCs was proposed to be included in the 2014 maintenance dredging campaign at a selection of sampling locations. Sampling for PFC's was also included in the SAP for the MSQ dredge area, with results of sampling in July not detecting any PFC residues.

3 SAMPLING AND ANALYSIS

3.1 Sampling Rationale

3.1.1 Number of Sampling Locations and Subsamples

As per NAGD, the number of sample locations for capital dredging in a port with existing contamination should be based on the volume of the layer of recent sediments which could be contaminated, not including the volume of underlying natural geological materials, which are expected to be uncontaminated. As per NAGD, the full depth of potentially contaminated sediment is defined as at least the top 1 m of sediment, or more if contamination could be found deeper.

Within Trinity Inlet, ebb tide currents are usually faster than the flood tide currents (at least 20 cm/s faster during spring tides) which leads to a net flux of sediments out of the inlet (Carter et al. 2002). However, it is noted that fine sediments can accumulate in low energy environments such as tidal creeks and the upper inlet areas. For the actual dredge area, the existing channel is dredged annually to maintain navigable depth, with the most recent maintenance dredging campaign in July 2013, i.e. only two to three months prior to the anticipated sampling. It also appears unlikely that large volumes of sediment and contaminants have accumulated on the banks of the dredged channel, which are proposed to be dredged as part of the Project.

Therefore, for calculating the number of sampling locations for the Outer Channel, the top 1 m of sediment was considered as potentially contaminated and the corresponding volume of potentially contaminated dredge material used for calculating the number of sampling locations. For the Inner Port area, the actual dredge volume was used for calculating the number of sampling locations given that large parts of the Inner Port are already sufficiently deep and would not be dredged as part of the Project (mainly areas around the existing swing basin and the Smith's Creek confluence). Refer to Figure 3-1 for the proposed Inner Port dredge areas. In accordance with NAGD recommendations, the total dredge area has been subdivided into two separate dredging subareas based on expected contaminant status as inferred from the review of existing data (Section 2). Table 6 of NAGD was used to determine the number of sampling locations for each dredging subarea (Table 3-1). Table 6 was linearly extended for calculating the number of sampling locations for the Outer Channel dredge area as per NAGD recommendations. 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.

3.1.1.1 Core Subsampling

Subsampling at all sample locations for total (whole) sediment analyses will be in accordance with NAGD requirements. Sediment will be collected in 0.5 m intervals in the upper one metre of the core, followed by a composite subsample from 1.0 m to the end of the core if the depth of dredging exceeds 1.0 m at the sample location (i.e. 0 to 0.5 m - Sample 1; 0.5 to 1.0 m - Sample 2; 1.0 m to the end of the core, which represents the entire thickness of sediment proposed for dredging at each core location or the depth of core refusal - Sample 3).

Due to the classification of Inner Port sediments as potentially contaminated, subsampling for the Inner Port cores will be undertaken in 0.5 m intervals down to dredge depth or core refusal. It is

noted, however, that Inner Port subsamples below 1.5 m will only be analysed for the contaminants of concern, i.e. metals/metalloids and organotins (refer Section 3.3.2). The numbers of subsamples presented in Table 3-1 correspond to the proposed subsampling protocol and to anticipated coring depths as per Table 3-3.

The total number of primary samples to be obtained is provided in Table 3-1. In case of core refusal in stiff clays, which are generally considered not to be contaminated, five clay samples will be analysed separately for the contaminants of concern (metals/metalloids and organotins) to confirm the expected low concentrations in this material.

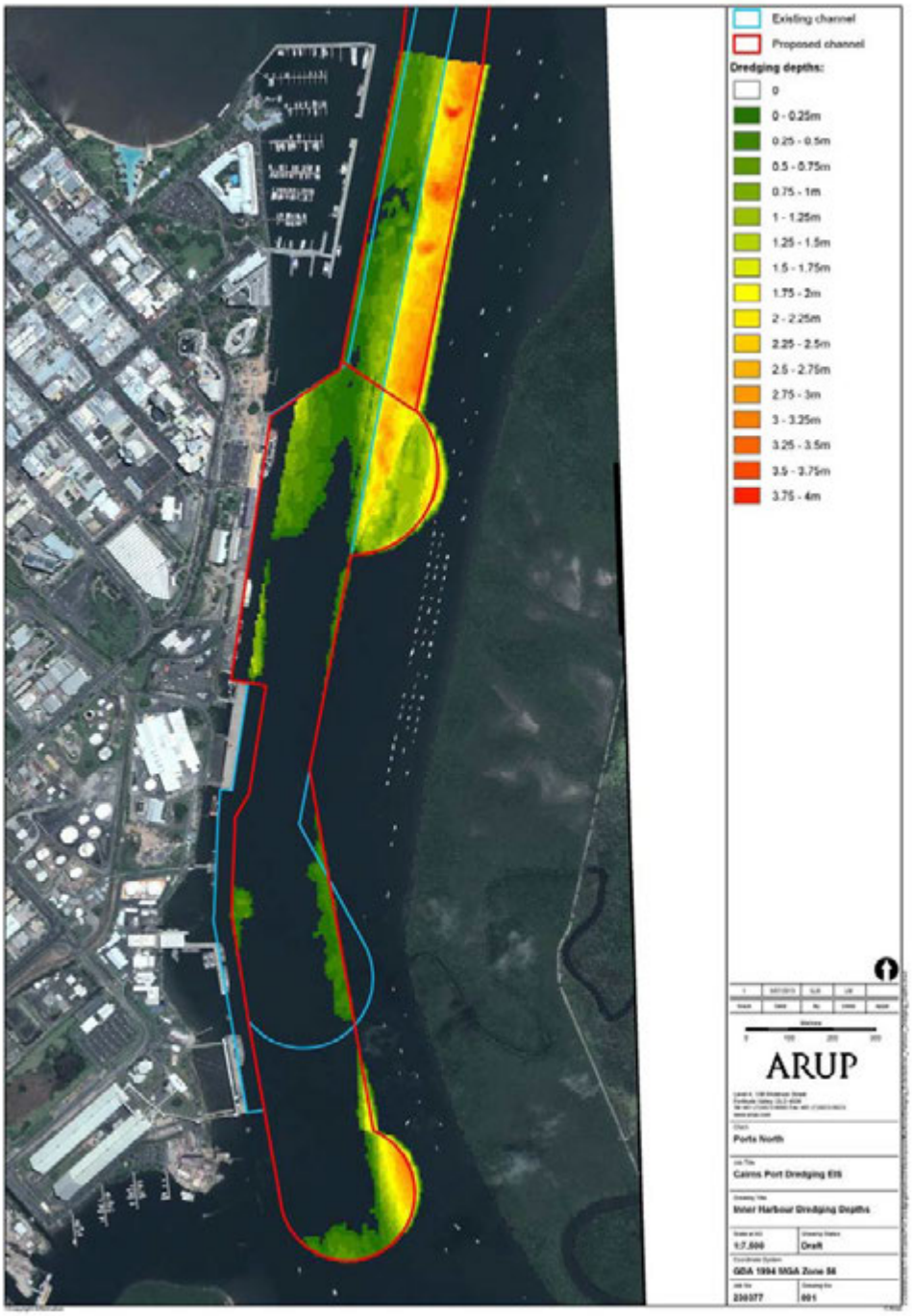


Figure 3-1 Inner Harbour Dredging Depths

Table 3-1 Number of Sampling Locations and Subsamples

Dredging Subarea	Classification	Potentially Contaminated Dredge Volume (m^3)	# Locations	# Subsamples[1]
Inner Port	Probably contaminated	418,723	13	33
Outer Channel	Probably clean	1,740,696	30	70

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 cores at 10% of sample locations) to determine the small scale variability of the sediment physical and chemical characteristics;
- Triplicate split samples (primary sample from 5% of locations thoroughly mixed and split into three sample container sets) from top sediment layer to assess laboratory variation, with one of the three samples sent to a second (reference) laboratory for analysis;
- One trip blank container per sampling day (maximum 7 samples) 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 two dredging subareas.

Table 3-2 Summary of QA/QC Samples

Dredging Subarea	Primary Sampling Locations	Field Triplicate Samples (Cores)	Triplicate Split Samples	Trip blanks
Inner Port	13	12 (4)	4	1 per day, maximum 5
Outer Channel	30	18 (6)	2	

3.1.3 Sampling for Elutriate and Bioavailability Testing

The proposed sediment sampling will not include collection of additional sediment samples for potential Phase III testing (elutriate and bioavailability). As per NAGD, Phase III testing would be required if the upper 95% confidence limit exceeds the screening level of a contaminant (refer to Section 3.7 for details).

However, should further Phase III testing for metals and metalloids be required, elutriate and bioavailability testing could be performed on remaining sample volume collected for the Phase II testing. In order to allow potential elutriate analysis, 20 L of seawater will be collected from the DMPA.

[1] Based on target coring depths (Table 3-3) and proposed subsampling protocol (Section 3.1.1.1). The number of subsamples may vary if core refusal is met or cores need to be taken away from centre of assigned grid cells due to operational restrictions (refer Section 3.2).

Should organic contaminants such as TBT exceed the screening level, additional sampling would likely be required, given that analysis of porewater concentrations is the recommended method for determining the acceptability for organic contaminants as per NAGD. Depending on the depth distribution of the contaminant, such additional sampling may be undertaken using coring or grab sampling.

3.2 Sampling Locations

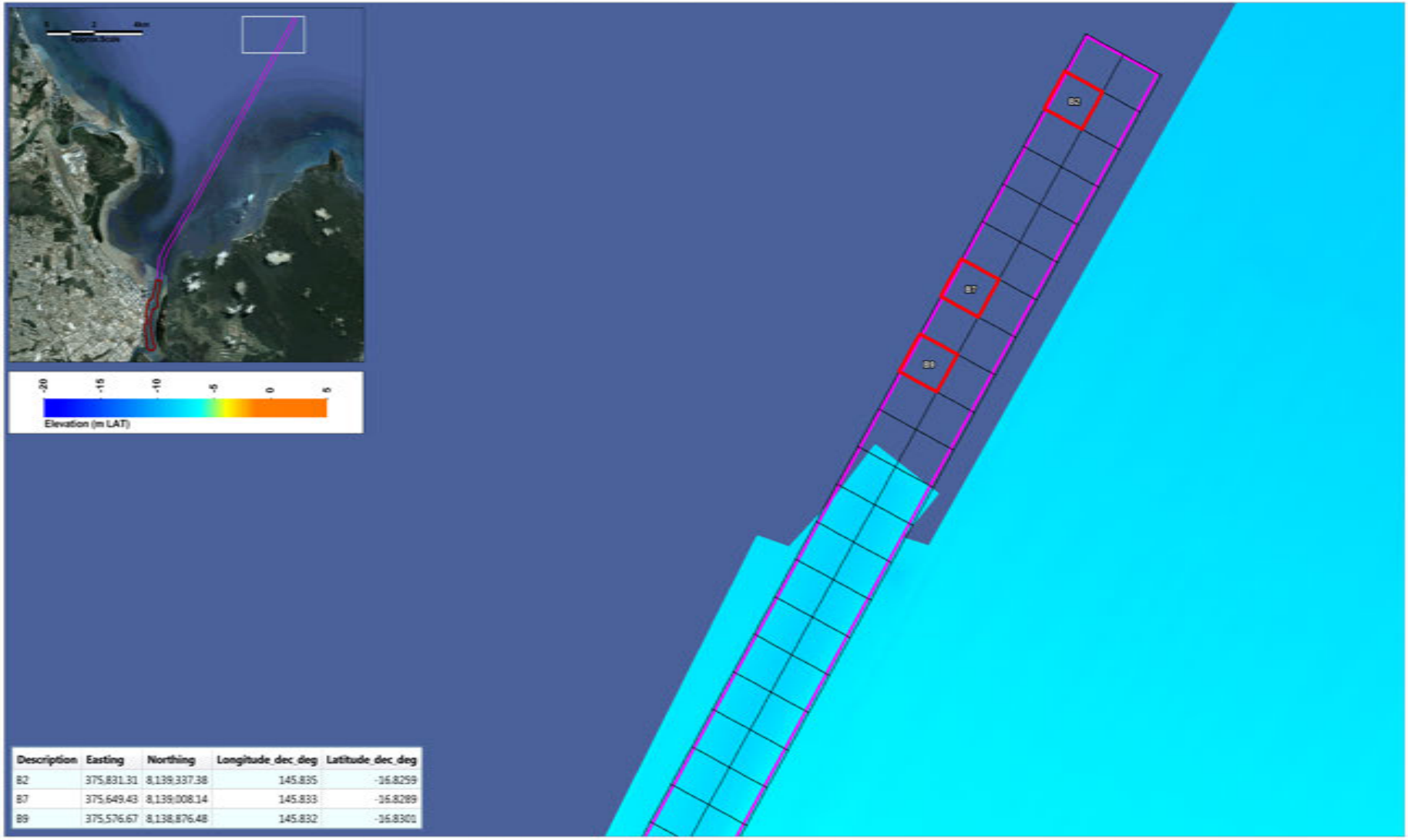
Sample locations were selected in accordance with NAGD by laying a square grid over the dredge subareas with at least five times the number of grid squares as the number of required sampling locations. The sampling locations were then randomly selected from the grid squares. As per NAGD, samples would generally be obtained from the centre of the selected grid squares. However, where the centre of grid cells is on the existing channel batters, the actual sampling location may need to be moved from the centre due to operational restrictions associated with coring on the batter slope. Sample locations for the Inner Port area were only chosen for areas that will be dredged as part of the Project (refer Figure 3-1).

Figures 3-2 to 3-8 provide the sampling locations for the Inner Port and Outer Channel dredge areas together with the coordinates (centre of grid squares). Table 3-3 outlines the proposed sampling locations along with the target coring depth for the centre of the grid square.

Table 3-3 Proposed Sampling Locations and Target Coring Depths (Centre of Grid Cells). Coordinates in GDA94, Zone 55

#	Borehole	Easting (m)	Northing (m)	Depth (m LAT)	Dredge Depth (m LAT)	Target Coring Depth (m)
Outer Channel						
1	B2	375831.31	8139337.38	-8.9	-9.9	1.0
2	B7	375649.43	8139008.14	-8.9	-9.9	1.0
3	B9	375576.67	8138876.48	-8.9	-9.9	1.0
4	B25	374994.6	8137823.11	-8.9	-9.9	1.0
5	B41	374412.48	8136769.73	-9.0	-9.9	0.9
6	B54	373939.62	8135913.81	-9.2	-10.3	1.1
7	B74	373212.06	8134597.05	-9.1	-11.1	2.0
8	B79	373030.16	8134267.87	-9.3	-11.1	1.8
9	B104	372120.64	8132622.01	-9.0	-10.1	1.1
10	B108	371975.13	8132358.66	-8.8	-10.1	1.3
11	C22	375169.89	8137984.37	-9.0	-9.9	0.9
12	C29	374915.18	8137523.56	-9.1	-9.9	0.8
13	C30	374878.81	8137457.74	-8.9	-9.9	1.0
14	C50	374151.25	8136141.01	-8.7	-9.9	1.2
15	C53	374042.16	8135943.52	-9.4	-10.3	0.9
16	C72	373350.95	8134692.6	-8.9	-11.1	2.2
17	C82	372987.15	8134034.15	-9.3	-11.1	1.8
18	C94	372550.66	8133244.14	-9.1	-10.1	1.0
19	C99	372368.68	8132914.96	-9.3	-10.1	0.8
20	B63	373612.13	8135321.32	-9.1	-11.1	2.0

#	Borehole	Easting (m)	Northing (m)	Depth (m LAT)	Dredge Depth (m LAT)	Target Coring Depth (m)
21	A140	370744.89	8130287.97	-8.0	-9.7	1.7
22	C146	370658.94	8129820.61	-9.0	-9.7	0.7
23	D147	370688.75	8129718.56	-9.1	-9.7	0.6
24	D149	370615.96	8129586.88	-9.3	-9.7	0.4
25	F150	370711.93	8129448.72	-6.6	-9.7	3.1
26	A127	371217.8	8131143.87	-8.2	-10.6	2.4
27	A138	370817.58	8130419.76	-8.4	-9.7	1.3
28	B130	371174.81	8130910.25	-10.1	-10.6	0.5
29	C119	371641.11	8131598.24	-9.9	-10.1	0.2
30	C121	371568.42	8131466.56	-9.8	-10.6	0.8
Inner Port						
31	F156	370493.67	8129053.68	-9.3	-9.7	0.4
32	G155	370596.17	8129083.3	-7.5	-9.7	2.2
33	H160	370480.5117	8128717.884	-9.0	-9.7	0.7
34	H162	370407.7256	8128586.211	-9.3	-9.7	0.4
35	H165	370298.6001	8128388.801	-9.4	-9.7	0.3
36	H167	370225.8223	8128257.118	-9.1	-9.7	0.6
37	I162	370473.882	8128550.098	-7.3	-9.7	2.4
38	J164	370467.2523	8128382.202	-7.5	-9.7	2.2
39	K167	370424.2832	8128148.47	-7.6	-8.3	0.7
40	M180	370083.7793	8127220.229	-9.3	-9.7	0.4
41	P180	370282.2238	8127111.691	-9.4	-9.7	0.3
42	U185	370431.185	8126601.525	-5.4	-8.3	2.9
43	U187	370358.4154	8126469.842	-8.2	-8.3	0.1



Description	Easting	Northing	Longitude_dec_deg	Latitude_dec_deg
B2	375,831.31	8,139,337.38	145.835	-16.8259
B7	375,649.43	8,139,008.14	145.833	-16.8289
B9	375,576.67	8,138,876.48	145.832	-16.8301

LEGEND

Outer Channel

Inner Port

Proposed Sampling Location

Grid Sampling Areas

Title:

Proposed Sampling Locations - Outer Channel

Figure: 3-2

Rev: A

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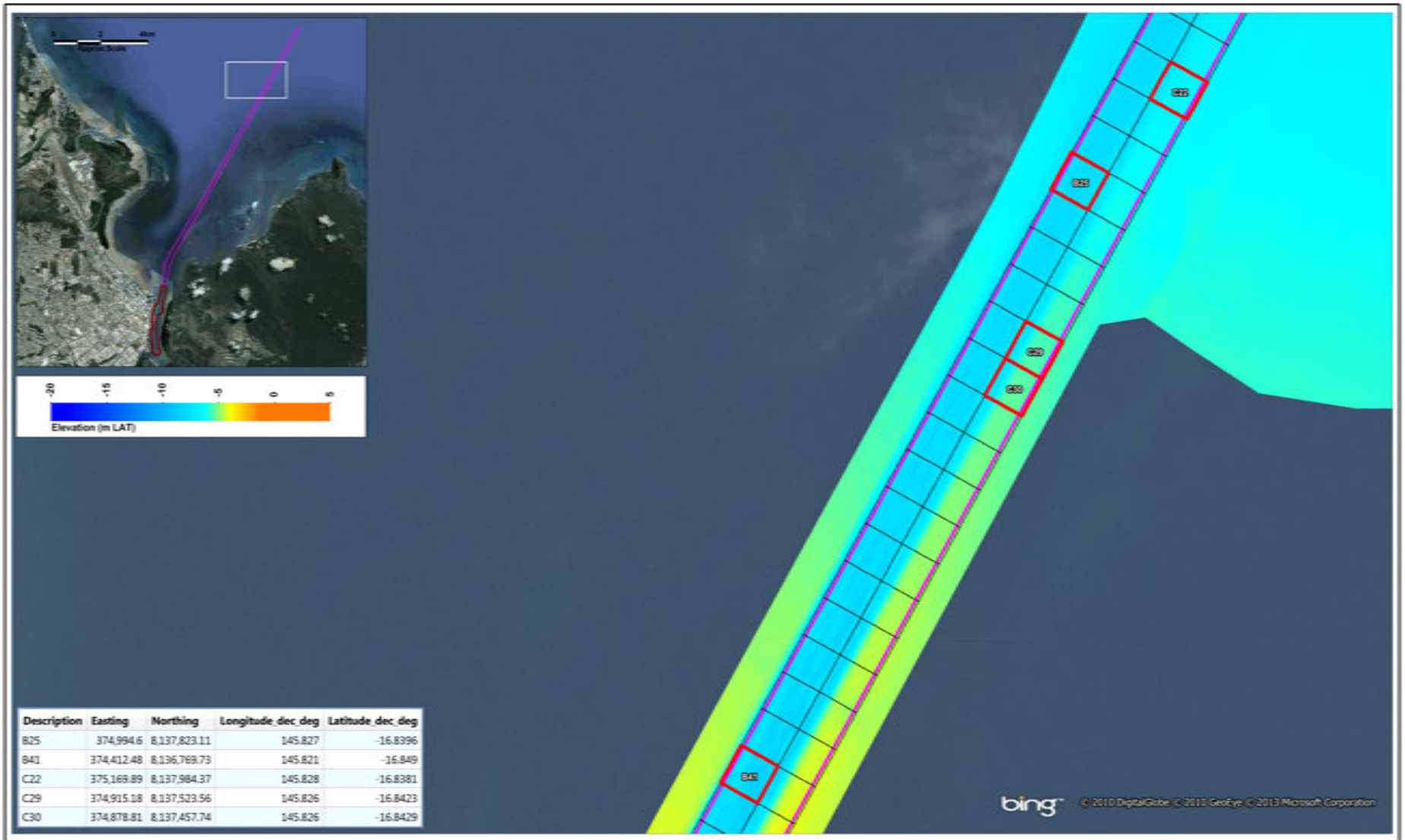

Description	Easting	Northing	Longitude_dec_deg	Latitude_dec_deg
B25	374,994.6	8,137,823.11	145.827	-16.8396
B41	374,412.48	8,136,769.73	145.821	-16.849
C22	375,169.89	8,137,984.37	145.828	-16.8381
C29	374,915.18	8,137,523.56	145.826	-16.8423
C30	374,878.81	8,137,457.74	145.826	-16.8429

LEGEND

Outer Channel

Inner Port

Proposed Sampling Location

Grid Sampling Areas

Title:

Proposed Sampling Locations - Outer Channel

Figure: 3-3

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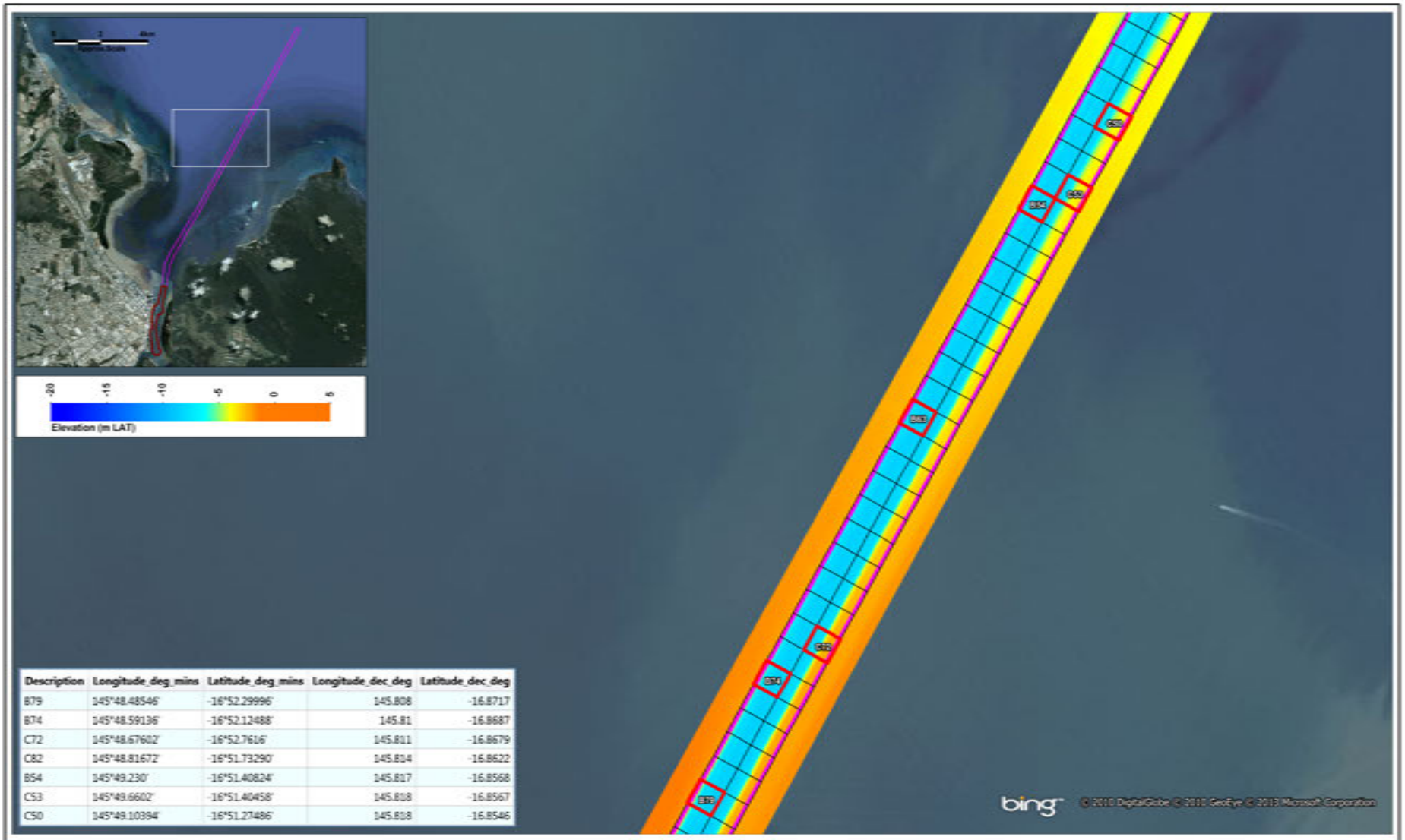

Description	Longitude_deg_mins	Latitude_deg_mins	Longitude_dec_deg	Latitude_dec_deg
B79	145°48.48546'	-16°52.29996'	145.808	-16.8717
B74	145°48.59136'	-16°52.12488'	145.81	-16.8687
C72	145°48.67602'	-16°52.7616'	145.811	-16.8679
C82	145°48.81672'	-16°51.73290'	145.814	-16.8622
B54	145°49.230'	-16°51.40824'	145.817	-16.8568
C53	145°49.6602'	-16°51.40458'	145.818	-16.8567
C50	145°49.10394'	-16°51.27486'	145.818	-16.8546

LEGEND

Outer Channel

Inner Port

Proposed Sampling Location

Grid Sampling Areas

Title:
Proposed Sampling Locations - Outer Channel

Figure: 3-4

Rev: A

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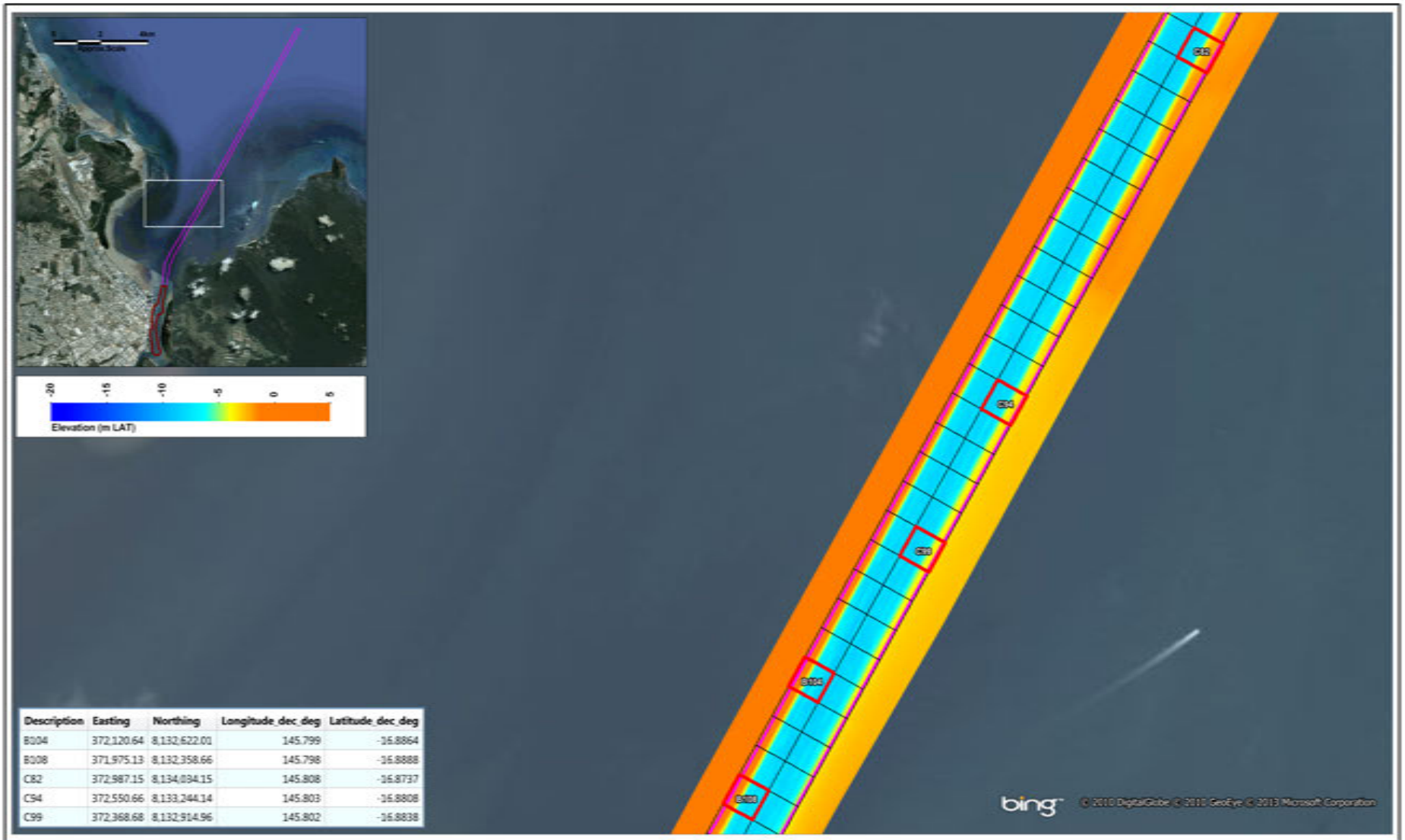

Description	Easting	Northing	Longitude_dec_deg	Latitude_dec_deg
B004	372,120.64	8,132,622.01	145.799	-16.8864
B008	371,975.13	8,132,358.66	145.798	-16.8888
C82	372,987.15	8,134,034.15	145.808	-16.8737
C94	372,550.66	8,133,244.14	145.803	-16.8808
C99	372,368.68	8,132,914.96	145.802	-16.8838

LEGEND

Outer Channel

Inner Port

Proposed Sampling Location

Grid Sampling Areas

Title:

Proposed Sampling Locations - Outer Channel

Figure: 3-5

Rev: A

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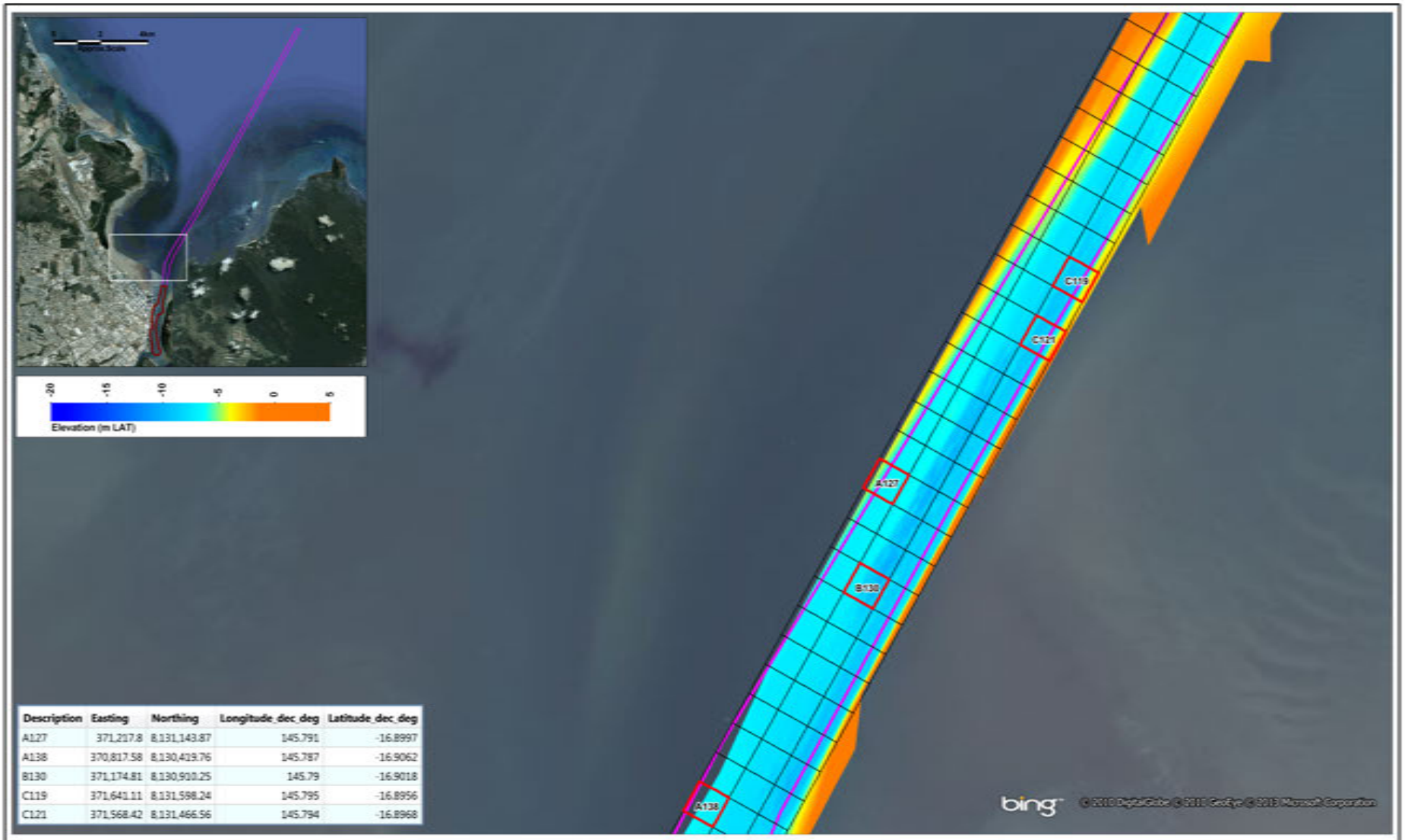

Description	Easting	Northing	Longitude_dec_deg	Latitude_dec_deg
A127	371,217.8	8,131,143.87	145.791	-16.8997
A138	370,817.58	8,130,419.76	145.787	-16.9062
B130	371,174.81	8,130,910.25	145.79	-16.9018
C119	371,641.11	8,131,598.24	145.795	-16.8956
C121	371,568.42	8,131,466.56	145.794	-16.8968

LEGEND

Outer Channel

Inner Port

Proposed Sampling Location

Grid Sampling Areas

Inner Base

Title:

Proposed Sampling Locations - Outer Channel

Figure: 3-6

Rev: A

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N

0 100 200m

Approx.Scale

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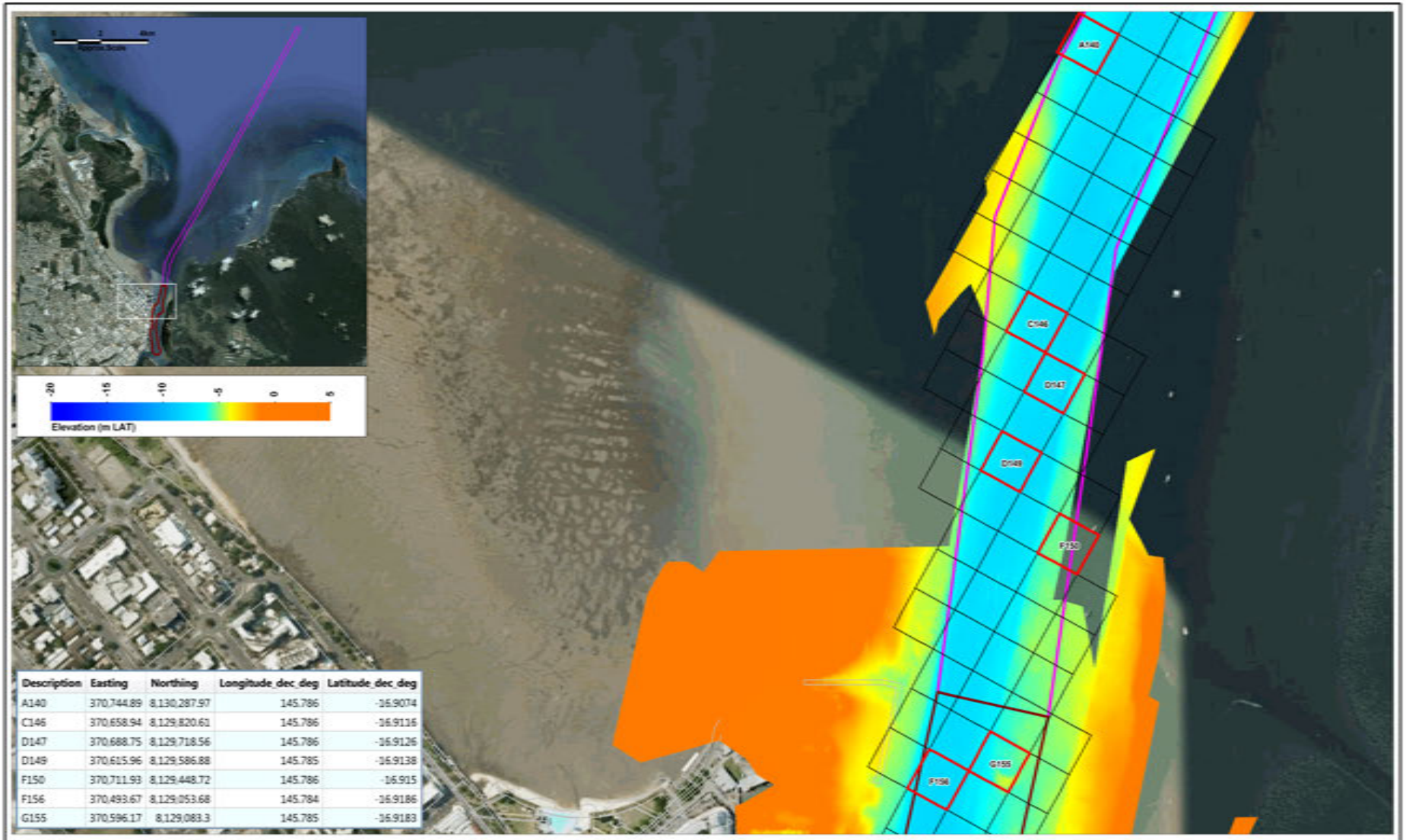
Filepath : I:\B20180_I_Port of Cairns-EIS\DRG\ECO_014_Sediment Sampling Location_Outer_A138 to C119.wor



Description	Easting	Northing	Longitude_dec_deg	Latitude_dec_deg
A140	370,744.89	8,130,287.97	145.786	-16.9074
C146	370,658.94	8,129,820.61	145.786	-16.9116
D147	370,688.75	8,129,718.56	145.786	-16.9126
D149	370,615.96	8,129,586.88	145.785	-16.9138
F150	370,711.93	8,129,448.72	145.786	-16.915
F156	370,493.67	8,129,053.68	145.784	-16.9186
G155	370,596.17	8,129,083.3	145.785	-16.9183

LEGEND

Outer Channel

Inner Port

Proposed Sampling Location

Grid Sampling Areas

Inner Base

Title:

Proposed Sampling Locations - Inner Port and Outer Channel

Figure: 3-7

Rev: A

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Approx.Scale

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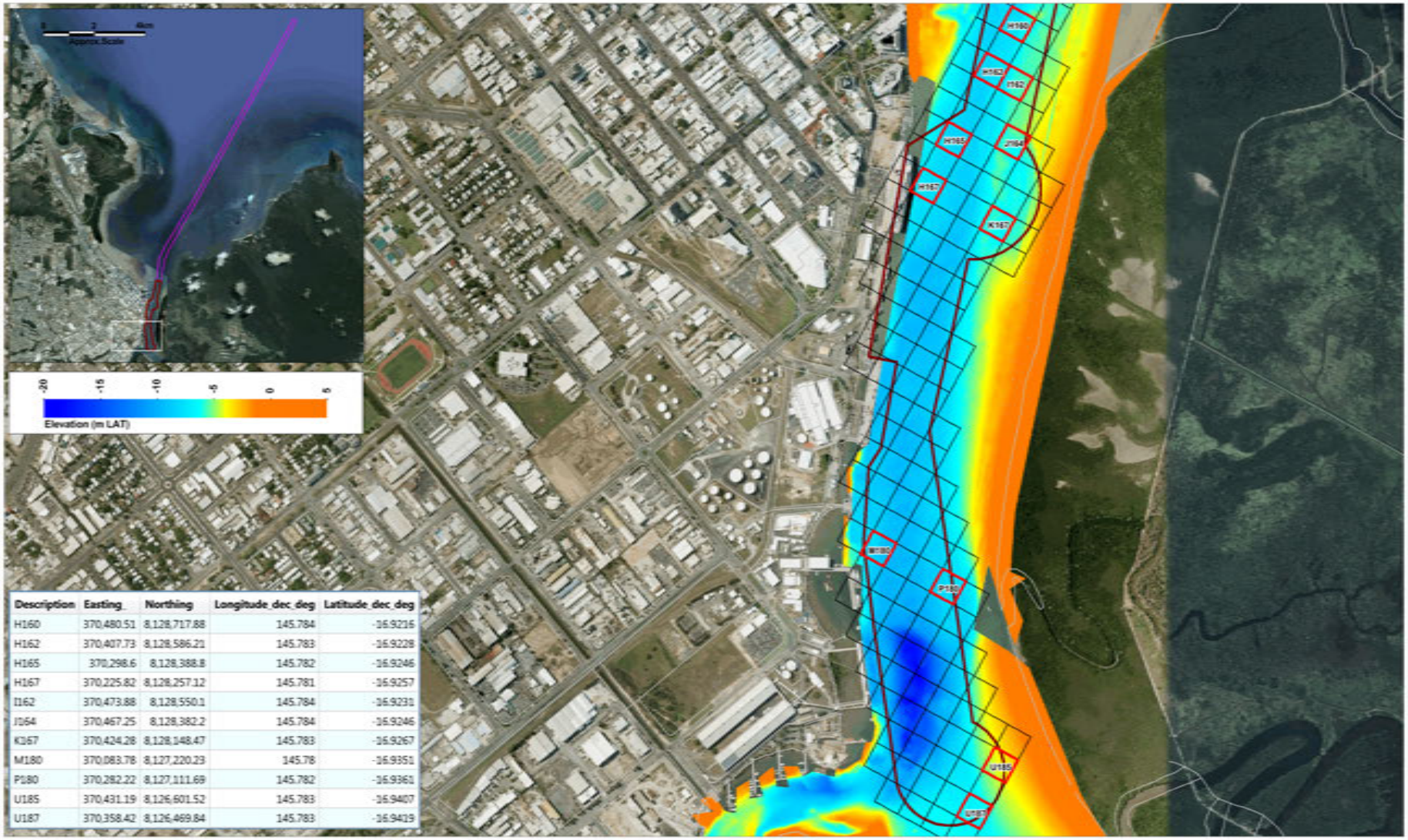
Filepath : I:\B20190_I_Port of Cairns EIS\DRG\ECO_013_Sediment Sampling Location_Inner_F156 to A140.wor



Description	Easting_	Northing	Longitude_dec_deg	Latitude_dec_deg
H160	370,480.51	8,128,717.88	145.784	-16.9216
H162	370,407.73	8,128,586.21	145.783	-16.9228
H165	370,298.6	8,128,388.8	145.782	-16.9246
H167	370,225.82	8,128,257.12	145.781	-16.9257
I162	370,473.88	8,128,550.1	145.784	-16.9231
J164	370,467.25	8,128,382.2	145.784	-16.9246
K167	370,424.28	8,128,148.47	145.783	-16.9267
M180	370,083.78	8,127,220.23	145.78	-16.9351
P180	370,282.22	8,127,111.69	145.782	-16.9361
U185	370,431.19	8,126,601.52	145.783	-16.9407
U187	370,358.42	8,126,469.84	145.783	-16.9419

LEGEND

Outer Channel

Inner Port

Proposed Sampling Location

Grid Sampling Areas

Inner Base

Title:
Proposed Sampling Locations - Inner Port

Figure: 3-8

Rev: A

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N

0 200 400m
Approx.Scale

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Filepath : I:\B20180_I_Port of Cairns\EIS\DRG\ECD_004_Sediment Sampling Location_Inner_L176 to U196.wor

3.3 Sample Collection Methodology

3.3.1 Survey Vessel and Positioning

A suitable sampling vessel (13 m barge, MV *Hercules*, in 2C commercial survey) will be used to undertake sediment sampling. The vessel is ideally suited for the proposed coring work with 25 m^2 deck space and appropriate davit. Sediment sampling is expected to take seven days of fieldwork.

Navigation to the sampling locations will be undertaken using a differentially corrected global positioning system (GPS) with an accuracy of approximately ±2 m.

3.3.2 Sediment Coring

Sediment cores will be collected by highly experienced personnel, using a combination of piston coring and vibrocoring. The choice of core barrel and coring methodology (i.e. vibrocoring or piston coring) would be dependent on the volume of material required for analyses, the texture of the sediment encountered at each sample location and the required length of core. Generally, vibrocoring would be undertaken in sandy substrates and shorter piston cores would be collected in muddy sands and muds.

It is proposed to use a medium weight vibrocorer with 50.8 mm (OD) stainless steel core tubes which is designed for collection of unconsolidated sediment samples in water depths to 34 m. The vibrocorer operates on 24V DC power and is highly efficient due to the energy-recovering weight system. Cores to a maximum length of 6 m can be collected in suitable (unconsolidated) substrates. Operation of the corer in deeper water areas may require a float system to ensure that the vibrocorer penetrates vertically.

A piston corer using a clean polycarbonate (84 mm OD) or stainless steel (50.8 mm OD) barrels would be used, where the sediments are fine grained and shorter cores (up to about 2.5 m) are required. This efficient technique has been successfully employed at numerous locations around Australia including Queensland. The piston corer collects complete and undisturbed cores at water depths of up to 17 m. The corer is able to penetrate and retain the entire profile of soft sediments, but penetration is limited in dense sand, clay or rocky sediments. A core barrel is manually pushed into the sediment with the piston remaining at bed level to create a partial vacuum and draw sediment into the barrel as the unit is raised. The core barrels is then lifted onto the barge and separated from the coring device.

Core penetration in muddy and sandy substrates is likely to be good, but limited in stiff, clay units which are unlikely to be contaminated. In clay substrates a “plug” of clay is typically retained in the barrel. The clay plugs would be subsampled separately and five samples would be analysed for the contaminants of potential concern (metals/metalloids and organotins) to confirm the expected low concentrations of contaminants in this material.

The acceptability of each sediment core will be determined immediately following collection, and the criteria for acceptance of the core will include:

- No obvious loss of surficial sediment;
- The core must have entered the profile vertically;
- There must be no gaps in the stratigraphy;
- There must be no disturbance of the sediment stratigraphy; and
- The core must reach the depth of dredging, or core refusal in clay, dense sand or rock.

3.3.3 Sample Handling

3.3.3.1 Sample Processing

Sample management procedures on the sampling barge will include the careful collection of sediment samples from the core tube, following the recovery of the sediment core from the seabed.

Photographs of the cores will be taken and field personnel will log each core profile for its physical characteristics and variations in sediment type and texture. The core length will be measured and the appropriate sample interval subsampled and collected in a clean, stainless steel bowl for homogenization prior to the filling of analytical laboratory-supplied clean sampling jars.

Subsampling of cores will be undertaken in accordance with NAGD requirements (refer to Section 3.1.1 for details).

Sample identifiers will include the location and depth interval, for example, C146_0.50-1.00 will indicate that the sediment sample was collected from grid cell location C146 (refer Section 3.2) over the interval from 0.50 m to 1.00 m.

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 Core Log

All sediment cores 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 core sampler used (vibrocorer/piston corer, type of core barrel 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

Field sampling and processing will be undertaken by Geochemical Assessments Pty Ltd, led by Dr Stuart Taylor who has almost 20 years of experience in undertaking environmental and geochemical assessments.

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 barge 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 core sample.

Utmost care will be maintained in ensuring that cross-contamination between samples is not possible. Samples collected from each interval 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 placed into an onboard freezer.

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. The frozen samples will be placed in eskies which are then sealed with tape and secured with a signed custody seal to provide an indication if the eskies were opened by unauthorized personnel.

3.4 Health & Safety and Contingency Plan

3.4.1 Health and Safety

The vessel skipper will keep in close contact with Cairns VTS/Harbour Control when sampling in the channels. Coring 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 dependant upon shipping movements).

A single anchor (30-40 kg) would be used to anchor the barge. The anchor would be placed upstream and upwind of the barge. A marker buoy may be placed on the anchor if required.

3.4.2 Adverse Weather

The planning of field sampling will involve regular checking of available weather forecast services for the study area. Given the anticipated duration of the sampling program of approximately seven days, it is acknowledged that adverse weather conditions may occur during the sampling campaign despite careful planning. There are no unusual hazards in operating the vibrocorer (operated by 24 V DC power) or piston corer 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.

It is noted that suitable sampling conditions in the study area are dependent on the wind fetch and local topography/bathymetry. Some parts of the study area are relatively sheltered, in particular the Inner Port area and nearshore parts of the Outer Channel. Sampling may continue in these areas with wind conditions of up to 15-20 knots. However, wind speeds in excess of 15 knots may restrict sampling for the more exposed sections of the Outer Channel dredge area. Sampling in these areas will be prioritized during periods of favourable weather conditions, and/or sampling may be started very early in the morning when winds are generally lighter.

3.4.3 Equipment Failure

A selection of spare replacement parts such as clamps and barrels will be carried on board during the field sampling. It is also noted that many parts with the exception of the vibrocoring head are interchangeable between the vibrocorer and piston corer. Repairs to any equipment would be undertaken as soon as possible to minimise delays as far as practical. However, in the unlikely event where critical repairs of equipment are required, the overall sampling program may be delayed.

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.

Furthermore, the sediment quality assessment needs to address the requirements outlined in the State Government's Terms of Reference (TOR) and the federal EIS Guidelines as follows.

Federal EIS guideline requirements

- *Assessment of sediment according to the NAGD 2009. This must include an assessment of the suitability of this material for land deposition and offshore disposal at any proposed dredged material disposal ground.*
- *Assessment of the risk and potential impacts of acid sulfate soils (ASS) and potential acid sulfate soils (PASS).*

State Terms of Reference requirements

- *Provide baseline information on marine sediments and sediment quality in the area likely to be disturbed by dredging or vessel movements including contaminants (such as heavy metals, nutrients and pesticides), the presence of fines and/or indurated layers and acid sulfate potential. Present this information as a map of sediment types based on their physical and chemical properties and include depth profiles.*
- *Assessment of marine sediments should be undertaken in accordance with the National Assessment Guidelines for Dredging (Commonwealth of Australia 2009).*

Based on the review of existing sediment quality data, separate contaminant lists are proposed for the Inner Port and Outer Channel dredge areas. Furthermore, it is proposed that contaminants that were regularly detected are analysed in all samples/subsamples.

However, contaminants for which existing data demonstrated a low environmental risk will be analysed in a tiered pilot study approach.

The tiered pilot study approach for 'low risk' contaminants can be summarised as:

- Initial analysis of 20% of locations (top, mid and lower subsamples) from the Inner Port; remaining 80% of samples stored as hold samples. No analysis proposed for Outer Channel, but hold samples will be stored;
- Significant detections (i.e. > 1/10th of screening level, or five times LOR where no screening level exists) in Inner Port will trigger analysis of hold samples; no further analysis if concentrations are below the above thresholds;
- Significant detection in top horizon only – Analysis of hold samples for respective contaminant(s) in top horizon only;

- Significant detection down to mid horizon - Analysis of hold samples for respective contaminant(s) in top and mid horizon only; and
- Significant detection down to lower horizon - Analysis of hold samples for respective contaminant(s) in top, middle and lower horizons.

If analysis of hold samples from the Inner Port is triggered, an initial analysis of 20% of samples for the respective parameter(s) and horizon(s) will be undertaken for the Outer Channel with a focus on sampling locations close to the Inner Port.

Table 3-4 provides a summary of the contaminant lists for the Inner Port and Outer Channel dredge areas. Further explanation is provided for the proposed contaminant lists and supplementary analyses in the following sections.

Table 3-4 Contaminant List for Inner Port and Outer Channel Dredge Areas

	Inner Port		Outer Channel	
Analytical Parameter	**Analysed (Yes/No)**	**Analysis Frequency**	**Analysed (Yes/No)[2]**	**Analysis Frequency**
Contaminants of Potential Concern				
Metals and Metalloids (Ag, As, Cd, Cr, Cu, Hg, Ni, Pb, Sb, Zn, Fe, Al)	Yes	All samples	Yes	All samples
Organotins (MBT, DBT, TBT)	Yes	All samples	Yes	All samples
'Low Risk' Contaminants				
BTEX	Yes	20%	No	-
Total Petroleum Hydrocarbons	Yes	20%	No	-
Polycyclic Aromatic Hydrocarbons (PAHs)	Yes	20%	No	-
Organochlorine and Organophosphate Pesticides	Yes	20%	No	-
Herbicide Diuron	Yes	20%	No	-
Perfluorinated Compounds (PFCs)	Yes	20%	No	-
Other Analyses				
Particle Size distribution (sieve and sedigraph)	Yes	All surface samples, 10 samples per sediment class[3]	Yes	All surface samples, 10 samples per sediment class
Nutrients (TN, TKN, TP, NH4, NOx)	Yes	20%	Yes	20%
Acid Sulfate Potential (Chromium Suite)	Yes	All samples	Yes	All samples
Moisture content	Yes	All samples	Yes	All samples
Total organic carbon	Yes	All samples	Yes	All samples

[2] Where no analysis is proposed, hold samples will be collected to be analysed if the respective contaminant is detected in high concentrations in the Inner Port dredge area
[3] Refer to Section 3.5.2.9 for details.

3.5.2 Sampling Parameter Description

3.5.2.1 Metals and Metalloids

Trace metal and metalloid concentrations showed the greatest variation of all contaminants in the Port of Cairns area in previous studies. Therefore, it is proposed to analyse trace metals and metalloids in all samples for both the Inner Port and Outer Channel dredge areas.

The metals/metalloids to be analysed as part of the Project are based on previous studies including all metals/metalloids listed with screening levels in Table 2 of NAGD. Specifically, sediments will be analysed for antimony, arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver and zinc. Furthermore, iron and aluminium will be analysed as a potential normalising elements.

Although cadmium and silver were mostly below detection limits in previous studies, individual exceedances of the NAGD screening level were noted for both metals in the past. It is therefore proposed to include analysis of silver and cadmium for the Project.

3.5.2.2 Organotins

Existing data suggests that the Inner Port area can exhibit elevated organotin concentrations. It is therefore proposed to analyse all samples from the Inner Port dredge area for organotins.

While no exceedance of the screening level at the 95% UCL has been detected in the Outer Channel, individual exceedances of the screening level were also noted for the Outer Channel. It is therefore proposed to analyse all samples for organotins within the Outer Channel dredge area.

3.5.2.3 BTEX

Existing data suggests that BTEX is of low environmental risk in the study area. BTEX has not been detected in the Outer Channel and only once in the Inner Port area in 2005. The last analysis of BTEX is from 2007, i.e. more than five years ago.

The most likely source of potential contamination with BTEX in recent years would be the urban/industrialized area around Cairns. It is therefore proposed to undertake initial analysis at 20% of locations within the Inner Port for BTEX. No analysis for BTEX is proposed for the Outer Channel dredge area. However, should significant[4] concentrations of BTEX be measured for the Inner Port, Outer Channel hold samples will be analysed as well.

3.5.2.4 Total Petroleum Hydrocarbons (TPHs)

Based on existing data, TPHs are classified as having a low environmental risk. Although TPH concentrations greater than 10% of the screening level were occasionally noted for both the Inner Port and Outer Channel, concentrations always remained well below screening level.

The most recent assessment of TPHs in 2012 indicated very low concentrations of TPHs for both the Inner Port and Outer Channel dredge areas with concentrations mostly below the LOR.

[4] Significant = greater 1/10th of the screening level

It is therefore proposed to undertake initial analysis at 20% of locations for the Inner Port. No analysis for TPHs are proposed for the Outer Channel. The remaining samples will be stored as hold samples to be analysed if necessary including Outer Channel samples.

3.5.2.5 Polycyclic Aromatic Hydrocarbons (PAHs)

PAHs were routinely detected in the Inner Port area and in 2008 naphthalene exceeded the screening level in one sample. However, total PAHs concentrations were always well below the screening level. PAHs are therefore considered a low environmental risk for the Inner Port area and it is proposed to undertake initial analysis at 20% of locations within the Inner Port for PAHs.

No analysis for PAHs is proposed for the Outer Channel as these compounds were never detected in this dredge area, including the most recent study undertaken in 2012. However, should significant concentrations of PAHs be measured for the Inner Port, Outer Channel hold samples will be analysed as well.

3.5.2.6 Organochlorine and Organophosphate Pesticides (OCPs and OPPs)

OCPs and OPPs were not detected in the Inner Port and Outer Channel dredge areas. However, OCPs and OPPs were last analysed in 2007, and are therefore not considered current in accordance with NAGD. It is also noted that the State Terms of Reference require analysis for pesticides.

Pesticides levels are considered to represent a low environmental risk within the dredge area based on existing data, with the most likely occurrence of pesticides within the Inner Port. It is therefore proposed to undertake initial analysis at 20% of locations within the Inner Port for OCPs and OPPs, whereas no analysis for pesticides is proposed for the Outer Channel. If significant concentrations of pesticides are measured for the Inner Port, Outer Channel hold samples will be analysed as well.

3.5.2.7 Diuron

Although diuron was routinely detected within the Inner Port, concentrations remained below screening levels in recent years. It is therefore proposed to undertake initial analysis at 20% of locations within the Inner Port for diuron.

Diuron was not detected in the Outer Channel dredge area. Therefore, no diuron analysis is proposed for the Outer Channel. If significant concentrations of diuron are measured for the Inner Port, Outer Channel hold samples will be analysed as well.

3.5.2.8 Perfluorinated Compounds (PFCs)

Based on existing data, PFCs were identified as a low risk to the Ports North dredging areas. Testing in 2013 detected PFCs in only two samples at low concentrations. However, due to the potentially bioaccumulation and biomagnifying effects of PFCs, an initial analysis at 20% of locations within the Inner Port is proposed. Given that the PFC spill occurred recently in January 2013, only the top sediment layer (0-0.5m) will be screened for potential PFC contamination.

No initial analysis of Outer Channel samples is proposed. However, should significant concentrations of PFCs be detected in the Inner Port, 20% of Outer Channel hold samples (top sediment layer) will be analysed as well.

3.5.2.9 Particle Size Distribution

Surface sediments have been well characterised for the Inner Port and Outer Channel dredge areas in terms of particle size distribution (PSD) due to the annual sampling undertaken in the Inner Port and Outer Channel dredge areas.

In order to characterize the sediments along the full profile of the core (to core refusal), the following approach is proposed:

- Field geotechnical core descriptions are undertaken for all cores and provides the main physical characterisation of sediments to be dredged;
- Ten samples from each of the qualitative identified sediment classes (e.g. silts, sands, clay etc.) will be analysed using sieve and sedigraph analysis (10 to 0.001 mm size classes); and
- All surface sediments will be characterised using sieve analysis (down to 0.063 mm) to provide input for the EIS.

3.5.2.10 Nutrients

Nutrient concentrations were relatively consistent over the last decade for both the Outer Channel and Inner Port dredge areas. The sediments in the study area can be considered well characterised with regards to nutrient concentrations. It is, however, noted that assessment of sediment nutrients are requested in the State Terms of Reference.

Given the well characterised nature of sediments in the study area with regards to nutrients and given that no screening levels exist for nutrients under NAGD, it is proposed to analyse nutrients at a representative 20% of locations for both the Inner Port and Outer Channel area. These measurements will be undertaken to confirm nutrient levels with results from previous studies. Nutrient analysis will be restricted to 20% of locations and it is not proposed to keep hold samples for the remaining sampling locations.

3.5.2.11 Acid Sulfate Potential

Assessment of acid sulfate potential is not prescribed under NAGD and it noted that acid sulfate potential would not be an issue should the dredged material be found suitable for unconfined ocean disposal. However, both the federal EIS guidelines and State Terms of Reference require an assessment of acid sulfate potential. It is also noted that existing sediment studies did not include assessment of acid sulfate potential, so no existing data is available.

It is therefore proposed that acid sulfate potential be analysed in all samples for both the Outer Channel and Inner Port dredge areas. The sampling frequency prescribed in NAGD does not strictly meet requirements of the Acid Sulfate Soils guidelines (Ahern et al. 1998) or the *State Planning Policy 2/02 – Guideline Acid sulfate soil*. More detailed assessment of acid sulfate potential may be required in the unlikely event that the dredged material will be classified as unsuitable for ocean disposal.

3.5.2.12 Not Included Contaminants

Contaminants such as cyanide, phenols, volatile chlorinated hydrocarbons and PCBs have not been detected in the study area. It is therefore not considered warranted that these contaminants are analysed as part of the Project.

Furthermore, it is not proposed to analyse for radionuclides, given that no source for radionuclides exists in the study area and catchment (e.g. mineral sand mining and handling).

It is also not proposed to analyse for dioxins/furans. The potential need to test for these compounds was assessed as part of the 2005 SAP development and it was agreed that testing for dioxins/furans was not warranted. There is no indication that dioxins may have been introduced to the ecosystem in recent years.

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). The National Measurement Institute (NMI) 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

In accordance with the SAP, all samples will be analysed for the contaminants listed in Table 3-5. 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 3-5).

Table 3-5 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
BTEX	200 µg/kg	200 µg/kg

Parameter	Target Practical Quantitation Limit (required)	Practical Quantitation Limit (Advanced Analytical Australia)
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
Trace Metals and Metalloids (antimony, arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, zinc, iron)	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/OPP Pesticides	OPP- 10–100 µg/kg; OCP-1 µg/kg	OPP- 20 µg/kg; OCP-1 µg/kg
Diuron	1 µg/kg (literature derived)	1 µg/kg
Total Nitrogen Total Kjeldahl Nitrogen Nitrate & Nitrite as N Ammonia Total Phosphorus	N/A N/A 0.1 mg/kg 0.1 mg/kg N/A	20 mg/kg 20 mg/kg 0.1 mg/kg 0.1 mg/kg 1 mg/kg
Acid Sulfate Soils	N/A	2 mole H^+/tonne

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 NMI 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 interested 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 NMI adopts specific recovery limits for individual compounds.

3.7 Data Analysis

3.7.1 Sediment Contaminants

Concentrations of chemicals measured in sediment samples will be compared to screening levels listed in Table 2 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) will be compared against NAGD guideline levels. This involves the following steps.

1. 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.

2. 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).

3. 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 Screening Levels

In general, all contaminant concentrations will be compared against the screening levels outlined in Table 2 of NAGD. Some exceptions would apply as follows.

Comparison of arsenic concentrations would be compared against the local screening level of 30 mg/kg. The modification of the arsenic screening level was based on more than a decade of arsenic data (total, elutriate and dilute acid extraction) demonstrating the low bioavailability of arsenic and evidence showing that elevated arsenic concentrations are caused by local mineralogy (refer Section 2.2.2).

NAGD does not specify a screening level for the herbicide diuron. Diuron concentrations will be compared against the literature derived screening level of 2 µg/kg that was adopted in all previous studies (refer Section 2.2.5.2).

It is noted that the screening level for the organochlorine pesticides chlordane (0.5 µg/kg) and lindane (0.32 µg/kg) are less than the PQL (1 µg/kg) achievable by any laboratory. In accordance with NAGD, reporting for these two pesticides will be either as 'detected' or 'not detected'.

Given the absence of sediment screening levels for PFCs in NAGD, concentrations of PFC's will be compared against a literature derived screening level. Assessment of findings would be interpreted in context of published references on ecological health, industry published information, and outcomes of investigations by the operator and QLD EHP compiled to date, where applicable.

3.7.3 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. It is noted that four locations from within the DMPA and two locations in the vicinity of the DMPA have been sampled on an annual basis in previous years. This dataset would be used to derive ambient baseline concentrations if required.

3.7.4 Elutriate and Bioavailability Testing

If concentrations of contaminants exceed the NAGD screening levels, Phase III testing would be required as per NAGD including elutriate and bioavailability testing.

Table 7 of NAGD will be used to determine the minimum required sampling locations for potential elutriate and bioavailability testing. In accordance with NAGD requirements, sampling locations for elutriate and bioavailability testing will be representative of the overall dredged material composition in the dredge area(s) which require these tests. Alternatively, if a defined sub-area of the dredge area has been selected for testing on the basis of elevated contamination levels, samples will be representative of this sub-area, including the most contaminated locations. Furthermore, samples for elutriate and bioavailability testing will be representative of the full depth of contaminated sediment as identified in the Phase II testing, except where a discrete 'hot spot' layer has been identified, which would be sampled separately.

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 would 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.

3.7.5 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.

3.8 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 3-6.

Table 3-6 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

3.9 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 Inner Port and Outer Channel 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.

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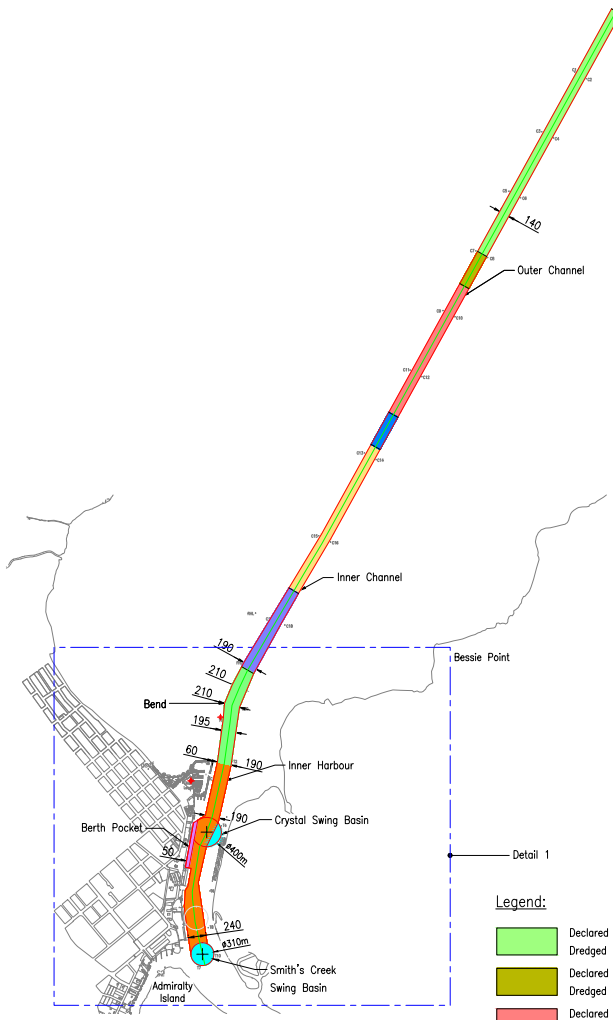
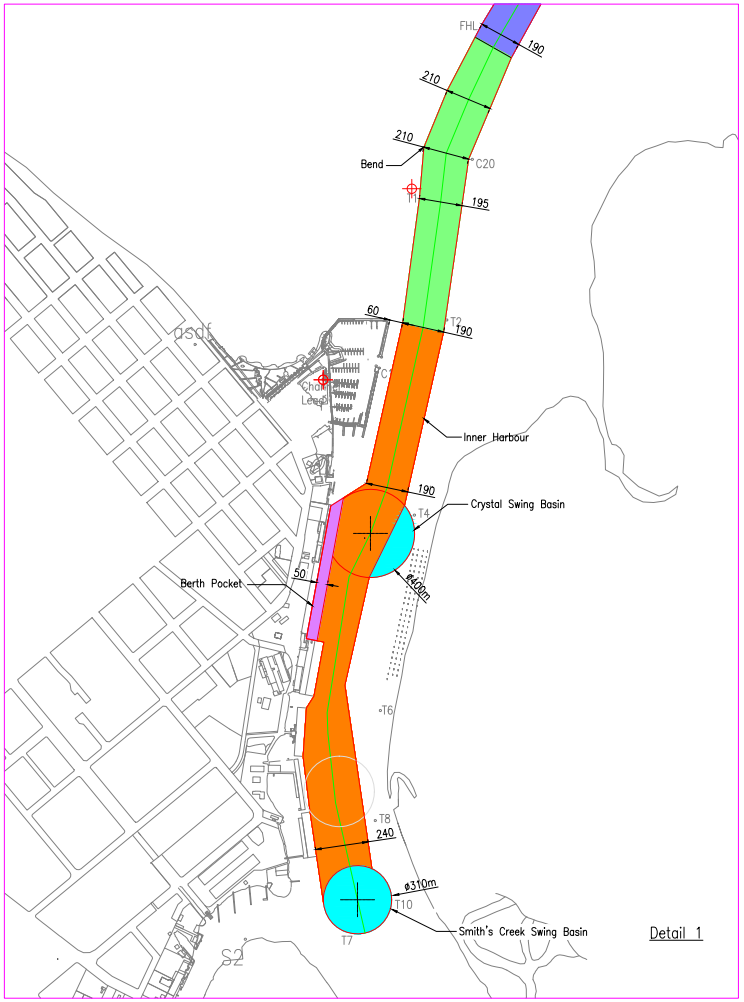
Worley Parsons (2013) Port of Cairns Maintenance Dredging: 2013 – Sediment Characterisation Report and Introduced Marine Pest Survey Report. Report prepared for Ports North.

APPENDIX A: DETAILED DREDGE DESIGN



General Layout – Channel B



Legend:

- Declared Depth = −9.40m LAT; Dredged Depth = −9.90m LAT
- Declared Depth = −9.40m LAT; Dredged Depth = −10.30m LAT
- Declared Depth = −9.40m LAT; Dredged Depth = −11.10m LAT
- Declared Depth = −9.40m LAT; Dredged Depth = −10.60m LAT
- Declared Depth = −9.40m LAT; Dredged Depth = −10.10m LAT
- Declared Depth = −9.40m LAT; Dredged Depth = −11.10m LAT
- Declared Depth = −9.40m LAT; Dredged Depth = −9.70m LAT
- Declared Depth = −9.40m LAT; Dredged Depth = −9.70m LAT
- Declared Depth = −9.30m LAT; Dredged Depth = −9.60m LAT
- Declared Depth = −8.00m LAT; Dredged Depth = −8.30m LAT

Issue	Date	By	Chkd	Appd
Navy expansion.	G	23/05/12	JCL	JO	GL
Revised depths and layout.	F	28/03/12	JCL	JO	GL
Updated layout for ship simulation.	E	20/02/12	JCL	JO	GL
Not issued - used for quantity calculation.	D	16/01/12	JCL	JO	GL
Design optimised post ship simulation.	C	29/11/11	JCL	JO	GL
Coordinates B07, B22 and B23 changed. All coordinates provided in Table. Channel and Swing Basin details shown.	B	22/10/11	JCL	JO	GL

Client: Ports North
Cnr Grafton & Hartley Streets
(PO Box 594)
Cairns, QLD, 4870

Job Title: Cruise Shipping Development Strategy

Scale at A1: 1:30, 1:10

Plot ID: 57C1A512-691A-4CA6-B0B8-71227C7EE908

ARUP
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Ove Arup Pty Ltd
ABN 18 000 966 165

Drawing Title: Shipping Channel - Channel B General Arrangement (Navy Expansion Option A)

Drawing Status: For Information

Job No	Drawing No	Issue
222368	002	G

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J:\222000\222368-00 Cairns Cruise Shipping Development Strategy\Drawings\Shipping Channel - Channel B-Rev G (Navy A) Aug 24 May 2012 09:47:30

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Appendix B Supplementary Sampling Plan

Australian Government
Great Barrier Reef
Marine Park Authority

Mr Alan Vico
General Manager
Planning and Projects
Ports North
PO Box 594
CAIRNS QLD 4870

REF: 17/2396

Dear Mr Vico

RE: CAIRNS SHIPPING DEVELOPMENT PROJECT EIS SUPPLEMENTARY SAMPLE AND ANAYSIS PLAN (SAP) GBRMPA REFERENCE: 17/2396

Thank you for your letter dated 16 May 2014 which addresses comments made by GBRMPA in relation to your Supplementary Sampling and Analysis Plan (SAP). The letter and attachments have been reviewed.

The SAP for the Cairns Shipping Development Project EIS is approved for implementation.

If you have any further questions regarding the SAP or other permit application matters, please contact Nicholas Baker on (07) 4750 0836 or email nicholas.baker@gbrmpa.gov.au.

Yours sincerely

Rean Gilbert
Manager Ports and Shipping

23 May 2014

cc: Chris Murphy
Department of the Environment

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Our Ref: L.B20180.011.Supplementary SAP_Rev2

15 May 2014

Ports North
Cnr Grafton and Hartley Streets
CAIRNS QLD 4870

Attention: Alan Vico

RE: SUPPLEMENTARY SAMPLING AND ANALYSIS PLAN FOR THE CAIRNS SHIPPING DEVELOPMENT PROJECT EIS

Dear Alan,

This letter responds to comments provided by the Great Barrier Reef Marine Park Authority (GBRMPA) in their letter to Ports North dated 19 February 2014 (Reference 17/2396), and subsequent letter dated 2 May 2014 (Reference 17/2396).

1 Initial Sediment Core Sampling

1.1 Adequacy of the Core Sampling

Sediment core sampling for the Inner Port and Outer Channel dredge areas was undertaken between 18 and 23 October 2013 by Geochemical Assessments. Table 2-1 provides a summary of the initial core sampling including:

- Target coring depths as per the approved Sampling and Analysis Plan (SAP);
- Achieved coring depths during actual sampling;
- Reason for core refusal (if any) as provided in sediment core logs;
- Initial pilot study analysis for diuron (and other organic contaminants) for the Inner Port including subsample analysis; and
- Additional grab sampling undertaken for further diuron characterisation.

Within the Outer Channel dredge area 17 out of 30 locations were sampled down to the target depth. For the Inner Port dredge area, 14% or two out of 14 locations were sampled down to the target depth.

It is evident from the information in Table 2-1 that the reasons for core refusal at the other locations were the presence of stiff clays or hard material such as rocky or gravelly substrate. As outlined in the approved SAP (Section 3.3.2) one of the acceptance criteria for a sediment core is that '*the core must reach the depth of dredging, or core refusal in clay, dense sand or rock*'.

It is noted in the National Assessment Guidelines for Dredging 2009 (NAGD) that natural geological materials such as rocky substrate or stiff clays are generally not considered contaminated (pg. 58 of NAGD). It is also noted that current coring techniques are generally not capable of penetrating such

materials. Furthermore, multiple coring attempts were undertaken at most locations were core refusal was encountered.

The initial core sampling is therefore considered adequate and in full compliance with the approved SAP and the NAGD.

2 Additional Grab Sampling

The initial data analysis for the Inner Port dredge area indicated that no further testing of hold samples would be required for most 'low risk' contaminants with the exception of diuron. A detailed summary of the diuron testing to date is provided in our letter dated 02 January 2014 (L.B20180.009.Diuron Status.docx). Given that no hold samples were available from the initial sampling, additional sampling was required. The additional sampling was undertaken using a Van Veen grab sampler.

2.1 Inner Port Grab Sampling

Initial analysis for diuron and other organic contaminants in the Inner Port dredge area was undertaken at 10 out of 14 locations. A total of 16 subsamples were analysed for diuron down to 2.9m sediment depth (Table 2-1). The core penetration depths for the remaining four locations (F156, G155, H160 and H162) were between 0m and 0.15m. Fragments of sediment on the core barrel were used for analysis at one location (H162) and a grab sample was taken by Geotechnical Assessments at another location (F156) due to the inability to obtain a sediment core.

Given that core refusal on stiff clays or rocky material occurred at shallow sediment depths for these four locations despite multiple coring attempts, the additional grab sampling at these locations was appropriate. It is also considered that an adequate characterisation of the potentially contaminated shallow surface sediments (less than 0.15m deep) was undertaken for the Inner Port sediments using grab sampling.

Whilst it is considered that an appropriate characterisation of sediment quality has been undertaken for the Inner Port dredge sediments in accordance with the SAP and in full compliance with the NAGD guidelines, in general accordance with GBRMPA's request by letter dated 2 May 2014, additional grab sampling and testing for diuron will be undertaken at Inner Port sites[1] H167, K167, M180, & P180 where the initial core depths were less than 0.3m. Should it not be possible to achieve a representative grab sample at these sites (due to the stiffness of the surface material), then a 'clay plug' will be taken at the site (where practicable) and tested for diuron.

To verify the assumption that the underlying consolidated material below core refusal is uncontaminated for diuron, samples of the consolidated underlying material ('clay plugs') will be taken and tested at sites G155, I172, H165, H167 & M180 where practicable. (Note: It may not be possible to collect clay plug samples at these five locations should the underlying material be very stiff / hard. Should this be the case, alternative locations will be chosen).

Following additional sampling and re-testing, a revised statistical analysis of the Inner Port sediment quality data will be undertaken which includes all sample test results (including additional grab and 'clay plug' test results). The revised mean normalised concentration of diuron at the 95% confidence level for the Inner Port samples will be compared to the diuron screening level to determine if the material is

[1] GBRMPA letter dated 2 May 2014 suggested that sites H165 and U187 should also be grab sampled; however these sites have already been sampled using a grab during initial sampling.

suitable for unconfined disposal as per the NAGD guidelines for all investigated contaminants (including diuron).

2.2 Outer Channel Grab Sampling

In accordance with the SAP analysis of diuron was undertaken at an additional 20% of sampling locations (i.e. six locations) from the Outer Channel dredge area with a focus on sampling locations close to the Inner Port dredge area. Additional sampling using a grab sampler was undertaken at six locations (A140, C146, D147, D149, F150 and A138) for analysis of diuron (Table 2-1).

Five of the six locations had shallow core refusal due to stiff clays or rocky substrate in the initial core sampling, with a maximum core penetration of 0.27m sediment depth. The only exception was location F150 where a core sample down to 0.8m sediment was collected in the initial sampling. It is therefore considered that the additional grab sampling at the five locations A140, C146, D147, D149, and A138 was appropriate for an adequate characterisation of shallow surface sediments (less than 0.27m deep) for diuron in accordance with the NAGD guidelines.

Location F150 will be re-sampled using a vibrocorer as part of additional core sampling proposed to be undertaken for the Outer Channel dredge area (refer Section 3).

Table 2-1 Initial Core Sampling and Supplementary Grab Sampling

#	Borehole	Easting (m)	Northing (m)	Depth (m LAT)	Dredge Depth (m LAT)	Target Coring Depth (m)	Achieved Coring Depth (m)	Unsampled (m)	Reason for Core Refusal	Initial analysis for diuron	Additional Grab Sampling
Outer Channel											
1	B2	375831.31	8139337.38	-8.9	-9.9	1	0.55	0.45	multiple core attempts, refusal at 'sandier (gravel) mud layer	-	-
2	B7	375649.43	8139008.14	-8.9	-9.9	1	0.95	0.05	N/A	-	-
3	B9	375576.67	8138876.48	-8.9	-9.9	1	0.7	0.3	Gravelly sandy mud	-	-
4	B25	374994.6	8137823.11	-8.9	-9.9	1	0.3	0.7	stiff clay	-	-
5	B41	374412.48	8136769.73	-9	-9.9	0.9	0.9	0	N/A	-	-
6	B54	373939.62	8135913.81	-9.2	-10.3	1.1	1.1	0	N/A	-	-
7	B74	373212.06	8134597.05	-9.1	-11.1	2	2	0	N/A	-	-
8	B79	373030.16	8134267.87	-9.3	-11.1	1.8	1.8	0	N/A	-	-
9	B104	372120.64	8132622.01	-9	-10.1	1.1	0.95	0.15	Multiple core attempts	-	-
10	B108	371975.13	8132358.66	-8.8	-10.1	1.3	1.2	0.1	N/A	-	-
11	C22	375169.89	8137984.37	-9	-9.9	0.9	0.9	0	N/A	-	-
12	C29	374915.18	8137523.56	-9.1	-9.9	0.8	0.8	0	N/A	-	-
13	C30	374878.81	8137457.74	-8.9	-9.9	1	1	0	N/A	-	-
14	C50	374151.25	8136141.01	-8.7	-9.9	1.2	1.2	0	N/A	-	-
15	C53	374042.16	8135943.52	-9.4	-10.3	0.9	0.9	0	N/A	-	-
16	C72	373350.95	8134692.6	-8.9	-11.1	2.2	2.1	0.1	N/A	-	-
17	C82	372987.15	8134034.15	-9.3	-11.1	1.8	1.67	0.13	stiff silty clay	-	-
18	C94	372550.66	8133244.14	-9.1	-10.1	1	1	0	N/A	-	-
19	C99	372368.68	8132914.96	-9.3	-10.1	0.8	0.8	0	N/A	-	-
20	B63	373612.13	8135321.32	-9.1	-11.1	2	1.5	0.5	stiff clay	-	-
21	A140	370744.89	8130287.97	-8	-9.7	1.7	0.26	1.44	stiff clay	-	Grab

#	Borehole	Easting (m)	Northing (m)	Depth (m LAT)	Dredge Depth (m LAT)	Target Coring Depth (m)	Achieved Coring Depth (m)	Unsampled (m)	Reason for Core Refusal	Initial analysis for diuron	Additional Grab Sampling
22	C146	370658.94	8129820.61	-9	-9.7	0.7	0.25	0.45	multiple core attempts, sandy (muddy) gravel	-	Grab
23	D147	370688.75	8129718.56	-9.1	-9.7	0.6	0.05	0.55	multiple failed core attempts, weathered rock, grab sample taken	-	Grab
24	D149	370615.96	8129586.88	-9.3	-9.7	0.4	0.15	0.25	multiple core attempts, gravelly clay	-	Grab
25	F150	370711.93	8129448.72	-6.6	-9.7	3.1	0.8	2.3	stiff clay	-	Grab
26	A127	371217.8	8131143.87	-8.2	-10.6	2.4	1.7	0.7	stiff silty clay	-	-
27	A138	370817.58	8130419.76	-8.4	-9.7	1.3	0.27	1.03	stiff clay	-	Grab
28	B130	371174.81	8130910.25	-10.1	-10.6	0.5	0.5	0	N/A	-	-
29	C119	371641.11	8131598.24	-9.9	-10.1	0.2	0.2	0	N/A	-	-
30	C121	371568.42	8131466.56	-9.8	-10.6	0.8	0.8	0	N/A	-	-
Inner Port											
31	F156	370493.67	8129053.68	-9.3	-9.7	0.4	0.05	0.35	multiple failed coring attempts, stiff orange clay underlying gravel, grab sample taken	-	Grab
32	G155	370596.17	8129083.3	-7.5	-9.7	2.2	0.15	2.05	several coring attempts, stiff clay, possibly weathered rock	-	Grab
33	H160	370480.5117	8128717.884	-9	-9.7	0.7	0.04	0.66	stiff clay	-	Grab
34	H162	370407.7256	8128586.211	-9.3	-9.7	0.4	0	0.4	stiff clay, corer no penetration, fragments on core barrel used for analysis	-	Grab
35	H165	370298.6001	8128388.801	-9.4	-9.7	0.3	0.2	0.1	rocks and clay (grab sample taken)	0-0.2	N/A
36	H167	370225.8223	8128257.118	-9.1	-9.7	0.6	0.2	0.4	stiff clay	0-0.2	N/A

#	Borehole	Easting (m)	Northing (m)	Depth (m LAT)	Dredge Depth (m LAT)	Target Coring Depth (m)	Achieved Coring Depth (m)	Unsampled (m)	Reason for Core Refusal	Initial analysis for diuron	Additional Grab Sampling
37	I162	370473.882	8128550.098	-7.3	-9.7	2.4	0.33	2.07	multiple coring attempts, stiff clay	0-0.13, 0.13-0.33	N/A
38	J164	370467.2523	8128382.202	-7.5	-9.7	2.2	1.02	1.18	stiff silty clay	0-0.5, 0.5-1.02	N/A
39	K167	370424.2832	8128148.47	-7.6	-8.3	0.7	0.25	0.45	stiff silty clay	0-0.25	N/A
40	M180	370083.7793	8127220.229	-9.3	-9.7	0.4	0.2	0.2	hard substrate	0-0.2	N/A
41	P180	370282.2238	8127111.691	-9.4	-9.7	0.3	0.05	0.25	stiff clay	0-0.05	N/A
42	U185	370431.185	8126601.525	-5.4	-8.3	2.9	2.9	0	N/A	0-0.5, 0.5-1.0, 1.0-1.5, 2.5-2.9	N/A
43	U187	370358.4154	8126469.842	-8.2	-8.3	0.1	0.1	0	N/A (grab sample taken)	0-0.1	N/A
44	I172 (additional)	370103	8127904	-8.4	-9.6	1.2	1.06	0.14	stiff clay	0-0.5, 0.5-1.0	N/A

3 Additional Core Sampling – Outer Channel

In accordance with the approved SAP, the detection of diuron at concentrations exceeding 10% of the screening level for two Outer Channel locations (D149 and F150) would require diuron analysis from the remaining Outer Channel locations.

A total of 25 locations will be resampled including the remaining 24 locations previously not analysed for diuron and location F150 where the grab sampling did not characterise the deeper sediment layers (refer Section 2.2).

Specifically, all Outer Channel locations outlined in Table 2-1 with the exception of locations A140, C146, D147, D149, and A138 will be resampled and analysed for diuron.

3.1 Sampling Methodology

3.1.1 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.

3.1.2 Sediment Core Sampling

Sediment cores will be obtained using a vibrocorer or other suitable coring devices down to the required depths or to refusal.

The acceptability of each sediment core will be determined immediately following collection, and the criteria for acceptance of the core will include:

- No obvious loss of surficial sediment;
- The core must have entered the profile vertically;
- There must be no gaps in the stratigraphy;
- There must be no disturbance of the sediment stratigraphy; and
- The core must reach the required depth (0.5 m below dredge depth), or core refusal in clay, dense sand or rock.

3.1.3 Grab Sampling

While grab sampling should only be necessary if it is not be possible to achieve a representative sample in shallow sediments by the proposed coring, as per GBRMPA request by letter dated 2 May 2014, grab samples of sediment will be taken and tested for diuron should the core sample depth (to refusal) be less than 0.3m.

3.1.4 Sediment Core Subsampling

Subsampling at all sample locations for total (whole) sediment analyses will be in accordance with NAGD requirements. Sediment will be collected in 0.5 m intervals in the upper one metre of the core, followed by a composite subsample from 1.0 m to the end of the core if the depth of dredging exceeds 1.0 m at the sample location (i.e. 0 to 0.5 m - Sample 1; 0.5 to 1.0 m - Sample 2; 1.0 m to the end of the core, which

represents the entire thickness of sediment proposed for dredging at each core location or the depth of core refusal - Sample 3).

3.1.5 Sample Handling and Chain of Custody

Sample management procedures will include the careful collection of sediment samples from the core tube, following the recovery of the sediment core from the seabed.

Photographs of the cores will be taken and field personnel will log each core profile for its physical characteristics and variations in sediment type and texture. All sediment cores will be geotechnically logged upon collection on a standardised pro-forma.

The core length will be measured and the appropriate sample interval subsampled and collected in a clean, stainless steel bowl for homogenization prior to the filling of analytical laboratory-supplied clean sampling jars.

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 core sample.

Utmost care will be maintained in ensuring that cross-contamination between samples is not possible. Samples collected from each interval 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.

The chilled samples will be submitted to the laboratory under appropriate Chain of Custody documentation to ensure that the sample possession and processing can be traced from sample collection to reporting of results.

3.2 Laboratory Analysis

3.2.1 Analytical Parameters

All subsamples will be analysed for:

- Herbicide diuron; and
- Total organic carbon (for normalisation of diuron concentrations to 1% TOC).

3.2.2 Analytical Laboratory

The analysis of diuron and TOC will be undertaken by Advanced Analytical Australia who is fully accredited by the National Association of Testing Authorities (NATA) for the required analyses.

3.3 Data Analysis

3.3.1 Diuron Analysis

Concentrations of diuron measured in sediment samples will be normalised to 1% TOC (if detected above the Limit of Reporting). The mean normalised concentration of diuron at the upper 95% confidence level (95% UCL) will be compared against the literature derived screening level of 2.0 µg/kg 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.

The statistical analysis will follow the approach given in Appendix A of NAGD.

Yours Faithfully
BMT WBM

Dr Markus Billerbeck
Senior Environmental Scientist

Appendix C Core Logs – SAP

GEOCHEMICAL ASSESSMENTS

SEDIMENT CORE LOG

Sheet 1 of 1

Core ID/No: C119

CLIENT:	Arup/BMT WBM	DATE:	18 October 2013 12:20
PROJECT:	Cairns ShippingDevelopment Project	CORING METHOD:	PISTON
AREA:		LOCATION:	
LOGGED BY:	S.Taylor WD = 11.0m	CORE LENGTH (m):	0.2 m

Hydrous Layer: 0.01m

Subsurface sediments: mud

Depth (m)	Graphic Log	Description Texture, colour/mottling, sand and gravel components	Consistency	Colour	Subsampling	Field Records/Comments
		mud 0.01	V.Soft			FINE ORGANIC FIBRES ON SURFACE
0.1		mud				Grey, with darker anoxic patches
			Soft			
0.2						
		FROM 0.2m				
						TRIPLICATE LOCATION
						CORES C119 C119A C119B

GEOCHEMICAL ASSESSMENTS

SEDIMENT CORE LOG

Sheet 1 of 1

Core ID/No: B130

CLIENT:	Arup/BMT WBM	DATE:	18 October 2013 14:00
PROJECT:	Cairns ShippingDevelopment Project	CORING METHOD:	Piston
AREA:		LOCATION:	
LOGGED BY:	S.Taylor WD = 9.1	CORE LENGTH (m):	0.80m

Hydrous Layer:

Subsurface sediments:

Depth (m)	Graphic Log	Description Texture, colour/mottling, sand and gravel components	Consistency	Colour	Subsampling	Field Records/Comments
		Hydrous Mud	V. soft			Light grey.
0.1						
0.2		Mud				
0.3			Soft			Grey Nil sand
0.4		Sandy layer 0.0005m Mud				
0.5						
		Mud	Soft			Nil sand
0.6						Some darker anoxic patches
0.7		Mud	Firm			Sampled 0 – 0.5m
0.8						
						QAQC 1 = 0 – 0.5m

GEOCHEMICAL ASSESSMENTS

SEDIMENT CORE LOG

Sheet 1 of 1

Core ID/No: A138

CLIENT:	Arup/BMT WBM	DATE:	18 October 2013 14:15
PROJECT:	Cairns ShippingDevelopment Project	CORING METHOD:	PISTON
AREA:		LOCATION:	
LOGGED BY:	S.Taylor WD = 8.7 m	CORE LENGTH (m):	0.27 m

Hydrous Layer:

Subsurface sediments:

Depth (m)	Graphic Log	Description Texture, colour/mottling, sand and gravel components	Consistency	Colour	Subsampling	Field Records/Comments
						GRAVEL, SHELLS AND SHELL FRAGMENTS
0.1		SAND FILLED CRACKS CLAY	STIFF			PALE GREY
0.2		BARK FROM TREE	VERY STIFF			
0.3		0.27m ROM				Sample 0 – 0.27m
		2 coring attempts No fine sediment				

GEOCHEMICAL ASSESSMENTS

SEDIMENT CORE LOG

Sheet 1 of 1

Core ID/No: A 140

CLIENT:	Arup/BMT WBM	DATE:	18 October 2013 14:30
PROJECT:	Cairns ShippingDevelopment Project	CORING METHOD:	
AREA:		LOCATION:	
LOGGED BY:	S.Taylor WD = 8.5m	CORE LENGTH (m):	0.26 m

Hydrous Layer:

Subsurface sediments:

Depth (m)	Graphic Log	Description Texture, colour/mottling, sand and gravel components	Consistency	Colour	Subsampling	Field Records/Comments
		Sandy gravelly clay	FIRM			0.03m Grey
0.1		CLAY	STIFF			Green/grey
0.2						Some pieces of bark/roots
		EOH 0.26m				
						One sample 0–0.26

GEOCHEMICAL ASSESSMENTS

SEDIMENT CORE LOG

Sheet 1 of 1

Core ID/No: D 149

CLIENT:	Arup/BMT WBM	DATE:	18 October 2013 14:50
PROJECT:	Cairns ShippingDevelopment Project	CORING METHOD:	
AREA:		LOCATION:	
LOGGED BY:	S.Taylor WD 10.1m	CORE LENGTH (m):	0.15m

Hydrous Layer:

Subsurface sediments:

Depth (m)	Graphic Log	Description Texture, colour/mottling, sand and gravel components	Consistency	Colour	Subsampling	Field Records/Comments
		Gravelly Clay				Grey/orange Large rocks to 8cm Abundant Shells
		EOH 0.15m				
						Multiple core attempts Insufficient sample for grainsize

GEOCHEMICAL ASSESSMENTS

SEDIMENT CORE LOG

Sheet 1 of 1

Core ID/No: C146

CLIENT:	Arup/BMT WBM	DATE:	18 October 2013 16:00
PROJECT:	Cairns ShippingDevelopment Project	CORING METHOD:	
AREA:		LOCATION:	
LOGGED BY:	S.Taylor WD = 9.7 m	CORE LENGTH (m):	0.25

Hydrous Layer:

Subsurface sediments:

Depth (m)	Graphic Log	Description Texture, colour/mottling, sand and gravel components	Consistency	Colour	Subsampling	Field Records/Comments
		Gravel				Abundant shells to 4cm dia
0.1		Sandy (muddy) Gravel				Quartz = sand
0.2						
		0.25m EOH				
0.3						one sample 0 – 0.25
						Multiple core attempts

GEOCHEMICAL ASSESSMENTS

SEDIMENT CORE LOG

Sheet 1 of 1

Core ID/No: D147

CLIENT:	Arup/BMT WBM	DATE:	18 October 2013 16:15
PROJECT:	Cairns ShippingDevelopment Project	CORING METHOD:	Grab
AREA:		LOCATION:	
LOGGED BY:	S.Taylor WD = 10.5 m	CORE LENGTH (m):	0.05

Hydrous Layer:

Subsurface sediments:

Depth (m)	Graphic Log	Description Texture, colour/mottling, sand and gravel components	Consistency	Colour	Subsampling	Field Records/Comments
0.00		Gravel, tr sand				Clasts of weathered Shale Shells Buff / light grey.
		0.05				
						multiple failed coring attempts on weathered rock(?)

GEOCHEMICAL ASSESSMENTS

SEDIMENT CORE LOG

Sheet 1 of 1

Core ID/No: B2

CLIENT:	Arup/BMT WBM	DATE:	19 October 2013 8:10am
PROJECT:	Cairns ShippingDevelopment Project	CORING METHOD:	PISTON
AREA:		LOCATION:	
LOGGED BY:	S.Taylor WD = 12.2 m	CORE LENGTH (m):	0.55

Hydrous Layer: Mud

Subsurface sediments: (Sandy) Mud

Depth (m)	Graphic Log	Description Texture, colour/mottling, sand and gravel components	Consistency	Colour	Subsampling	Field Records/Comments
		0.02				
			Firm			Bioturbation = worm burrows
0.1		Mud				
0.2		Mud				grey / green
			F. Hr			
0.3		Sandier 0.25 – 0.35				
0.4		Mud				grey / green
		Sandier (gravel) Mud	Stiff			Some shells and echinoderms
		0.55m				
						One sample 0 - 0.55
						multiple core attempts
						refusal and firm / stiff base.

GEOCHEMICAL ASSESSMENTS

SEDIMENT CORE LOG

Sheet 1 of 1

Core ID/No: B7

CLIENT:	Arup/BMT WBM	DATE:	19 October 2013 08:25
PROJECT:	Cairns ShippingDevelopment Project	CORING METHOD:	PISTON
AREA:		LOCATION:	
LOGGED BY:	S.Taylor WD = 12.1	CORE LENGTH (m):	0.95

Hydrous Layer: 0.02 Brown Mud

Subsurface sediments: Mud

Depth (m)	Graphic Log	Description (Texture, colour/mottling, sand and gravel components)	Consistency	Colour	Subsampling	Field Records/Comments
		SANDY MUD	SOFT			STARFISH
		SANDY MUD	FIRM			occasional shell
0.1						Grey
		MUD				occasional shell to 2.5cm dia.
0.2		SANDY PATCHES.	FIRM			
						Grey
0.3		Mud	SOFT			
0.4			FIRM			Grey
0.5		Mud				
		SANDY PATCHES				Sand composed of fine shell fragments.
						Grey
		Mud	STIFF			
						Grey
		Mud				
0.9			STIFF			2 samples 0-0.5 0.5-0.95
		EOH 0.95				

GEOCHEMICAL ASSESSMENTS

SEDIMENT CORE LOG

Sheet 1 of 1

Core ID/No: B9

CLIENT:	Arup/BMT WBM	DATE:	19 October 2013 08:45
PROJECT:	Cairns ShippingDevelopment Project	CORING METHOD:	PISTON
AREA:		LOCATION:	
LOGGED BY:	S.Taylor WD = 11.7	CORE LENGTH (m):	0.70

Hydrous Layer: 0.01m Brown

Subsurface sediments: Mud

Depth (m)	Graphic Log	Description (Texture, colour/mottling, sand and gravel components)	Consistency	Colour	Subsampling	Field Records/Comments
		Mud	Firm			Brown. Grey
		(Sandy) Mud	Firm			Sand composed of fine shell fragments.
			Firm			Grey
		(Sandy) Mud	Firm			
			Soft			Grey
0.5		Gravelly sandy mud 0.5–0.6m	Firm			0.5 Gravel sized shells. Grey
			Firm			
		EOH 0.70m				Very good core very firm refusal on stiff material. 2 samples 0–0.5, 0.5–0.70

GEOCHEMICAL ASSESSMENTS

SEDIMENT CORE LOG

Sheet 1 of 1

Core ID/No: C22

CLIENT:	Arup/BMT WBM	DATE:	19 October 2013 09:30
PROJECT:	Cairns ShippingDevelopment Project	CORING METHOD:	PISTON
AREA:		LOCATION:	
LOGGED BY:	S.Taylor WD = 10.9	CORE LENGTH (m):	1.10m

Hydrous Layer: Brown 0.02m

Subsurface sediments: Mud

Depth (m)	Graphic Log	Description Texture, colour/mottling, sand and gravel components	Consistency	Colour	Subsampling	Field Records/Comments
		Mud.	Soft			Brown
0.2		Mud				Dark grey Massive
0.4						nil sand
					0.5	
0.6		Mud	Firm			Dark grey Massive, fenestrales
0.8						
					0.9	Dark grey
1.0		Mud.	Firm			NOT SAMPLED
		EOH 1.10m				

GEOCHEMICAL ASSESSMENTS

SEDIMENT CORE LOG

Sheet 1 of 1

Core ID/No: C29

CLIENT:	Arup/BMT WBM	DATE:	19 October 2013 10:30
PROJECT:	Cairns ShippingDevelopment Project	CORING METHOD:	PISTON
AREA:		LOCATION:	
LOGGED BY:	S.Taylor WD = 10.2	CORE LENGTH (m):	1.07

Hydrous Layer: 0.4m Brown hydrous

Subsurface sediments: Mud.

Depth (m)	Graphic Log	Description Texture, colour/mottling, sand and gravel components	Consistency	Colour	Subsampling	Field Records/Comments
		0.04	FIRM			
0.2			SOFT			Grey Massive
0.4		Mud				
					0.5	
0.6		0.6 Sandy mud	FIRM			
0.8		0.8			0.8	
		Mud	STIFF			
1.0		Sandy patches				NOT SAMPLED
		FOR 1.07m				
1.1						2 samples 0-0.5 0.5-0.8

GEOCHEMICAL ASSESSMENTS

SEDIMENT CORE LOG

Sheet 1 of 1

Core ID/No: B25

CLIENT:	Arup/BMT WBM	DATE:	19 October 2013 09:45
PROJECT:	Cairns ShippingDevelopment Project	CORING METHOD:	PISTON
AREA:		LOCATION:	
LOGGED BY:	S.Taylor WD = 10.8	CORE LENGTH (m):	0.3

Hydrous Layer:

Subsurface sediments:

Depth (m)	Graphic Log	Description Texture, colour/mottling, sand and gravel components	Consistency	Colour	Subsampling	Field Records/Comments
0.1		Mud to sand	Soft			Dark grey
0.2		CLAY	STIFF — V. STIFF			0.2 Orange
0.3		FROM 0.3m				

GEOCHEMICAL ASSESSMENTS

SEDIMENT CORE LOG

Sheet 1 of 1

Core ID/No: C30

CLIENT:	Arup/BMT WBM	DATE:	19 October 2013 11:45
PROJECT:	Cairns ShippingDevelopment Project	CORING METHOD:	PISTON
AREA:		LOCATION:	
LOGGED BY:	S.Taylor WD = 10.1 m	CORE LENGTH (m):	1.16

Hydrous Layer:

Subsurface sediments:

Depth (m)	Graphic Log	Description Texture, colour/mottling, sand and gravel components	Consistency	Colour	Subsampling	Field Records/Comments
		Mud				brown
			V. Soft			
0.2						Grey, massive
		Mud.	Soft			
0.4						
					0.5	
0.6		Mud.				Grey, massive
			Soft			
0.8						
		Mud	Soft			
1.0						
			Firm			Abundant rescilles.
1.1		Mud.				NOT SAMPLED
1.2						2 samples 0 – 0.5 0.5 – 1.0

GEOCHEMICAL ASSESSMENTS

SEDIMENT CORE LOG

Sheet 1 of 1

Core ID/No: C9Q

CLIENT:	Arup/BMT WBM	DATE:	19 October 2013 15:00
PROJECT:	Cairns ShippingDevelopment Project	CORING METHOD:	PISTON
AREA:		LOCATION:	
LOGGED BY:	S.Taylor WD = 9.6	CORE LENGTH (m):	1.20m

Hydrous Layer: 0.04m Brown

Subsurface sediments:

Depth (m)	Graphic Log	Description (Texture, colour/mottling, sand and gravel components)	Consistency	Colour	Subsampling	Field Records/Comments
		MUD	Soft			Brown Fine organic debris
0.2			Soft			
		Mud				
0.4						Grey, massive
					0.5	featureless
0.6			Soft			
0.8		Mud				Clay
			Soft			
1.0						
1.1		Mud				NOT SAMPLED
			Firm			
1.2						
						2 samples 0-0.5 0.5-1.0

GEOCHEMICAL ASSESSMENTS

SEDIMENT CORE LOG

Sheet 1 of 1

Core ID/No: C99

CLIENT:	Arup/BMT WBM	DATE:	19 October 2013 15:30
PROJECT:	Cairns ShippingDevelopment Project	CORING METHOD:	PISTON
AREA:		LOCATION:	
LOGGED BY:	S.Taylor W.D = 9.7	CORE LENGTH (m):	1.20m

Hydrous Layer: 0.03m Mud + Organic Debris

Subsurface sediments: Mud

Depth (m)	Graphic Log	Description (Texture, colour/mottling, sand and gravel components)	Consistency	Colour	Subsampling	Field Records/Comments
		Mud				Hydrous, organic debris
			Soft			Brown to light grey massive
0.2		Bronze patch – black				
		Mud	Soft			
0.4						
					0.5	
0.6			Firm			Mud, dark grey, abundant vesicles
		Mud				
0.8					0.8	
			Firm			NOT SAMPLED
		Mud				
1.0						
1.1		Mud	Stiff			NOT SAMPLED
		black				
1.2						
		EOH 1.20m				2 SAMPLES 0 – 0.5 0.5 – 0.8

GEOCHEMICAL ASSESSMENTS

SEDIMENT CORE LOG

Sheet 1 of 1

Core ID/No: C 121

CLIENT:	Arup/BMT WBM	DATE:	19 October 2013 16:00
PROJECT:	Cairns ShippingDevelopment Project	CORING METHOD:	PISTON
AREA:		LOCATION:	
LOGGED BY:	S.Taylor WD = 10.4	CORE LENGTH (m):	1.06m

Hydrous Layer: hydrous mud

Subsurface sediments: Mud

Depth (m)	Graphic Log	Description Texture, colour/mottling, sand and gravel components	Consistency	Colour	Subsampling	Field Records/Comments
		Brown Mud				
0.2		Mud with sand				Dark grey bright grey
0.4						
0.6		Mud with sand				0.5 light grey
0.8						NOT SAMPLED
1.0		Brown CLAY	STIFF			
		1.06m EOH				
1.2						2 samples 0 – 0.5 0.5 – 0.8

GEOCHEMICAL ASSESSMENTS

SEDIMENT CORE LOG

Sheet 1 of 1

Core ID/No: F156

CLIENT: Arup/BMT WBM

DATE: 19 October 2013

PROJECT: Cairns ShippingDevelopment Project

CORING METHOD: GRAB

AREA:

LOCATION:

LOGGED BY: S.Taylor

Depth (m): 0.05

Hydrous Layer:

Subsurface sediments:

Depth (m)	Graphic Log	Description Texture, colour/mottling, sand and gravel components	Consistency	Colour	Subsampling	Field Records/Comments
		(Sandy, muddy) GRAVEL				weathered slate fragment schiordems, shells small rocks, some mud and sand (<10%)
0.05		EOH 0.05				
0.10						
						Several failed core attempts Grab used to collect gravel Some very stiff orange clay underlying gravel

GEOCHEMICAL ASSESSMENTS

SEDIMENT CORE LOG

Sheet 1 of 1

Core ID/No: B108

CLIENT:	Arup/BMT WBM	DATE:	20 October 2013 08:15
PROJECT:	Cairns ShippingDevelopment Project	CORING METHOD:	PISTON
AREA:		LOCATION:	
LOGGED BY:	S.Taylor WD 11.1 m	CORE LENGTH (m):	1.20 m

Hydrous Layer: Brown 0 – 0.4

Subsurface sediments:

Depth (m)	Graphic Log	Description (Texture, colour/mottling, sand and gravel components)	Consistency	Colour	Subsampling	Field Records/Comments
			Soft			sticky lightness mud.
0.2		Anoxic patches Black	Firm			Grey organic material, decomposed
0.4		Mud	Firm			
					0.5	
0.6		Sandy layer 0.02m	Firm			vesicles 0.6 – 0.9m
		Mud				Dark grey
0.8			Firm			
		Sandier layer 0.02m				
1.0					1.0	
		Mud				Dark grey
			Firm			
1.1						
1.2		EOH 1.20				3 samples 0–0.5, 0.5 – 1.0, 1.0 – 1.20
						multiple core attempts

GEOCHEMICAL ASSESSMENTS

SEDIMENT CORE LOG

Sheet 1 of 1

Core ID/No: C 50

CLIENT:	Arup/BMT WBM	DATE:	20 October 2013 09:45
PROJECT:	Cairns ShippingDevelopment Project	CORING METHOD:	PISTON
AREA:		LOCATION:	
LOGGED BY:	S.Taylor WD = 10.7	CORE LENGTH (m):	1.30m

Hydrous Layer: 0.05 Brown hydrous

Subsurface sediments:

Depth (m)	Graphic Log	Description (Texture, colour/mottling, sand and gravel components)	Consistency	Colour	Subsampling	Field Records/Comments
		Brown mud. 0.05	V.Soft			Mud Hydrous
			Soft			
0.2		Mud Fine grained sandy layers ~0.02m				Light grey
0.4		Mud Mid sand			0.5	
0.6			Soft			Grey
0.8		Mud	Soft			
		Silty – fine sand				
1.0		Muddy sand/sandy mud 1–1.1m				Dark grey Fine and grey/grey
1.2			Firm			
						NOT SAMPLED
		EOH 1.30m				
1.4						3 Samples 0 – 0.5 0.5 – 1.00 1.00 – 1.20

GEOCHEMICAL ASSESSMENTS

SEDIMENT CORE LOG

Sheet 1 of 1

Core ID/No: C53

CLIENT:	Arup/BMT WBM	DATE:	20 October 2013 10:10
PROJECT:	Cairns ShippingDevelopment Project	CORING METHOD:	
AREA:		LOCATION:	
LOGGED BY:	S.Taylor WD = 10.9	CORE LENGTH (m):	1.10 m

Hydrous Layer: 0.05m BROWN

Subsurface sediments: Mud

Depth (m)	Graphic Log	Description (Texture, colour/mottling, sand and gravel components)	Consistency	Colour	Subsampling	Field Records/Comments
		Mud	V. Soft			Brown.
0.2		Mud nil sand	Soft			Light grey
0.4			Soft			
					0.5	
0.6		Mud. nil sand	Soft			Light grey Massive, featureless
0.8		Mud nil sand	Soft			
					0.9	Grey
1.0			Firm			NOT SAMPLED
		EOH 1.10m				
1.2						2 SAMPLES 0 - 0.5 0.5 - 0.9

GEOCHEMICAL ASSESSMENTS

SEDIMENT CORE LOG

Sheet 1 of 1

Core ID/No: B54

CLIENT:	Arup/BMT WBM	DATE:	20 October 2013 10:30
PROJECT:	Cairns ShippingDevelopment Project	CORING METHOD:	PISTON
AREA:		LOCATION:	
LOGGED BY:	S.Taylor WD = 11.2	CORE LENGTH (m):	1.10

Hydrous Layer: 0.1 m

Subsurface sediments:

Depth (m)	Graphic Log	Description (Texture, colour/mottling, sand and gravel components)	Consistency	Colour	Subsampling	Field Records/Comments
		Mud	V. Soft			Brown. Mottled
0.2		Mud	Soft			Light grey
0.4		Mud	Soft			
0.6		Mud	Soft		0.5	Grey
0.8		Mud	Soft			
1.0		Mud.				Dark grey
		Mud	Firm		1.0	Abundant vesicles.
		FROM 1.10m				

3 Samples
0 - 0.5
0.5 - 1.0
1.0 - 1.10

QAQC 2
= B54 0-0.5

GEOCHEMICAL ASSESSMENTS

SEDIMENT CORE LOG

Sheet 1 of 1

Core ID/No: H160

CLIENT:	Arup/BMT WBM	DATE:	20 October 2013 16:45
PROJECT:	Cairns ShippingDevelopment Project	CORING METHOD:	PISTON
AREA:		LOCATION:	
LOGGED BY:	S.Taylor WD = 10.1	CORE LENGTH (m):	0.04

Hydrous Layer:

Subsurface sediments:

Depth (m)	Graphic Log	Description Texture, colour/mottling, sand and gravel components	Consistency	Colour	Subsampling	Field Records/Comments
		Sandy gravel	SOFT			Rocks, weathered shale, shells mangrove roots.
		0.02 CLAY	V. HARD			Yellow
0.05		FOM 0.04				

2 samples

0.0 – 0.02

0.02 – 0.04

FOUR CORING ATTEMPTS

Very little unconsolidated material overlying very hard clay.

GEOCHEMICAL ASSESSMENTS

SEDIMENT CORE LOG

Sheet 1 of 1

Core ID/No: K167

CLIENT:	Arup/BMT WBM	DATE:	20 October 2013 16:21
PROJECT:	Cairns ShippingDevelopment Project	CORING METHOD:	
AREA:		LOCATION:	
LOGGED BY:	S.Taylor WD = 8.8	CORE LENGTH (m):	0.25

Hydrous Layer:

Subsurface sediments:

Depth (m)	Graphic Log	Description Texture, colour/mottling, sand and gravel components	Consistency	Colour	Subsampling	Field Records/Comments
		Sandy, muddy gravel	FIRM			Shells and small rocks.
0.1		CLAYEY SILT	FIRM			occasional gravel pieces
0.2		SILTY CLAY	STIFF			PIECES OF BARK OR ROOTS TO 0.04m LONG.
0.3		FROM 0.25m				Sampled 0 – 0.25m

GEOCHEMICAL ASSESSMENTS

SEDIMENT CORE LOG

Sheet 1 of 1

Core ID/No: P180

CLIENT:	Arup/BMT WBM	DATE:	21 October 2013 10:15
PROJECT:	Cairns ShippingDevelopment Project	CORING METHOD:	
AREA:		LOCATION:	
LOGGED BY:	S.Taylor 12.0 m	CORE LENGTH (m):	0.05

Hydrous Layer:

Subsurface sediments:

Depth (m)	Graphic Log	Description Texture, colour/mottling, sand and gravel components	Consistency	Colour	Subsampling	Field Records/Comments
		CLAY FRAGMENTS	STIFF			Some brown mud yellow/orange and green clay fragment
		0.05				
						Core terminated on very stiff material Sample of muddy surface of clay layer. 2 Jars only
						Sample P180 0-0.05

GEOCHEMICAL ASSESSMENTS

SEDIMENT CORE LOG

Sheet 1 of 1

Core ID/No: H162

CLIENT:	Arup/BMT WBM	DATE:	21 October 2013 17:10
PROJECT:	Cairns ShippingDevelopment Project	CORING METHOD:	
AREA:		LOCATION:	
LOGGED BY:	S.Taylor WD = 10.6	CORE LENGTH (m):	—

Hydrous Layer:

Subsurface sediments:

Depth (m)	Graphic Log	Description Texture, colour/mottling, sand and gravel components	Consistency	Colour	Subsampling	Field Records/Comments
		CLAY	v.stiff			Yellow / orange
		FRAGMENTS ON CORE BARREL ONLY.				
						No unconsolidated material. Clay only. Core - no penetration

GEOCHEMICAL ASSESSMENTS

SEDIMENT CORE LOG

Sheet 1 of 1

Core ID/No: M167

CLIENT:	Arup/BMT WBM	DATE:	21 October 2013 09:45
PROJECT:	Cairns ShippingDevelopment Project	CORING METHOD:	
AREA:		LOCATION:	
LOGGED BY:	S.Taylor WD = 11.2	CORE LENGTH (m):	0.20 m

Hydrous Layer:

Subsurface sediments:

Depth (m)	Graphic Log	Description Texture, colour/mottling, sand and gravel components	Consistency	Colour	Subsampling	Field Records/Comments
		Sandy gravelly mud 0 - 0.01 m				
0.1		Mud				Black, anoxic
0.2		- shells of clay				
						Duplicate and reference laboratory samples QAQC 3

GEOCHEMICAL ASSESSMENTS

SEDIMENT CORE LOG

Sheet 1 of 1

Core ID/No: H165

CLIENT:	Arup/BMT WBM	DATE:	21 October 2013 11:40
PROJECT:	Cairns ShippingDevelopment Project	CORING METHOD:	CORE AND GRAB
AREA:		LOCATION:	370279 | 8128402
LOGGED BY:	S.Taylor WD = 11.8	CORE LENGTH (m):	0.2

Hydrous Layer: 0.01 thickness

Subsurface sediments:

Depth (m)	Graphic Log	Description Texture, colour/mottling, sand and gravel components	Consistency	Colour	Subsampling	Field Records/Comments
		Mud				Grey
		0.01				
0.1		Mud				Black, anoxic
						Large rocks and clay clasts in core sample
0.2						
		REF 0.2m				
						Cores terminated on hard bottom
						Pore water sample PWB
						Gravelly clay at location. Location moved 20m W
		TRIPLICATE LOCATION				H165 H165A H165B

GEOCHEMICAL ASSESSMENTS

SEDIMENT CORE LOG

Sheet 1 of 1

Core ID/No: U187

CLIENT:	Arup/BMT WBM	DATE:	21 October 2013 14:00
PROJECT:	Cairns ShippingDevelopment Project	CORING METHOD:	Grab
AREA:		LOCATION:	370342 | 8126459
LOGGED BY:	S.Taylor WD = 9.3	CORE LENGTH (m):	0.15

Hydrous Layer: Brown Hydrous

Subsurface sediments:

Depth (m)	Graphic Log	Description (Texture, colour/mottling, sand and gravel components)	Consistency	Colour	Subsampling	Field Records/Comments
		~~Sandy mud~~				
0.05		Mud nil sand.				bioturbation more brown grey, green
0.1		Mud				NOT SAMPLED
0.15						

TRIPLICATE LOCATION
U187 0 - 0.2
U187A 0 - 0.2
U187B 0 - 0.2

Pore water sample
PWC

Location moved, first attempt at proposed location — no soft sediment

370342 8126459

GEOCHEMICAL ASSESSMENTS

SEDIMENT CORE LOG

Sheet 1 of 3

Core ID/No: U185

CLIENT:	Arup/BMT WBM	DATE:	21 October 2013 14:50
PROJECT:	Cairns ShippingDevelopment Project	CORING METHOD:	Vibrocore
AREA:		LOCATION:	
LOGGED BY:	S.Taylor WD = 6.6	CORE LENGTH (m):	2.9

Hydrous Layer:

Subsurface sediments:

Depth (m)	Graphic Log	Description Texture, colour/mottling, sand and gravel components	Consistency	Colour	Subsampling	Field Records/Comments
		Gravelly sandy Sand	Soft			
0.2						
			Firm			
0.4		Sandy, gravelly 0.02m Mud				
			Firm			0.5
		0.52 Sandy gravelly mud				
0.6		0.60				
			Firm			
		Mud				
			Stiff			
		Muddy sand				QA QC 4 = 0 – 0.5
1.0						1.0 QA QC5 – 0.5 – 1.0
		1.0	Stiff			
		Mud				
1.2		1.2 Sandy mud				
		1.3	Stiff			
1.4						
						1.5 Samples
		Mud (Silty clay)	Stiff			0 – 0.5 0.5 – 1.0 1.0 – 1.5 1.5 – 2.0 2.0 – 2.5 2.5 – 2.9

GEOCHEMICAL ASSESSMENTS

SEDIMENT CORE LOG

Sheet 2 of 2

Core ID/No: U185

CLIENT:	Arup/BMT WBM	DATE:	21 October 2013
PROJECT:	Cairns ShippingDevelopment Project	CORING METHOD:	VIBROCORE
AREA:		LOCATION:	
LOGGED BY:	S.Taylor	CORE LENGTH (m):	2.9

Hydrous Layer:

Subsurface sediments:

Depth (m)	Graphic Log	Description Texture, colour/mottling, sand and gravel components	Consistency	Colour	Subsampling	Field Records/Comments
		Mud Silty Clay	Stiff			Massive homogenous featureless
2.8						
		From 2.9m				
3.0						

GEOCHEMICAL ASSESSMENTS

SEDIMENT CORE LOG

Sheet 1 of 1

Core ID/No: B63

CLIENT:	Arup/BMT WBM	DATE:	22 October 2013 10:10
PROJECT:	Cairns ShippingDevelopment Project	CORING METHOD:	Piston
AREA:		LOCATION:	
LOGGED BY:	S.Taylor WD = 10.9	CORE LENGTH (m):	1.50

Hydrous Layer:

Subsurface sediments:

Depth (m)	Graphic Log	Description Texture, colour/mottling, sand and gravel components	Consistency	Colour	Subsampling	Field Records/Comments
		Brown, light brown mud	V. Soft			Brown
0.2		Mud	Soft			Light grey
0.4			Soft			Grey
0.6		Mud				
0.8		Tr. sand	Soft			
1.0						Dark grey
1.2		Mud	Soft			
		Sandy layer 0.02m				
1.4		1.45 CLAY	STIFF			GREEN/YELLOW
1.6		EOH 1.5m				3 samples 0 - 0.5 0.5 - 1.0 1.0 - 1.45 No grainsize

GEOCHEMICAL ASSESSMENTS

SEDIMENT CORE LOG

Sheet 1 of 1

Core ID/No: B41

CLIENT:	Arup/BMT WBM	DATE:	22 October 2013 08:15
PROJECT:	Cairns ShippingDevelopment Project	CORING METHOD:	
AREA:		LOCATION:	
LOGGED BY:	S.Taylor WD = 10.4	CORE LENGTH (m):	1.40m

Hydrous Layer: Hydrous, brown

Subsurface sediments: Mud

Depth (m)	Graphic Log	Description (Texture, colour/mottling, sand and gravel components)	Consistency	Colour	Subsampling	Field Records/Comments
			V. Soft			Oxic, brown.
0.2		Mud	Soft			Grey
0.4						
		Mud nil sand			0.5	
0.6			Soft			Dark grey
0.8						
1.0						Dark grey
		Mud nil sand	Soft			NOT SAMPLED
1.2						
1.4						
		FROM 1.4m				
		QAQC6 = B41 0-0.5 QAQC7 = B4 0.5-0.9				TRIPLICATE LOCATION B41 B41A B41B

GEOCHEMICAL ASSESSMENTS

SEDIMENT CORE LOG

Sheet 1 of 1

Core ID/No: C72

CLIENT:	Arup/BMT WBM	DATE:	October 2013 11:15
PROJECT:	Cairns ShippingDevelopment Project	CORING METHOD:	
AREA:		LOCATION:	
LOGGED BY:	S.Taylor WD = 10.1m	CORE LENGTH (m):	2.1m

Hydrous Layer:

Subsurface sediments: Mud

Depth (m)	Graphic Log	Description (Texture, colour/mottling, sand and gravel components)	Consistency	Colour	Subsampling	Field Records/Comments
						Brown, tightness
		Mud	Soft			
0.2		Sandy layer 0.01m				
			Soft			Grey
0.4						
					0.5	
		Mud	Soft			
0.6						Grey
0.8						
1.0					1.0	
		Mud	Soft			
1.2		to sand				Grey
1.4			Soft			
1.6		Mud				
						Samples 0-0.5, 0.5-1.0, 1.0-2.1
1.8						
		Sandy layer				Dark grey
		FROM 2.1m	Firm			

GEOCHEMICAL ASSESSMENTS

SEDIMENT CORE LOG

Sheet 1 of 1

Core ID/No: A127

CLIENT:	Arup/BMT WBM	DATE:	23 October 2013 09:50
PROJECT:	Cairns ShippingDevelopment Project	CORING METHOD:	vibrocore
AREA:		LOCATION:	within 3m of location
LOGGED BY:	S.Taylor WD = 9.7m	CORE LENGTH (m):	1.70m

Hydrous Layer:

Subsurface sediments:

Depth (m)	Graphic Log	Description Texture, colour/mottling, sand and gravel components	Consistency	Colour	Subsampling	Field Records/Comments
		Sandy mud	Soft			Brown
		0.15				
0.2			Firm			Grey, green
		Mud (Silty clay)	Stiff			
0.4						
					0.5	
0.6		Mud				grey
			Stiff			
0.8						grey
		Mud				
1.0					1.0	
			Stiff			grey
		Mud				
1.2						grey
1.4		Mud				
1.6		Mud Silty clay	Very Stiff			Pale grey
		EOH 1.7m				3 samples 0 - 0.5 0.5 - 1.0 1.0 - 1.7

GEOCHEMICAL ASSESSMENTS

SEDIMENT CORE LOG

Sheet 1 of 1

Core ID/No: F150

CLIENT:	Arup/BMT WBM	DATE:	23 October 2013 11:25
PROJECT:	Cairns ShippingDevelopment Project	CORING METHOD:	
AREA:		LOCATION:	
LOGGED BY:	S.Taylor WD = 8.9	CORE LENGTH (m):	0.8 m

Hydrous Layer:

Subsurface sediments:

Depth (m)	Graphic Log	Description Texture, colour/mottling, sand and gravel components	Consistency	Colour	Subsampling	Field Records/Comments
		Muddy gravel 0.04 Muddy sand	Soft			Grey green
0.1						
0.2		Mud	Firm			Dark grey
0.3						
0.4						
		0.43				
0.5		Silty clay	Stiff			Pale grey
0.6						
		0.62				
0.7		Clay	Very Stiff			Light orange
0.8						
		PCD 0.8 m Samples 0 - 0.43 0.43 - 0.62 0.62 - 0.8 m				Core located within 5 m of proposed location

GEOCHEMICAL ASSESSMENTS

SEDIMENT CORE LOG

Sheet 1 of 1

Core ID/No: G155

CLIENT:	Arup/BMT WBM	DATE:	23 October 2013 11:55
PROJECT:	Cairns ShippingDevelopment Project	CORING METHOD:	Vibrocoring
AREA:		LOCATION:	
LOGGED BY:	S.Taylor WD = 9.5	CORE LENGTH (m):	0.15m

Hydrous Layer:

Subsurface sediments:

Depth (m)	Graphic Log	Description Texture, colour/mottling, sand and gravel components	Consistency	Colour	Subsampling	Field Records/Comments
0.1		Clay	V. Stiff. Hard.			Crumbly, stiffly tough at surface Possibly weathered rock.
		Refusal 0.15m				
						Sheared vibrocoring attempts

GEOCHEMICAL ASSESSMENTS

SEDIMENT CORE LOG

Sheet 1 of 1

Core ID/No: I 162

CLIENT:	Arup/BMT WBM	DATE:	23 October 2013 13:35
PROJECT:	Cairns ShippingDevelopment Project	CORING METHOD:	V. BROCORNG
AREA:		LOCATION:	
LOGGED BY:	S.Taylor WD = 9.5	CORE LENGTH (m):	0.33

Hydrous Layer:

Subsurface sediments:

Depth (m)	Graphic Log	Description Texture, colour/mottling, sand and gravel components	Consistency	Colour	Subsampling	Field Records/Comments
0.1		Sandy Gravel 0.13	FIRM			Carbonate grains and shells "clean"
0.2 0.3		CLAY	V. STIFF HARD			Green / yellow possibly weathered rock.
0.4		EOH 0.33m				

Several attempts

2 samples
0 – 0.13
0.13 – 0.33

GEOCHEMICAL ASSESSMENTS

SEDIMENT CORE LOG

Sheet 1 of 1

Core ID/No: J164

CLIENT:	Arup/BMT WBM	DATE:	23 October 2013 14:46
PROJECT:	Cairns ShippingDevelopment Project	CORING METHOD:	
AREA:		LOCATION:	
LOGGED BY:	S.Taylor WD = 9.6 m	CORE LENGTH (m):	1.02

Hydrous Layer:

Subsurface sediments:

Depth (m)	Graphic Log	Description Texture, colour/mottling, sand and gravel components	Consistency	Colour	Subsampling	Field Records/Comments
		Sandy gravel				Quartz and shells
0.2		Mud	Firm			Dark grey
0.4		Mud	Stiff			Dark grey
0.6		Silty clay	Stiff			Pale grey to grey.
0.8			Hard			
		EOH 1.02 m				

GEOCHEMICAL ASSESSMENTS

SEDIMENT CORE LOG

Sheet 1 of 1

Core ID/No: I 172

CLIENT: Arup/BMT WBM

PROJECT: Cairns ShippingDevelopment Project

AREA:

LOGGED BY: S.Taylor WD = 10.3

DATE: 23 October 2013 16:00

CORING METHOD:

LOCATION: 370103 | 8127904

CORE LENGTH (m): 1.06m

Hydrous Layer:

Subsurface sediments:

Depth (m)	Graphic Log	Description Texture, colour/mottling, sand and gravel components	Consistency	Colour	Subsampling	Field Records/Comments
		Mud	V. Soft			Black
0.2			Soft			
		Mud				
0.4						Black
			Soft			
0.6		Mud.				
0.8			Soft			Black
1.0		CLAY	V. Stiff			NOT SAMPLED ← Yellow/orange
		EOH 1.06m				
1.2						

NEW ADDITIONAL SAMPLING LOCATION.

GEOCHEMICAL ASSESSMENTS

SEDIMENT CORE LOG

Sheet 1 of 1

Core ID/No: B 74

CLIENT:	Arup/BMT WBM	DATE:	22 October 2013 12:00
PROJECT:	Cairns ShippingDevelopment Project	CORING METHOD:	
AREA:		LOCATION:	
LOGGED BY:	S.Taylor WD = 10.9	CORE LENGTH (m):	2.0

Hydrous Layer:

Subsurface sediments:

Depth (m)	Graphic Log	Description (Texture, colour/mottling, sand and gravel components)	Consistency	Colour	Subsampling	Field Records/Comments
		Mud	V. Soft			
0.2		Mud				
0.4			Soft			
					0.5	
0.6		Mud				Light grey/brown
			Soft			
0.8		Mud				
1.0					1.0	Samples 0 – 0.5 0.5 – 1.0 1.0 – 1.9 1.9 – 2.0
			Soft.			
1.2		Mud				
1.4						
			Firm			Dark grey
1.6		Mud				
1.8			V. FIRM			Pale grey, mud in patches
		1.90 Clay	Stiff		1.9	Right in bottom corner of channel Very close to shore
2.0						

Eoy 2.0

GEOCHEMICAL ASSESSMENTS

SEDIMENT CORE LOG

Sheet 1 of 1

Core ID/No: B 79

CLIENT:	Arup/BMT WBM	DATE:	22 October 2013 14:10
PROJECT:	Cairns ShippingDevelopment Project	CORING METHOD:	
AREA:		LOCATION:	
LOGGED BY:	S.Taylor WD = 10.8	CORE LENGTH (m):	1.8 m

Hydrous Layer:

Subsurface sediments:

Depth (m)	Graphic Log	Description (Texture, colour/mottling, sand and gravel components)	Consistency	Colour	Subsampling	Field Records/Comments
		Sandy mud	V. Soft			
		muddy sand	Soft			Green / grey
0.2		Mud	Soft			
		muddy sand	Firm			
0.4					0.5	
0.6		Mud	Soft			Mottle, grey
0.8						
1.0		Mud			1.0	Mottle, grey
			Soft			
		Mud				
			Firm			Dark grey
						3 samples 0 – 0.5 0.5 – 1.0 1.0 – 1.8
1.8		EOH 1.8 m				

GEOCHEMICAL ASSESSMENTS

SEDIMENT CORE LOG

Sheet 1 of 1

Core ID/No: B10

CLIENT:	Arup/BMT WBM	DATE:	20 October 2013 09:00
PROJECT:	Cairns ShippingDevelopment Project	CORING METHOD:	Piston
AREA:		LOCATION:	
LOGGED BY:	S.Taylor 11-3	CORE LENGTH (m):	0.95

Hydrous Layer:

Subsurface sediments:

Depth (m)	Graphic Log	Description Texture, colour/mottling, sand and gravel components	Consistency	Colour	Subsampling	Field Records/Comments
		0.05 Crumbly mud	Soft			Shells and rock fragments Grey
0.2		Sandy patch Mud to sand	Soft			
0.4		Mud				Grey
			Soft		0.5	
0.6		Mud				
0.8		Mud	Firm			Dark grey
1.0		EOH 0.95m				

Multiple core attempts

2 samples
0 – 0.5
0.5 – 0.95

GEOCHEMICAL ASSESSMENTS

SEDIMENT CORE LOG

Sheet 1 of 1

Core ID/No: C 82

CLIENT: Arup/BMT WBM

DATE: 22 October 2013 16:40

PROJECT: Cairns ShippingDevelopment Project

CORING METHOD:

AREA:

LOCATION:

LOGGED BY: S.Taylor WD = 10.4m

CORE LENGTH (m): 1.67m

Hydrous Layer:

Subsurface sediments:

Depth (m)	Graphic Log	Description Texture, colour/mottling, sand and gravel components	Consistency	Colour	Subsampling	Field Records/Comments
						Light brown/grey
0.2		Mud				
			Soft			Pale grey
0.4						
		Mud			0.5	
0.6						Grey
			Firm			
0.8		Mud				
1.0					1.0	grey
1.2		Mud	Firm			Dark grey
1.4						
		1.53				
1.6		silty clay	Stiff			Very pale grey
		EOH 1.67m				4 samples 0 - 0.5 0.5 - 1.0 1.0 - 1.53 1.53 - 1.67

GEOCHEMICAL ASSESSMENTS

SEDIMENT CORE LOG

Sheet 1 of 1

Core ID/No: M180

CLIENT: Arup/BMT WBM

DATE: 20 October 2013 15:30

PROJECT: Cairns ShippingDevelopment Project

CORING METHOD:

AREA:

LOCATION: 0370100 8127211

LOGGED BY: S.Taylor WD = 10.7

CORE LENGTH (m): 0.20

Hydrous Layer:

Subsurface sediments:

Depth (m)	Graphic Log	Description Texture, colour/mottling, sand and gravel components	Consistency	Colour	Subsampling	Field Records/Comments
		Sandy (gravelly) mud				
0.1		Mud to sand	Soft			Black, anoxic
0.2		Refusal 0.20m				
						Refusal at 0.2m on hard base
						Pore Water A
						Triplicate location:
						M180
						M180A
						M180B

Appendix D Core Logs – Supplementary SAP

GEOCHEMICAL ASSESSMENTS

SEDIMENT CORE LOG

Sheet 1 of 1

Core ID/No: C94

CLIENT:	Arup/BMT WBM	DATE:	2 May 2014 June
PROJECT:	Cairns ShippingDevelopment Project	CORING METHOD:	
AREA:		LOCATION:	
LOGGED BY:	S.Taylor	CORE LENGTH (m):	0.95

Hydrous Layer: < 1cm

Subsurface sediments: Mud.

Depth (m)	Graphic Log	Description Texture, colour/mottling, sand and gravel components	Consistency	Colour	Subsampling	Field Records/Comments
						U Soft, light brown
0.1		Mud				light grey
0.2						
0.3			Soft			Grey
0.4		Mud				Slight sulphuric odour
0.5						
		Mud				
0.6			Soft			
0.7		Mud				Dark grey
0.8		Sandy Layer 0.8 - 0.85m	Firm			Green/grey
0.9		Mud				
		FCO 0.95				2 samples 0-0.5, 0.5-0.95

GEOCHEMICAL ASSESSMENTS

SEDIMENT CORE LOG

Sheet 1 of 1

Core ID/No: B2

CLIENT:	Arup/BMT WBM	DATE:	2 May 2014 JONR
PROJECT:	Cairns ShippingDevelopment Project	CORING METHOD:	
AREA:		LOCATION:	16.49.554 | 145° 50'.078
LOGGED BY:	S.Taylor	CORE LENGTH (m):	1.30

Hydrous Layer:

Subsurface sediments:

Depth (m)	Graphic Log	Description (Texture, colour/mottling, sand and gravel components)	Consistency	Colour	Subsampling	Field Records/Comments
		Mud	Soft			Grey
0.2		Gravelly (shells) 0.15–0.18				
		Gravelly 0.38–0.45				
0.4		(Sandy) Mud	Firm			light grey
					0.5	
0.6		Mud				
		Thore gravel				fine shell grit
0.8		Sandy Mud	Firm			light grey
1.0						
			Firm			NOT SAMPLED
1.2		Sandy mud				
		EOH 1.3				2 samples 0–0.5 0.5–1.0
						NOTE ACTUAL COORDINATES

GEOCHEMICAL ASSESSMENTS

SEDIMENT CORE LOG

Sheet 1 of 1

Core ID/No: B7

CLIENT:	Arup/BMT WBM	DATE:	2 ~~May~~ JUNE 2014
PROJECT:	Cairns ShippingDevelopment Project	CORING METHOD:	
AREA:		LOCATION:	<10m
LOGGED BY:	S.Taylor	CORE LENGTH (m):	0.9

Hydrous Layer:

Subsurface sediments:

Depth (m)	Graphic Log	Description Texture, colour/mottling, sand and gravel components	Consistency	Colour	Subsampling	Field Records/Comments
		Sandy Mud 0.05	Soft			Light grey
0.1			Soft			
0.2		Mud tr. sand				Light grey
			Firm			
0.3						
0.4		Mud				Light grey
0.5						0.5
		Gravelly 0.53	Firm			
0.6						
0.7		Gravelly 0.70				Light grey
		Mud	Firm			Shell fragments
0.8		Gravelly 0.81				2 samples 0-0.5 0.5-0.9
		Mud				
0.9		EOH 0.9m				2 bags 0.75 + 0.90m

GEOCHEMICAL ASSESSMENTS

SEDIMENT CORE LOG

Sheet 1 of 1

Core ID/No: B9

CLIENT:	Arup/BMT WBM	DATE:	2 ~~May~~ June 2014
PROJECT:	Cairns ShippingDevelopment Project	CORING METHOD:	
AREA:		LOCATION:	
LOGGED BY:	S.Taylor	CORE LENGTH (m):	1.10

Hydrous Layer:

Subsurface sediments:

Depth (m)	Graphic Log	Description Texture, colour/mottling, sand and gravel components	Consistency	Colour	Subsampling	Field Records/Comments
		(Sandy) Mud	V. Soft			Grey
		0.18	Firm			QAQC1 = 0 – 0.5m
0.2		Mud tr. sand Gravelly layer				Grey
0.4					0.5	
			Soft			
0.6		Gravelly layer. Mud tr. sand				Grey
			Firm			
0.8		Sandy layer 0.82				Grey.
		Mud	Firm			
1.0		Sandy layer 0.98 – 1.0				NOT SAMPLED
			Firm			
		EOH 1.1m				

2 samples
0 – 0.5
0.5 – 1.0
+ QAQC1

GEOCHEMICAL ASSESSMENTS

SEDIMENT CORE LOG

Sheet 1 of 1

Core ID/No: C22

CLIENT:	Arup/BMT WBM	DATE:	2 May 2014 JUNE
PROJECT:	Cairns ShippingDevelopment Project	CORING METHOD:	
AREA:		LOCATION:	
LOGGED BY:	S.Taylor	CORE LENGTH (m):	1.5 m

Hydrous Layer:

Subsurface sediments:

Depth (m)	Graphic Log	Description Texture, colour/mottling, sand and gravel components	Consistency	Colour	Subsampling	Field Records/Comments
		Mud	V. Soft			Mottled brown.
0.2			Soft			
		Mud wt sand				Grey
0.4					0.5	
0.6			Soft			Grey
0.8		Mud wt sand			0.9	Grey
1.0			Firm			NOT SAMPLED
1.2		1.25				Grey
		Sandy Mud	Firm			
1.4		1.45	Soft			
		EOH 1.5m				2 samples.
1.6						

GEOCHEMICAL ASSESSMENTS

SEDIMENT CORE LOG

Sheet 1 of 1

Core ID/No: B25

CLIENT:	Arup/BMT WBM	DATE:	2 May 2014 June
PROJECT:	Cairns ShippingDevelopment Project	CORING METHOD:	
AREA:		LOCATION:	
LOGGED BY:	S.Taylor	CORE LENGTH (m):	1.47

Hydrous Layer:

Subsurface sediments:

Depth (m)	Graphic Log	Description Texture, colour/mottling, sand and gravel components	Consistency	Colour	Subsampling	Field Records/Comments
		Sandy mud	V. Soft			Brown tightness.
0.2		0.14				
		Mud				Grey
0.4						
					0.5	
0.6		Sandy layer				Grey
		Sandy				Darker, organic particles
0.8		Mud				
1.0					1.0	Grey
		Mud				
1.2						NOT SAMPLED
		Mud with sand				
1.4						
		EOH 1.47m				2 samples 0 – 0.5 0.5 – 1.0

GEOCHEMICAL ASSESSMENTS

SEDIMENT CORE LOG

Sheet 1 of 1

Core ID/No: C29

CLIENT:	Arup/BMT WBM	DATE:	2 May 2014 June
PROJECT:	Cairns ShippingDevelopment Project	CORING METHOD:	
AREA:		LOCATION:	
LOGGED BY:	S.Taylor	CORE LENGTH (m):	1.60m

Hydrous Layer:

Subsurface sediments:

Depth (m)	Graphic Log	Description Texture, colour/mottling, sand and gravel components	Consistency	Colour	Subsampling	Field Records/Comments
		Mud to sand	Vi Soft			Brown - Grey
		0.1				
0.2		Cy	Firm			Grey
0.4		Mud	Firm			Dark grey
						0.5
0.6						Dark Grey
		Mud	Firm			
0.8						0.8
			Firm			Grey
1.0						
		Mud				NOT SAMPLED
1.2			Firm			Grey Massive Homogeneous
1.4		Mud with sand				Traces of coloring - shells
1.6		EOH 1.6m				2 samples 0 - 0.5 0.5 - 0.8

GEOCHEMICAL ASSESSMENTS

SEDIMENT CORE LOG

Sheet 1 of 1

Core ID/No: C30

CLIENT:	Arup/BMT WBM	DATE:	2 May 2014
PROJECT:	Cairns ShippingDevelopment Project	CORING METHOD:	JONE
AREA:		LOCATION:	
LOGGED BY:	S.Taylor	CORE LENGTH (m):	1.3

Hydrous Layer:

Subsurface sediments:

Depth (m)	Graphic Log	Description Texture, colour/mottling, sand and gravel components	Consistency	Colour	Subsampling	Field Records/Comments
		Mud to sand	Soft			
0.3			Soft			Grey
0.4		Mud not sand	Soft			Grey
					0.5	
0.6						Grey
			Soft			
0.8		Mud not sand				Homogeneous
			Soft			
1.0		1.02			1.0	Grey
		(Sandy) mud				NOT SAMPLED
1.2			Firm			Grey
		EOH 1.30m				
1.4						2 samples 0 – 0.5 0.5 – 1.0

GEOCHEMICAL ASSESSMENTS

SEDIMENT CORE LOG

Sheet 1 of 1

Core ID/No: B41

CLIENT:	Arup/BMT WBM	DATE:	~~2 May~~ JUNE 2014
PROJECT:	Cairns ShippingDevelopment Project	CORING METHOD:	
AREA:		LOCATION:	
LOGGED BY:	S.Taylor	CORE LENGTH (m):	1.40

Hydrous Layer:

Subsurface sediments:

Depth (m)	Graphic Log	Description Texture, colour/mottling, sand and gravel components	Consistency	Colour	Subsampling	Field Records/Comments
		Sandy Mud	Soft			Light grey/brown
0.2		0.25 / 0.3 Muddy Sand SHARP				
0.4		Mud	Soft			grey
0.6						
0.8		Mud	Firm			grey
		Mud				
1.2			Firm			NOT SAMPLED grey
1.4		EOH 1.40m				

GEOCHEMICAL ASSESSMENTS

SEDIMENT CORE LOG

Sheet 1 of 1

Core ID/No: C50

CLIENT:	Arup/BMT WBM	DATE:	May 2014
PROJECT:	Cairns ShippingDevelopment Project	CORING METHOD:	
AREA:		LOCATION:	
LOGGED BY:	S.Taylor	CORE LENGTH (m):	1.60

Hydrous Layer:

Subsurface sediments:

Depth (m)	Graphic Log	Description Texture, colour/mottling, sand and gravel components	Consistency	Colour	Subsampling	Field Records/Comments
		Mud	V. Soft			Brown
0.2			Soft			QAQC 2 = 0 – 0.5
0.4		Mud			0.5	
0.6			Soft			
0.8		Mud				
1.0					1.0	
1.2		Mud.	Firm		1.2	
1.4						NOT SAMPLED
1.6	1.57	CLAY	Firm HARD			
		END 1.60				3 samples 0 – 0.5 0.5 – 1.0 1.0 – 1.2

GEOCHEMICAL ASSESSMENTS

SEDIMENT CORE LOG

Sheet 1 of 1

Core ID/No: C53

CLIENT:	Arup/BMT WBM	DATE:	2 June May 2014
PROJECT:	Cairns ShippingDevelopment Project	CORING METHOD:	
AREA:		LOCATION:	
LOGGED BY:	S.Taylor	CORE LENGTH (m):	1.58

Hydrous Layer:

Subsurface sediments:

Depth (m)	Graphic Log	Description Texture, colour/mottling, sand and gravel components	Consistency	Colour	Subsampling	Field Records/Comments
		Mud Sandy 0.08 – 0.1	V. Soft			Brown, hydrous
0.2						Grey
0.4		Mud	Soft		0.5	
0.6						Grey
0.8		Mud	Soft		0.9	
1.0						Manganese
1.2		Mud				Grey
1.4			Firm		NOT SAMPLED	
1.6		EOH 1.58m				

GEOCHEMICAL ASSESSMENTS

SEDIMENT CORE LOG

Sheet 1 of 1

Core ID/No: B54

CLIENT:	Arup/BMT WBM	DATE:	2 June May 2014
PROJECT:	Cairns ShippingDevelopment Project	CORING METHOD:	
AREA:		LOCATION:	
LOGGED BY:	S.Taylor	CORE LENGTH (m):	1.55

Hydrous Layer:

Subsurface sediments:

Depth (m)	Graphic Log	Description Texture, colour/mottling, sand and gravel components	Consistency	Colour	Subsampling	Field Records/Comments
		(Sandy) Mud	Vs Soft			light grey/brown
		0.15 - 0.30				
0.2		Muddy Sand	Firm			grey
		Mud				
0.4						
			Soft		0.5	
0.6		Mud				grey
			Soft			
0.8						
		Mud				
1.0					1.0	
						grey
		1.18 - 1.17 Sandy				
1.2						
		Mud	Firm			NOT SAMPLED
1.4						
		1.48 - 1.50 Sandy				grey
1.6		EOH 1.55				
						3 samples

GEOCHEMICAL ASSESSMENTS

SEDIMENT CORE LOG

Sheet 1 of 1

Core ID/No: C99

CLIENT:	Arup/BMT WBM	DATE:	~~May 2014~~ JUNE
PROJECT:	Cairns ShippingDevelopment Project	CORING METHOD:	
AREA:		LOCATION:	
LOGGED BY:	S.Taylor	CORE LENGTH (m):	1.75

Hydrous Layer:

Subsurface sediments:

Depth (m)	Graphic Log	Description Texture, colour/mottling, sand and gravel components	Consistency	Colour	Subsampling	Field Records/Comments
			V. Soft			Grey
0.2		← Sandy layers				
		Mud	Soft			Grey
0.4						organic debris
0.6			Soft			
		Mud				
0.8					0.6	Grey
1.0						
1.2		Mud	Firm			Grey
1.4						
1.6						Grey
		Mud				NOT SAMPLED
1.8		Refusal 1.75				

GEOCHEMICAL ASSESSMENTS

SEDIMENT CORE LOG

Sheet 1 of 1

Core ID/No: B63

CLIENT:	Arup/BMT WBM	DATE:	3 ~~May~~ JUNE 2014
PROJECT:	Cairns ShippingDevelopment Project	CORING METHOD:	
AREA:		LOCATION:	
LOGGED BY:	S.Taylor	CORE LENGTH (m):	1.80

Hydrous Layer:

Subsurface sediments:

Depth (m)	Graphic Log	Description Texture, colour/mottling, sand and gravel components	Consistency	Colour	Subsampling	Field Records/Comments
		0.04 MUD	V.Soft			Brown
		Muddy sand	Firm			Green grey, trace shelly gravel
0.2		0.2				
			Soft			Grey
0.4		Mud				
						0.5
0.6			Soft			Grey
		Mud				
			Soft			
1.0		Mud				1.0 Grey
1.2						Homogeneous.
		Sandy layer 1.30m	Soft			
1.4		Mud				Grey
		Sandy layer 1.50m				
1.6		Mud	Firm			
1.8		EOH 1.8m				3 samples 0 – 0.5 0.5 – 1.0 1.0 – 1.8

GEOCHEMICAL ASSESSMENTS

SEDIMENT CORE LOG

Sheet 1 of 1

Core ID/No: C72

CLIENT:	Arup/BMT WBM	DATE:	3 ~~May~~ June 2014
PROJECT:	Cairns ShippingDevelopment Project	CORING METHOD:	
AREA:		LOCATION:	
LOGGED BY:	S.Taylor	CORE LENGTH (m):	1.95 m

Hydrous Layer:

Subsurface sediments:

Depth (m)	Graphic Log	Description Texture, colour/mottling, sand and gravel components	Consistency	Colour	Subsampling	Field Records/Comments
		Sandy layers	V. Soft			
		Mud				
0.2			Soft			Grey
		Mud				
0.4						
					0.5	
		Mud	Soft			
0.6						QAQC 3 = 0.5–1.0 m
0.8						Grey
1.0		Sandy layer			1.0	
		Mud				Homogeneous
1.2			Soft			
		Mud				Grey
1.4						
1.6			Soft			3 samples 0 – 0.5 0.5 – 1.0 1.0 – 1.95
1.8		Sandy layer				Grey
		Mud				
		EOH 1.95 m				

GEOCHEMICAL ASSESSMENTS

SEDIMENT CORE LOG

Sheet 1 of 1

Core ID/No: B74

CLIENT:	Arup/BMT WBM	DATE:	3 ~~May~~ JUNE 2014
PROJECT:	Cairns ShippingDevelopment Project	CORING METHOD:	
AREA:		LOCATION:	
LOGGED BY:	S.Taylor	CORE LENGTH (m):	2.0m

Hydrous Layer:

Subsurface sediments:

Depth (m)	Graphic Log	Description Texture, colour/mottling, sand and gravel components	Consistency	Colour	Subsampling	Field Records/Comments
		0.02-0.04 Sandy layer	Soft			
0.2			Soft			
0.4		Mud				Grey
0.6			Soft			
0.8		Mud				Grey
1.0						1.0
1.2			Soft			
1.4		Mud				Grey
1.6			Soft			3 samples 0 - 0.5 0.5 - 1.0 1.0 - 2.0
		1.70-1.73 Sandy				
1.8		Mud				Grey vesicles on 1.70-2.0m
2.0						

EOH 2.0m

GEOCHEMICAL ASSESSMENTS

SEDIMENT CORE LOG

Sheet 1 of 1

Core ID/No: B79

CLIENT:	Arup/BMT WBM	DATE:	3 ~~May~~ JUNE 2014
PROJECT:	Cairns ShippingDevelopment Project	CORING METHOD:	
AREA:		LOCATION:	
LOGGED BY:	S.Taylor	CORE LENGTH (m):	1.8 m

Hydrous Layer:

Subsurface sediments:

Depth (m)	Graphic Log	Description Texture, colour/mottling, sand and gravel components	Consistency	Colour	Subsampling	Field Records/Comments
			V.Soft			Grey
0.2		Mud	Soft			QAQC = 0–0.5 m
0.4						
		Mud			0.5	Grey
0.6			Soft			
0.8						
		Mud	Soft			Grey
1.0					1.0	
1.2						
		Mud	Soft			Grey
1.4						
			Firm			
1.6		Mud	Firm			Dark Grey Small vesicles 1.5–1.8 m Sulphurous odour
1.8		muddy sand EOH 1.8 m	Stiff			3 samples 0–0.5 0.5–1.0 1.0–1.8

GEOCHEMICAL ASSESSMENTS

SEDIMENT CORE LOG

Sheet 1 of 1

Core ID/No: C82

CLIENT:	Arup/BMT WBM	DATE:	3 ~~May~~ JUNE 2014
PROJECT:	Cairns ShippingDevelopment Project	CORING METHOD:	
AREA:		LOCATION:	
LOGGED BY:	S.Taylor	CORE LENGTH (m):	1.90m

Hydrous Layer:

Subsurface sediments:

Depth (m)	Graphic Log	Description Texture, colour/mottling, sand and gravel components	Consistency	Colour	Subsampling	Field Records/Comments
		Mud	V.Soft			Brown/grey
			Soft			
		Mud				Grey
			Soft			
		Mud				Grey
			Soft			
		Mud				Grey
						1.0
		Mud				Grey
			Soft			
		Mud	Firm			Grey
			Firm			1.8
		END 1.9m				NOT SAMPLED

? samples
0–0.5
0.5–1.0
1.0–1.8

GEOCHEMICAL ASSESSMENTS

SEDIMENT CORE LOG

Sheet 1 of 1

Core ID/No: B104

CLIENT:	Arup/BMT WBM	DATE:	3 ~~May~~ June 2014
PROJECT:	Cairns ShippingDevelopment Project	CORING METHOD:	
AREA:		LOCATION:	
LOGGED BY:	S.Taylor	CORE LENGTH (m):	1.55

Hydrous Layer:

Subsurface sediments:

Depth (m)	Graphic Log	Description (Texture, colour/mottling, sand and gravel components)	Consistency	Colour	Subsampling	Field Records/Comments
		Sandy Gravel	Firm			Brown, Abundant small shells and fragments
0.2		0.2				
		Gravelly Muddy Sand				Shell to 5mm dia
0.4					0.5	
0.6						
		0.75				
0.8		(Gravelly) Muddy Sand				
1.0					1.0	
		1.10			1.1	
1.2		(Sandy) Mud				NOT SAMPLED
1.4		1.50 organic layer				
		EOH 1.55				
1.6						3 samples 0–0.5 0.5–1.0 1.0–1.1

GEOCHEMICAL ASSESSMENTS

SEDIMENT CORE LOG

Sheet 1 of 1

Core ID/No: B108

CLIENT:	Arup/BMT WBM	DATE:	3 ~~May~~ June 2014
PROJECT:	Cairns ShippingDevelopment Project	CORING METHOD:	
AREA:		LOCATION:	
LOGGED BY:	S.Taylor	CORE LENGTH (m):	2.05

Hydrous Layer:

Subsurface sediments:

Depth (m)	Graphic Log	Description (Texture, colour/mottling, sand and gravel components)	Consistency	Colour	Subsampling	Field Records/Comments
		(Muddy) Sandy Gravel	Firm			Brown Abundant shells to 3cm
0.2			Firm			
0.4		0.44 Gravelly Muddy Sand			0.5	
0.6		0.60 Muddy Sand	Firm			Dark grey
		0.73				
0.8		Muddy Sandy Gravel				
1.0			Firm		1.0	Grey
1.2		More gravel 1.20 – 1.30m				
		1.3 Muddy Sand	Firm		1.3	Grey
1.4		1.56				
1.6		Sandy Mud	Firm			Dark grey
		Sandier 1.88 – 1.92 Mud				Some veinlets
2.0						

Kon 2.05

GEOCHEMICAL ASSESSMENTS

SEDIMENT CORE LOG

Sheet 1 of 1

Core ID/No: C119

CLIENT:	Arup/BMT WBM	DATE:	3 ~~May~~ 2014
PROJECT:	Cairns ShippingDevelopment Project	CORING METHOD:	Jue
AREA:		LOCATION:	
LOGGED BY:	S.Taylor	CORE LENGTH (m):	0.97

Hydrous Layer:

Subsurface sediments:

Depth (m)	Graphic Log	Description Texture, colour/mottling, sand and gravel components	Consistency	Colour	Subsampling	Field Records/Comments
		Sandy 0.01 - 0.03	V. Soft			Light Brown Grey
0.2		Mud	Soft			0.2 — Dredge depth
		Mud	Soft			Grey
						Grey
		Mud	Soft			
			Firm			Dark grey
			Firm			
		EOH 0.97				2 samples 0 - 0.2 (0.2 - 0.97)

GEOCHEMICAL ASSESSMENTS

SEDIMENT CORE LOG

Sheet 1 of 1

Core ID/No: C121

CLIENT:	Arup/BMT WBM	DATE:	3 ~~May~~ Jne 2014
PROJECT:	Cairns ShippingDevelopment Project	CORING METHOD:	
AREA:		LOCATION:	
LOGGED BY:	S.Taylor	CORE LENGTH (m):	1.16

Hydrous Layer:

Subsurface sediments:

Depth (m)	Graphic Log	Description Texture, colour/mottling, sand and gravel components	Consistency	Colour	Subsampling	Field Records/Comments
		Sandy Mud 0.01 – 0.03	V. Soft			Light brown
						Grey
0.2			Soft			
		Mud				Vegetative material 0.28 m
0.4						Grey
						0.5
			Soft			Anomic 0.58 m (Black)
0.6		Mud				
						Grey
0.8						0.8
		Mud	Soft			Dark Grey
						NOT SAMPLED.
		Refusal 1.16 m				
1.2						2 samples 0 – 0.5 0.5 – 0.8

GEOCHEMICAL ASSESSMENTS

SEDIMENT CORE LOG

Sheet 1 of 1

Core ID/No: B130

CLIENT:	Arup/BMT WBM	DATE:	~~May~~ 3 JUNE 2014
PROJECT:	Cairns ShippingDevelopment Project	CORING METHOD:	
AREA:		LOCATION:	
LOGGED BY:	S.Taylor	CORE LENGTH (m):	1.57

Hydrous Layer:

Subsurface sediments:

Depth (m)	Graphic Log	Description Texture, colour/mottling, sand and gravel components	Consistency	Colour	Subsampling	Field Records/Comments
		Mud				Brown V. Soft higher Grey
0.2						QAQC5 = 0–0.5
0.4		Mud				Grey
					0.5	
0.6						
		Mud				Grey
0.8						
1.0		Mud			1.0	
						Grey
1.2		Mud				
1.4						
					1.57	
1.6		Rock 1.57				3 samples 0–0.5 0.5–1.0 1.0–1.57

GEOCHEMICAL ASSESSMENTS

SEDIMENT CORE LOG

Sheet 1 of 1

Core ID/No: A127

CLIENT:	Arup/BMT WBM	DATE:	3 ~~May~~ June 2014
PROJECT:	Cairns ShippingDevelopment Project	CORING METHOD:	
AREA:		LOCATION:	
LOGGED BY:	S.Taylor	CORE LENGTH (m):	0.55

Hydrous Layer:

Subsurface sediments:

Depth (m)	Graphic Log	Description Texture, colour/mottling, sand and gravel components	Consistency	Colour	Subsampling	Field Records/Comments
		Mud	Very Soft			Brown to Grey
		0.08 Muddy Gravel	Soft			
0.1		0.1				
			Stiff			
0.2		Silty Clay				light grey/green
0.3			Stiff			
0.4						
		Silty clay				light grey/green
0.5						
		EOH = 0.55 m				
						2 samples 0 – 0.1 0.1 – 0.55
						Two cores at same location 0.5 and 0.55 m Refusal on very stiff material

GEOCHEMICAL ASSESSMENTS

SEDIMENT CORE LOG

Sheet 1 of 1

Core ID/No: F150

CLIENT:	Arup/BMT WBM	DATE:	3 ~~May~~ JUNE 2014
PROJECT:	Cairns ShippingDevelopment Project	CORING METHOD:	
AREA:		LOCATION:	
LOGGED BY:	S.Taylor	CORE LENGTH (m):	0.45m

Hydrous Layer:

Subsurface sediments:

Depth (m)	Graphic Log	Description Texture, colour/mottling, sand and gravel components	Consistency	Colour	Subsampling	Field Records/Comments
		0.01m Crumbly mud	Stiff			V. Soft Brown
0.1		Silty Clay	Stiff			Dark grey with red/brown vegetation material (roots?)
0.2			Stiff			
0.3		Silty Clay	Stiff			
0.4			Stiff			
		EOH 0.45m				
0.5						one sample 0.01 – 0.45
						Refusal on very stiff material.

GEOCHEMICAL ASSESSMENTS

SEDIMENT CORE LOG

Sheet 1 of 1

Core ID/No: 4 165

CLIENT:	Arup/BMT WBM	DATE:	4 ~~May~~ JUNE 2014
PROJECT:	Cairns ShippingDevelopment Project	CORING METHOD:	
AREA:		LOCATION:	
LOGGED BY:	S.Taylor	CORE LENGTH (m):	0.1 m

Hydrous Layer:

Subsurface sediments:

Depth (m)	Graphic Log	Description Texture, colour/mottling, sand and gravel components	Consistency	Colour	Subsampling	Field Records/Comments
		< 0.01m Crumbly mud		V. Soft		Brown mud with shells
0.05		Silty Clay	Very Stiff			Pebbles of orange/light grey Some vegetation - roots?
0.10		BOH 0.1m				
						2 coring attempts 0.08 and 0.10m
						Sample 0.02 – 0.1

GEOCHEMICAL ASSESSMENTS

SEDIMENT CORE LOG

Sheet 1 of 1

Core ID/No: G155

CLIENT:	Arup/BMT WBM	DATE:	4 ~~May~~ June 2014
PROJECT:	Cairns ShippingDevelopment Project	CORING METHOD:	
AREA:		LOCATION:	
LOGGED BY:	S.Taylor	CORE LENGTH (m):	0.05

Hydrous Layer:

Subsurface sediments:

Depth (m)	Graphic Log	Description Texture, colour/mottling, sand and gravel components	Consistency	Colour	Subsampling	Field Records/Comments
		Silty clay	V. Stiff			light dusting of mud
		EOH 0.05m				
						Sample 0 – 0.05 (did not include surficial mud)

GEOCHEMICAL ASSESSMENTS

SEDIMENT CORE LOG

Sheet 1 of 1

Core ID/No: H167

CLIENT:	Arup/BMT WBM	DATE:	1 May 2014
PROJECT:	Cairns ShippingDevelopment Project	CORING METHOD:	JUNK + PISTON + GRAB
AREA:		LOCATION:	
LOGGED BY:	S.Taylor	CORE LENGTH (m):	0.11

Hydrous Layer:

Subsurface sediments:

Depth (m)	Graphic Log	Description Texture, colour/mottling, sand and gravel components	Consistency	Colour	Subsampling	Field Records/Comments
		Mud	Soft			Black, anoxic
		Mud and clay clasts				Brown oxidised layer
		0.05				
		Silty clay	V. Stiff			Orange / pale grey mottled
		EOH 0.11				
						Clay sample 0.05 – 0.11
		Grab sample 0 – 0.01 brown soft mud 0.01 – 0.08 black sandy mud, occ. rounded pebble				
		QAQC G = 0 – 0.08 (grab)				Mud sample 0 – 0.08

GEOCHEMICAL ASSESSMENTS

SEDIMENT CORE LOG

Sheet 1 of 1

~~Core~~ ID/No: K167

CLIENT:	Arup/BMT WBM	DATE:	~~May~~ 4 JUNE 2014
PROJECT:	Cairns ShippingDevelopment Project	~~CORING~~ METHOD:	GRAB
AREA:		LOCATION:	
LOGGED BY:	S.Taylor	~~CORE LENGTH~~ Depth (m):	0.03

Hydrous Layer:

Subsurface sediments:

Depth (m)	Graphic Log	Description Texture, colour/mottling, sand and gravel components	Consistency	Colour	Subsampling	Field Records/Comments
0.01 0.02 0.03		Gravelly Muddy Sand	Soft			Brown surficial hydrous layer <0.01m thick Shelly, rounded pebbles, mica flakes organic debris.

GEOCHEMICAL ASSESSMENTS

SEDIMENT CORE LOG

Sheet 1 of 1

~~Core~~ ID/No: P180

CLIENT:	Arup/BMT WBM	DATE:	4 ~~May~~ JUNE 2014
PROJECT:	Cairns ShippingDevelopment Project	~~CORING~~ METHOD:	GRAB
AREA:		LOCATION:	
LOGGED BY:	S.Taylor	CORE LENGTH (m):	0.04

Hydrous Layer:

Subsurface sediments:

Depth (m)	Graphic Log	Description Texture, colour/mottling, sand and gravel components	Consistency	Colour	Subsampling	Field Records/Comments
0.01		Mud	V. Soft			V. Soft brown, brown clay clasts.
0.02			V. Soft			
0.03						clay clasts and shells to 5cm
0.04		Gravelly				
		EOH 0.04				
						GRAB only
						Sample 0 - 0.04m

GEOCHEMICAL ASSESSMENTS

SEDIMENT CORE LOG

Sheet 1 of 1

Core ID/No: I172

CLIENT:	Arup/BMT WBM	DATE:	4 ~~May~~ June 2014
PROJECT:	Cairns ShippingDevelopment Project	CORING METHOD:	
AREA:		LOCATION:	
LOGGED BY:	S.Taylor	CORE LENGTH (m):	1.10 m

Hydrous Layer:

Subsurface sediments:

Depth (m)	Graphic Log	Description Texture, colour/mottling, sand and gravel components	Consistency	Colour	Subsampling	Field Records/Comments
		Mud to sand	Soft			
0.2						Dark grey
			Soft			
0.4						
						Dark grey
0.6		Mud to. sand	Soft			
0.8						
1.0						
		1.05	V.Stiff			
		Refusal 1.10m				
						6 core attempts
						Sample 1.05 – 1.10

GEOCHEMICAL ASSESSMENTS

SEDIMENT CORE LOG

Sheet 1 of 1

Core ID/No: M180

CLIENT:	Arup/BMT WBM	DATE:	4 ~~May~~ June 2014
PROJECT:	Cairns ShippingDevelopment Project	CORING METHOD:	
AREA:		LOCATION:	
LOGGED BY:	S.Taylor	CORE LENGTH (m):	0.12 m

Hydrous Layer:

Subsurface sediments:

Depth (m)	Graphic Log	Description Texture, colour/mottling, sand and gravel components	Consistency	Colour	Subsampling	Field Records/Comments
		Coarsely ~~(sandy)~~ muddy Sand 0.02	Soft			light grey. Shelly pebbles
		Mud	V. Soft			Dark grey – black, anoxic
		0.06 Silty clay	V. Stiff			0.06 Orange / pale green
		EOH 0.12				
		Crab Coarsely sand overlying black anoxic mud				one sample

Appendix E Results – Primary Laboratory

...AIN OF CUSTODY

ALS Laboratory: please tick →

Environmental Division Brisbane

Work Order

EB1326059

Telephone : +61-7-3243 7222

CLIENT: BMT WBM	TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)	☐ Standard TAT (List due date): ☐ Non Standard or urgent TAT (List due date):	
OFFICE: Brisbane			
PROJECT: B20180 Cairns EIS	ALS QUOTE NO.: BN/915/13 V2	COC SEQUENCE NUMBER (Circle)	
ORDER NUMBER:		COC: 1 2 3 4 5 6	
PROJECT MANAGER: Markus Bilterbeck	CONTACT PH: 07 3831 6744	OF: 1 2 3 4 5 6	
SAMPLER: Stuart Taylor	SAMPLER MOBILE: 0403 877 203	RELINQUISHED BY: S. Taylor	RECEIVED BY: T. Creagh
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default):	DATE/TIME: 24/10/13 10:30	DATE/TIME: 25/10/13 09:50
Email Reports to (will default to PM if no other addresses are listed): markus.bilterbeck@bmtwbm.com.au			
Email Invoice to (will default to PM if no other addresses are listed): brad.grant@bmtwbm.com.au			

No NA
No NA
°C
BY:

ALS USE ONLY	SAMPLE DETAILS MATRIX: Solid(S) Water(W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required)									Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES/ BAGS	Particle Size to 75um - Sieve only (EA150)	Particle Size plus Hydrometer 1-5um (EA150H)	Metals - Ag, As, Cd, Cr, Cu, Hg, Ni, Pb, Sb, Zn, Fe, Al (SD-3)	Organotins (EP090)	BTEX, TPH, PAH, OCP/OPP, Diuron	PFCs (EP231-PFC)	Nutrients - TN, TKN, TP, NH4, Nox (NT-11S plus EK055-SD)	Chromium Suite (EA033)	TOC (EP003)	Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
1	C119 0-0.2	18/10	Sed		4	✓	✓	✓	✓			✓	✓	✓	
2	C119A 0-0.2	"	Sed		4	✓	✓	✓	✓			✓	✓	✓	
3	C119B 0-0.2	"	Sed		4	✓	✓	✓	✓			✓	✓	✓	
4	B130 0-0.5	"	Sed		4	✓	✓	✓	✓			✓	✓	✓	
5	A138 0-0.27	"	Sed		4	✓	✓	✓	✓				✓	✓	NO NUTRIENTS
6	A140 0-0.26	"	Sed		4	✓	✓	✓	✓			✓	✓	✓	
7	D149 0-0.15	"	Sed		3			✓	✓			✓	✓	✓	NO GRAINSIZE
8	C146 0-0.25	"	Sed		4	✓	✓	✓	✓				✓	✓	NO NUTRIENTS
9	D147 0-0.05	"	Sed		4	✓	✓	✓	✓				✓	✓	NO NUTRIENTS
10	B2 0-0.55	19/10	Sed		4	✓	✓	✓	✓			✓	✓	✓	
11	B7 0-0.50	"	Sed		4	✓	✓	✓	✓			✓	✓	✓	
12	B7 0.5-0.95	"	Sed		4	✓	✓	✓	✓				✓	✓	NO NUTRIENTS
13	B9 0-0.5	"	Sed		4	✓	✓	✓	✓			✓	✓	✓	
14	B9 0.5-0.7	"	Sed		4	✓	✓	✓	✓				✓	✓	NO NUTRIENTS
15	C22 0-0.5	"	Sed		4	✓	✓	✓	✓				✓	✓	
16	C22 0.5-0.9	"	Sed		4	✓	✓	✓	✓			✓	✓	✓	
17	C29 0-0.5	"	Sed		4	✓	✓	✓	✓			✓	✓	✓	
18	C29 0.5-0.8	"	Sed		4	✓	✓	✓	✓				✓	✓	
19	B25 0-0.2	"	Sed		4	✓	✓	✓	✓			✓	✓	✓	
20	B25 0.2-0.3	"	Sed		3			✓	✓				✓	✓	NO GRAINSIZE
21	QAQC 1	18/10	Sed		4										HOLD

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

CHAIN OF CUSTODY

ALS Laboratory: please tick →

CLIENT: BMT WBM	TURNAROUND REQUIREMENTS: ☐ Standard TAT (List due date): ☐ Non Standard or urgent TAT (List due date): (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)
OFFICE: Brisbane	ALS QUOTE NO.: BN/915/13 V2
PROJECT: B20180 Cairns EIS	COC SEQUENCE NUMBER (Circle) COC: 1 2 3 4 5 6 7 OF: 1 2 3 4 5 6 7
ORDER NUMBER:	
PROJECT MANAGER: Markus Bilterbeck	CONTACT PH: 07 3831 6744
SAMPLER: Stuart Taylor	SAMPLER MOBILE: 0403 877 289
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default):
Email Reports to (will default to PM if no other addresses are listed): markus.bilterbeck@bmtwbm.com.au	
Email Invoice to (will default to PM if no other addresses are listed): brad.grant@bmtwbm.com.au	

FOR LABORATORY USE ONLY (Circle)

Custody Seal Intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt:		°C	
Other comment:			

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
S. Taylor	T. Creagh		
DATE/TIME: 24/10/13 10:30	DATE/TIME: 25/10/13 0930	DATE/TIME:	DATE/TIME:

ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price)

Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).

ALS USE ONLY	SAMPLE DETAILS MATRIX: Solid(S) Water(W)			CONTAINER INFORMATION		Particle Size to 75um - Sieve only (EA150)	Particle Size plus Hydrometer 1-5um (EA150H)	Metals - Ag, As, Cd, Cr, Cu, Hg, Ni, Pb, Sb, Zn, Fe, Al (SD-3)	Organotins (EP090)	BTEX, TPH, PAH, OCP/OPP, Diuron	PFCs (EP231-PFC)	Nutrients - TN, TKN, TP, NH4, NOx (NT-11S plus EK055-SD)	Chromium Suite (EA033)	TOC (EP003)	Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES BA03										Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc
22	C30 0-0.5	19/10	Sed		4	✓	✓	✓	✓			✓	✓	✓	
23	C30 0.5-1.0	"	Sed		4	✓	✓	✓	✓				✓	✓	
24	C94 0-0.5	"	Sed		4	✓	✓	✓	✓			✓	✓	✓	
25	C94 0.5-1.0	"	Sed		4	✓	✓	✓	✓				✓	✓	
26	C99 0-0.5	"	Sed		4			✓	✓				✓	✓	
27	C99 0.5-0.8	"	Sed		4	✓	✓	✓	✓			✓	✓	✓	
28	C121 0-0.5	"	Sed		4			✓	✓				✓	✓	
29	C121 0.5-0.8	"	Sed		4			✓	✓				✓	✓	
30	F156 0-0.05	"	Sed		4	✓	✓	✓	✓			✓	✓	✓	
31	B108 0-0.5	20/10	Sed		4	✓	✓	✓	✓			✓	✓	✓	
32	B108 0.5-1.0	"	Sed		4			✓	✓				✓	✓	
33	B108 1.0-1.2	"	Sed		4	✓	✓	✓	✓				✓	✓	
34	B104 0-0.5	"	Sed		4	✓	✓	✓	✓			✓	✓	✓	
35	B104 0.5-0.95	"	Sed		4	✓	✓	✓	✓			✓	✓	✓	
36	C50 0-0.5	"	Sed		4			✓	✓				✓	✓	
37	C50 0.5-1.0	"	Sed		4	✓	✓	✓	✓				✓	✓	
38	C50 1.0-1.2	"	Sed		4	✓	✓	✓	✓				✓	✓	
39	C53 0-0.5	"	Sed		4			✓	✓			✓	✓	✓	
40	C53 0.5-0.9	"	Sed												
		"	Sed												HOLD
	QAQC 2	"	Sed		4										
				Total											

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

CHAIN OF CUSTODY

ALS Laboratory: please tick →

CLIENT: BMT WBM	TURNAROUND REQUIREMENTS: ☐ Standard TAT (List due date):		FOR LABORATORY USE ONLY (Circle)
OFFICE: Brisbane	(Standard TAT may be longer for some tests e.g. Ultra Trace Organics) ☐ Non Standard or urgent TAT (List due date):		Custody Seal intact? Yes No N/A
PROJECT: B20180 Cairns EIS	ALS QUOTE NO.: BN/315/13 V2	COC SEQUENCE NUMBER (Circle)	Free ice / frozen ice bricks present upon receipt? Yes No N/A
ORDER NUMBER:		COC: 1 2 3 4 5 6 7	Random Sample Temperature on Receipt: °C
PROJECT MANAGER: Markus Billerbeck	CONTACT PH: 07 3831 6744	OF: 1 2 3 4 5 6 7	Other comment:

SAMPLER: Stuart Taylor	SAMPLER MOBILE: 0403 577 209	RELINQUISHED BY: S. Taylor	RECEIVED BY: T. Geach	RELINQUISHED BY: / RECEIVED BY:
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default):			
Email Reports to (will default to PM if no other addresses are listed): markus.billerbeck@bmtwbm.com.au		DATE/TIME: 24/10/13 10:30	DATE/TIME: 25/10/13 0930	DATE/TIME: / DATE/TIME:
Email Invoice to (will default to PM if no other addresses are listed): brad.grant@bmtwbm.com.au				

ANALYSIS REQUIRED Including SUITES (NB. Suite Codes must be listed to attract suite price)
Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required)

ALS USE ONLY LAB ID	SAMPLE DETAILS SAMPLE ID	DATE / TIME	MATRIX (Solid(S) Water(W))	CONTAINER INFORMATION TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	Particle Size to 75um - Sieve only (EA150)	Particle Size plus Hydrometer 1-5um (EA150H)	Metals - Ag, As, Cd, Cr, Cu, Hg, Ni, Pb, Sb, Zn, Fe, Al (SD-3)	Organotins (EP090)	BTEX, TPH, PAH, OCP/OPP, Diuron	PFCs (EP231-PFC)	Nutrients - TN, TKN, TP, NH4, N0x (NT-11S plus EK055-SD)	Chromium Suite (EA033)	TOC (EP003)	Additional Information (Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.)
42	B54 0-0.5	20/10/13	Sed		4	✓	✓	✓	✓			✓	✓	✓	
43	B54 0.5-1.0	"	Sed		4			✓	✓				✓	✓	
44	B54 1.0-1.1	"	Sed		3	—		✓	✓				✓	✓	NO GRAINSIZE
45	H160 0-0.02	"	Sed		1			✓	✓					✓	NO BAGS
46	H160 0.02-0.04	"	Sed		1			✓	✓					✓	NO BAGS
47	K167 0-0.25	"	Sed		4	✓	✓	✓	✓	✓	✓	✓	✓	✓	
48	M180 0-0.2	"	Sed		4	✓	✓	✓	✓	✓	✓	✓	✓	✓	
49	M180A 0-0.2	"	Sed		4	✓	✓	✓	✓	✓	✓	✓	✓	✓	
50	M180B 0-0.2	"	Sed		4	✓	✓	✓	✓	✓	✓	✓	✓	✓	
51	P180 0-0.05	21/10/13	Sed		2			✓	✓	✓	✓	✓		✓	NO BAGS
52	H167 0-0.2	"	Sed		4	✓	✓	✓	✓	✓	✓	✓	✓	✓	
"	H167 0-0.2	"	Sed		4										TO ENVIROCABS (ALL ANALYTES)
53	H165 0-0.2	"	Sed		4	✓	✓	✓	✓	✓	✓	✓	✓	✓	
54	H165A 0-0.2	"	Sed		4	✓	✓	✓	✓	✓	✓	✓	✓	✓	
55	H165B 0-0.2	"	Sed		4	✓	✓	✓	✓	✓	✓	✓	✓	✓	
~~56~~ SNR	U187 0-0.2	"	Sed		4	✓	✓	✓	✓	✓	✓	✓	✓	✓	
57	U187A 0-0.2*	"	Sed		4	✓	✓	✓	✓	✓	✓	✓	✓	✓	
58	U187B 0-0.2	"	Sed		4	✓	✓	✓	✓	✓	✓	✓	✓	✓	
59	H162	"	Sed		1			✓	✓					✓	ONE JAR ONLY
			Sed					✓	✓						
60	QAQC 3		Sed		4	✓	✓	✓	✓	✓	✓	✓	✓	✓	
				TOTAL											

(56) U187 0-0.1 *

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

CHAIN OF CUSTODY

ALS Laboratory: please tick →

CLIENT: BMT WBM	TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)	☐ Standard TAT (List due date): ☐ Non Standard or urgent TAT (List due date):	FOR LABORATORY USE ONLY (Circle)
OFFICE: Brisbane			Custody Seal Intact? Yes No N/A
PROJECT: B20180 Cairns EIS	ALS QUOTE NO.: BN/915/13 V2	COC SEQUENCE NUMBER (Circle)	Free ice / frozen ice bricks present upon receipt? Yes No N/A
ORDER NUMBER:		COC: 1 2 3 4 5 6 7	Random Sample Temperature on Receipt: °C
PROJECT MANAGER: Markus Hillerbeck	CONTACT PH: 07 3831 6744	OF: 1 2 3 4 5 6 7	Other comment:
SAMPLER: Stuart Taylor	SAMPLER MOBILE: 0403 977 209	RELINQUISHED BY:	RECEIVED BY: T. Creagh
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default):		
Email Reports to (will default to PM if no other addresses are listed): markus.hillerbeck@bmtwbm.com.au		DATE/TIME:	DATE/TIME: 25/10/13 0930
Email Invoice to (will default to PM if no other addresses are listed): brad.grant@bmtwbm.com.au			

RELINQUISHED BY:	RECEIVED BY:
DATE/TIME:	DATE/TIME:

ALS USE ONLY	SAMPLE DETAILS MATRIX: Solid(S) Water(W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).									Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	Particle Size to 75um - Sieve only (EA150)	Particle Size plus Hydrometer 1-5um (EA150H)	Metals - Ag, As, Cd, Cr, Cu, Hg, Ni, Pb, Sb, Zn, Fe, Al (SD-3)	Organotins (EP090)	BTEX, TPH, PAH, OCP/OPP, Diuron	PFCs (EP231-PFC)	Nutrients - TN, TKN, TP, NH4, NOx (NT-11S plus EK055-SD)	Chromium Suite (EA033)	TOC (EP003)	Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
62	U185 0-0.5	21/10/13	Sed		4	✓	✓	✓	✓	✓	✓	✓	✓	✓	
"	U185 0-0.5	"	Sed		4										ENVIROLABS
63	U185 0.5-1.0	"	Sed		4	✓	✓	✓	✓	✓	✓	✓	✓	✓	
"	U185 0.5-1.0	"	Sed		4										ENVIROLABS
64	U185 1.0-1.5	"	Sed		4	✓	✓	✓	✓	✓	✓	✓	✓	✓	
65	U185 1.5-2.0	"	Sed		4			✓	✓				✓	✓	
66	U185 2.0-2.5	"	Sed		4			✓	✓				✓	✓	
67	U185 2.5-2.9	"	Sed		4	✓	✓	✓	✓	✓	✓	✓	✓	✓	
68	B63 0-0.5	22/10/12	Sed		4	✓	✓	✓	✓				✓	✓	
69	B63 0.5-1.0	"	Sed		3			✓	✓			✓	✓	✓	NO GRAIN SIZE BAG
70	B63 1.0-1.45	"	Sed		3			✓	✓				✓	✓	
		"	Sed					✓	✓						
		"	Sed					✓	✓						
		"	Sed					✓	✓						
		"	Sed					✓	✓						
		"	Sed					✓	✓						
		"	Sed					✓	✓						
		"	Sed					✓	✓						
		"	Sed					✓	✓						
71	QAQC5	21/10/13	Sed		4	✓	✓	✓	✓	✓	✓	✓	✓	✓	
72	QAQC4	"	Sed		4	✓	✓	✓	✓	✓	✓	✓	✓	✓	
					TOTAL										

ALL ANALYSES.

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

CHAIN OF CUSTODY

ALS Laboratory: please tick →

CLIENT: BMT WBM	TURNAROUND REQUIREMENTS: (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)	☐ Standard TAT (List due date): ☐ Non Standard or urgent TAT (List due date):	FOR LABORATORY USE ONLY (Circle)
OFFICE: Brisbane			Custody Seal Intact? Yes No N/A
PROJECT: B20160 Cairns EIS	ALS QUOTE NO.: EN/915/13 V2	COC SEQUENCE NUMBER (Circle)	Free ice / frozen ice bricks present upon receipt? Yes No N/A
ORDER NUMBER:		COC: 1 2 3 4 5 6 7	Random Sample Temperature on Receipt: °C
PROJECT MANAGER: Markus Bilterbeck	CONTACT PH: 07 3831 6744	OF: 1 2 3 4 5 6 7	Other comment:
SAMPLER: Stuart Taylor	SAMPLER MOBILE: 0403 977 209	RELINQUISHED BY: S. Taylor	RECEIVED BY: T. Crean
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default):	DATE/TIME: 24/10/13 10:30	DATE/TIME: 25/10/13 0930
Email Reports to (will default to PM if no other addresses are listed): markus.bilterbeck@bmtwbm.com.au		RELINQUISHED BY:	RECEIVED BY:
Email Invoice to (will default to PM if no other addresses are listed): brad.grant@bmtwbm.com.au		DATE/TIME:	DATE/TIME:

MORE NEXT PAGE

ALS USE ONLY	SAMPLE DETAILS MATRIX: Solid(S) Water(W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).									Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES / BAGS	Particle Size to 75um - Sieve only (EA150)	Particle Size plus Hydrometer 1-5um (EA150H)	Metals - Ag, As, Cd, Cr, Cu, Hg, Ni, Pb, Sb, Zn, Fe, Al (SD-3)	Organotins (EP090)	BTEX, TPH, PAH, OCP/OPP, Diuron	PFCs (EP231-PFC)	Nutrients - TN, TKN, TP, NH4, NOx (NT-11S plus EK055-SD)	Chromium Suite (EA033)	TOC (EP003)	Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc
73	B41 0-0.5	22/10/13	Sed		4	✓	✓	✓	✓				✓	✓	
"	B41 0-0.5	"	Sed		4										ENVIROLAB
74	B41 0.5-0.9	"	Sed		4	✓	✓	✓	✓				✓	✓	
"	B41 0.5-0.9	"	Sed		4										ENVIROLAB
75	C72 0-0.5	"	Sed		4	✓	✓	✓	✓			✓	✓	✓	
76	C72 0.5-1.0	"	Sed		3			✓	✓				✓	✓	NO GRAINSIZE BAG
77	C72 1.0-2.1	"	Sed		4			✓	✓				✓	✓	
78	B74 0-0.5	"	Sed		4	✓	✓	✓	✓			✓	✓	✓	
79	B74 0.5-1.0	"	Sed		3			✓	✓				✓	✓	NO GRAINSIZE BAG
80	B74 1.0-1.9	"	Sed		4	✓	✓	✓	✓			✓	✓	✓	
Jar 81	B74 1.9-2.0	"	Sed		1			✓	✓					✓	NO BAGS
82	B79 0-0.5	"	Sed		4			✓	✓						
83	B79 0.5-1.0	"	Sed		3			✓	✓				✓	✓	NO GRAINSIZE BAG
84	B79 1.0-1.8	"	Sed		4	✓	✓	✓	✓			✓	✓	✓	
85	C82 0-0.5	"	Sed		4			✓	✓				✓	✓	
86	C82 0.5-1.0	"	Sed		3			✓	✓				✓	✓	NO GRAINSIZE BAG
87	C82 1.0-1.53	"	Sed		4	✓	✓	✓	✓			✓	✓	✓	
Jar 88	C82 1.53-1.67	"	Sed		1			✓	✓					✓	ONE JAR ONLY
			Sed					✓	✓						
89	QAQC 7		Sed		4	✓	✓	✓	✓				✓	✓	
90	QAQC 6		Sed		4	✓	✓	✓	✓				✓	✓	
					TOTAL										

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

CHAIN OF CUSTODY

ALS Laboratory: please tick →

CLIENT: BMT WBM	TURNAROUND REQUIREMENTS: ☐ Standard TAT (List due date):
OFFICE: Brisbane	(Standard TAT may be longer for some tests e.g. Ultra Trace Organics) ☐ Non Standard or urgent TAT (List due date):
PROJECT: B20160 Cairns EIS	ALS QUOTE NO.: BN/915/13 V2
ORDER NUMBER:	
PROJECT MANAGER: Markus Silberbeck	CONTACT PH: 07 3831 6744
SAMPLER: Stuart Taylor	SAMPLER MOBILE: 0403 977 209
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default):
Email Reports to (will default to PM if no other addresses are listed): markus.silberbeck@bmtwbm.com.au	
Email Invoice to (will default to PM if no other addresses are listed): brad.grant@bmtwbm.com.au	

COC SEQUENCE NUMBER (Circle)

COC:	1	2	3	4	5	6	7
OF:	1	2	3	4	5	6	7

FOR LABORATORY USE ONLY (Circle)

Custody Seal Intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt:	°C		
Other comment:			

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
S. Taylor	T. Creagh		
DATE/TIME: 24/10/13 10:30	DATE/TIME: 25/10/13 0930	DATE/TIME:	DATE/TIME:

ALS USE ONLY	SAMPLE DETAILS MATRIX: Solid(S) Water(W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).									Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	Particle Size to 75um - Sieve only (EA150)	Particle Size plus Hydrometer 1-5um (EA150H)	Metals - Ag, As, Cd, Cr, Cu, Hg, Ni, Pb, Sb, Zn, Fe, Al (SD-3)	Organotins (EP090)	BTEX, TPH, PAH, OCP/OPP, Diuron	PFCs (EP231-PFC)	Nutrients - TN, TKN, TP, NH4, NOx (NT-11S plus EK055-SD)	Chromium Suite (EA033)	TOC (EP003)	Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
91	A127 0-0.5	23/10/13	Sed		4	✓	✓	✓	✓				✓	✓	
92	A127 0.5-1.0	"	Sed		4			✓	✓				✓	✓	
93	A127 1.0-1.7	"	Sed		4	✓	✓	✓	✓				✓	✓	
94	E150 0-0.43	"	Sed		4	✓	✓	✓	✓			✓	✓	✓	
95	F150 0.43-0.62	"	Sed		1			✓	✓					✓	
96	F150 0.62-0.90	"	Sed		1			✓	✓					✓	
97	G155 0-0.15	"	Sed		1			✓	✓					✓	
98	I162 0-0.13	"	Sed		2			✓	✓	✓	✓			✓	JARS ONLY
99	I162 0.13-0.33	"	Sed		3	✓	✓	✓	✓	✓	✓	✓	✓	✓	JAR, 2 BAGS
100	J164 0-0.5	"	Sed		4	✓	✓	✓	✓	✓	✓	✓	✓	✓	
101	J164 0.5-1.02	"	Sed		4	✓	✓	✓	✓	✓	✓	✓	✓	✓	
102	I172 0-0.5	"	Sed		4	✓	✓	✓	✓	✓	✓	✓	✓	✓	
103	I172 0.5-1.0	"	Sed		4	✓	✓	✓	✓	✓	✓	✓	✓	✓	
104	B41B 0-0.5	22/10/13	Sed		4	✓	✓	✓	✓				✓	✓	
105	B41B 0.5-0.9	"	Sed		4	✓	✓	✓	✓				✓	✓	
106	B41A 0-0.5	"	Sed		4	✓	✓	✓	✓				✓	✓	
107	B41A 0.5-0.9	"	Sed		4	✓	✓	✓	✓				✓	✓	
			Sed					✓	✓						
			Sed					✓	✓						
			Sed					✓	✓						
			Sed					✓	✓						
				TOTAL											

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

N OF CUSTODY

Laboratory: please tick →

		TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g.. Ultra Trace Organics)	☐ Standard TAT (List due date): ☐ Non Standard or urgent TAT (List due date):
20180 Cairns EIS		ALS QUOTE NO.: BN/315/13 V2	COC SEQUENCE NUMBER (Circle) COC: 1 2 3 4 5 6 7 OF: 1 2 3 4 5 6 7
NUMBER:			
ECT MANAGER: Markus Billerbeck	CONTACT PH: 07 3831 6744		
AMPLER: Stuart Taylor	SAMPLER MOBILE: 0403 377 209		
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default):		
Email Reports to (will default to PM if no other addresses are listed):	markus.billerbeck@bmtwbm.com.au		
Email Invoice to (will default to PM if no other addresses are listed):	brad.grant@bmtwbm.com.au		

FOR LABORATORY USE ONLY (Circle)

Custody Seal Intact?	Yes	No	N/A
Free Ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt:		°C	
Other comment:			

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
S. Taylor	J. Crespo		
DATE/TIME: 24/10/13	DATE/TIME: 25/10/13 0930	DATE/TIME:	DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE ONLY	SAMPLE DETAILS MATRIX: Solid(S) Water(W)			CONTAINER INFORMATION		ANALYSIS REQUIRED Including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required)								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	Total metals - Ag, As, Cd, Cr, Cu, Hg, Ni, Pb, Sb, Zn (W-2T and EG020T)	Dissolved metals - Ag, As, Cd, Cr, Cu, Hg, Ni, Pb, Sb, Zn (W-2 and EG020F)	Nutrient Suite - TN, TP, NOx, NH4, FRP (NT-8A)	TBT (EP090)	Diuron (EP208)				Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
108	PWA	20/10/13	S		30	✓	✓	✓	✓	✓				PORE WATER
109	PWB	21/10/13	S		30	✓	✓	✓	✓	✓				
110	PWC	21/10/13	S		31	✓	✓	✓	✓	✓				
111	ELUTRIATE WATER 22/10				1	✓	✓	✓	✓	✓				SEAWATER BLANK
~~112~~	ELUTRIATE WATER 22/10				1	✓	✓	✓	✓	✓				
113	PWA	20/10/13			30	✓	✓	✓	✓	✓				ELUTRIATE
114	PWB	21/10/13			30	✓	✓	✓	✓	✓				
115	PWC	21/10/13			31	✓	✓	✓	✓	✓				
				TOTAL										

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

ENVIROLABS

9 of 9.

CHAIN OF CUSTODY

CLIENT: BMT WBM	TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)	☐ Standard TAT (List due date): ☐ Non Standard or urgent TAT (List due date):
OFFICE: Brisbane		
PROJECT: B20180 Cairns EIS		
ORDER NUMBER:		
PROJECT MANAGER: Markus Bilterbeck	CONTACT PH: 07 3831 6744	
SAMPLER: Stuart Taylor	SAMPLER MOBILE: 0403 977 709	
(S / NO)	EDD FORMAT (or default):	
Email Reports to (will default to PM if no other addresses are listed): markus.bilterbeck@bmtwbm.com.au		
Email Invoice to (will default to PM if no other addresses are listed): brad.grant@bmtwbm.com.au		

COC SEQUENCE NUMBER (Circle)

COC: 1 2 3 4 5 6 7

CF: 1 2 3 4 5 6 7

FOR LABORATORY USE ONLY (Circle)

Custody Seal Intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt:		°C	
Other comment:			

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
S. Taylor	T. Cooper		
DATE/TIME: 24/10/13 10:30	DATE/TIME: 25/10/13 0930	DATE/TIME:	DATE/TIME:

ALS USE ONLY	SAMPLE DETAILS MATRIX: Solid(S) Water(W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).									Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	Particle Size to 75um - Sieve only (EA150)	Particle Size plus Hydrometer 1-5um (EA150H)	Metals - Ag, As, Cd, Cr, Cu, Hg, Ni, Pb, Sb, Zn, Fe, Al (SD-3)	Organotins (EP090)	BTEX, TPH, PAH, OCP/OPP, Diuron	PFCs (EP231-PFC)	Nutrients - TN, TKN, TP, NH4, NOx (NT-11S plus EK055-SD)	Chromium Suite (EA033)	TOC (EP003)	Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc
	U167 0-0.2		Sed		4	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	U185 0-0.5		Sed		4	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	U185 0.5-1.0		Sed		4	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	B41 0-0.5		Sed		4	✓	✓	✓	✓				✓	✓	
	B41 0.5-0.9		Sed		4	✓	✓	✓	✓				✓	✓	
			Sed					✓	✓						
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			Sed					✓	✓						
			Sed					✓	✓						
			Sed					✓	✓						
			Sed					✓	✓						
				TOTAL											

SEND TO ENVIROLABS

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

CHAIN OF CUSTODY

ALS Laboratory: ***please tick →***

☐ADELAIDE 21 Burma Road Pooraka SA 5095 Ph: 08 8359 0890 E: adelaide@alsglobal.com
☐BRISBANE 2 Byth Street Stafford QLD 4053 Ph: 07 3243 7222 E: samples.brisbane@alsglobal.com
☐GLADSTONE 46 Callemondah Drive Clinton QLD 4680 Ph: 07 7471 5600 E: gladstone@alsglobal.com
☐MACKAY 78 Harbour Road Mackay QLD 4740 Ph: 07 4944 0177 E: mackay@alsglobal.com
☐MELBOURNE 2-4 Westall Road Springvale VIC 3171 Ph: 03 8549 9600 E: samples.melbourne@alsglobal.com
☐MUDGEE 1/29 Sydney Road Mudgee NSW 2850 Ph: 02 6372 6735 E: mudgee.mail@alsglobal.com
☐NEWCASTLE 5 Rose Gum Road Warabrook NSW 2304 Ph: 02 4968 9433 E: samples.newcastle@alsglobal.com
☐NOWRA 4/13 Geary Place North Nowra NSW 2541 Ph: 02 4423 2063 E: nowra@alsglobal.com
☐PERTH 10 Hod Way Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsglobal.com
☐SYDNEY 277-289 Woodpark Road Smithfield NSW 2164 Ph: 02 8784 8555 E: samples.sydney@alsglobal.com
☐TOWNSVILLE 14-15 Desma Court Bohle QLD 4818 Ph: 07 4796 0600 E: townesville.environmental@alsglobal.com
☐WOLLONGONG 99 Kenny Street Wollongong NSW 2500 Ph: 02 4225 3125 E: wollongong@alsglobal.com

BMT WBM

TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g.. Ultra Trace Organics)
☐ Standard TAT **(List due date):**
☐ Non Standard or urgent TAT **(List due date):**

FOR LABORATORY USE ONLY (Circle)

Custody Seal Intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt:		°C	
Other comment:			

PROJECT NO.:
ALS QUOTE NO.:
R NUMBER: **PURCHASE ORDER NO.:**
COUNTRY OF ORIGIN:
OJECT MANAGER: **CONTACT PH:**
SAMPLER: **SAMPLER MOBILE:**
COC Emailed to ALS? (YES / NO) **EDD FORMAT (or default):**
Email Reports to (will default to PM if no other addresses are listed):
Email Invoice to (will default to PM if no other addresses are listed):

COC SEQUENCE NUMBER (Circle)

COC:	1	2	3	4	5	6	7
OF:	1	2	3	4	5	6	7

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE/TIME:	DATE/TIME:	DATE/TIME:	DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE ONLY	SAMPLE DETAILS MATRIX: Solid(S) Water(W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where **Metals** are required, specify **Total** (unfiltered bottle required) or **Dissolved** (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE *(refer to codes below)*	TOTAL BOTTLES									Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
	Extra samples	received by	ALS.											
116	QAQC 101	18/10/13	Sand	1 x Jar	1									
117	QAQC 102	19/10/13	↓	↓	1									
118	QAQC 103	20/10/13			1									
119	QAQC 104	21/10/13			1									
120	QAQC 105	23/10/13			1									
				TOTAL										

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

A13/5337

CHAIN OF CUSTODY

Att:	
Due Date:	7/11/2013
Purchase Order #:	500122
ALS Batch #:	EB1326059

From: Australian Laboratory Services Pty Ltd (ABN 84 009 936 029)
32 Shand St
Stafford QLD 4053
PH: 07 3243 7222
FAX: 07 3352 3662

To: Advanced Analytical Australia
Riverside Corporation Park 11 Julius Ave
NORTH RYDE NSW 2113
PH: 02 9888 9077

PLEASE RETURN ESKY TO ALS BRISBANE

Please email results to: subresults.bri@alsenviro.com

A13/5337

	ALS sample	SAMPLE ID.	CONTAINER DATA # DATE	TYPE	NO.	DIURON in Soil(LOR 1 µg/kg)	COMMENTS
1	47	K167 0-0.25	20/10/13	S	1	X	
2	48	M180 0-0.2				X	
3	49	M180A 0-0.2				X	
4	50	M180B 0-0.2				X	
5	51	P180 0-0.05	21/10/13			X	
6	52	H167 0-0.2				X	
7	53	H165 0-0.2				X	
8	54	H165A 0-0.2				X	
9	55	H165B 0-0.2				X	
10	56	V187 0-0.1				X	
11	58	V187A 0-0.2				X	
12	59	V187B 0-0.2				X	
13	61	QAQC 3				X	
14	62	V185 0-0.5				X	
15	63	V185 0.5-1.0				X	
16	64	V185 1.0-1.5				X	
17	67	V185 2.5-2.9				X	
18	71	~~I162 0-0.13~~ QAQC5				X	
19	72	~~I162 0-0.13~~ ~~QAQC~~ QAQC4				X	
20	98	I162 0-0.13	23/10/13			X	

NOTES:
1. Please ensure that a signed copy is emailed back immediately to subresults.bri@alsenviro.com acknowledging receipt.
2. Contact Matt Goodwin if the requested TAT cannot be met .07 3552 8634

RELINQUISHED BY (SIGN / PRINT): David	DATE: 29/10/13
OF: ALS	TIME: 17:00
RECEIVED BY (SIGN / PRINT): Charlene / DAWA	DATE: 31/10/13
OF: Advanced Analytical	(ARRIVAL TEMP: 12 deg. C) TIME: 10:15
RELINQUISHED BY (SIGN / PRINT):	DATE:
OF:	TIME:
RECEIVED BY (SIGN / PRINT):	DATE:
OF:	(ARRIVAL TEMP: deg. C) TIME:

AUSTRALIAN LABORATORY SERVICES P/L

A13/5337

CHAIN OF CUSTODY

Att:

Due Date: 7/11/2013

Purchase Order #: 500122

ALS Batch #: EB1326059

PLEASE RETURN ESKY TO ALS BRISBANE

From: Australian Laboratory Services Pty Ltd (ABN 84 009 936 029)
32 Shand St
Stafford QLD 4053
PH: 07 3243 7222
FAX: 07 3352 3662

To: **Advanced Analytical Australia**
Riverside Corporation Park 11 Julius Ave
NORTH RYDE NSW 2113
PH: **02 9888 9077**

Please email results to: ***subresults.bri@alsenviro.com***

A13/5337

	SAMPLE IDENTIFICATION		CONTAINER DATA #			LABORATORY PARAMETERS	
ALS sample	SAMPLE ID.		DATE	TYPE	NO.	DIURON in Soil(LOR 1 µg/kg)	COMMENTS
21	99	J162 0·13-0·33	23/10/13	S	1	X	
22	100	J164 0-0·5	↓	↓	↓	X	
23	101	J164 0·5-1·02				X	
24	102	J172 0-0·5				X	
25	103	J172 0·5-1·0				X	

NOTES:
1. Please ensure that a signed copy is emailed back immediately to subresults.bri@alsenviro.com acknowledging receipt.
2. Contact Matt Goodwin if the requested TAT cannot be met .07 3552 8634

RELINQUISHED BY (SIGN / PRINT): David	DATE: 24/10/13	RECEIVED BY (SIGN / PRINT): Charlie Bhana	DATE: 31/10/13
OF: ALS	TIME: 17:40	OF: Advanced Analytical	(ARRIVAL TEMP: 12 deg. C) TIME: 10:15
RELINQUISHED BY (SIGN / PRINT):	DATE:	RECEIVED BY (SIGN / PRINT):	DATE:
OF:	TIME:	OF:	(ARRIVAL TEMP: deg. C) TIME:

AUSTRALIAN LABORATORY SERVICES P/L

CERTIFICATE OF ANALYSIS

Work Order	: **EB1326059**	Page	: 1 of 98
Client	: **BMT WBM GROUP LTD**	Laboratory	: Environmental Division Brisbane
Contact	: DR MARKUS BILLERBECK	Contact	: Customer Services
Address	: PO BOX 203 SPRING HILL BRISBANE QLD 4004	Address	: 2 Byth Street Stafford QLD Australia 4053
E-mail	: markus.billerbeck@bmtwbm.com.au	E-mail	: Brisbane.Enviro.Services@alsglobal.com
Telephone	: +61 07 3831 6744	Telephone	: +61 7 3243 7222
Facsimile	: +61 07 3832 3627	Facsimile	: +61 7 3243 7218
Project	: B20180 Cairns EIS	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: ----		
C-O-C number	: ----	Date Samples Received	: 25-OCT-2013
Sampler	: Stuart Taylor	Issue Date	: 16-NOV-2013
Site	: ----		
		No. of samples received	: 118
Quote number	: BN/915/13 V2	No. of samples analysed	: 111

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

General Comments

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

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

- **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: EA033 (CRS Suite):Retained Acidity not required because pH KCl greater than or equal to 4.5**
- **EA150H: Soil Particle Density required for Hydrometer analysis according to AS 1289.3.5.1-2006 was not requested by the client. Typical sediment SPD values used for calculations and consequently NATA endorsement does not apply to hydrometer results.**
- **EG020-F (Dissolved Metals by ICP-MS): LOR raised for sample EB1326059 - 111 (ELUTRIATE WATER), 113 (PWA), 114 (PWB) & 115 (PWC) due to saline sample matrix.**
- **EG020-T (Total Metals): LOR raised for samples EB1326059-111 (ELUTRIATE WATER), -113 (PWA), -114 (PWB), -115 (PWC) due to saline sample matrix.**
- **EK055G (Ammonia as N): Some samples were diluted due to matrix interference. LOR adjusted accordingly.**
- **EK061G (Total Kjeldahl Nitrogen as N): Sample ELUTRIATE WATER was diluted due to matrix interference. LOR adjusted accordingly.**
- **EK067G (Total Phosphorus as P): Sample ELUTRIATE WATER was diluted due to matrix interference. LOR adjusted accordingly.**
- **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.**
- **EP071: Poor duplicate precision for sample K167 0-0.25 due to sample heterogeneity. Confirmed by re-extraction and re-analysis.**
- **EP090 (TBT): Particular samples show poor matrix spike recoveries for monobutyltin and dibutyltin due to matrix interference.**
- **EP231: PFOA and PFOS results are reported as an aggregate of linear and branched isomers.**
- **EP231: Poor matrix spike recovery due to matrix interference.**
- **It is recognised that EG093A-T(Total Metals in Saline water by ORC-ICPMS) is less than EG093A-F(Dissolved Metals in Saline water by ORC-ICPMS) for sample EB1309230 - 001. However, the difference is within experimental variation of the methods.**

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
Andrew Epps	Metals Production Chemist	Brisbane Inorganics
		WB Water Lab Brisbane
Ashesh Patel	Inorganic Chemist	Sydney Inorganics
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Hamish Murray	Supervisor - Soils	Newcastle - Inorganics
Hoa Nguyen	Senior Inorganic Chemist	Sydney Inorganics
Jiah Wallace	Physical Chemistry Section Supervisor	Brisbane Inorganics
Kim McCabe	Senior Inorganic Chemist	Brisbane Acid Sulphate Soils
		Brisbane Inorganics
Matt Frost	Senior Organic Chemist	Brisbane Organics
Pabi Subba	Senior Organic Chemist	Sydney Organics
Phalak Inthaksone	Laboratory Manager - Organics	Sydney Organics
Stephen Hislop	Senior Inorganic Chemist	Brisbane Inorganics

Analytical Results

Sub-Matrix: ELUTRIATE (Matrix: WATER)			Client sample ID	PWA Seawater Elutriate	PWB Seawater Elutriate	PWC Seawater Elutriate	----	----
			Client sampling date / time	15-NOV-2013 12:00	31-OCT-2013 12:00	21-OCT-2013 15:00	----	----
Compound	CAS Number	LOR	Unit	EB1326059-113	EB1326059-114	EB1326059-115	----	----
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	----	----
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS								
Aluminium	7429-90-5	5	µg/L	<5	<5	<5	----	----
Antimony	7440-36-0	0.5	µg/L	**0.6**	**1.8**	<0.5	----	----
Arsenic	7440-38-2	0.5	µg/L	**1.4**	**3.3**	<0.5	----	----
Cadmium	7440-43-9	0.2	µg/L	<0.2	<0.2	<0.2	----	----
Chromium	7440-47-3	0.5	µg/L	<0.5	<0.5	<0.5	----	----
Copper	7440-50-8	1	µg/L	<1	<1	<1	----	----
Lead	7439-92-1	0.2	µg/L	<0.2	<0.2	<0.2	----	----
Nickel	7440-02-0	0.5	µg/L	**0.5**	**1.5**	<0.5	----	----
Silver	7440-22-4	0.1	µg/L	<0.1	<0.1	<0.1	----	----
Zinc	7440-66-6	5	µg/L	<5	<5	<5	----	----
EG093T: Total Metals in Saline Water by ORC-ICPMS								
Aluminium	7429-90-5	5	µg/L	**1170**	**914**	**1240**	----	----
Antimony	7440-36-0	0.5	µg/L	**1.2**	**1.3**	**1.7**	----	----
Arsenic	7440-38-2	0.5	µg/L	**3.1**	**2.8**	**2.2**	----	----
Cadmium	7440-43-9	0.2	µg/L	<0.2	<0.2	<0.2	----	----
Chromium	7440-47-3	0.5	µg/L	<0.5	<0.5	<0.5	----	----
Copper	7440-50-8	1	µg/L	<1	<1	<1	----	----
Lead	7439-92-1	0.2	µg/L	**0.7**	**0.5**	**1.1**	----	----
Nickel	7440-02-0	0.5	µg/L	**0.7**	**1.5**	**1.7**	----	----
Silver	7440-22-4	0.1	µg/L	<0.1	<0.1	<0.1	----	----
Zinc	7440-66-6	5	µg/L	**18**	**15**	**14**	----	----
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	**3.95**	**4.35**	**0.94**	----	----
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	----	0.01	mg/L	<0.01	<0.01	<0.01	----	----
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	<0.01	<0.01	<0.01	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	<0.01	----	----

Analytical Results

Sub-Matrix: ELUTRIATE (Matrix: WATER)			Client sample ID	PWA Seawater Elutriate	PWB Seawater Elutriate	PWC Seawater Elutriate	----	----
			Client sampling date / time	15-NOV-2013 12:00	31-OCT-2013 12:00	21-OCT-2013 15:00	----	----
Compound	CAS Number	LOR	Unit	EB1326059-113	EB1326059-114	EB1326059-115	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	6.0	4.3	1.2	----	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ Total Nitrogen as N	----	0.1	mg/L	6.0	4.3	1.2	----	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	0.04	0.03	0.03	----	----
EK071G: Reactive Phosphorus as P by discrete analyser								
Reactive Phosphorus as P	14265-44-2	0.01	mg/L	0.01	0.01	0.02	----	----
EP090: Organotin Compounds (Soluble)								
Tributyltin	56573-85-4	2	ngSn/L	<2	<2	----	----	----
EP208: Phenylurea Herbicides								
Diuron	330-54-1	5.0	µg/L	<5.0	<5.0	<5.0	----	----
EP090S: Organotin Surrogate								
Tripropyltin	----	0.1	%	66.0	83.1	----	----	----

Analytical Results

Sub-Matrix: PORE WATER (Matrix: WATER)			Client sample ID	PWA Pore Water	PWB Pore Water	PWC Pore Water	----	----
			Client sampling date / time	15-NOV-2013 12:00	21-OCT-2013 15:00	31-OCT-2013 12:00	----	----
Compound	CAS Number	LOR	Unit	EB1326059-108	EB1326059-109	EB1326059-110	----	----
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	----	----
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS								
Aluminium	7429-90-5	5	µg/L	**5**	**12**	**15**	----	----
Antimony	7440-36-0	0.5	µg/L	<0.5	<0.5	<0.5	----	----
Arsenic	7440-38-2	0.5	µg/L	**5.5**	**2.7**	**3.0**	----	----
Cadmium	7440-43-9	0.2	µg/L	<0.2	<0.2	<0.2	----	----
Chromium	7440-47-3	0.5	µg/L	<0.5	<0.5	<0.5	----	----
Copper	7440-50-8	1	µg/L	<1	<1	<1	----	----
Lead	7439-92-1	0.2	µg/L	<0.2	<0.2	<0.2	----	----
Nickel	7440-02-0	0.5	µg/L	<0.5	<0.5	<0.5	----	----
Silver	7440-22-4	0.1	µg/L	<0.1	<0.1	**0.2**	----	----
Zinc	7440-66-6	5	µg/L	<5	<5	<5	----	----
EG093T: Total Metals in Saline Water by ORC-ICPMS								
Aluminium	7429-90-5	5	µg/L	**7800**	**5230**	**29300**	----	----
Antimony	7440-36-0	0.5	µg/L	<0.5	<0.5	<0.5	----	----
Arsenic	7440-38-2	0.5	µg/L	**14.4**	**7.8**	**26.7**	----	----
Cadmium	7440-43-9	0.2	µg/L	<0.2	<0.2	<0.2	----	----
Chromium	7440-47-3	0.5	µg/L	**12.4**	**5.8**	**52.9**	----	----
Copper	7440-50-8	1	µg/L	**6**	**2**	**24**	----	----
Lead	7439-92-1	0.2	µg/L	**5.7**	**4.9**	**31.9**	----	----
Nickel	7440-02-0	0.5	µg/L	**7.4**	**4.9**	**26.5**	----	----
Silver	7440-22-4	0.1	µg/L	<0.1	<0.1	<0.1	----	----
Zinc	7440-66-6	5	µg/L	**25**	**19**	**97**	----	----
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	**1.64**	**1.37**	**0.46**	----	----
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	----	0.01	mg/L	<0.01	<0.01	<0.01	----	----
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	<0.01	<0.01	<0.01	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	<0.01	----	----

Analytical Results

Sub-Matrix: PORE WATER (Matrix: WATER)			Client sample ID	PWA Pore Water	PWB Pore Water	PWC Pore Water	----	----
			Client sampling date / time	15-NOV-2013 12:00	21-OCT-2013 15:00	31-OCT-2013 12:00	----	----
Compound	CAS Number	LOR	Unit	EB1326059-108	EB1326059-109	EB1326059-110	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	2.2	1.4	0.8	----	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ Total Nitrogen as N	----	0.1	mg/L	2.2	1.4	0.8	----	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	0.13	0.13	0.14	----	----
EK071G: Reactive Phosphorus as P by discrete analyser								
Reactive Phosphorus as P	14265-44-2	0.01	mg/L	0.07	0.04	0.05	----	----
EP090: Organotin Compounds (Soluble)								
Tributyltin	56573-85-4	2	ngSn/L	<2	----	----	----	----
EP208: Phenylurea Herbicides								
Diuron	330-54-1	5.0	µg/L	<5.0	<5.0	<5.0	----	----
EP090S: Organotin Surrogate								
Tripropyltin	----	0.1	%	81.6	----	----	----	----

Analytical Results

Sub-Matrix: SEAWATER (Matrix: WATER)			Client sample ID	ELUTRIATE WATER Seawater Blank	----	----	----	----
			Client sampling date / time	22-OCT-2013 15:00	----	----	----	----
Compound	CAS Number	LOR	Unit	EB1326059-111	----	----	----	----
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	----	----	----	----
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS								
Aluminium	7429-90-5	5	µg/L	<5	----	----	----	----
Antimony	7440-36-0	0.5	µg/L	<0.5	----	----	----	----
Arsenic	7440-38-2	0.5	µg/L	<0.5	----	----	----	----
Cadmium	7440-43-9	0.2	µg/L	<0.2	----	----	----	----
Chromium	7440-47-3	0.5	µg/L	<0.5	----	----	----	----
Copper	7440-50-8	1	µg/L	<1	----	----	----	----
Lead	7439-92-1	0.2	µg/L	<0.2	----	----	----	----
Nickel	7440-02-0	0.5	µg/L	<0.5	----	----	----	----
Silver	7440-22-4	0.1	µg/L	<0.1	----	----	----	----
Zinc	7440-66-6	5	µg/L	<5	----	----	----	----
EG093T: Total Metals in Saline Water by ORC-ICPMS								
Aluminium	7429-90-5	5	µg/L	<5	----	----	----	----
Antimony	7440-36-0	0.5	µg/L	<0.5	----	----	----	----
Arsenic	7440-38-2	0.5	µg/L	<0.5	----	----	----	----
Cadmium	7440-43-9	0.2	µg/L	<0.2	----	----	----	----
Chromium	7440-47-3	0.5	µg/L	<0.5	----	----	----	----
Copper	7440-50-8	1	µg/L	<1	----	----	----	----
Lead	7439-92-1	0.2	µg/L	<0.2	----	----	----	----
Nickel	7440-02-0	0.5	µg/L	<0.5	----	----	----	----
Silver	7440-22-4	0.1	µg/L	<0.1	----	----	----	----
Zinc	7440-66-6	5	µg/L	<5	----	----	----	----
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	<0.05	----	----	----	----
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	----	0.01	mg/L	<0.01	----	----	----	----
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	<0.01	----	----	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	----	----	----	----

Analytical Results

Sub-Matrix: SEAWATER (Matrix: WATER)			Client sample ID	ELUTRIATE WATER Seawater Blank	----	----	----	----
			Client sampling date / time	22-OCT-2013 15:00	----	----	----	----
Compound	CAS Number	LOR	Unit	EB1326059-111	----	----	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.2	----	----	----	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ Total Nitrogen as N	----	0.1	mg/L	<0.1	----	----	----	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	<0.02	----	----	----	----
EK071G: Reactive Phosphorus as P by discrete analyser								
Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	----	----	----	----
EP090: Organotin Compounds (Soluble)								
Tributyltin	56573-85-4	2	ngSn/L	<2	----	----	----	----
EP208: Phenylurea Herbicides								
Diuron	330-54-1	5.0	µg/L	<5.0	----	----	----	----
EP090S: Organotin Surrogate								
Tripropyltin	----	0.1	%	**59.5**	----	----	----	----

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Client sample ID	C119 0-0.2	C119A 0-0.2	C119B 0-0.2	B130 0-0.5	A138 0-0.27
			Client sampling date / time	18-OCT-2013 15:00	18-OCT-2013 15:00	18-OCT-2013 15:00	18-OCT-2013 15:00	18-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EB1326059-001	EB1326059-002	EB1326059-003	EB1326059-004	EB1326059-005
EA150: Particle Sizing								
+75µm	----	1	%	5	4	5	2	1
+150µm	----	1	%	2	1	2	<1	1
+300µm	----	1	%	2	1	1	<1	<1
+425µm	----	1	%	1	<1	1	<1	<1
+600µm	----	1	%	1	<1	<1	<1	<1
+1180µm	----	1	%	<1	<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
EA033-A: Actual Acidity								
pH KCl (23A)	----	0.1	pH Unit	8.9	8.9	8.9	8.9	7.1
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	0.308	0.251	0.298	0.230	1.18
acidity - Chromium Reducible Sulfur (a-22B)	----	10	mole H+ / t	192	156	186	143	734
EA033-C: Acid Neutralising Capacity								
Acid Neutralising Capacity (19A2)	----	0.01	% CaCO3	11.7	11.9	11.9	12.3	0.85
acidity - Acid Neutralising Capacity (a-19A2)	----	10	mole H+ / t	2330	2370	2380	2450	170
sulfidic - Acid Neutralising Capacity (s-19A2)	----	0.01	% pyrite S	3.74	3.80	3.81	3.93	0.27
EA033-E: Acid Base Accounting								
ANC Fineness Factor	----	0.5	-	1.5	1.5	1.5	1.5	1.5
Net Acidity (sulfur units)	----	0.02	% S	<0.02	<0.02	<0.02	<0.02	1.00
Net Acidity (acidity units)	----	10	mole H+ / t	<10	<10	<10	<10	621
Liming Rate	----	1	kg CaCO3/t	<1	<1	<1	<1	46
EA055: Moisture Content								
Moisture Content (dried @ 103°C)	----	1.0	%	51.6	52.6	51.6	53.4	38.5
EA150: Soil Classification based on Particle Size								

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Client sample ID	C119 0-0.2	C119A 0-0.2	C119B 0-0.2	B130 0-0.5	A138 0-0.27
			Client sampling date / time	18-OCT-2013 15:00	18-OCT-2013 15:00	18-OCT-2013 15:00	18-OCT-2013 15:00	18-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EB1326059-001	EB1326059-002	EB1326059-003	EB1326059-004	EB1326059-005
EA150: Soil Classification based on Particle Size - Continued								
Clay (<2 µm)	----	1	%	33	33	34	31	49
Silt (2-60 µm)	----	1	%	58	61	60	64	50
Sand (0.06-2.00 mm)	----	1	%	8	6	6	5	1
Gravel (>2mm)	----	1	%	1	<1	<1	<1	<1
Cobbles (>6cm)	----	1	%	<1	<1	<1	<1	<1
EG005-SD: Total Metals in Sediments by ICP-AES								
Aluminium	7429-90-5	50	mg/kg	17900	16800	15500	15400	20700
Iron	7439-89-6	50	mg/kg	27500	27400	25000	24500	25900
EG020-SD: Total Metals in Sediments by ICPMS								
Antimony	7440-36-0	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Arsenic	7440-38-2	1.00	mg/kg	18.6	20.3	16.4	16.2	24.5
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	32.6	35.7	29.3	29.1	33.6
Copper	7440-50-8	1.0	mg/kg	10.5	12.0	9.1	9.0	13.5
Cobalt	7440-48-4	0.5	mg/kg	8.7	10.2	7.8	7.7	12.8
Lead	7439-92-1	1.0	mg/kg	15.8	16.4	13.9	14.0	21.1
Manganese	7439-96-5	10	mg/kg	711	874	641	624	261
Nickel	7440-02-0	1.0	mg/kg	15.7	16.4	13.9	13.8	15.7
Selenium	7782-49-2	0.1	mg/kg	1.9	2.6	1.9	2.0	3.0
Silver	7440-22-4	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Vanadium	7440-62-2	2.0	mg/kg	38.7	43.7	35.2	34.7	47.9
Zinc	7440-66-6	1.0	mg/kg	43.2	48.4	38.3	38.3	39.1
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.01	mg/kg	0.02	0.02	0.02	0.02	0.02
EK055: Ammonia as N								
Ammonia as N	7664-41-7	1	mg/kg	51	40	44	19	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	20	mg/kg	1020	550	1020	970	----
EK062: Total Nitrogen as N (TKN + NOx)								
^ Total Nitrogen as N	----	20	mg/kg	1020	550	1020	970	----
EK067G: Total Phosphorus as P by Discrete Analyser								

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Client sample ID	C119 0-0.2	C119A 0-0.2	C119B 0-0.2	B130 0-0.5	A138 0-0.27
			Client sampling date / time	18-OCT-2013 15:00	18-OCT-2013 15:00	18-OCT-2013 15:00	18-OCT-2013 15:00	18-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EB1326059-001	EB1326059-002	EB1326059-003	EB1326059-004	EB1326059-005
EK067G: Total Phosphorus as P by Discrete Analyser - Continued								
Total Phosphorus as P	----	2	mg/kg	370	244	393	406	----
EP003: Total Organic Carbon (TOC) in Soil								
Total Organic Carbon	----	0.02	%	1.19	1.11	1.17	0.97	0.90
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
EP090S: Organotin Surrogate								
Tripropyltin	----	0.1	%	58.0	78.1	71.5	71.2	47.4

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Client sample ID	A140 0-0.26	D149 0-0.15	C146 0-0.25	D147 0-0.05	B2 0-0.55
			Client sampling date / time	18-OCT-2013 15:00	18-OCT-2013 15:00	18-OCT-2013 15:00	18-OCT-2013 15:00	19-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EB1326059-006	EB1326059-007	EB1326059-008	EB1326059-009	EB1326059-010
EA150: Particle Sizing								
+75µm	----	1	%	2	----	63	52	20
+150µm	----	1	%	2	----	62	51	8
+300µm	----	1	%	1	----	57	49	5
+425µm	----	1	%	<1	----	50	45	4
+600µm	----	1	%	<1	----	42	39	3
+1180µm	----	1	%	<1	----	30	30	2
+2.36mm	----	1	%	<1	----	18	21	<1
+4.75mm	----	1	%	<1	----	12	16	<1
+9.5mm	----	1	%	<1	----	8	13	<1
+19.0mm	----	1	%	<1	----	5	3	<1
+37.5mm	----	1	%	<1	----	<1	<1	<1
+75.0mm	----	1	%	<1	----	<1	<1	<1
EA033-A: Actual Acidity								
pH KCl (23A)	----	0.1	pH Unit	6.6	9.0	9.2	9.1	9.2
Titratable Actual Acidity (23F)	----	2	mole H+ / t	<2	<2	<2	<2	<2
sulfidic - Titratable Actual Acidity (s-23F)	----	0.02	% pyrite S	<0.02	<0.02	<0.02	<0.02	<0.02
EA033-B: Potential Acidity								
Chromium Reducible Sulfur (22B)	----	0.005	% S	1.22	0.039	0.059	0.025	0.195
acidity - Chromium Reducible Sulfur (a-22B)	----	10	mole H+ / t	758	24	37	15	122
EA033-C: Acid Neutralising Capacity								
Acid Neutralising Capacity (19A2)	----	0.01	% CaCO3	0.87	20.9	22.6	29.9	20.6
acidity - Acid Neutralising Capacity (a-19A2)	----	10	mole H+ / t	174	4170	4510	5980	4120
sulfidic - Acid Neutralising Capacity (s-19A2)	----	0.01	% pyrite S	0.28	6.69	7.23	9.58	6.61
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	1.03	<0.02	<0.02	<0.02	<0.02
Net Acidity (acidity units)	----	10	mole H+ / t	642	<10	<10	<10	<10
Liming Rate	----	1	kg CaCO3/t	48	<1	<1	<1	<1
EA055: Moisture Content								
Moisture Content (dried @ 103°C)	----	1.0	%	42.1	27.5	21.9	24.6	36.1
EA150: Soil Classification based on Particle Size								

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Client sample ID	A140 0-0.26	D149 0-0.15	C146 0-0.25	D147 0-0.05	B2 0-0.55
			Client sampling date / time	18-OCT-2013 15:00	18-OCT-2013 15:00	18-OCT-2013 15:00	18-OCT-2013 15:00	19-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EB1326059-006	EB1326059-007	EB1326059-008	EB1326059-009	EB1326059-010
EA150: Soil Classification based on Particle Size - Continued								
Clay (<2 µm)	----	1	%	48	----	19	24	27
Silt (2-60 µm)	----	1	%	50	----	17	24	49
Sand (0.06-2.00 mm)	----	1	%	2	----	46	31	23
Gravel (>2mm)	----	1	%	<1	----	18	21	1
Cobbles (>6cm)	----	1	%	<1	----	<1	<1	<1
EG005-SD: Total Metals in Sediments by ICP-AES								
Aluminium	7429-90-5	50	mg/kg	22100	13200	7310	12400	16200
Iron	7439-89-6	50	mg/kg	26200	25700	20200	23200	23700
EG020-SD: Total Metals in Sediments by ICPMS								
Antimony	7440-36-0	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Arsenic	7440-38-2	1.00	mg/kg	16.3	10.1	16.4	16.9	13.2
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	35.6	32.0	24.4	26.0	29.3
Copper	7440-50-8	1.0	mg/kg	14.4	5.1	4.8	5.4	6.7
Cobalt	7440-48-4	0.5	mg/kg	10.9	5.5	5.0	6.2	8.0
Lead	7439-92-1	1.0	mg/kg	22.1	16.2	9.5	15.4	12.0
Manganese	7439-96-5	10	mg/kg	231	503	408	411	342
Nickel	7440-02-0	1.0	mg/kg	16.3	9.1	6.6	10.4	14.0
Selenium	7782-49-2	0.1	mg/kg	3.3	2.8	1.2	1.8	2.0
Silver	7440-22-4	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Vanadium	7440-62-2	2.0	mg/kg	50.0	34.0	26.6	28.0	33.0
Zinc	7440-66-6	1.0	mg/kg	37.0	17.6	18.5	28.1	35.1
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.01	mg/kg	0.02	0.02	<0.01	<0.01	<0.01
EK055: Ammonia as N								
Ammonia as N	7664-41-7	1	mg/kg	<1	<1	----	----	<1
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	<0.1	<0.1	----	----	<0.1
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	20	mg/kg	560	150	----	----	370
EK062: Total Nitrogen as N (TKN + NOx)								
^ Total Nitrogen as N	----	20	mg/kg	560	150	----	----	370
EK067G: Total Phosphorus as P by Discrete Analyser								

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Client sample ID	A140 0-0.26	D149 0-0.15	C146 0-0.25	D147 0-0.05	B2 0-0.55
			Client sampling date / time	18-OCT-2013 15:00	18-OCT-2013 15:00	18-OCT-2013 15:00	18-OCT-2013 15:00	19-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EB1326059-006	EB1326059-007	EB1326059-008	EB1326059-009	EB1326059-010
EK067G: Total Phosphorus as P by Discrete Analyser - Continued								
Total Phosphorus as P	----	2	mg/kg	233	139	----	----	301
EP003: Total Organic Carbon (TOC) in Soil								
Total Organic Carbon	----	0.02	%	1.31	0.34	0.30	0.09	0.45
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
EP090S: Organotin Surrogate								
Tripropyltin	----	0.1	%	65.8	62.0	70.3	90.7	127

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Client sample ID	B7 0-0.50	B7 0.5-0.95	B9 0-0.5	B9 0.5-0.7	C22 0-0.5
			Client sampling date / time	19-OCT-2013 15:00	19-OCT-2013 15:00	19-OCT-2013 15:00	19-OCT-2013 15:00	19-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EB1326059-011	EB1326059-012	EB1326059-013	EB1326059-014	EB1326059-015
EA150: Particle Sizing								
+75µm	----	1	%	19	20	16	17	2
+150µm	----	1	%	7	6	4	6	<1
+300µm	----	1	%	5	3	2	4	<1
+425µm	----	1	%	4	3	2	3	<1
+600µm	----	1	%	3	2	2	2	<1
+1180µm	----	1	%	2	1	<1	1	<1
+2.36mm	----	1	%	2	1	<1	<1	<1
+4.75mm	----	1	%	2	<1	<1	<1	<1
+9.5mm	----	1	%	2	<1	<1	<1	<1
+19.0mm	----	1	%	2	<1	<1	<1	<1
+37.5mm	----	1	%	<1	<1	<1	<1	<1
+75.0mm	----	1	%	<1	<1	<1	<1	<1
EA033-A: Actual Acidity								
pH KCl (23A)	----	0.1	pH Unit	9.2	9.1	9.2	9.2	9.0
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	0.193	0.306	0.204	0.238	0.164
acidity - Chromium Reducible Sulfur (a-22B)	----	10	mole H+ / t	120	191	127	149	102
EA033-C: Acid Neutralising Capacity								
Acid Neutralising Capacity (19A2)	----	0.01	% CaCO3	22.8	19.2	19.9	21.2	13.8
acidity - Acid Neutralising Capacity (a-19A2)	----	10	mole H+ / t	4550	3840	3980	4230	2770
sulfidic - Acid Neutralising Capacity (s-19A2)	----	0.01	% pyrite S	7.29	6.16	6.38	6.78	4.44
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
EA055: Moisture Content								
Moisture Content (dried @ 103°C)	----	1.0	%	34.8	35.7	37.4	33.4	53.6
EA150: Soil Classification based on Particle Size								

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Client sample ID	B7 0-0.50	B7 0.5-0.95	B9 0-0.5	B9 0.5-0.7	C22 0-0.5
			Client sampling date / time	19-OCT-2013 15:00	19-OCT-2013 15:00	19-OCT-2013 15:00	19-OCT-2013 15:00	19-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EB1326059-011	EB1326059-012	EB1326059-013	EB1326059-014	EB1326059-015
EA150: Soil Classification based on Particle Size - Continued								
Clay (<2 µm)	----	1	%	25	25	26	25	39
Silt (2-60 µm)	----	1	%	51	50	54	56	54
Sand (0.06-2.00 mm)	----	1	%	22	24	20	18	7
Gravel (>2mm)	----	1	%	2	1	<1	1	<1
Cobbles (>6cm)	----	1	%	<1	<1	<1	<1	<1
EG005-SD: Total Metals in Sediments by ICP-AES								
Aluminium	7429-90-5	50	mg/kg	15300	15900	17200	15200	19600
Iron	7439-89-6	50	mg/kg	23400	24600	24200	22500	28300
EG020-SD: Total Metals in Sediments by ICPMS								
Antimony	7440-36-0	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Arsenic	7440-38-2	1.00	mg/kg	13.9	14.4	12.9	13.0	16.0
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	28.6	29.2	30.9	28.0	34.1
Copper	7440-50-8	1.0	mg/kg	6.4	6.7	7.3	6.3	9.3
Cobalt	7440-48-4	0.5	mg/kg	8.0	8.0	8.5	7.6	9.0
Lead	7439-92-1	1.0	mg/kg	11.8	11.7	13.0	11.2	15.7
Manganese	7439-96-5	10	mg/kg	340	322	360	330	599
Nickel	7440-02-0	1.0	mg/kg	13.8	14.2	14.7	13.6	16.9
Selenium	7782-49-2	0.1	mg/kg	1.8	2.0	2.2	1.9	2.0
Silver	7440-22-4	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Vanadium	7440-62-2	2.0	mg/kg	33.1	32.0	35.6	31.4	40.5
Zinc	7440-66-6	1.0	mg/kg	33.8	34.5	37.5	32.8	42.6
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.01	mg/kg	0.01	<0.01	0.01	<0.01	0.02
EK055: Ammonia as N								
Ammonia as N	7664-41-7	1	mg/kg	<1	----	<1	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	<0.1	----	<0.1	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	20	mg/kg	450	----	390	----	----
EK062: Total Nitrogen as N (TKN + NOx)								
^ Total Nitrogen as N	----	20	mg/kg	450	----	390	----	----
EK067G: Total Phosphorus as P by Discrete Analyser								

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Client sample ID	B7 0-0.50	B7 0.5-0.95	B9 0-0.5	B9 0.5-0.7	C22 0-0.5
			Client sampling date / time	19-OCT-2013 15:00	19-OCT-2013 15:00	19-OCT-2013 15:00	19-OCT-2013 15:00	19-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EB1326059-011	EB1326059-012	EB1326059-013	EB1326059-014	EB1326059-015
EK067G: Total Phosphorus as P by Discrete Analyser - Continued								
Total Phosphorus as P	----	2	mg/kg	338	----	326	----	----
EP003: Total Organic Carbon (TOC) in Soil								
Total Organic Carbon	----	0.02	%	0.40	0.47	0.46	0.42	0.79
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
EP090S: Organotin Surrogate								
Tripropyltin	----	0.1	%	83.2	63.0	59.3	76.4	78.8

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Client sample ID	C22 0.5-0.9	C29 0-0.5	C29 0.5-0.8	B25 0-0.2	B25 0.2-0.3
			Client sampling date / time	19-OCT-2013 15:00	19-OCT-2013 15:00	19-OCT-2013 15:00	19-OCT-2013 15:00	19-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EB1326059-016	EB1326059-017	EB1326059-018	EB1326059-019	EB1326059-020
EA150: Particle Sizing								
+75µm	----	1	%	3	5	7	11	----
+150µm	----	1	%	<1	2	3	3	----
+300µm	----	1	%	<1	1	2	1	----
+425µm	----	1	%	<1	1	2	1	----
+600µm	----	1	%	<1	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	----
EA033-A: Actual Acidity								
pH KCl (23A)	----	0.1	pH Unit	9.0	9.0	9.0	9.0	8.9
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	0.208	0.190	0.276	0.234	0.159
acidity - Chromium Reducible Sulfur (a-22B)	----	10	mole H+ / t	130	119	172	146	99
EA033-C: Acid Neutralising Capacity								
Acid Neutralising Capacity (19A2)	----	0.01	% CaCO3	14.3	13.8	14.4	13.8	1.66
acidity - Acid Neutralising Capacity (a-19A2)	----	10	mole H+ / t	2850	2760	2880	2750	333
sulfidic - Acid Neutralising Capacity (s-19A2)	----	0.01	% pyrite S	4.57	4.42	4.61	4.40	0.53
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
EA055: Moisture Content								
Moisture Content (dried @ 103°C)	----	1.0	%	45.5	42.6	47.4	49.8	23.8
EA150: Soil Classification based on Particle Size								

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Client sample ID	C22 0.5-0.9	C29 0-0.5	C29 0.5-0.8	B25 0-0.2	B25 0.2-0.3
			Client sampling date / time	19-OCT-2013 15:00	19-OCT-2013 15:00	19-OCT-2013 15:00	19-OCT-2013 15:00	19-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EB1326059-016	EB1326059-017	EB1326059-018	EB1326059-019	EB1326059-020
EA150: Soil Classification based on Particle Size - Continued								
Clay (<2 µm)	----	1	%	38	34	27	33	----
Silt (2-60 µm)	----	1	%	56	58	61	51	----
Sand (0.06-2.00 mm)	----	1	%	6	8	12	16	----
Gravel (>2mm)	----	1	%	<1	<1	<1	<1	----
Cobbles (>6cm)	----	1	%	<1	<1	<1	<1	----
EG005-SD: Total Metals in Sediments by ICP-AES								
Aluminium	7429-90-5	50	mg/kg	23700	19700	17600	16900	16400
Iron	7439-89-6	50	mg/kg	31600	28500	28000	26100	30100
EG020-SD: Total Metals in Sediments by ICPMS								
Antimony	7440-36-0	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Arsenic	7440-38-2	1.00	mg/kg	19.8	18.6	18.2	17.0	9.61
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	40.0	36.1	33.1	31.3	29.2
Copper	7440-50-8	1.0	mg/kg	10.5	10.0	9.4	9.0	3.1
Cobalt	7440-48-4	0.5	mg/kg	10.3	9.3	9.0	8.2	3.2
Lead	7439-92-1	1.0	mg/kg	19.2	16.7	16.2	14.9	20.4
Manganese	7439-96-5	10	mg/kg	699	576	576	521	114
Nickel	7440-02-0	1.0	mg/kg	19.6	17.6	16.0	15.1	7.5
Selenium	7782-49-2	0.1	mg/kg	2.4	2.2	2.2	1.9	2.8
Silver	7440-22-4	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Vanadium	7440-62-2	2.0	mg/kg	47.5	44.3	40.3	36.9	44.4
Zinc	7440-66-6	1.0	mg/kg	48.6	44.1	42.2	39.5	4.9
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.01	mg/kg	0.02	0.02	0.02	0.02	0.01
EK055: Ammonia as N								
Ammonia as N	7664-41-7	1	mg/kg	64	22	----	39	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	<0.1	<0.1	----	<0.1	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	20	mg/kg	760	780	----	890	----
EK062: Total Nitrogen as N (TKN + NOx)								
^ Total Nitrogen as N	----	20	mg/kg	760	780	----	890	----
EK067G: Total Phosphorus as P by Discrete Analyser								

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Client sample ID	C22 0.5-0.9	C29 0-0.5	C29 0.5-0.8	B25 0-0.2	B25 0.2-0.3
			Client sampling date / time	19-OCT-2013 15:00	19-OCT-2013 15:00	19-OCT-2013 15:00	19-OCT-2013 15:00	19-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EB1326059-016	EB1326059-017	EB1326059-018	EB1326059-019	EB1326059-020
EK067G: Total Phosphorus as P by Discrete Analyser - Continued								
Total Phosphorus as P	----	2	mg/kg	457	419	----	461	----
EP003: Total Organic Carbon (TOC) in Soil								
Total Organic Carbon	----	0.02	%	0.80	0.83	0.83	0.80	0.23
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
EP090S: Organotin Surrogate								
Tripropyltin	----	0.1	%	44.4	78.8	57.1	55.8	80.7

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Client sample ID	C30 0-0.5	C30 0.5-1.0	C94 0-0.5	C94 0.5-1.0	C99 0-0.5
			Client sampling date / time	19-OCT-2013 15:00	19-OCT-2013 15:00	19-OCT-2013 15:00	19-OCT-2013 15:00	19-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EB1326059-022	EB1326059-023	EB1326059-024	EB1326059-025	EB1326059-026
EA150: Particle Sizing								
+75µm	----	1	%	<1	<1	2	3	2
+150µm	----	1	%	<1	<1	<1	1	<1
+300µm	----	1	%	<1	<1	<1	<1	<1
+425µm	----	1	%	<1	<1	<1	<1	<1
+600µm	----	1	%	<1	<1	<1	<1	<1
+1180µm	----	1	%	<1	<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
EA033-A: Actual Acidity								
pH KCl (23A)	----	0.1	pH Unit	8.9	8.9	8.9	8.8	8.8
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	0.197	0.208	0.290	0.348	0.268
acidity - Chromium Reducible Sulfur (a-22B)	----	10	mole H+ / t	123	130	181	217	167
EA033-C: Acid Neutralising Capacity								
Acid Neutralising Capacity (19A2)	----	0.01	% CaCO3	12.4	12.2	10.5	9.47	9.42
acidity - Acid Neutralising Capacity (a-19A2)	----	10	mole H+ / t	2480	2440	2100	1890	1880
sulfidic - Acid Neutralising Capacity (s-19A2)	----	0.01	% pyrite S	3.97	3.91	3.37	3.03	3.02
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
EA055: Moisture Content								
Moisture Content (dried @ 103°C)	----	1.0	%	57.3	55.1	53.5	54.1	56.1
EA150: Soil Classification based on Particle Size								

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Client sample ID	C30 0-0.5	C30 0.5-1.0	C94 0-0.5	C94 0.5-1.0	C99 0-0.5
			Client sampling date / time	19-OCT-2013 15:00	19-OCT-2013 15:00	19-OCT-2013 15:00	19-OCT-2013 15:00	19-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EB1326059-022	EB1326059-023	EB1326059-024	EB1326059-025	EB1326059-026
EA150: Soil Classification based on Particle Size - Continued								
Clay (<2 µm)	----	1	%	38	41	34	37	40
Silt (2-60 µm)	----	1	%	60	55	59	59	58
Sand (0.06-2.00 mm)	----	1	%	2	4	7	4	2
Gravel (>2mm)	----	1	%	<1	<1	<1	<1	<1
Cobbles (>6cm)	----	1	%	<1	<1	<1	<1	<1
EG005-SD: Total Metals in Sediments by ICP-AES								
Aluminium	7429-90-5	50	mg/kg	23300	23100	19600	19500	19600
Iron	7439-89-6	50	mg/kg	32300	31400	29800	31900	31800
EG020-SD: Total Metals in Sediments by ICPMS								
Antimony	7440-36-0	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Arsenic	7440-38-2	1.00	mg/kg	19.0	20.3	20.9	21.8	20.8
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	38.5	40.2	35.9	36.9	37.6
Copper	7440-50-8	1.0	mg/kg	10.8	11.4	12.9	15.2	13.5
Cobalt	7440-48-4	0.5	mg/kg	10.0	10.3	9.5	10.1	10.0
Lead	7439-92-1	1.0	mg/kg	17.8	17.8	17.5	18.9	19.4
Manganese	7439-96-5	10	mg/kg	822	785	698	756	757
Nickel	7440-02-0	1.0	mg/kg	19.9	19.8	17.2	17.6	18.2
Selenium	7782-49-2	0.1	mg/kg	2.2	2.3	2.7	2.6	2.6
Silver	7440-22-4	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Vanadium	7440-62-2	2.0	mg/kg	46.3	46.4	42.0	44.4	45.3
Zinc	7440-66-6	1.0	mg/kg	48.5	49.4	48.7	52.4	51.4
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.01	mg/kg	0.02	0.02	0.03	0.03	0.03
EK055: Ammonia as N								
Ammonia as N	7664-41-7	1	mg/kg	----	124	----	80	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	----	<0.1	----	<0.1	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	20	mg/kg	----	1000	----	1180	----
EK062: Total Nitrogen as N (TKN + NOx)								
^ Total Nitrogen as N	----	20	mg/kg	----	1000	----	1180	----
EK067G: Total Phosphorus as P by Discrete Analyser								

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Client sample ID	C30 0-0.5	C30 0.5-1.0	C94 0-0.5	C94 0.5-1.0	C99 0-0.5
			Client sampling date / time	19-OCT-2013 15:00	19-OCT-2013 15:00	19-OCT-2013 15:00	19-OCT-2013 15:00	19-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EB1326059-022	EB1326059-023	EB1326059-024	EB1326059-025	EB1326059-026
EK067G: Total Phosphorus as P by Discrete Analyser - Continued								
Total Phosphorus as P	----	2	mg/kg	----	478	----	417	----
EP003: Total Organic Carbon (TOC) in Soil								
Total Organic Carbon	----	0.02	%	0.86	0.90	1.23	1.41	1.30
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	0.7	0.8	<0.5
EP090S: Organotin Surrogate								
Tripropyltin	----	0.1	%	75.4	72.3	83.8	90.1	84.4

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Client sample ID	C99 0.5-0.8	C121 0-0.5	C121 0.5-0.8	F156 0-0.05	B108 0-0.5
			Client sampling date / time	19-OCT-2013 15:00	19-OCT-2013 15:00	19-OCT-2013 15:00	19-OCT-2013 15:00	20-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EB1326059-027	EB1326059-028	EB1326059-029	EB1326059-030	EB1326059-031
EA150: Particle Sizing								
+75µm	----	1	%	----	5	----	----	4
+150µm	----	1	%	----	1	----	----	2
+300µm	----	1	%	----	<1	----	----	1
+425µm	----	1	%	----	<1	----	----	1
+600µm	----	1	%	----	<1	----	----	1
+1180µm	----	1	%	----	<1	----	----	<1
+2.36mm	----	1	%	----	<1	----	----	<1
+4.75mm	----	1	%	----	<1	----	----	<1
+9.5mm	----	1	%	----	<1	----	----	<1
+19.0mm	----	1	%	----	<1	----	----	<1
+37.5mm	----	1	%	----	<1	----	----	<1
+75.0mm	----	1	%	----	<1	----	----	<1
EA033-A: Actual Acidity								
pH KCl (23A)	----	0.1	pH Unit	8.7	8.9	8.9	8.9	8.9
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	0.438	0.266	0.311	0.186	0.343
acidity - Chromium Reducible Sulfur (a-22B)	----	10	mole H+ / t	273	166	194	116	214
EA033-C: Acid Neutralising Capacity								
Acid Neutralising Capacity (19A2)	----	0.01	% CaCO3	8.38	12.3	12.1	22.1	10.5
acidity - Acid Neutralising Capacity (a-19A2)	----	10	mole H+ / t	1670	2460	2420	4420	2100
sulfidic - Acid Neutralising Capacity (s-19A2)	----	0.01	% pyrite S	2.68	3.95	3.89	7.09	3.36
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
EA055: Moisture Content								
Moisture Content (dried @ 103°C)	----	1.0	%	54.8	52.2	52.6	34.1	55.9
EA150: Soil Classification based on Particle Size								

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Client sample ID	C99 0.5-0.8	C121 0-0.5	C121 0.5-0.8	F156 0-0.05	B108 0-0.5
			Client sampling date / time	19-OCT-2013 15:00	19-OCT-2013 15:00	19-OCT-2013 15:00	19-OCT-2013 15:00	20-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EB1326059-027	EB1326059-028	EB1326059-029	EB1326059-030	EB1326059-031
EA150: Soil Classification based on Particle Size - Continued								
Clay (<2 µm)	----	1	%	----	27	----	----	33
Silt (2-60 µm)	----	1	%	----	67	----	----	64
Sand (0.06-2.00 mm)	----	1	%	----	6	----	----	3
Gravel (>2mm)	----	1	%	----	<1	----	----	<1
Cobbles (>6cm)	----	1	%	----	<1	----	----	<1
EG005-SD: Total Metals in Sediments by ICP-AES								
Aluminium	7429-90-5	50	mg/kg	16900	15100	16100	10700	21000
Iron	7439-89-6	50	mg/kg	27800	25600	27900	41600	35400
EG020-SD: Total Metals in Sediments by ICPMS								
Antimony	7440-36-0	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Arsenic	7440-38-2	1.00	mg/kg	18.6	18.8	20.8	33.3	22.2
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	32.8	32.2	33.1	29.8	39.0
Copper	7440-50-8	1.0	mg/kg	13.0	10.2	10.7	8.0	14.4
Cobalt	7440-48-4	0.5	mg/kg	8.8	8.8	9.3	12.1	11.0
Lead	7439-92-1	1.0	mg/kg	17.0	15.7	16.8	24.6	20.0
Manganese	7439-96-5	10	mg/kg	589	690	754	959	732
Nickel	7440-02-0	1.0	mg/kg	15.0	14.9	15.6	12.3	18.3
Selenium	7782-49-2	0.1	mg/kg	2.1	2.2	2.4	2.3	2.8
Silver	7440-22-4	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Vanadium	7440-62-2	2.0	mg/kg	38.2	39.0	39.9	49.1	47.4
Zinc	7440-66-6	1.0	mg/kg	46.2	42.8	44.2	28.8	54.8
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.01	mg/kg	0.02	0.02	0.02	<0.01	0.03
EK055: Ammonia as N								
Ammonia as N	7664-41-7	1	mg/kg	----	32	----	----	35
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	----	<0.1	----	----	<0.1
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	20	mg/kg	----	970	----	----	1300
EK062: Total Nitrogen as N (TKN + NOx)								
^ Total Nitrogen as N	----	20	mg/kg	----	970	----	----	1300
EK067G: Total Phosphorus as P by Discrete Analyser								

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Client sample ID	C99 0.5-0.8	C121 0-0.5	C121 0.5-0.8	F156 0-0.05	B108 0-0.5
			Client sampling date / time	19-OCT-2013 15:00	19-OCT-2013 15:00	19-OCT-2013 15:00	19-OCT-2013 15:00	20-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EB1326059-027	EB1326059-028	EB1326059-029	EB1326059-030	EB1326059-031
EK067G: Total Phosphorus as P by Discrete Analyser - Continued								
Total Phosphorus as P	----	2	mg/kg	----	394	----	----	439
EP003: Total Organic Carbon (TOC) in Soil								
Total Organic Carbon	----	0.02	%	1.67	1.09	1.26	0.67	1.43
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	0.7	<0.5	<0.5	<0.5	0.6
EP090S: Organotin Surrogate								
Tripropyltin	----	0.1	%	74.4	89.5	69.0	77.2	77.8

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Client sample ID	B108 0.5-1.0	B108 1.0-1.2	B104 0-0.5	B104 0.5-0.95	C50 0-0.5
			Client sampling date / time	20-OCT-2013 15:00	20-OCT-2013 15:00	20-OCT-2013 15:00	20-OCT-2013 15:00	20-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EB1326059-032	EB1326059-033	EB1326059-034	EB1326059-035	EB1326059-036
EA150: Particle Sizing								
+75µm	----	1	%	8	----	28	10	3
+150µm	----	1	%	6	----	21	6	<1
+300µm	----	1	%	4	----	13	4	<1
+425µm	----	1	%	4	----	11	4	<1
+600µm	----	1	%	4	----	9	3	<1
+1180µm	----	1	%	3	----	6	2	<1
+2.36mm	----	1	%	2	----	2	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
EA033-A: Actual Acidity								
pH KCl (23A)	----	0.1	pH Unit	8.8	8.7	8.9	8.7	8.9
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	0.412	0.400	0.304	0.416	0.204
acidity - Chromium Reducible Sulfur (a-22B)	----	10	mole H+ / t	257	250	189	259	127
EA033-C: Acid Neutralising Capacity								
Acid Neutralising Capacity (19A2)	----	0.01	% CaCO3	10.2	8.40	15.1	9.94	12.4
acidity - Acid Neutralising Capacity (a-19A2)	----	10	mole H+ / t	2030	1680	3020	1990	2480
sulfidic - Acid Neutralising Capacity (s-19A2)	----	0.01	% pyrite S	3.26	2.69	4.84	3.18	3.97
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
EA055: Moisture Content								
Moisture Content (dried @ 103°C)	----	1.0	%	55.0	57.8	49.8	51.9	52.3
EA150: Soil Classification based on Particle Size								

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Client sample ID	B108 0.5-1.0	B108 1.0-1.2	B104 0-0.5	B104 0.5-0.95	C50 0-0.5
			Client sampling date / time	20-OCT-2013 15:00	20-OCT-2013 15:00	20-OCT-2013 15:00	20-OCT-2013 15:00	20-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EB1326059-032	EB1326059-033	EB1326059-034	EB1326059-035	EB1326059-036
EA150: Soil Classification based on Particle Size - Continued								
Clay (<2 µm)	----	1	%	36	----	31	36	32
Silt (2-60 µm)	----	1	%	56	----	42	54	62
Sand (0.06-2.00 mm)	----	1	%	6	----	25	9	6
Gravel (>2mm)	----	1	%	2	----	2	1	<1
Cobbles (>6cm)	----	1	%	<1	----	<1	<1	<1
EG005-SD: Total Metals in Sediments by ICP-AES								
Aluminium	7429-90-5	50	mg/kg	20000	21300	14400	17700	18300
Iron	7439-89-6	50	mg/kg	33500	35300	26500	30000	29800
EG020-SD: Total Metals in Sediments by ICPMS								
Antimony	7440-36-0	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Arsenic	7440-38-2	1.00	mg/kg	22.4	24.0	21.2	20.8	20.8
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	37.7	40.9	29.4	34.6	35.3
Copper	7440-50-8	1.0	mg/kg	15.0	16.8	11.4	13.1	11.8
Cobalt	7440-48-4	0.5	mg/kg	10.5	11.1	8.4	9.7	9.7
Lead	7439-92-1	1.0	mg/kg	20.0	23.3	17.4	18.1	18.1
Manganese	7439-96-5	10	mg/kg	774	790	613	710	752
Nickel	7440-02-0	1.0	mg/kg	17.9	18.6	13.5	16.2	16.7
Selenium	7782-49-2	0.1	mg/kg	2.5	2.8	2.2	2.3	2.5
Silver	7440-22-4	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Vanadium	7440-62-2	2.0	mg/kg	45.5	49.4	37.2	42.7	41.8
Zinc	7440-66-6	1.0	mg/kg	55.0	60.0	41.5	50.7	47.4
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.01	mg/kg	0.02	0.03	0.02	0.02	0.02
EK055: Ammonia as N								
Ammonia as N	7664-41-7	1	mg/kg	81	----	----	80	48
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	<0.1	----	----	<0.1	<0.1
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	20	mg/kg	1220	----	----	1120	1040
EK062: Total Nitrogen as N (TKN + NOx)								
^ Total Nitrogen as N	----	20	mg/kg	1220	----	----	1120	1040
EK067G: Total Phosphorus as P by Discrete Analyser								

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Client sample ID	B108 0.5-1.0	B108 1.0-1.2	B104 0-0.5	B104 0.5-0.95	C50 0-0.5
			Client sampling date / time	20-OCT-2013 15:00	20-OCT-2013 15:00	20-OCT-2013 15:00	20-OCT-2013 15:00	20-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EB1326059-032	EB1326059-033	EB1326059-034	EB1326059-035	EB1326059-036
EK067G: Total Phosphorus as P by Discrete Analyser - Continued								
Total Phosphorus as P	----	2	mg/kg	446	----	----	1770	503
EP003: Total Organic Carbon (TOC) in Soil								
Total Organic Carbon	----	0.02	%	1.48	1.73	1.60	1.64	0.97
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	1.0	2.7	1.2	1.2	<0.5
EP090S: Organotin Surrogate								
Tripropyltin	----	0.1	%	82.2	63.6	75.6	72.1	73.1

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Client sample ID	C50 0.5-1.0	C50 1.0-1.2	C53 0-0.5	C53 0.5-0.9	B54 0-0.5
			Client sampling date / time	20-OCT-2013 15:00	20-OCT-2013 15:00	20-OCT-2013 15:00	20-OCT-2013 15:00	20-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EB1326059-037	EB1326059-038	EB1326059-039	EB1326059-040	EB1326059-042
EA150: Particle Sizing								
+75µm	----	1	%	----	3	2	----	2
+150µm	----	1	%	----	<1	<1	----	<1
+300µm	----	1	%	----	<1	<1	----	<1
+425µm	----	1	%	----	<1	<1	----	<1
+600µm	----	1	%	----	<1	<1	----	<1
+1180µm	----	1	%	----	<1	<1	----	<1
+2.36mm	----	1	%	----	<1	<1	----	<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
EA033-A: Actual Acidity								
pH KCl (23A)	----	0.1	pH Unit	8.9	8.9	8.8	8.9	8.9
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	0.229	0.225	0.232	0.204	0.218
acidity - Chromium Reducible Sulfur (a-22B)	----	10	mole H+ / t	143	140	145	127	136
EA033-C: Acid Neutralising Capacity								
Acid Neutralising Capacity (19A2)	----	0.01	% CaCO3	12.4	14.3	10.3	12.2	11.4
acidity - Acid Neutralising Capacity (a-19A2)	----	10	mole H+ / t	2480	2860	2060	2450	2280
sulfidic - Acid Neutralising Capacity (s-19A2)	----	0.01	% pyrite S	3.97	4.58	3.30	3.92	3.65
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
EA055: Moisture Content								
Moisture Content (dried @ 103°C)	----	1.0	%	47.8	45.0	55.1	50.4	54.0
EA150: Soil Classification based on Particle Size								

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Client sample ID	C50 0.5-1.0	C50 1.0-1.2	C53 0-0.5	C53 0.5-0.9	B54 0-0.5
			Client sampling date / time	20-OCT-2013 15:00	20-OCT-2013 15:00	20-OCT-2013 15:00	20-OCT-2013 15:00	20-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EB1326059-037	EB1326059-038	EB1326059-039	EB1326059-040	EB1326059-042
EA150: Soil Classification based on Particle Size - Continued								
Clay (<2 µm)	----	1	%	----	27	35	----	33
Silt (2-60 µm)	----	1	%	----	62	63	----	62
Sand (0.06-2.00 mm)	----	1	%	----	11	2	----	5
Gravel (>2mm)	----	1	%	----	<1	<1	----	<1
Cobbles (>6cm)	----	1	%	----	<1	<1	----	<1
EG005-SD: Total Metals in Sediments by ICP-AES								
Aluminium	7429-90-5	50	mg/kg	17700	15500	16800	15400	15500
Iron	7439-89-6	50	mg/kg	29400	25700	28200	25800	26200
EG020-SD: Total Metals in Sediments by ICPMS								
Antimony	7440-36-0	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Arsenic	7440-38-2	1.00	mg/kg	19.6	17.7	19.5	16.8	18.1
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	33.8	31.0	32.3	29.3	30.0
Copper	7440-50-8	1.0	mg/kg	11.0	9.1	11.4	9.7	10.2
Cobalt	7440-48-4	0.5	mg/kg	9.3	8.5	8.8	8.1	8.3
Lead	7439-92-1	1.0	mg/kg	16.9	15.4	16.3	15.0	15.6
Manganese	7439-96-5	10	mg/kg	745	640	710	616	641
Nickel	7440-02-0	1.0	mg/kg	16.2	14.6	15.1	14.0	14.4
Selenium	7782-49-2	0.1	mg/kg	2.3	2.1	2.0	2.0	2.2
Silver	7440-22-4	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Vanadium	7440-62-2	2.0	mg/kg	40.8	37.4	38.9	35.8	37.1
Zinc	7440-66-6	1.0	mg/kg	45.1	40.0	44.1	39.7	40.5
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.01	mg/kg	0.02	0.02	0.29	0.02	0.02
EK055: Ammonia as N								
Ammonia as N	7664-41-7	1	mg/kg	----	----	----	18	44
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	----	----	----	<0.1	<0.1
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	20	mg/kg	----	----	----	1000	1190
EK062: Total Nitrogen as N (TKN + NOx)								
^ Total Nitrogen as N	----	20	mg/kg	----	----	----	1000	1190
EK067G: Total Phosphorus as P by Discrete Analyser								

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Client sample ID	C50 0.5-1.0	C50 1.0-1.2	C53 0-0.5	C53 0.5-0.9	B54 0-0.5
			Client sampling date / time	20-OCT-2013 15:00	20-OCT-2013 15:00	20-OCT-2013 15:00	20-OCT-2013 15:00	20-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EB1326059-037	EB1326059-038	EB1326059-039	EB1326059-040	EB1326059-042
EK067G: Total Phosphorus as P by Discrete Analyser - Continued								
Total Phosphorus as P	----	2	mg/kg	----	----	----	388	469
EP003: Total Organic Carbon (TOC) in Soil								
Total Organic Carbon	----	0.02	%	0.99	0.85	1.22	1.08	1.14
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
EP090S: Organotin Surrogate								
Tripropyltin	----	0.1	%	72.4	70.0	69.2	90.5	83.6

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Client sample ID	B54 0.5-1.0	B54 1.0-1.1	H160 0-0.02	H160 0.02-0.04	K167 0-0.25
			Client sampling date / time	20-OCT-2013 15:00	20-OCT-2013 15:00	20-OCT-2013 15:00	20-OCT-2013 15:00	20-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EB1326059-043	EB1326059-044	EB1326059-045	EB1326059-046	EB1326059-047
EA150: Particle Sizing								
+75µm	----	1	%	----	----	----	----	8
+150µm	----	1	%	----	----	----	----	7
+300µm	----	1	%	----	----	----	----	6
+425µm	----	1	%	----	----	----	----	6
+600µm	----	1	%	----	----	----	----	5
+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
EA033-A: Actual Acidity								
pH KCl (23A)	----	0.1	pH Unit	8.9	8.8	----	----	8.3
Titratable Actual Acidity (23F)	----	2	mole H+ / t	<2	<2	----	----	<2
sulfidic - Titratable Actual Acidity (s-23F)	----	0.02	% pyrite S	<0.02	<0.02	----	----	<0.02
EA033-B: Potential Acidity								
Chromium Reducible Sulfur (22B)	----	0.005	% S	0.246	0.297	----	----	1.65
acidity - Chromium Reducible Sulfur (a-22B)	----	10	mole H+ / t	154	185	----	----	1030
EA033-C: Acid Neutralising Capacity								
Acid Neutralising Capacity (19A2)	----	0.01	% CaCO3	12.1	11.4	----	----	2.64
acidity - Acid Neutralising Capacity (a-19A2)	----	10	mole H+ / t	2420	2280	----	----	528
sulfidic - Acid Neutralising Capacity (s-19A2)	----	0.01	% pyrite S	3.87	3.66	----	----	0.85
EA033-E: Acid Base Accounting								
ANC Fineness Factor	----	0.5	-	1.5	1.5	----	----	1.5
Net Acidity (sulfur units)	----	0.02	% S	<0.02	<0.02	----	----	1.09
Net Acidity (acidity units)	----	10	mole H+ / t	<10	<10	----	----	680
Liming Rate	----	1	kg CaCO3/t	<1	<1	----	----	51
EA055: Moisture Content								
Moisture Content (dried @ 103°C)	----	1.0	%	46.7	47.4	19.2	24.9	43.4
EA150: Soil Classification based on Particle Size								

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Client sample ID	B54 0.5-1.0	B54 1.0-1.1	H160 0-0.02	H160 0.02-0.04	K167 0-0.25
			Client sampling date / time	20-OCT-2013 15:00	20-OCT-2013 15:00	20-OCT-2013 15:00	20-OCT-2013 15:00	20-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EB1326059-043	EB1326059-044	EB1326059-045	EB1326059-046	EB1326059-047
EA150: Soil Classification based on Particle Size - Continued								
Clay (<2 µm)	----	1	%	----	----	----	----	47
Silt (2-60 µm)	----	1	%	----	----	----	----	45
Sand (0.06-2.00 mm)	----	1	%	----	----	----	----	7
Gravel (>2mm)	----	1	%	----	----	----	----	1
Cobbles (>6cm)	----	1	%	----	----	----	----	<1
EG005-SD: Total Metals in Sediments by ICP-AES								
Aluminium	7429-90-5	50	mg/kg	17300	17100	3620	15100	15800
Iron	7439-89-6	50	mg/kg	29200	29700	10500	26400	27500
EG020-SD: Total Metals in Sediments by ICPMS								
Antimony	7440-36-0	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Arsenic	7440-38-2	1.00	mg/kg	19.7	20.2	10.2	7.48	24.6
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	33.8	34.3	9.3	30.3	29.4
Copper	7440-50-8	1.0	mg/kg	10.8	11.4	2.7	3.8	14.6
Cobalt	7440-48-4	0.5	mg/kg	9.3	10.1	2.7	5.6	15.3
Lead	7439-92-1	1.0	mg/kg	17.2	18.3	5.0	18.3	19.1
Manganese	7439-96-5	10	mg/kg	711	774	238	428	269
Nickel	7440-02-0	1.0	mg/kg	15.7	16.9	3.8	9.6	15.1
Selenium	7782-49-2	0.1	mg/kg	3.0	3.2	1.0	2.9	3.7
Silver	7440-22-4	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Vanadium	7440-62-2	2.0	mg/kg	43.0	43.6	14.6	38.6	43.8
Zinc	7440-66-6	1.0	mg/kg	47.8	51.0	13.6	18.3	37.3
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.01	mg/kg	0.02	0.02	<0.01	0.02	0.02
EK055: Ammonia as N								
Ammonia as N	7664-41-7	1	mg/kg	----	----	----	----	<1
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	----	----	----	----	<0.1
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	20	mg/kg	----	----	----	----	600
EK062: Total Nitrogen as N (TKN + NOx)								
^ Total Nitrogen as N	----	20	mg/kg	----	----	----	----	600
EK067G: Total Phosphorus as P by Discrete Analyser								

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Client sample ID	B54 0.5-1.0	B54 1.0-1.1	H160 0-0.02	H160 0.02-0.04	K167 0-0.25
			Client sampling date / time	20-OCT-2013 15:00	20-OCT-2013 15:00	20-OCT-2013 15:00	20-OCT-2013 15:00	20-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EB1326059-043	EB1326059-044	EB1326059-045	EB1326059-046	EB1326059-047
EK067G: Total Phosphorus as P by Discrete Analyser - Continued								
Total Phosphorus as P	----	2	mg/kg	----	----	----	----	186
EP003: Total Organic Carbon (TOC) in Soil								
Total Organic Carbon	----	0.02	%	0.98	1.02	0.35	0.19	2.75
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
C29 - C36 Fraction	----	5	mg/kg	----	----	----	----	31
^ C10 - C36 Fraction (sum)	----	3	mg/kg	----	----	----	----	43
EP080-SD / EP071-SD: Total Recoverable Hydrocarbons								
C6 - C10 Fraction	C6_C10	3	mg/kg	----	----	----	----	<3
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	1330-20-7	0.5	mg/kg	----	----	----	----	<0.5
^ Sum of BTEX	----	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	0.6	<0.5	<0.5	<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)			Client sample ID	B54 0.5-1.0	B54 1.0-1.1	H160 0-0.02	H160 0.02-0.04	K167 0-0.25
			Client sampling date / time	20-OCT-2013 15:00	20-OCT-2013 15:00	20-OCT-2013 15:00	20-OCT-2013 15:00	20-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EB1326059-043	EB1326059-044	EB1326059-045	EB1326059-046	EB1326059-047
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	----	----	----	----	<0.50
4.4`-DDT	50-29-3	0.50	µg/kg	----	----	----	----	<0.50
^ Sum of DDD + DDE + DDT	----	0.50	µg/kg	----	----	----	----	<0.50
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
cis-Chlordane	5103-71-9	0.25	µg/kg	----	----	----	----	<0.25

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Client sample ID	B54 0.5-1.0	B54 1.0-1.1	H160 0-0.02	H160 0.02-0.04	K167 0-0.25
			Client sampling date / time	20-OCT-2013 15:00	20-OCT-2013 15:00	20-OCT-2013 15:00	20-OCT-2013 15:00	20-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EB1326059-043	EB1326059-044	EB1326059-045	EB1326059-046	EB1326059-047
EP131A: Organochlorine Pesticides - Continued								
trans-Chlordane	5103-74-2	0.25	µg/kg	----	----	----	----	<0.25
^ Total Chlordane (sum)	----	0.25	µg/kg	----	----	----	----	<0.25
Oxychlordane	27304-13-8	0.50	µg/kg	----	----	----	----	<0.50
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	----	----	----	----	**22**
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	----	----	----	----	<4
Pyrene	129-00-0	4	µg/kg	----	----	----	----	**25**
Benz(a)anthracene	56-55-3	4	µg/kg	----	----	----	----	<4
Chrysene	218-01-9	4	µg/kg	----	----	----	----	<4
Benzo(b)fluoranthene	205-99-2	4	µg/kg	----	----	----	----	<4
Benzo(k)fluoranthene	207-08-9	4	µg/kg	----	----	----	----	<4
Benzo(e)pyrene	192-97-2	4	µg/kg	----	----	----	----	<4
Benzo(a)pyrene	50-32-8	4	µg/kg	----	----	----	----	<4
Perylene	198-55-0	4	µg/kg	----	----	----	----	**121**
Benzo(g.h.i)perylene	191-24-2	4	µg/kg	----	----	----	----	<4
Dibenz(a.h)anthracene	53-70-3	4	µg/kg	----	----	----	----	<4
Indeno(1.2.3.cd)pyrene	193-39-5	4	µg/kg	----	----	----	----	<4
Coronene	191-07-1	5	µg/kg	----	----	----	----	<5
^ Sum of PAHs	----	4	µg/kg	----	----	----	----	**168**
EP231: Perfluorinated Compounds								
PFOS	1763-23-1	0.0005	mg/kg	----	----	----	----	<0.0005
PFOA	335-67-1	0.0005	mg/kg	----	----	----	----	<0.0005
6:2 Fluorotelomer sulfonate (6:2 FtS)	27619-97-2	0.005	mg/kg	----	----	----	----	**0.007**
8:2 Fluorotelomer sulfonate	39108-34-4	0.001	mg/kg	----	----	----	----	<0.001
PFOSA	754-91-6	0.0002	mg/kg	----	----	----	----	<0.0002
N-Me-FOSA	31506-32-8	0.001	mg/kg	----	----	----	----	<0.001
N-Et-FOSA	4151-50-2	0.001	mg/kg	----	----	----	----	<0.001

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Client sample ID	B54 0.5-1.0	B54 1.0-1.1	H160 0-0.02	H160 0.02-0.04	K167 0-0.25
			Client sampling date / time	20-OCT-2013 15:00	20-OCT-2013 15:00	20-OCT-2013 15:00	20-OCT-2013 15:00	20-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EB1326059-043	EB1326059-044	EB1326059-045	EB1326059-046	EB1326059-047
EP231: Perfluorinated Compounds - Continued								
N-Me-FOSE	2448-09-7	0.001	mg/kg	----	----	----	----	<0.001
N-Et-FOSE	1691-99-2	0.001	mg/kg	----	----	----	----	<0.001
PFBS	375-73-5	0.0002	mg/kg	----	----	----	----	<0.0002
PFHxS	3871-99-6	0.0002	mg/kg	----	----	----	----	<0.0002
PFDcS	67906-42-7	0.0002	mg/kg	----	----	----	----	<0.0002
PFHxA	307-24-4	0.0002	mg/kg	----	----	----	----	<0.0002
PFHpA	375-85-9	0.0002	mg/kg	----	----	----	----	<0.0002
PFNA	375-95-1	0.0002	mg/kg	----	----	----	----	<0.0002
PFDcA	335-76-2	0.0002	mg/kg	----	----	----	----	<0.0002
PFUnA	2058-94-8	0.0002	mg/kg	----	----	----	----	<0.0002
PFDoA	307-55-1	0.0002	mg/kg	----	----	----	----	<0.0002
PFTriA	72629-94-8	0.0002	mg/kg	----	----	----	----	<0.0002
PFTeA	376-06-7	0.001	mg/kg	----	----	----	----	<0.001
EP080-SD: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	----	----	----	----	**75.1**
Toluene-D8	2037-26-5	0.1	%	----	----	----	----	**91.7**
4-Bromofluorobenzene	460-00-4	0.1	%	----	----	----	----	**100**
EP090S: Organotin Surrogate								
Tripropyltin	----	0.1	%	**96.2**	**112**	**93.9**	**81.2**	**71.1**
EP130S: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.1	%	----	----	----	----	**30.7**
EP131S: OC Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.1	%	----	----	----	----	**45.9**
EP132T: Base/Neutral Extractable Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	----	----	----	----	**88.1**
Anthracene-d10	1719-06-8	0.1	%	----	----	----	----	**100**
4-Terphenyl-d14	1718-51-0	0.1	%	----	----	----	----	**85.8**

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Client sample ID	M180 0-0.2	M180A 0-0.2	M180B 0-0.2	P180 0-0.05	H167 0-0.2
			Client sampling date / time	20-OCT-2013 15:00	20-OCT-2013 15:00	20-OCT-2013 15:00	21-OCT-2013 15:00	21-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EB1326059-048	EB1326059-049	EB1326059-050	EB1326059-051	EB1326059-052
EA150: Particle Sizing								
+75µm	----	1	%	7	19	7	----	2
+150µm	----	1	%	5	16	5	----	2
+300µm	----	1	%	3	11	2	----	<1
+425µm	----	1	%	2	7	1	----	<1
+600µm	----	1	%	1	4	<1	----	<1
+1180µm	----	1	%	<1	2	<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
EA033-A: Actual Acidity								
pH KCl (23A)	----	0.1	pH Unit	8.6	8.6	8.6	----	8.6
Titratable Actual Acidity (23F)	----	2	mole H+ / t	<2	<2	<2	----	<2
sulfidic - Titratable Actual Acidity (s-23F)	----	0.02	% pyrite S	<0.02	<0.02	<0.02	----	<0.02
EA033-B: Potential Acidity								
Chromium Reducible Sulfur (22B)	----	0.005	% S	0.428	0.421	0.447	----	0.338
acidity - Chromium Reducible Sulfur (a-22B)	----	10	mole H+ / t	267	262	279	----	211
EA033-C: Acid Neutralising Capacity								
Acid Neutralising Capacity (19A2)	----	0.01	% CaCO3	6.74	5.92	6.32	----	7.43
acidity - Acid Neutralising Capacity (a-19A2)	----	10	mole H+ / t	1350	1180	1260	----	1480
sulfidic - Acid Neutralising Capacity (s-19A2)	----	0.01	% pyrite S	2.16	1.90	2.02	----	2.38
EA033-E: Acid Base Accounting								
ANC Fineness Factor	----	0.5	-	1.5	1.5	1.5	----	1.5
Net Acidity (sulfur units)	----	0.02	% S	<0.02	<0.02	<0.02	----	<0.02
Net Acidity (acidity units)	----	10	mole H+ / t	<10	<10	<10	----	<10
Liming Rate	----	1	kg CaCO3/t	<1	<1	<1	----	<1
EA055: Moisture Content								
Moisture Content (dried @ 103°C)	----	1.0	%	58.7	57.0	60.2	31.1	61.9
EA150: Soil Classification based on Particle Size								

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Client sample ID	M180 0-0.2	M180A 0-0.2	M180B 0-0.2	P180 0-0.05	H167 0-0.2
			Client sampling date / time	20-OCT-2013 15:00	20-OCT-2013 15:00	20-OCT-2013 15:00	21-OCT-2013 15:00	21-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EB1326059-048	EB1326059-049	EB1326059-050	EB1326059-051	EB1326059-052
EA150: Soil Classification based on Particle Size - Continued								
Clay (<2 µm)	----	1	%	41	36	37	----	42
Silt (2-60 µm)	----	1	%	52	45	56	----	56
Sand (0.06-2.00 mm)	----	1	%	7	18	7	----	2
Gravel (>2mm)	----	1	%	<1	1	<1	----	<1
Cobbles (>6cm)	----	1	%	<1	<1	<1	----	<1
EG005-SD: Total Metals in Sediments by ICP-AES								
Aluminium	7429-90-5	50	mg/kg	17700	16200	19500	18900	19200
Iron	7439-89-6	50	mg/kg	31100	31300	33600	25600	32400
EG020-SD: Total Metals in Sediments by ICPMS								
Antimony	7440-36-0	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Arsenic	7440-38-2	1.00	mg/kg	18.9	20.4	21.2	22.4	19.8
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	35.1	33.2	38.1	33.3	37.1
Copper	7440-50-8	1.0	mg/kg	23.0	19.0	23.3	11.3	17.4
Cobalt	7440-48-4	0.5	mg/kg	10.4	9.8	11.8	18.2	10.9
Lead	7439-92-1	1.0	mg/kg	19.6	20.8	21.7	20.8	20.9
Manganese	7439-96-5	10	mg/kg	709	570	739	1220	818
Nickel	7440-02-0	1.0	mg/kg	17.5	15.6	18.2	18.2	18.2
Selenium	7782-49-2	0.1	mg/kg	3.3	3.1	3.4	1.2	3.3
Silver	7440-22-4	0.1	mg/kg	<0.1	<0.1	<0.1	0.4	<0.1
Vanadium	7440-62-2	2.0	mg/kg	45.5	46.4	50.3	36.3	49.1
Zinc	7440-66-6	1.0	mg/kg	67.5	59.9	73.0	37.5	64.5
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.01	mg/kg	0.03	0.03	0.03	<0.01	0.03
EK055: Ammonia as N								
Ammonia as N	7664-41-7	1	mg/kg	34	18	30	<1	40
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	<0.1	<0.1	<0.1	0.1	<0.1
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	20	mg/kg	1460	1300	1380	160	1470
EK062: Total Nitrogen as N (TKN + NOx)								
^ Total Nitrogen as N	----	20	mg/kg	1460	1300	1380	160	1470
EK067G: Total Phosphorus as P by Discrete Analyser								

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Client sample ID	M180 0-0.2	M180A 0-0.2	M180B 0-0.2	P180 0-0.05	H167 0-0.2
			Client sampling date / time	20-OCT-2013 15:00	20-OCT-2013 15:00	20-OCT-2013 15:00	21-OCT-2013 15:00	21-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EB1326059-048	EB1326059-049	EB1326059-050	EB1326059-051	EB1326059-052
EK067G: Total Phosphorus as P by Discrete Analyser - Continued								
Total Phosphorus as P	----	2	mg/kg	581	440	633	217	497
EP003: Total Organic Carbon (TOC) in Soil								
Total Organic Carbon	----	0.02	%	2.11	2.11	2.18	0.33	1.59
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	3	mg/kg	<3	<3	<3	<3	<3
C10 - C14 Fraction	----	3	mg/kg	<3	<3	<3	<3	<3
C15 - C28 Fraction	----	3	mg/kg	10	13	14	6	19
C29 - C36 Fraction	----	5	mg/kg	12	13	16	<5	26
^ C10 - C36 Fraction (sum)	----	3	mg/kg	22	26	30	6	45
EP080-SD / EP071-SD: Total Recoverable Hydrocarbons								
C6 - C10 Fraction	C6_C10	3	mg/kg	<3	<3	<3	<3	<3
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	1330-20-7	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
EP090: Organotin Compounds								
Monobutyltin	78763-54-9	1	µgSn/kg	<1	<1	<1	2	<1
Dibutyltin	1002-53-5	1	µgSn/kg	2	1	1	<1	<1
Tributyltin	56573-85-4	0.5	µgSn/kg	4.1	2.9	2.8	<0.5	1.0
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

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Client sample ID	M180 0-0.2	M180A 0-0.2	M180B 0-0.2	P180 0-0.05	H167 0-0.2
			Client sampling date / time	20-OCT-2013 15:00	20-OCT-2013 15:00	20-OCT-2013 15:00	21-OCT-2013 15:00	21-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EB1326059-048	EB1326059-049	EB1326059-050	EB1326059-051	EB1326059-052
EP130A: Organophosphorus Pesticides (Ultra-trace) - Continued								
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	<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	<0.50
^ Sum of DDD + DDE + DDT	----	0.50	µg/kg	<0.50	<0.50	<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	0.25	µg/kg	<0.25	<0.25	<0.25	<0.25	<0.25

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Client sample ID	M180 0-0.2	M180A 0-0.2	M180B 0-0.2	P180 0-0.05	H167 0-0.2
			Client sampling date / time	20-OCT-2013 15:00	20-OCT-2013 15:00	20-OCT-2013 15:00	21-OCT-2013 15:00	21-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EB1326059-048	EB1326059-049	EB1326059-050	EB1326059-051	EB1326059-052
EP131A: Organochlorine Pesticides - Continued								
trans-Chlordane	5103-74-2	0.25	µg/kg	<0.25	<0.25	<0.25	<0.25	<0.25
^ Total Chlordane (sum)	----	0.25	µg/kg	<0.25	<0.25	<0.25	<0.25	<0.25
Oxychlordane	27304-13-8	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
EP132B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	5	µg/kg	**9**	**8**	**8**	<5	<5
2-Methylnaphthalene	91-57-6	5	µg/kg	<5	<5	<5	<5	<5
Acenaphthylene	208-96-8	4	µg/kg	**14**	**6**	**6**	<4	<5
Acenaphthene	83-32-9	4	µg/kg	<5	<5	<5	<4	<5
Fluorene	86-73-7	4	µg/kg	<5	<5	<5	<4	<5
Phenanthrene	85-01-8	4	µg/kg	<5	<5	<5	<4	<5
Anthracene	120-12-7	4	µg/kg	<5	<5	<5	<4	**6**
Fluoranthene	206-44-0	4	µg/kg	<5	**6**	**5**	<4	**10**
Pyrene	129-00-0	4	µg/kg	**6**	**8**	**7**	<4	**12**
Benz(a)anthracene	56-55-3	4	µg/kg	<5	<5	<5	<4	**9**
Chrysene	218-01-9	4	µg/kg	<5	<5	<5	<4	**8**
Benzo(b)fluoranthene	205-99-2	4	µg/kg	<5	**6**	<5	<4	**9**
Benzo(k)fluoranthene	207-08-9	4	µg/kg	<5	<5	<5	<4	<5
Benzo(e)pyrene	192-97-2	4	µg/kg	<5	<5	<5	<4	**6**
Benzo(a)pyrene	50-32-8	4	µg/kg	<5	<5	<5	<4	**9**
Perylene	198-55-0	4	µg/kg	**15**	**46**	**36**	<4	**28**
Benzo(g.h.i)perylene	191-24-2	4	µg/kg	<5	**6**	**5**	<4	**5**
Dibenz(a.h)anthracene	53-70-3	4	µg/kg	<5	<5	<5	<4	<5
Indeno(1.2.3.cd)pyrene	193-39-5	4	µg/kg	<5	<5	<5	<4	<5
Coronene	191-07-1	5	µg/kg	<5	<5	<5	<5	<5
^ Sum of PAHs	----	4	µg/kg	**44**	**86**	**67**	<4	**102**
EP231: Perfluorinated Compounds								
PFOS	1763-23-1	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
PFOA	335-67-1	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonate (6:2 FtS)	27619-97-2	0.005	mg/kg	<0.005	<0.005	<0.005	<0.005	<0.005
8:2 Fluorotelomer sulfonate	39108-34-4	0.001	mg/kg	<0.001	<0.001	<0.001	<0.001	<0.001
PFOSA	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Me-FOSA	31506-32-8	0.001	mg/kg	<0.001	<0.001	<0.001	<0.001	<0.001
N-Et-FOSA	4151-50-2	0.001	mg/kg	<0.001	<0.001	<0.001	<0.001	<0.001

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Client sample ID	M180 0-0.2	M180A 0-0.2	M180B 0-0.2	P180 0-0.05	H167 0-0.2
			Client sampling date / time	20-OCT-2013 15:00	20-OCT-2013 15:00	20-OCT-2013 15:00	21-OCT-2013 15:00	21-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EB1326059-048	EB1326059-049	EB1326059-050	EB1326059-051	EB1326059-052
EP231: Perfluorinated Compounds - Continued								
N-Me-FOSE	2448-09-7	0.001	mg/kg	<0.001	<0.001	<0.001	<0.001	<0.001
N-Et-FOSE	1691-99-2	0.001	mg/kg	<0.001	<0.001	<0.001	<0.001	<0.001
PFBS	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
PFHxS	3871-99-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
PFDcS	67906-42-7	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
PFHxA	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
PFHpA	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
PFNA	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
PFDcA	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
PFUnA	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
PFDoA	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
PFTriA	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
PFTeA	376-06-7	0.001	mg/kg	<0.001	<0.001	<0.001	<0.001	<0.001
EP080-SD: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	84.3	86.6	87.1	81.5	99.7
Toluene-D8	2037-26-5	0.1	%	80.4	84.4	81.1	84.9	93.1
4-Bromofluorobenzene	460-00-4	0.1	%	120	124	126	114	134
EP090S: Organotin Surrogate								
Tripropyltin	----	0.1	%	73.3	88.8	78.7	76.3	83.8
EP130S: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.1	%	36.5	38.7	36.7	40.1	34.7
EP131S: OC Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.1	%	43.9	46.6	51.4	63.4	44.6
EP132T: Base/Neutral Extractable Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	86.0	97.1	88.0	104	87.8
Anthracene-d10	1719-06-8	0.1	%	93.4	88.4	80.7	84.5	82.2
4-Terphenyl-d14	1718-51-0	0.1	%	90.9	89.3	90.3	79.1	87.6

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Client sample ID	H165 0-0.2	H165A 0-0.2	H165B 0-0.2	V187 0-0.1	V187A 0-0.2
			Client sampling date / time	21-OCT-2013 15:00	21-OCT-2013 15:00	21-OCT-2013 15:00	21-OCT-2013 15:00	21-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EB1326059-053	EB1326059-054	EB1326059-055	EB1326059-056	EB1326059-058
EA150: Particle Sizing								
+75µm	----	1	%	4	3	4	3	3
+150µm	----	1	%	3	2	3	<1	1
+300µm	----	1	%	2	2	2	<1	<1
+425µm	----	1	%	1	1	2	<1	<1
+600µm	----	1	%	<1	<1	1	<1	<1
+1180µm	----	1	%	<1	<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
EA033-A: Actual Acidity								
pH KCl (23A)	----	0.1	pH Unit	8.6	8.6	8.6	8.6	8.8
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	0.415	0.434	0.393	0.338	0.319
acidity - Chromium Reducible Sulfur (a-22B)	----	10	mole H+ / t	259	271	245	211	199
EA033-C: Acid Neutralising Capacity								
Acid Neutralising Capacity (19A2)	----	0.01	% CaCO3	7.48	8.04	7.23	5.82	6.90
acidity - Acid Neutralising Capacity (a-19A2)	----	10	mole H+ / t	1500	1610	1440	1160	1380
sulfidic - Acid Neutralising Capacity (s-19A2)	----	0.01	% pyrite S	2.40	2.58	2.32	1.86	2.21
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
EA055: Moisture Content								
Moisture Content (dried @ 103°C)	----	1.0	%	61.0	61.1	61.7	65.4	65.0
EA150: Soil Classification based on Particle Size								

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Client sample ID	H165 0-0.2	H165A 0-0.2	H165B 0-0.2	V187 0-0.1	V187A 0-0.2
			Client sampling date / time	21-OCT-2013 15:00	21-OCT-2013 15:00	21-OCT-2013 15:00	21-OCT-2013 15:00	21-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EB1326059-053	EB1326059-054	EB1326059-055	EB1326059-056	EB1326059-058
EA150: Soil Classification based on Particle Size - Continued								
Clay (<2 µm)	----	1	%	42	42	46	39	41
Silt (2-60 µm)	----	1	%	54	55	50	58	56
Sand (0.06-2.00 mm)	----	1	%	4	3	4	3	3
Gravel (>2mm)	----	1	%	<1	<1	<1	<1	<1
Cobbles (>6cm)	----	1	%	<1	<1	<1	<1	<1
EG005-SD: Total Metals in Sediments by ICP-AES								
Aluminium	7429-90-5	50	mg/kg	19000	20200	20700	24300	22400
Iron	7439-89-6	50	mg/kg	33300	35500	34700	38100	33100
EG020-SD: Total Metals in Sediments by ICPMS								
Antimony	7440-36-0	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Arsenic	7440-38-2	1.00	mg/kg	20.9	21.4	21.2	19.4	16.3
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	37.9	38.4	38.6	43.5	39.8
Copper	7440-50-8	1.0	mg/kg	18.2	19.2	18.0	19.7	16.3
Cobalt	7440-48-4	0.5	mg/kg	11.1	11.4	11.0	12.4	11.2
Lead	7439-92-1	1.0	mg/kg	21.3	21.8	21.2	23.6	21.0
Manganese	7439-96-5	10	mg/kg	799	796	814	550	522
Nickel	7440-02-0	1.0	mg/kg	18.4	18.7	19.3	21.9	19.6
Selenium	7782-49-2	0.1	mg/kg	3.6	3.4	3.2	4.2	3.6
Silver	7440-22-4	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Vanadium	7440-62-2	2.0	mg/kg	48.1	49.7	49.4	56.1	50.8
Zinc	7440-66-6	1.0	mg/kg	67.5	68.3	67.1	73.5	63.9
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.01	mg/kg	0.03	0.03	0.03	0.04	0.04
EK055: Ammonia as N								
Ammonia as N	7664-41-7	1	mg/kg	44	42	31	8	6
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	20	mg/kg	1500	1490	1520	1540	1720
EK062: Total Nitrogen as N (TKN + NOx)								
^ Total Nitrogen as N	----	20	mg/kg	1500	1490	1520	1540	1720
EK067G: Total Phosphorus as P by Discrete Analyser								

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Client sample ID	H165 0-0.2	H165A 0-0.2	H165B 0-0.2	V187 0-0.1	V187A 0-0.2
			Client sampling date / time	21-OCT-2013 15:00	21-OCT-2013 15:00	21-OCT-2013 15:00	21-OCT-2013 15:00	21-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EB1326059-053	EB1326059-054	EB1326059-055	EB1326059-056	EB1326059-058
EK067G: Total Phosphorus as P by Discrete Analyser - Continued								
Total Phosphorus as P	----	2	mg/kg	500	563	580	499	517
EP003: Total Organic Carbon (TOC) in Soil								
Total Organic Carbon	----	0.02	%	2.07	2.07	2.05	1.65	1.59
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	3	mg/kg	<3	<3	<3	<3	<3
C10 - C14 Fraction	----	3	mg/kg	<3	<3	<3	<3	4
C15 - C28 Fraction	----	3	mg/kg	31	30	28	27	25
C29 - C36 Fraction	----	5	mg/kg	31	33	26	32	31
^ C10 - C36 Fraction (sum)	----	3	mg/kg	62	63	54	59	60
EP080-SD / EP071-SD: Total Recoverable Hydrocarbons								
C6 - C10 Fraction	C6_C10	3	mg/kg	<3	<3	<3	<3	<3
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	1330-20-7	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
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	1.7	1.7	1.5	0.9	0.8
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

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Client sample ID	H165 0-0.2	H165A 0-0.2	H165B 0-0.2	V187 0-0.1	V187A 0-0.2
			Client sampling date / time	21-OCT-2013 15:00	21-OCT-2013 15:00	21-OCT-2013 15:00	21-OCT-2013 15:00	21-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EB1326059-053	EB1326059-054	EB1326059-055	EB1326059-056	EB1326059-058
EP130A: Organophosphorus Pesticides (Ultra-trace) - Continued								
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	<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	<0.50
^ Sum of DDD + DDE + DDT	----	0.50	µg/kg	<0.50	<0.50	<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	0.25	µg/kg	<0.25	<0.25	<0.25	<0.25	<0.25

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Client sample ID	H165 0-0.2	H165A 0-0.2	H165B 0-0.2	V187 0-0.1	V187A 0-0.2
			Client sampling date / time	21-OCT-2013 15:00	21-OCT-2013 15:00	21-OCT-2013 15:00	21-OCT-2013 15:00	21-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EB1326059-053	EB1326059-054	EB1326059-055	EB1326059-056	EB1326059-058
EP131A: Organochlorine Pesticides - Continued								
trans-Chlordane	5103-74-2	0.25	µg/kg	<0.25	<0.25	<0.25	<0.25	<0.25
^ Total Chlordane (sum)	----	0.25	µg/kg	<0.25	<0.25	<0.25	<0.25	<0.25
Oxychlordane	27304-13-8	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
EP132B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	5	µg/kg	**6**	**6**	<5	**6**	<5
2-Methylnaphthalene	91-57-6	5	µg/kg	<5	<5	<5	<5	<5
Acenaphthylene	208-96-8	4	µg/kg	**9**	**6**	**13**	<5	<5
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	<5	<5	<5	<5	<5
Anthracene	120-12-7	4	µg/kg	<5	<5	<5	<5	<5
Fluoranthene	206-44-0	4	µg/kg	**11**	**5**	**6**	**5**	<5
Pyrene	129-00-0	4	µg/kg	**13**	**7**	**8**	**7**	<5
Benz(a)anthracene	56-55-3	4	µg/kg	**8**	**6**	<5	<5	<5
Chrysene	218-01-9	4	µg/kg	**8**	**30**	<5	<5	<5
Benzo(b)fluoranthene	205-99-2	4	µg/kg	**8**	**7**	<5	<5	<5
Benzo(k)fluoranthene	207-08-9	4	µg/kg	<5	<5	<5	<5	<5
Benzo(e)pyrene	192-97-2	4	µg/kg	**6**	<5	<5	<5	<5
Benzo(a)pyrene	50-32-8	4	µg/kg	**9**	**6**	<5	<5	<5
Perylene	198-55-0	4	µg/kg	**38**	**54**	**40**	**11**	**7**
Benzo(g.h.i)perylene	191-24-2	4	µg/kg	**5**	<5	<5	<5	<5
Dibenz(a.h)anthracene	53-70-3	4	µg/kg	<5	<5	<5	<5	<5
Indeno(1.2.3.cd)pyrene	193-39-5	4	µg/kg	<5	<5	<5	<5	<5
Coronene	191-07-1	5	µg/kg	<5	<5	<5	<5	<5
^ Sum of PAHs	----	4	µg/kg	**121**	**127**	**67**	**29**	**7**
EP231: Perfluorinated Compounds								
PFOS	1763-23-1	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
PFOA	335-67-1	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonate (6:2 FtS)	27619-97-2	0.005	mg/kg	<0.005	<0.005	<0.005	<0.005	<0.005
8:2 Fluorotelomer sulfonate	39108-34-4	0.001	mg/kg	<0.001	<0.001	<0.001	<0.001	<0.001
PFOSA	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Me-FOSA	31506-32-8	0.001	mg/kg	<0.001	<0.001	<0.001	<0.001	<0.001
N-Et-FOSA	4151-50-2	0.001	mg/kg	<0.001	<0.001	<0.001	<0.001	<0.001

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Client sample ID	H165 0-0.2	H165A 0-0.2	H165B 0-0.2	V187 0-0.1	V187A 0-0.2
			Client sampling date / time	21-OCT-2013 15:00	21-OCT-2013 15:00	21-OCT-2013 15:00	21-OCT-2013 15:00	21-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EB1326059-053	EB1326059-054	EB1326059-055	EB1326059-056	EB1326059-058
EP231: Perfluorinated Compounds - Continued								
N-Me-FOSE	2448-09-7	0.001	mg/kg	<0.001	<0.001	<0.001	<0.001	<0.001
N-Et-FOSE	1691-99-2	0.001	mg/kg	<0.001	<0.001	<0.001	<0.001	<0.001
PFBS	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
PFHxS	3871-99-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
PFDcS	67906-42-7	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
PFHxA	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
PFHpA	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
PFNA	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
PFDcA	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
PFUnA	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
PFDoA	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
PFTriA	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
PFTeA	376-06-7	0.001	mg/kg	<0.001	<0.001	<0.001	<0.001	<0.001
EP080-SD: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	**97.0**	**91.3**	**78.2**	**85.0**	**85.1**
Toluene-D8	2037-26-5	0.1	%	**90.8**	**83.8**	**72.6**	**78.0**	**91.4**
4-Bromofluorobenzene	460-00-4	0.1	%	**132**	**121**	**105**	**114**	**112**
EP090S: Organotin Surrogate								
Tripropyltin	----	0.1	%	**86.7**	**88.8**	**80.0**	**81.7**	**94.3**
EP130S: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.1	%	**45.6**	**36.8**	**36.3**	**35.7**	**37.5**
EP131S: OC Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.1	%	**75.4**	**42.9**	**48.6**	**27.8**	**55.1**
EP132T: Base/Neutral Extractable Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**84.5**	**84.6**	**90.8**	**84.2**	**86.3**
Anthracene-d10	1719-06-8	0.1	%	**83.8**	**84.0**	**82.3**	**97.8**	**81.4**
4-Terphenyl-d14	1718-51-0	0.1	%	**82.3**	**82.9**	**89.0**	**95.1**	**84.1**

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Client sample ID	V187B 0-0.2	H162	QAQC3	V185 0-0.5	V185 0.5-1.0
			Client sampling date / time	21-OCT-2013 15:00	21-OCT-2013 15:00	[21-OCT-2013]	21-OCT-2013 15:00	21-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EB1326059-059	EB1326059-060	EB1326059-061	EB1326059-062	EB1326059-063
EA150: Particle Sizing								
+75µm	----	1	%	2	----	2	54	58
+150µm	----	1	%	<1	----	2	53	57
+300µm	----	1	%	<1	----	1	50	51
+425µm	----	1	%	<1	----	<1	44	45
+600µm	----	1	%	<1	----	<1	38	37
+1180µm	----	1	%	<1	----	<1	22	21
+2.36mm	----	1	%	<1	----	<1	7	8
+4.75mm	----	1	%	<1	----	<1	1	2
+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
EA033-A: Actual Acidity								
pH KCl (23A)	----	0.1	pH Unit	8.7	----	8.7	8.7	8.9
Titratable Actual Acidity (23F)	----	2	mole H+ / t	<2	----	<2	<2	<2
sulfidic - Titratable Actual Acidity (s-23F)	----	0.02	% pyrite S	<0.02	----	<0.02	<0.02	<0.02
EA033-B: Potential Acidity								
Chromium Reducible Sulfur (22B)	----	0.005	% S	0.326	----	0.360	0.618	0.690
acidity - Chromium Reducible Sulfur (a-22B)	----	10	mole H+ / t	204	----	225	385	430
EA033-C: Acid Neutralising Capacity								
Acid Neutralising Capacity (19A2)	----	0.01	% CaCO3	5.98	----	7.06	6.68	9.00
acidity - Acid Neutralising Capacity (a-19A2)	----	10	mole H+ / t	1200	----	1410	1330	1800
sulfidic - Acid Neutralising Capacity (s-19A2)	----	0.01	% pyrite S	1.92	----	2.26	2.14	2.88
EA033-E: Acid Base Accounting								
ANC Fineness Factor	----	0.5	-	1.5	----	1.5	1.5	1.5
Net Acidity (sulfur units)	----	0.02	% S	<0.02	----	<0.02	<0.02	<0.02
Net Acidity (acidity units)	----	10	mole H+ / t	<10	----	<10	<10	<10
Liming Rate	----	1	kg CaCO3/t	<1	----	<1	<1	<1
EA055: Moisture Content								
Moisture Content (dried @ 103°C)	----	1.0	%	62.8	26.7	57.9	41.0	44.3
EA150: Soil Classification based on Particle Size								

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Client sample ID	V187B 0-0.2	H162	QAQC3	V185 0-0.5	V185 0.5-1.0
			Client sampling date / time	21-OCT-2013 15:00	21-OCT-2013 15:00	[21-OCT-2013]	21-OCT-2013 15:00	21-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EB1326059-059	EB1326059-060	EB1326059-061	EB1326059-062	EB1326059-063
EA150: Soil Classification based on Particle Size - Continued								
Clay (<2 µm)	----	1	%	40	----	42	24	22
Silt (2-60 µm)	----	1	%	58	----	56	22	20
Sand (0.06-2.00 mm)	----	1	%	2	----	2	47	50
Gravel (>2mm)	----	1	%	<1	----	<1	7	8
Cobbles (>6cm)	----	1	%	<1	----	<1	<1	<1
EG005-SD: Total Metals in Sediments by ICP-AES								
Aluminium	7429-90-5	50	mg/kg	22900	18700	23000	11000	16000
Iron	7439-89-6	50	mg/kg	34100	31800	33500	20400	27000
EG020-SD: Total Metals in Sediments by ICPMS								
Antimony	7440-36-0	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Arsenic	7440-38-2	1.00	mg/kg	17.6	18.8	20.7	14.5	16.0
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	40.1	37.4	41.3	23.7	30.9
Copper	7440-50-8	1.0	mg/kg	17.1	6.2	20.3	9.0	8.4
Cobalt	7440-48-4	0.5	mg/kg	11.3	7.2	11.6	7.1	8.6
Lead	7439-92-1	1.0	mg/kg	20.9	15.7	21.0	13.3	14.4
Manganese	7439-96-5	10	mg/kg	503	599	902	445	531
Nickel	7440-02-0	1.0	mg/kg	20.4	15.3	21.4	11.3	14.6
Selenium	7782-49-2	0.1	mg/kg	3.7	3.0	1.6	2.3	2.7
Silver	7440-22-4	0.1	mg/kg	<0.1	<0.1	1.5	<0.1	<0.1
Vanadium	7440-62-2	2.0	mg/kg	51.6	36.5	46.2	31.8	38.2
Zinc	7440-66-6	1.0	mg/kg	65.3	41.2	67.5	34.5	38.0
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.01	mg/kg	0.04	1.20	<0.01	0.05	0.03
EK055: Ammonia as N								
Ammonia as N	7664-41-7	1	mg/kg	7	----	15	<1	2
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	<0.1	----	0.1	<0.1	<0.1
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	20	mg/kg	1640	----	1300	960	850
EK062: Total Nitrogen as N (TKN + NOx)								
^ Total Nitrogen as N	----	20	mg/kg	1640	----	1300	960	850
EK067G: Total Phosphorus as P by Discrete Analyser								

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Client sample ID	V187B 0-0.2	H162	QAQC3	V185 0-0.5	V185 0.5-1.0
			Client sampling date / time	21-OCT-2013 15:00	21-OCT-2013 15:00	[21-OCT-2013]	21-OCT-2013 15:00	21-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EB1326059-059	EB1326059-060	EB1326059-061	EB1326059-062	EB1326059-063
EK067G: Total Phosphorus as P by Discrete Analyser - Continued								
Total Phosphorus as P	----	2	mg/kg	524	----	367	232	252
EP003: Total Organic Carbon (TOC) in Soil								
Total Organic Carbon	----	0.02	%	2.14	0.06	2.14	1.46	0.97
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	3	mg/kg	<3	----	<3	<3	<3
C10 - C14 Fraction	----	3	mg/kg	<3	----	<3	<3	<3
C15 - C28 Fraction	----	3	mg/kg	26	----	20	13	12
C29 - C36 Fraction	----	5	mg/kg	25	----	27	14	20
^ C10 - C36 Fraction (sum)	----	3	mg/kg	51	----	47	27	32
EP080-SD / EP071-SD: Total Recoverable Hydrocarbons								
C6 - C10 Fraction	C6_C10	3	mg/kg	<3	----	<3	<3	<3
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	1330-20-7	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
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	0.8	<0.5	1.2	1.1	<0.5
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)			Client sample ID	V187B 0-0.2	H162	QAQC3	V185 0-0.5	V185 0.5-1.0
			Client sampling date / time	21-OCT-2013 15:00	21-OCT-2013 15:00	[21-OCT-2013]	21-OCT-2013 15:00	21-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EB1326059-059	EB1326059-060	EB1326059-061	EB1326059-062	EB1326059-063
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	----	<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	----	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	0.25	µg/kg	<0.25	----	<0.25	<0.25	<0.25

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Client sample ID	V187B 0-0.2	H162	QAQC3	V185 0-0.5	V185 0.5-1.0
			Client sampling date / time	21-OCT-2013 15:00	21-OCT-2013 15:00	[21-OCT-2013]	21-OCT-2013 15:00	21-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EB1326059-059	EB1326059-060	EB1326059-061	EB1326059-062	EB1326059-063
EP131A: Organochlorine Pesticides - Continued								
trans-Chlordane	5103-74-2	0.25	µg/kg	<0.25	----	<0.25	<0.25	<0.25
^ Total Chlordane (sum)	----	0.25	µg/kg	<0.25	----	<0.25	<0.25	<0.25
Oxychlordane	27304-13-8	0.50	µg/kg	<0.50	----	<0.50	<0.50	<0.50
EP132B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	5	µg/kg	**10**	----	**7**	<5	<5
2-Methylnaphthalene	91-57-6	5	µg/kg	<5	----	<5	<5	<5
Acenaphthylene	208-96-8	4	µg/kg	<5	----	<5	<4	<4
Acenaphthene	83-32-9	4	µg/kg	**41**	----	<5	<4	<4
Fluorene	86-73-7	4	µg/kg	<5	----	<5	<4	<4
Phenanthrene	85-01-8	4	µg/kg	<5	----	<5	<4	<4
Anthracene	120-12-7	4	µg/kg	<5	----	<5	<4	<4
Fluoranthene	206-44-0	4	µg/kg	**5**	----	**7**	<4	<4
Pyrene	129-00-0	4	µg/kg	**43**	----	**8**	<4	<4
Benz(a)anthracene	56-55-3	4	µg/kg	<5	----	<5	<4	<4
Chrysene	218-01-9	4	µg/kg	<5	----	<5	<4	<4
Benzo(b)fluoranthene	205-99-2	4	µg/kg	<5	----	<5	<4	<4
Benzo(k)fluoranthene	207-08-9	4	µg/kg	<5	----	<5	<4	<4
Benzo(e)pyrene	192-97-2	4	µg/kg	<5	----	<5	<4	<4
Benzo(a)pyrene	50-32-8	4	µg/kg	<5	----	<5	<4	<4
Perylene	198-55-0	4	µg/kg	**54**	----	**32**	**7**	**6**
Benzo(g.h.i)perylene	191-24-2	4	µg/kg	**5**	----	<5	<4	<4
Dibenz(a.h)anthracene	53-70-3	4	µg/kg	<5	----	<5	<4	<4
Indeno(1.2.3.cd)pyrene	193-39-5	4	µg/kg	<5	----	<5	<4	<4
Coronene	191-07-1	5	µg/kg	<5	----	<5	<5	<5
^ Sum of PAHs	----	4	µg/kg	**158**	----	**54**	**7**	**6**
EP231: Perfluorinated Compounds								
PFOS	1763-23-1	0.0005	mg/kg	<0.0005	----	<0.0005	<0.0005	<0.0005
PFOA	335-67-1	0.0005	mg/kg	<0.0005	----	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonate (6:2 FtS)	27619-97-2	0.005	mg/kg	<0.005	----	<0.005	<0.005	<0.005
8:2 Fluorotelomer sulfonate	39108-34-4	0.001	mg/kg	<0.001	----	<0.001	<0.001	<0.001
PFOSA	754-91-6	0.0002	mg/kg	<0.0002	----	<0.0002	<0.0002	<0.0002
N-Me-FOSA	31506-32-8	0.001	mg/kg	<0.001	----	<0.001	<0.001	<0.001
N-Et-FOSA	4151-50-2	0.001	mg/kg	<0.001	----	<0.001	<0.001	<0.001

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Client sample ID	V187B 0-0.2	H162	QAQC3	V185 0-0.5	V185 0.5-1.0
			Client sampling date / time	21-OCT-2013 15:00	21-OCT-2013 15:00	[21-OCT-2013]	21-OCT-2013 15:00	21-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EB1326059-059	EB1326059-060	EB1326059-061	EB1326059-062	EB1326059-063
EP231: Perfluorinated Compounds - Continued								
N-Me-FOSE	2448-09-7	0.001	mg/kg	<0.001	----	<0.001	<0.001	<0.001
N-Et-FOSE	1691-99-2	0.001	mg/kg	<0.001	----	<0.001	<0.001	<0.001
PFBS	375-73-5	0.0002	mg/kg	<0.0002	----	<0.0002	<0.0002	<0.0002
PFHxS	3871-99-6	0.0002	mg/kg	<0.0002	----	<0.0002	<0.0002	<0.0002
PFDcS	67906-42-7	0.0002	mg/kg	<0.0002	----	<0.0002	<0.0002	<0.0002
PFHxA	307-24-4	0.0002	mg/kg	<0.0002	----	<0.0002	<0.0002	<0.0002
PFHpA	375-85-9	0.0002	mg/kg	<0.0002	----	<0.0002	<0.0002	<0.0002
PFNA	375-95-1	0.0002	mg/kg	<0.0002	----	<0.0002	<0.0002	<0.0002
PFDcA	335-76-2	0.0002	mg/kg	<0.0002	----	<0.0002	<0.0002	<0.0002
PFUnA	2058-94-8	0.0002	mg/kg	<0.0002	----	<0.0002	<0.0002	<0.0002
PFDoA	307-55-1	0.0002	mg/kg	<0.0002	----	<0.0002	<0.0002	<0.0002
PFTriA	72629-94-8	0.0002	mg/kg	<0.0002	----	<0.0002	<0.0002	<0.0002
PFTeA	376-06-7	0.001	mg/kg	<0.001	----	<0.001	<0.001	<0.001
EP080-SD: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	**72.0**	----	**68.1**	**77.0**	**93.9**
Toluene-D8	2037-26-5	0.1	%	**82.2**	----	**89.2**	**95.3**	**92.1**
4-Bromofluorobenzene	460-00-4	0.1	%	**84.4**	----	**114**	**129**	**133**
EP090S: Organotin Surrogate								
Tripropyltin	----	0.1	%	**85.1**	**83.8**	**77.3**	**91.0**	**81.8**
EP130S: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.1	%	**34.3**	----	**35.1**	**36.2**	**36.6**
EP131S: OC Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.1	%	**54.4**	----	**42.7**	**55.0**	**52.3**
EP132T: Base/Neutral Extractable Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**85.5**	----	**84.1**	**81.9**	**88.8**
Anthracene-d10	1719-06-8	0.1	%	**88.7**	----	**88.1**	**87.2**	**91.6**
4-Terphenyl-d14	1718-51-0	0.1	%	**80.2**	----	**83.2**	**89.7**	**94.7**

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Client sample ID	V185 1.0-1.5	V185 1.5-2.0	V185 2.0-2.5	V185 2.5-2.9	B63 0-0.5
			Client sampling date / time	21-OCT-2013 15:00	21-OCT-2013 15:00	21-OCT-2013 15:00	21-OCT-2013 15:00	22-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EB1326059-064	EB1326059-065	EB1326059-066	EB1326059-067	EB1326059-068
EA150: Particle Sizing								
+75µm	----	1	%	34	----	----	2	2
+150µm	----	1	%	31	----	----	1	<1
+300µm	----	1	%	22	----	----	1	<1
+425µm	----	1	%	18	----	----	1	<1
+600µm	----	1	%	16	----	----	<1	<1
+1180µm	----	1	%	14	----	----	<1	<1
+2.36mm	----	1	%	11	----	----	<1	<1
+4.75mm	----	1	%	9	----	----	<1	<1
+9.5mm	----	1	%	8	----	----	<1	<1
+19.0mm	----	1	%	<1	----	----	<1	<1
+37.5mm	----	1	%	<1	----	----	<1	<1
+75.0mm	----	1	%	<1	----	----	<1	<1
EA033-A: Actual Acidity								
pH KCl (23A)	----	0.1	pH Unit	8.8	7.8	6.9	6.0	8.8
Titratable Actual Acidity (23F)	----	2	mole H+ / t	<2	<2	<2	5	<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	1.05	1.20	1.30	1.56	0.248
acidity - Chromium Reducible Sulfur (a-22B)	----	10	mole H+ / t	658	750	813	974	155
EA033-C: Acid Neutralising Capacity								
Acid Neutralising Capacity (19A2)	----	0.01	% CaCO3	8.01	1.35	1.20	----	10.1
acidity - Acid Neutralising Capacity (a-19A2)	----	10	mole H+ / t	1600	269	240	----	2020
sulfidic - Acid Neutralising Capacity (s-19A2)	----	0.01	% pyrite S	2.57	0.43	0.38	----	3.24
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	0.91	1.05	1.57	<0.02
Net Acidity (acidity units)	----	10	mole H+ / t	<10	570	652	979	<10
Liming Rate	----	1	kg CaCO3/t	<1	43	49	73	<1
EA055: Moisture Content								
Moisture Content (dried @ 103°C)	----	1.0	%	45.4	46.8	38.3	37.8	55.0
EA150: Soil Classification based on Particle Size								

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Client sample ID	V185 1.0-1.5	V185 1.5-2.0	V185 2.0-2.5	V185 2.5-2.9	B63 0-0.5
			Client sampling date / time	21-OCT-2013 15:00	21-OCT-2013 15:00	21-OCT-2013 15:00	21-OCT-2013 15:00	22-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EB1326059-064	EB1326059-065	EB1326059-066	EB1326059-067	EB1326059-068
EA150: Soil Classification based on Particle Size - Continued								
Clay (<2 µm)	----	1	%	34	----	----	42	34
Silt (2-60 µm)	----	1	%	33	----	----	55	62
Sand (0.06-2.00 mm)	----	1	%	22	----	----	3	4
Gravel (>2mm)	----	1	%	11	----	----	<1	<1
Cobbles (>6cm)	----	1	%	<1	----	----	<1	<1
EG005-SD: Total Metals in Sediments by ICP-AES								
Aluminium	7429-90-5	50	mg/kg	18800	16600	17700	17500	16600
Iron	7439-89-6	50	mg/kg	30200	31500	21700	21800	27900
EG020-SD: Total Metals in Sediments by ICPMS								
Antimony	7440-36-0	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Arsenic	7440-38-2	1.00	mg/kg	18.5	26.5	17.5	18.4	18.2
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	35.5	35.9	32.5	31.9	32.4
Copper	7440-50-8	1.0	mg/kg	10.0	11.6	14.4	15.1	10.9
Cobalt	7440-48-4	0.5	mg/kg	10.3	10.9	14.6	11.8	9.0
Lead	7439-92-1	1.0	mg/kg	15.7	18.0	21.9	21.2	16.6
Manganese	7439-96-5	10	mg/kg	427	372	143	226	755
Nickel	7440-02-0	1.0	mg/kg	17.6	15.7	16.8	15.5	16.4
Selenium	7782-49-2	0.1	mg/kg	3.1	3.6	4.2	4.0	2.8
Silver	7440-22-4	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Vanadium	7440-62-2	2.0	mg/kg	40.2	61.8	52.1	47.8	41.7
Zinc	7440-66-6	1.0	mg/kg	45.0	39.7	38.3	37.2	47.1
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.01	mg/kg	0.62	0.01	0.02	0.03	0.04
EK055: Ammonia as N								
Ammonia as N	7664-41-7	1	mg/kg	1	----	----	1	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	<0.1	----	----	<0.1	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	20	mg/kg	900	----	----	660	----
EK062: Total Nitrogen as N (TKN + NOx)								
^ Total Nitrogen as N	----	20	mg/kg	900	----	----	660	----
EK067G: Total Phosphorus as P by Discrete Analyser								

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Client sample ID	V185 1.0-1.5	V185 1.5-2.0	V185 2.0-2.5	V185 2.5-2.9	B63 0-0.5
			Client sampling date / time	21-OCT-2013 15:00	21-OCT-2013 15:00	21-OCT-2013 15:00	21-OCT-2013 15:00	22-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EB1326059-064	EB1326059-065	EB1326059-066	EB1326059-067	EB1326059-068
EK067G: Total Phosphorus as P by Discrete Analyser - Continued								
Total Phosphorus as P	----	2	mg/kg	288	----	----	225	----
EP003: Total Organic Carbon (TOC) in Soil								
Total Organic Carbon	----	0.02	%	1.54	2.56	1.67	1.41	1.33
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	3	mg/kg	<3	----	----	<3	----
C10 - C14 Fraction	----	3	mg/kg	<3	----	----	<3	----
C15 - C28 Fraction	----	3	mg/kg	12	----	----	4	----
C29 - C36 Fraction	----	5	mg/kg	13	----	----	15	----
^ C10 - C36 Fraction (sum)	----	3	mg/kg	25	----	----	19	----
EP080-SD / EP071-SD: Total Recoverable Hydrocarbons								
C6 - C10 Fraction	C6_C10	3	mg/kg	<3	----	----	<3	----
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	1330-20-7	0.5	mg/kg	<0.5	----	----	<0.5	----
^ Sum of BTEX	----	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	----
Carbophenothion	786-19-6	10	µg/kg	<10	----	----	<10	----
Chlorfenvinphos (E)	18708-86-6	10.0	µg/kg	<10.0	----	----	<10.0	----
Chlorfenvinphos (Z)	18708-87-7	10	µg/kg	<10	----	----	<10	----
Chlorpyrifos	2921-88-2	10	µg/kg	<10	----	----	<10	----
Chlorpyrifos-methyl	5598-13-0	10	µg/kg	<10	----	----	<10	----
Demeton-S-methyl	919-86-8	10	µg/kg	<10	----	----	<10	----
Diazinon	333-41-5	10	µg/kg	<10	----	----	<10	----
Dichlorvos	62-73-7	10	µg/kg	<10	----	----	<10	----

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Client sample ID	V185 1.0-1.5	V185 1.5-2.0	V185 2.0-2.5	V185 2.5-2.9	B63 0-0.5
			Client sampling date / time	21-OCT-2013 15:00	21-OCT-2013 15:00	21-OCT-2013 15:00	21-OCT-2013 15:00	22-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EB1326059-064	EB1326059-065	EB1326059-066	EB1326059-067	EB1326059-068
EP130A: Organophosphorus Pesticides (Ultra-trace) - Continued								
Dimethoate	60-51-5	10	µg/kg	<10	----	----	<10	----
Ethion	563-12-2	10	µg/kg	<10	----	----	<10	----
Fenamiphos	22224-92-6	10	µg/kg	<10	----	----	<10	----
Fenthion	55-38-9	10	µg/kg	<10	----	----	<10	----
Malathion	121-75-5	10	µg/kg	<10	----	----	<10	----
Azinphos Methyl	86-50-0	10	µg/kg	<10	----	----	<10	----
Monocrotophos	6923-22-4	10	µg/kg	<10	----	----	<10	----
Parathion	56-38-2	10	µg/kg	<10	----	----	<10	----
Parathion-methyl	298-00-0	10	µg/kg	<10	----	----	<10	----
Pirimphos-ethyl	23505-41-1	10	µg/kg	<10	----	----	<10	----
Prothiofos	34643-46-4	10	µg/kg	<10	----	----	<10	----
EP131A: Organochlorine Pesticides								
Aldrin	309-00-2	0.50	µg/kg	<0.50	----	----	<0.50	----
alpha-BHC	319-84-6	0.50	µg/kg	<0.50	----	----	<0.50	----
beta-BHC	319-85-7	0.50	µg/kg	<0.50	----	----	<0.50	----
delta-BHC	319-86-8	0.50	µg/kg	<0.50	----	----	<0.50	----
4.4`-DDD	72-54-8	0.50	µg/kg	<0.50	----	----	<0.50	----
4.4`-DDE	72-55-9	0.50	µg/kg	<0.50	----	----	<0.50	----
4.4`-DDT	50-29-3	0.50	µg/kg	<0.50	----	----	<0.50	----
^ Sum of DDD + DDE + DDT	----	0.50	µg/kg	<0.50	----	----	<0.50	----
Dieldrin	60-57-1	0.50	µg/kg	<0.50	----	----	<0.50	----
alpha-Endosulfan	959-98-8	0.50	µg/kg	<0.50	----	----	<0.50	----
beta-Endosulfan	33213-65-9	0.50	µg/kg	<0.50	----	----	<0.50	----
Endosulfan sulfate	1031-07-8	0.50	µg/kg	<0.50	----	----	<0.50	----
^ Endosulfan (sum)	115-29-7	0.50	µg/kg	<0.50	----	----	<0.50	----
Endrin	72-20-8	0.50	µg/kg	<0.50	----	----	<0.50	----
Endrin aldehyde	7421-93-4	0.50	µg/kg	<0.50	----	----	<0.50	----
Endrin ketone	53494-70-5	0.50	µg/kg	<0.50	----	----	<0.50	----
Heptachlor	76-44-8	0.50	µg/kg	<0.50	----	----	<0.50	----
Heptachlor epoxide	1024-57-3	0.50	µg/kg	<0.50	----	----	<0.50	----
Hexachlorobenzene (HCB)	118-74-1	0.50	µg/kg	<0.50	----	----	<0.50	----
gamma-BHC	58-89-9	0.25	µg/kg	<0.25	----	----	<0.25	----
Methoxychlor	72-43-5	0.50	µg/kg	<0.50	----	----	<0.50	----
cis-Chlordane	5103-71-9	0.25	µg/kg	<0.25	----	----	<0.25	----

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Client sample ID	V185 1.0-1.5	V185 1.5-2.0	V185 2.0-2.5	V185 2.5-2.9	B63 0-0.5
			Client sampling date / time	21-OCT-2013 15:00	21-OCT-2013 15:00	21-OCT-2013 15:00	21-OCT-2013 15:00	22-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EB1326059-064	EB1326059-065	EB1326059-066	EB1326059-067	EB1326059-068
EP131A: Organochlorine Pesticides - Continued								
trans-Chlordane	5103-74-2	0.25	µg/kg	<0.25	----	----	<0.25	----
^ Total Chlordane (sum)	----	0.25	µg/kg	<0.25	----	----	<0.25	----
Oxychlordane	27304-13-8	0.50	µg/kg	<0.50	----	----	<0.50	----
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	<4	----	----	<4	----
Acenaphthene	83-32-9	4	µg/kg	<4	----	----	<4	----
Fluorene	86-73-7	4	µg/kg	<4	----	----	<4	----
Phenanthrene	85-01-8	4	µg/kg	<4	----	----	<4	----
Anthracene	120-12-7	4	µg/kg	<4	----	----	<4	----
Fluoranthene	206-44-0	4	µg/kg	<4	----	----	<4	----
Pyrene	129-00-0	4	µg/kg	<4	----	----	<4	----
Benz(a)anthracene	56-55-3	4	µg/kg	<4	----	----	<4	----
Chrysene	218-01-9	4	µg/kg	<4	----	----	<4	----
Benzo(b)fluoranthene	205-99-2	4	µg/kg	<4	----	----	<4	----
Benzo(k)fluoranthene	207-08-9	4	µg/kg	<4	----	----	<4	----
Benzo(e)pyrene	192-97-2	4	µg/kg	<4	----	----	<4	----
Benzo(a)pyrene	50-32-8	4	µg/kg	<4	----	----	<4	----
Perylene	198-55-0	4	µg/kg	**6**	----	----	**92**	----
Benzo(g.h.i)perylene	191-24-2	4	µg/kg	<4	----	----	<4	----
Dibenz(a.h)anthracene	53-70-3	4	µg/kg	<4	----	----	<4	----
Indeno(1.2.3.cd)pyrene	193-39-5	4	µg/kg	<4	----	----	<4	----
Coronene	191-07-1	5	µg/kg	<5	----	----	<5	----
^ Sum of PAHs	----	4	µg/kg	**6**	----	----	**92**	----
EP231: Perfluorinated Compounds								
PFOS	1763-23-1	0.0005	mg/kg	<0.0005	----	----	<0.0005	----
PFOA	335-67-1	0.0005	mg/kg	<0.0005	----	----	<0.0005	----
6:2 Fluorotelomer sulfonate (6:2 FtS)	27619-97-2	0.005	mg/kg	<0.005	----	----	<0.005	----
8:2 Fluorotelomer sulfonate	39108-34-4	0.001	mg/kg	<0.001	----	----	<0.001	----
PFOSA	754-91-6	0.0002	mg/kg	<0.0002	----	----	<0.0002	----
N-Me-FOSA	31506-32-8	0.001	mg/kg	<0.001	----	----	<0.001	----
N-Et-FOSA	4151-50-2	0.001	mg/kg	<0.001	----	----	<0.001	----

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Client sample ID	V185 1.0-1.5	V185 1.5-2.0	V185 2.0-2.5	V185 2.5-2.9	B63 0-0.5
			Client sampling date / time	21-OCT-2013 15:00	21-OCT-2013 15:00	21-OCT-2013 15:00	21-OCT-2013 15:00	22-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EB1326059-064	EB1326059-065	EB1326059-066	EB1326059-067	EB1326059-068
EP231: Perfluorinated Compounds - Continued								
N-Me-FOSE	2448-09-7	0.001	mg/kg	<0.001	----	----	<0.001	----
N-Et-FOSE	1691-99-2	0.001	mg/kg	<0.001	----	----	<0.001	----
PFBS	375-73-5	0.0002	mg/kg	<0.0002	----	----	<0.0002	----
PFHxS	3871-99-6	0.0002	mg/kg	<0.0002	----	----	<0.0002	----
PFDcS	67906-42-7	0.0002	mg/kg	<0.0002	----	----	<0.0002	----
PFHxA	307-24-4	0.0002	mg/kg	<0.0002	----	----	<0.0002	----
PFHpA	375-85-9	0.0002	mg/kg	<0.0002	----	----	<0.0002	----
PFNA	375-95-1	0.0002	mg/kg	<0.0002	----	----	<0.0002	----
PFDcA	335-76-2	0.0002	mg/kg	<0.0002	----	----	<0.0002	----
PFUnA	2058-94-8	0.0002	mg/kg	<0.0002	----	----	<0.0002	----
PFDoA	307-55-1	0.0002	mg/kg	<0.0002	----	----	<0.0002	----
PFTriA	72629-94-8	0.0002	mg/kg	<0.0002	----	----	<0.0002	----
PFTeA	376-06-7	0.001	mg/kg	<0.001	----	----	<0.001	----
EP080-SD: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	**94.4**	----	----	**94.0**	----
Toluene-D8	2037-26-5	0.1	%	**103**	----	----	**106**	----
4-Bromofluorobenzene	460-00-4	0.1	%	**136**	----	----	**137**	----
EP090S: Organotin Surrogate								
Tripropyltin	----	0.1	%	**62.8**	**87.4**	**84.7**	**92.8**	**103**
EP130S: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.1	%	**37.2**	----	----	**35.5**	----
EP131S: OC Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.1	%	**34.8**	----	----	**27.0**	----
EP132T: Base/Neutral Extractable Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**88.0**	----	----	**88.1**	----
Anthracene-d10	1719-06-8	0.1	%	**86.2**	----	----	**92.3**	----
4-Terphenyl-d14	1718-51-0	0.1	%	**81.2**	----	----	**80.6**	----

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Client sample ID	B63 0.5-1.0	B63 1.0-1.45	QAQC5	QAQC4	B41 0-0.5
			Client sampling date / time	22-OCT-2013 15:00	22-OCT-2013 15:00	21-OCT-2013 15:00	21-OCT-2013 15:00	22-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EB1326059-069	EB1326059-070	EB1326059-071	EB1326059-072	EB1326059-073
EA150: Particle Sizing								
+75µm	----	1	%	----	----	56	57	3
+150µm	----	1	%	----	----	55	56	<1
+300µm	----	1	%	----	----	50	53	<1
+425µm	----	1	%	----	----	44	48	<1
+600µm	----	1	%	----	----	37	41	<1
+1180µm	----	1	%	----	----	23	26	<1
+2.36mm	----	1	%	----	----	9	12	<1
+4.75mm	----	1	%	----	----	3	7	<1
+9.5mm	----	1	%	----	----	<1	2	<1
+19.0mm	----	1	%	----	----	<1	<1	<1
+37.5mm	----	1	%	----	----	<1	<1	<1
+75.0mm	----	1	%	----	----	<1	<1	<1
EA033-A: Actual Acidity								
pH KCl (23A)	----	0.1	pH Unit	8.8	8.8	8.9	8.5	8.9
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	0.226	0.283	0.583	0.720	0.168
acidity - Chromium Reducible Sulfur (a-22B)	----	10	mole H+ / t	141	176	364	449	105
EA033-C: Acid Neutralising Capacity								
Acid Neutralising Capacity (19A2)	----	0.01	% CaCO3	11.5	10.1	10.0	6.99	12.9
acidity - Acid Neutralising Capacity (a-19A2)	----	10	mole H+ / t	2310	2010	2000	1400	2580
sulfidic - Acid Neutralising Capacity (s-19A2)	----	0.01	% pyrite S	3.70	3.23	3.21	2.24	4.13
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
EA055: Moisture Content								
Moisture Content (dried @ 103°C)	----	1.0	%	51.2	48.1	35.1	38.3	58.3
EA150: Soil Classification based on Particle Size								

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Client sample ID	B63 0.5-1.0	B63 1.0-1.45	QAQC5	QAQC4	B41 0-0.5
			Client sampling date / time	22-OCT-2013 15:00	22-OCT-2013 15:00	21-OCT-2013 15:00	21-OCT-2013 15:00	22-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EB1326059-069	EB1326059-070	EB1326059-071	EB1326059-072	EB1326059-073
EA150: Soil Classification based on Particle Size - Continued								
Clay (<2 µm)	----	1	%	----	----	21	22	36
Silt (2-60 µm)	----	1	%	----	----	23	20	56
Sand (0.06-2.00 mm)	----	1	%	----	----	47	46	8
Gravel (>2mm)	----	1	%	----	----	9	12	<1
Cobbles (>6cm)	----	1	%	----	----	<1	<1	<1
EG005-SD: Total Metals in Sediments by ICP-AES								
Aluminium	7429-90-5	50	mg/kg	17300	19400	13000	11800	23600
Iron	7439-89-6	50	mg/kg	27900	30000	22500	34200	31800
EG020-SD: Total Metals in Sediments by ICPMS								
Antimony	7440-36-0	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Arsenic	7440-38-2	1.00	mg/kg	19.7	19.1	21.8	18.6	18.9
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	32.6	36.0	25.7	43.1	38.1
Copper	7440-50-8	1.0	mg/kg	10.6	12.1	6.2	12.1	11.3
Cobalt	7440-48-4	0.5	mg/kg	9.2	9.9	6.6	6.5	10.2
Lead	7439-92-1	1.0	mg/kg	16.6	18.8	11.6	12.0	18.3
Manganese	7439-96-5	10	mg/kg	727	781	374	358	835
Nickel	7440-02-0	1.0	mg/kg	16.0	18.0	11.1	10.9	20.2
Selenium	7782-49-2	0.1	mg/kg	2.9	2.9	2.0	2.4	3.2
Silver	7440-22-4	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Vanadium	7440-62-2	2.0	mg/kg	41.9	45.9	30.0	47.9	48.3
Zinc	7440-66-6	1.0	mg/kg	46.7	52.5	29.4	34.0	52.9
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.01	mg/kg	0.05	0.03	0.01	0.02	0.03
EK055: Ammonia as N								
Ammonia as N	7664-41-7	1	mg/kg	24	----	<1	<1	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	<0.1	----	<0.1	<0.1	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	20	mg/kg	1860	----	640	660	----
EK062: Total Nitrogen as N (TKN + NOx)								
^ Total Nitrogen as N	----	20	mg/kg	1860	----	640	660	----
EK067G: Total Phosphorus as P by Discrete Analyser								

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Client sample ID	B63 0.5-1.0	B63 1.0-1.45	QAQC5	QAQC4	B41 0-0.5
			Client sampling date / time	22-OCT-2013 15:00	22-OCT-2013 15:00	21-OCT-2013 15:00	21-OCT-2013 15:00	22-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EB1326059-069	EB1326059-070	EB1326059-071	EB1326059-072	EB1326059-073
EK067G: Total Phosphorus as P by Discrete Analyser - Continued								
Total Phosphorus as P	----	2	mg/kg	386	----	281	213	----
EP003: Total Organic Carbon (TOC) in Soil								
Total Organic Carbon	----	0.02	%	1.24	1.35	0.98	1.90	0.97
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	3	mg/kg	----	----	<3	<3	----
C10 - C14 Fraction	----	3	mg/kg	----	----	<3	<3	----
C15 - C28 Fraction	----	3	mg/kg	----	----	10	12	----
C29 - C36 Fraction	----	5	mg/kg	----	----	11	15	----
^ C10 - C36 Fraction (sum)	----	3	mg/kg	----	----	21	27	----
EP080-SD / EP071-SD: Total Recoverable Hydrocarbons								
C6 - C10 Fraction	C6_C10	3	mg/kg	----	----	<3	<3	----
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	1330-20-7	0.5	mg/kg	----	----	<0.5	<0.5	----
^ Sum of BTEX	----	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	0.6	<0.5	<0.5	1.3	<0.5
EP130A: Organophosphorus Pesticides (Ultra-trace)								
Bromophos-ethyl	4824-78-6	10	µg/kg	----	----	<10	<10	----
Carbophenothion	786-19-6	10	µg/kg	----	----	<10	<10	----
Chlorfenvinphos (E)	18708-86-6	10.0	µg/kg	----	----	<10.0	<10.0	----
Chlorfenvinphos (Z)	18708-87-7	10	µg/kg	----	----	<10	<10	----
Chlorpyrifos	2921-88-2	10	µg/kg	----	----	<10	<10	----
Chlorpyrifos-methyl	5598-13-0	10	µg/kg	----	----	<10	<10	----
Demeton-S-methyl	919-86-8	10	µg/kg	----	----	<10	<10	----
Diazinon	333-41-5	10	µg/kg	----	----	<10	<10	----
Dichlorvos	62-73-7	10	µg/kg	----	----	<10	<10	----

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Client sample ID	B63 0.5-1.0	B63 1.0-1.45	QAQC5	QAQC4	B41 0-0.5
			Client sampling date / time	22-OCT-2013 15:00	22-OCT-2013 15:00	21-OCT-2013 15:00	21-OCT-2013 15:00	22-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EB1326059-069	EB1326059-070	EB1326059-071	EB1326059-072	EB1326059-073
EP130A: Organophosphorus Pesticides (Ultra-trace) - Continued								
Dimethoate	60-51-5	10	µg/kg	----	----	<10	<10	----
Ethion	563-12-2	10	µg/kg	----	----	<10	<10	----
Fenamiphos	22224-92-6	10	µg/kg	----	----	<10	<10	----
Fenthion	55-38-9	10	µg/kg	----	----	<10	<10	----
Malathion	121-75-5	10	µg/kg	----	----	<10	<10	----
Azinphos Methyl	86-50-0	10	µg/kg	----	----	<10	<10	----
Monocrotophos	6923-22-4	10	µg/kg	----	----	<10	<10	----
Parathion	56-38-2	10	µg/kg	----	----	<10	<10	----
Parathion-methyl	298-00-0	10	µg/kg	----	----	<10	<10	----
Pirimphos-ethyl	23505-41-1	10	µg/kg	----	----	<10	<10	----
Prothiofos	34643-46-4	10	µg/kg	----	----	<10	<10	----
EP131A: Organochlorine Pesticides								
Aldrin	309-00-2	0.50	µg/kg	----	----	<0.50	<0.50	----
alpha-BHC	319-84-6	0.50	µg/kg	----	----	<0.50	<0.50	----
beta-BHC	319-85-7	0.50	µg/kg	----	----	<0.50	<0.50	----
delta-BHC	319-86-8	0.50	µg/kg	----	----	<0.50	<0.50	----
4.4`-DDD	72-54-8	0.50	µg/kg	----	----	<0.50	<0.50	----
4.4`-DDE	72-55-9	0.50	µg/kg	----	----	<0.50	<0.50	----
4.4`-DDT	50-29-3	0.50	µg/kg	----	----	<0.50	<0.50	----
^ Sum of DDD + DDE + DDT	----	0.50	µg/kg	----	----	<0.50	<0.50	----
Dieldrin	60-57-1	0.50	µg/kg	----	----	<0.50	<0.50	----
alpha-Endosulfan	959-98-8	0.50	µg/kg	----	----	<0.50	<0.50	----
beta-Endosulfan	33213-65-9	0.50	µg/kg	----	----	<0.50	<0.50	----
Endosulfan sulfate	1031-07-8	0.50	µg/kg	----	----	<0.50	<0.50	----
^ Endosulfan (sum)	115-29-7	0.50	µg/kg	----	----	<0.50	<0.50	----
Endrin	72-20-8	0.50	µg/kg	----	----	<0.50	<0.50	----
Endrin aldehyde	7421-93-4	0.50	µg/kg	----	----	<0.50	<0.50	----
Endrin ketone	53494-70-5	0.50	µg/kg	----	----	<0.50	<0.50	----
Heptachlor	76-44-8	0.50	µg/kg	----	----	<0.50	<0.50	----
Heptachlor epoxide	1024-57-3	0.50	µg/kg	----	----	<0.50	<0.50	----
Hexachlorobenzene (HCB)	118-74-1	0.50	µg/kg	----	----	<0.50	<0.50	----
gamma-BHC	58-89-9	0.25	µg/kg	----	----	<0.25	<0.25	----
Methoxychlor	72-43-5	0.50	µg/kg	----	----	<0.50	<0.50	----
cis-Chlordane	5103-71-9	0.25	µg/kg	----	----	<0.25	<0.25	----

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Client sample ID	B63 0.5-1.0	B63 1.0-1.45	QAQC5	QAQC4	B41 0-0.5
			Client sampling date / time	22-OCT-2013 15:00	22-OCT-2013 15:00	21-OCT-2013 15:00	21-OCT-2013 15:00	22-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EB1326059-069	EB1326059-070	EB1326059-071	EB1326059-072	EB1326059-073
EP131A: Organochlorine Pesticides - Continued								
trans-Chlordane	5103-74-2	0.25	µg/kg	----	----	<0.25	<0.25	----
^ Total Chlordane (sum)	----	0.25	µg/kg	----	----	<0.25	<0.25	----
Oxychlordane	27304-13-8	0.50	µg/kg	----	----	<0.50	<0.50	----
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	----	----	<4	<4	----
Acenaphthene	83-32-9	4	µg/kg	----	----	<4	<4	----
Fluorene	86-73-7	4	µg/kg	----	----	<4	<4	----
Phenanthrene	85-01-8	4	µg/kg	----	----	<4	<4	----
Anthracene	120-12-7	4	µg/kg	----	----	<4	<4	----
Fluoranthene	206-44-0	4	µg/kg	----	----	<4	<4	----
Pyrene	129-00-0	4	µg/kg	----	----	<4	<4	----
Benz(a)anthracene	56-55-3	4	µg/kg	----	----	<4	<4	----
Chrysene	218-01-9	4	µg/kg	----	----	<4	<4	----
Benzo(b)fluoranthene	205-99-2	4	µg/kg	----	----	<4	<4	----
Benzo(k)fluoranthene	207-08-9	4	µg/kg	----	----	<4	<4	----
Benzo(e)pyrene	192-97-2	4	µg/kg	----	----	<4	<4	----
Benzo(a)pyrene	50-32-8	4	µg/kg	----	----	<4	<4	----
Perylene	198-55-0	4	µg/kg	----	----	**19**	**17**	----
Benzo(g.h.i)perylene	191-24-2	4	µg/kg	----	----	<4	<4	----
Dibenz(a.h)anthracene	53-70-3	4	µg/kg	----	----	<4	<4	----
Indeno(1.2.3.cd)pyrene	193-39-5	4	µg/kg	----	----	<4	<4	----
Coronene	191-07-1	5	µg/kg	----	----	<5	<5	----
^ Sum of PAHs	----	4	µg/kg	----	----	**19**	**17**	----
EP231: Perfluorinated Compounds								
PFOS	1763-23-1	0.0005	mg/kg	----	----	<0.0005	<0.0005	----
PFOA	335-67-1	0.0005	mg/kg	----	----	<0.0005	<0.0005	----
6:2 Fluorotelomer sulfonate (6:2 FtS)	27619-97-2	0.005	mg/kg	----	----	<0.005	<0.005	----
8:2 Fluorotelomer sulfonate	39108-34-4	0.001	mg/kg	----	----	<0.001	<0.001	----
PFOSA	754-91-6	0.0002	mg/kg	----	----	<0.0002	<0.0002	----
N-Me-FOSA	31506-32-8	0.001	mg/kg	----	----	<0.001	<0.001	----
N-Et-FOSA	4151-50-2	0.001	mg/kg	----	----	<0.001	<0.001	----

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Client sample ID	B63 0.5-1.0	B63 1.0-1.45	QAQC5	QAQC4	B41 0-0.5
			Client sampling date / time	22-OCT-2013 15:00	22-OCT-2013 15:00	21-OCT-2013 15:00	21-OCT-2013 15:00	22-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EB1326059-069	EB1326059-070	EB1326059-071	EB1326059-072	EB1326059-073
EP231: Perfluorinated Compounds - Continued								
N-Me-FOSE	2448-09-7	0.001	mg/kg	----	----	<0.001	<0.001	----
N-Et-FOSE	1691-99-2	0.001	mg/kg	----	----	<0.001	<0.001	----
PFBS	375-73-5	0.0002	mg/kg	----	----	<0.0002	<0.0002	----
PFHxS	3871-99-6	0.0002	mg/kg	----	----	<0.0002	<0.0002	----
PFDcS	67906-42-7	0.0002	mg/kg	----	----	<0.0002	<0.0002	----
PFHxA	307-24-4	0.0002	mg/kg	----	----	<0.0002	<0.0002	----
PFHpA	375-85-9	0.0002	mg/kg	----	----	<0.0002	<0.0002	----
PFNA	375-95-1	0.0002	mg/kg	----	----	<0.0002	<0.0002	----
PFDcA	335-76-2	0.0002	mg/kg	----	----	<0.0002	<0.0002	----
PFUnA	2058-94-8	0.0002	mg/kg	----	----	<0.0002	<0.0002	----
PFDoA	307-55-1	0.0002	mg/kg	----	----	<0.0002	<0.0002	----
PFTriA	72629-94-8	0.0002	mg/kg	----	----	<0.0002	<0.0002	----
PFTeA	376-06-7	0.001	mg/kg	----	----	<0.001	<0.001	----
EP080-SD: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	----	----	**71.1**	**82.9**	----
Toluene-D8	2037-26-5	0.1	%	----	----	**91.8**	**95.8**	----
4-Bromofluorobenzene	460-00-4	0.1	%	----	----	**96.8**	**128**	----
EP090S: Organotin Surrogate								
Tripropyltin	----	0.1	%	**69.2**	**82.9**	**90.8**	**88.6**	**82.6**
EP130S: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.1	%	----	----	**38.7**	**36.0**	----
EP131S: OC Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.1	%	----	----	**56.6**	**59.3**	----
EP132T: Base/Neutral Extractable Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	----	----	**82.9**	**77.1**	----
Anthracene-d10	1719-06-8	0.1	%	----	----	**95.3**	**103**	----
4-Terphenyl-d14	1718-51-0	0.1	%	----	----	**110**	**82.1**	----

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Client sample ID	B41 0.5-0.9	C72 0-0.5	C72 0.5-1.0	C72 1.0-2.1	B74 0-0.5
			Client sampling date / time	22-OCT-2013 15:00	22-OCT-2013 15:00	22-OCT-2013 15:00	22-OCT-2013 15:00	22-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EB1326059-074	EB1326059-075	EB1326059-076	EB1326059-077	EB1326059-078
EA150: Particle Sizing								
+75µm	----	1	%	3	8	----	----	2
+150µm	----	1	%	<1	1	----	----	1
+300µm	----	1	%	<1	<1	----	----	<1
+425µm	----	1	%	<1	<1	----	----	<1
+600µm	----	1	%	<1	<1	----	----	<1
+1180µm	----	1	%	<1	<1	----	----	<1
+2.36mm	----	1	%	<1	<1	----	----	<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
EA033-A: Actual Acidity								
pH KCl (23A)	----	0.1	pH Unit	8.8	8.9	8.9	8.8	8.7
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	0.251	0.217	0.267	0.348	0.235
acidity - Chromium Reducible Sulfur (a-22B)	----	10	mole H+ / t	156	135	167	217	147
EA033-C: Acid Neutralising Capacity								
Acid Neutralising Capacity (19A2)	----	0.01	% CaCO3	11.4	11.8	12.7	11.2	10.3
acidity - Acid Neutralising Capacity (a-19A2)	----	10	mole H+ / t	2280	2360	2540	2230	2060
sulfidic - Acid Neutralising Capacity (s-19A2)	----	0.01	% pyrite S	3.65	3.79	4.06	3.58	3.31
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
EA055: Moisture Content								
Moisture Content (dried @ 103°C)	----	1.0	%	51.6	48.6	49.6	47.8	53.4
EA150: Soil Classification based on Particle Size								

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Client sample ID	B41 0.5-0.9	C72 0-0.5	C72 0.5-1.0	C72 1.0-2.1	B74 0-0.5
			Client sampling date / time	22-OCT-2013 15:00	22-OCT-2013 15:00	22-OCT-2013 15:00	22-OCT-2013 15:00	22-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EB1326059-074	EB1326059-075	EB1326059-076	EB1326059-077	EB1326059-078
EA150: Soil Classification based on Particle Size - Continued								
Clay (<2 µm)	----	1	%	34	33	----	----	29
Silt (2-60 µm)	----	1	%	63	53	----	----	69
Sand (0.06-2.00 mm)	----	1	%	3	14	----	----	2
Gravel (>2mm)	----	1	%	<1	<1	----	----	<1
Cobbles (>6cm)	----	1	%	<1	<1	----	----	<1
EG005-SD: Total Metals in Sediments by ICP-AES								
Aluminium	7429-90-5	50	mg/kg	18700	8820	18000	16200	20200
Iron	7439-89-6	50	mg/kg	30000	11600	28200	22800	30100
EG020-SD: Total Metals in Sediments by ICPMS								
Antimony	7440-36-0	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Arsenic	7440-38-2	1.00	mg/kg	19.6	8.19	21.0	14.7	20.0
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	35.2	14.6	33.7	26.8	36.5
Copper	7440-50-8	1.0	mg/kg	11.4	5.1	10.5	9.3	12.4
Cobalt	7440-48-4	0.5	mg/kg	9.9	3.9	9.2	7.1	9.6
Lead	7439-92-1	1.0	mg/kg	19.4	7.0	16.8	13.1	18.3
Manganese	7439-96-5	10	mg/kg	756	320	787	557	806
Nickel	7440-02-0	1.0	mg/kg	17.5	7.8	17.0	13.7	18.4
Selenium	7782-49-2	0.1	mg/kg	3.1	1.2	3.1	2.5	3.1
Silver	7440-22-4	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Vanadium	7440-62-2	2.0	mg/kg	45.3	18.1	43.5	33.4	45.5
Zinc	7440-66-6	1.0	mg/kg	50.7	21.8	48.1	39.5	54.2
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.01	mg/kg	0.03	0.01	0.03	0.02	0.02
EK055: Ammonia as N								
Ammonia as N	7664-41-7	1	mg/kg	----	55	----	----	18
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	----	<0.1	----	----	<0.1
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	20	mg/kg	----	990	----	----	1180
EK062: Total Nitrogen as N (TKN + NOx)								
^ Total Nitrogen as N	----	20	mg/kg	----	990	----	----	1180
EK067G: Total Phosphorus as P by Discrete Analyser								

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Client sample ID	B41 0.5-0.9	C72 0-0.5	C72 0.5-1.0	C72 1.0-2.1	B74 0-0.5
			Client sampling date / time	22-OCT-2013 15:00	22-OCT-2013 15:00	22-OCT-2013 15:00	22-OCT-2013 15:00	22-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EB1326059-074	EB1326059-075	EB1326059-076	EB1326059-077	EB1326059-078
EK067G: Total Phosphorus as P by Discrete Analyser - Continued								
Total Phosphorus as P	----	2	mg/kg	----	396	----	----	448
EP003: Total Organic Carbon (TOC) in Soil								
Total Organic Carbon	----	0.02	%	1.22	1.32	1.18	1.35	1.40
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	0.6	0.9	0.6	<0.5
EP090S: Organotin Surrogate								
Tripropyltin	----	0.1	%	88.9	82.0	83.3	82.7	79.5

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Client sample ID	B74 0.5-1.0	B74 1.0-1.9	B74 1.9-2.0	B79 0-0.5	B79 0.5-1.0
			Client sampling date / time	22-OCT-2013 15:00	22-OCT-2013 15:00	22-OCT-2013 15:00	22-OCT-2013 15:00	22-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EB1326059-079	EB1326059-080	EB1326059-081	EB1326059-082	EB1326059-083
EA150: Particle Sizing								
+75µm	----	1	%	----	3	----	----	----
+150µm	----	1	%	----	1	----	----	----
+300µm	----	1	%	----	<1	----	----	----
+425µm	----	1	%	----	<1	----	----	----
+600µm	----	1	%	----	<1	----	----	----
+1180µm	----	1	%	----	<1	----	----	----
+2.36mm	----	1	%	----	<1	----	----	----
+4.75mm	----	1	%	----	<1	----	----	----
+9.5mm	----	1	%	----	<1	----	----	----
+19.0mm	----	1	%	----	<1	----	----	----
+37.5mm	----	1	%	----	<1	----	----	----
+75.0mm	----	1	%	----	<1	----	----	----
EA033-A: Actual Acidity								
pH KCl (23A)	----	0.1	pH Unit	8.8	8.8	----	----	8.8
Titratable Actual Acidity (23F)	----	2	mole H+ / t	<2	<2	----	----	<2
sulfidic - Titratable Actual Acidity (s-23F)	----	0.02	% pyrite S	<0.02	<0.02	----	----	<0.02
EA033-B: Potential Acidity								
Chromium Reducible Sulfur (22B)	----	0.005	% S	0.256	0.445	----	----	0.300
acidity - Chromium Reducible Sulfur (a-22B)	----	10	mole H+ / t	160	278	----	----	187
EA033-C: Acid Neutralising Capacity								
Acid Neutralising Capacity (19A2)	----	0.01	% CaCO3	10.5	8.32	----	----	9.77
acidity - Acid Neutralising Capacity (a-19A2)	----	10	mole H+ / t	2100	1660	----	----	1950
sulfidic - Acid Neutralising Capacity (s-19A2)	----	0.01	% pyrite S	3.36	2.66	----	----	3.13
EA033-E: Acid Base Accounting								
ANC Fineness Factor	----	0.5	-	1.5	1.5	----	----	1.5
Net Acidity (sulfur units)	----	0.02	% S	<0.02	<0.02	----	----	<0.02
Net Acidity (acidity units)	----	10	mole H+ / t	<10	<10	----	----	<10
Liming Rate	----	1	kg CaCO3/t	<1	<1	----	----	<1
EA055: Moisture Content								
Moisture Content (dried @ 103°C)	----	1.0	%	55.4	51.1	44.0	53.6	54.2
EA150: Soil Classification based on Particle Size								

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Client sample ID	B74 0.5-1.0	B74 1.0-1.9	B74 1.9-2.0	B79 0-0.5	B79 0.5-1.0
			Client sampling date / time	22-OCT-2013 15:00	22-OCT-2013 15:00	22-OCT-2013 15:00	22-OCT-2013 15:00	22-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EB1326059-079	EB1326059-080	EB1326059-081	EB1326059-082	EB1326059-083
EA150: Soil Classification based on Particle Size - Continued								
Clay (<2 µm)	----	1	%	----	39	----	----	----
Silt (2-60 µm)	----	1	%	----	57	----	----	----
Sand (0.06-2.00 mm)	----	1	%	----	4	----	----	----
Gravel (>2mm)	----	1	%	----	<1	----	----	----
Cobbles (>6cm)	----	1	%	----	<1	----	----	----
EG005-SD: Total Metals in Sediments by ICP-AES								
Aluminium	7429-90-5	50	mg/kg	19200	21500	22900	19500	20900
Iron	7439-89-6	50	mg/kg	29200	31900	28500	30700	31800
EG020-SD: Total Metals in Sediments by ICPMS								
Antimony	7440-36-0	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Arsenic	7440-38-2	1.00	mg/kg	18.6	21.3	19.3	22.0	21.8
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	34.9	39.0	41.6	36.5	37.8
Copper	7440-50-8	1.0	mg/kg	11.9	14.2	13.8	12.1	12.9
Cobalt	7440-48-4	0.5	mg/kg	9.4	10.3	9.3	10.3	10.5
Lead	7439-92-1	1.0	mg/kg	17.5	21.3	21.8	18.2	20.2
Manganese	7439-96-5	10	mg/kg	725	730	433	818	849
Nickel	7440-02-0	1.0	mg/kg	17.2	18.3	17.2	18.4	19.3
Selenium	7782-49-2	0.1	mg/kg	3.0	3.3	3.9	3.2	3.3
Silver	7440-22-4	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Vanadium	7440-62-2	2.0	mg/kg	44.0	50.0	82.0	46.2	47.9
Zinc	7440-66-6	1.0	mg/kg	50.4	55.5	49.9	54.9	55.7
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.01	mg/kg	0.03	0.03	0.02	0.03	0.03
EK055: Ammonia as N								
Ammonia as N	7664-41-7	1	mg/kg	----	75	----	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	----	<0.1	----	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	20	mg/kg	----	1060	----	----	----
EK062: Total Nitrogen as N (TKN + NOx)								
^ Total Nitrogen as N	----	20	mg/kg	----	1060	----	----	----
EK067G: Total Phosphorus as P by Discrete Analyser								

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Client sample ID	B74 0.5-1.0	B74 1.0-1.9	B74 1.9-2.0	B79 0-0.5	B79 0.5-1.0
			Client sampling date / time	22-OCT-2013 15:00	22-OCT-2013 15:00	22-OCT-2013 15:00	22-OCT-2013 15:00	22-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EB1326059-079	EB1326059-080	EB1326059-081	EB1326059-082	EB1326059-083
EK067G: Total Phosphorus as P by Discrete Analyser - Continued								
Total Phosphorus as P	----	2	mg/kg	----	413	----	----	----
EP003: Total Organic Carbon (TOC) in Soil								
Total Organic Carbon	----	0.02	%	1.42	1.34	1.23	----	1.31
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	0.6	<0.5	0.6	0.5
EP090S: Organotin Surrogate								
Tripropyltin	----	0.1	%	85.6	88.9	100	81.4	89.9

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Client sample ID	B79 1.0-1.8	C82 0-0.5	C82 0.5-1.0	C82 1.0-1.53	C82 1.53-1.67
			Client sampling date / time	22-OCT-2013 15:00	22-OCT-2013 15:00	22-OCT-2013 15:00	22-OCT-2013 15:00	22-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EB1326059-084	EB1326059-085	EB1326059-086	EB1326059-087	EB1326059-088
EA150: Particle Sizing								
+75µm	----	1	%	3	----	----	6	----
+150µm	----	1	%	1	----	----	3	----
+300µm	----	1	%	<1	----	----	2	----
+425µm	----	1	%	<1	----	----	2	----
+600µm	----	1	%	<1	----	----	1	----
+1180µm	----	1	%	<1	----	----	<1	----
+2.36mm	----	1	%	<1	----	----	<1	----
+4.75mm	----	1	%	<1	----	----	<1	----
+9.5mm	----	1	%	<1	----	----	<1	----
+19.0mm	----	1	%	<1	----	----	<1	----
+37.5mm	----	1	%	<1	----	----	<1	----
+75.0mm	----	1	%	<1	----	----	<1	----
EA033-A: Actual Acidity								
pH KCl (23A)	----	0.1	pH Unit	8.8	8.8	8.8	8.9	----
Titratable Actual Acidity (23F)	----	2	mole H+ / t	<2	<2	<2	<2	----
sulfidic - Titratable Actual Acidity (s-23F)	----	0.02	% pyrite S	<0.02	<0.02	<0.02	<0.02	----
EA033-B: Potential Acidity								
Chromium Reducible Sulfur (22B)	----	0.005	% S	0.338	0.274	0.367	0.455	----
acidity - Chromium Reducible Sulfur (a-22B)	----	10	mole H+ / t	211	171	229	284	----
EA033-C: Acid Neutralising Capacity								
Acid Neutralising Capacity (19A2)	----	0.01	% CaCO3	10.1	10.6	10.0	10.5	----
acidity - Acid Neutralising Capacity (a-19A2)	----	10	mole H+ / t	2020	2110	2000	2100	----
sulfidic - Acid Neutralising Capacity (s-19A2)	----	0.01	% pyrite S	3.23	3.39	3.20	3.37	----
EA033-E: Acid Base Accounting								
ANC Fineness Factor	----	0.5	-	1.5	1.5	1.5	1.5	----
Net Acidity (sulfur units)	----	0.02	% S	<0.02	<0.02	<0.02	<0.02	----
Net Acidity (acidity units)	----	10	mole H+ / t	<10	<10	<10	<10	----
Liming Rate	----	1	kg CaCO3/t	<1	<1	<1	<1	----
EA055: Moisture Content								
Moisture Content (dried @ 103°C)	----	1.0	%	53.1	54.7	53.2	49.7	40.7
EA150: Soil Classification based on Particle Size								

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Client sample ID	B79 1.0-1.8	C82 0-0.5	C82 0.5-1.0	C82 1.0-1.53	C82 1.53-1.67
			Client sampling date / time	22-OCT-2013 15:00	22-OCT-2013 15:00	22-OCT-2013 15:00	22-OCT-2013 15:00	22-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EB1326059-084	EB1326059-085	EB1326059-086	EB1326059-087	EB1326059-088
EA150: Soil Classification based on Particle Size - Continued								
Clay (<2 µm)	----	1	%	38	----	----	34	----
Silt (2-60 µm)	----	1	%	59	----	----	59	----
Sand (0.06-2.00 mm)	----	1	%	3	----	----	7	----
Gravel (>2mm)	----	1	%	<1	----	----	<1	----
Cobbles (>6cm)	----	1	%	<1	----	----	<1	----
EG005-SD: Total Metals in Sediments by ICP-AES								
Aluminium	7429-90-5	50	mg/kg	16400	16200	18600	17300	20000
Iron	7439-89-6	50	mg/kg	28600	27900	31600	29000	25500
EG020-SD: Total Metals in Sediments by ICPMS								
Antimony	7440-36-0	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Arsenic	7440-38-2	1.00	mg/kg	19.3	20.4	22.4	20.4	20.7
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	31.9	32.4	37.2	34.3	33.2
Copper	7440-50-8	1.0	mg/kg	13.0	12.4	14.6	13.8	13.0
Cobalt	7440-48-4	0.5	mg/kg	9.5	9.6	11.0	10.0	11.7
Lead	7439-92-1	1.0	mg/kg	16.7	16.4	19.5	17.9	22.1
Manganese	7439-96-5	10	mg/kg	724	804	845	741	273
Nickel	7440-02-0	1.0	mg/kg	16.6	16.9	18.7	17.4	15.9
Selenium	7782-49-2	0.1	mg/kg	2.3	2.3	2.8	2.3	3.6
Silver	7440-22-4	0.1	mg/kg	<0.1	0.1	<0.1	<0.1	<0.1
Vanadium	7440-62-2	2.0	mg/kg	42.1	43.9	49.0	44.4	50.8
Zinc	7440-66-6	1.0	mg/kg	50.0	49.6	58.6	52.0	40.4
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.01	mg/kg	0.03	0.03	0.03	0.03	0.02
EK055: Ammonia as N								
Ammonia as N	7664-41-7	1	mg/kg	77	----	----	65	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	<0.1	----	----	<0.1	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	20	mg/kg	1020	----	----	1070	----
EK062: Total Nitrogen as N (TKN + NOx)								
^ Total Nitrogen as N	----	20	mg/kg	1020	----	----	1070	----
EK067G: Total Phosphorus as P by Discrete Analyser								

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Client sample ID	B79 1.0-1.8	C82 0-0.5	C82 0.5-1.0	C82 1.0-1.53	C82 1.53-1.67
			Client sampling date / time	22-OCT-2013 15:00	22-OCT-2013 15:00	22-OCT-2013 15:00	22-OCT-2013 15:00	22-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EB1326059-084	EB1326059-085	EB1326059-086	EB1326059-087	EB1326059-088
EK067G: Total Phosphorus as P by Discrete Analyser - Continued								
Total Phosphorus as P	----	2	mg/kg	452	----	----	427	----
EP003: Total Organic Carbon (TOC) in Soil								
Total Organic Carbon	----	0.02	%	1.60	1.44	1.51	1.51	1.28
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	0.8	0.8	0.7	1.2	<0.5
EP090S: Organotin Surrogate								
Tripropyltin	----	0.1	%	91.2	97.5	116	101	81.4

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Client sample ID	QAQC7	QAQC6	A127 0-0.5	A127 0.5-1.0	A127 1.0-1.7
			Client sampling date / time	[22-OCT-2013]	[22-OCT-2013]	23-OCT-2013 15:00	23-OCT-2013 15:00	23-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EB1326059-089	EB1326059-090	EB1326059-091	EB1326059-092	EB1326059-093
EA150: Particle Sizing								
+75µm	----	1	%	3	2	10	----	1
+150µm	----	1	%	<1	<1	7	----	<1
+300µm	----	1	%	<1	<1	4	----	<1
+425µm	----	1	%	<1	<1	3	----	<1
+600µm	----	1	%	<1	<1	2	----	<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
EA033-A: Actual Acidity								
pH KCl (23A)	----	0.1	pH Unit	8.9	8.8	8.8	9.0	8.9
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	0.245	0.158	1.13	1.04	1.37
acidity - Chromium Reducible Sulfur (a-22B)	----	10	mole H+ / t	153	99	704	649	854
EA033-C: Acid Neutralising Capacity								
Acid Neutralising Capacity (19A2)	----	0.01	% CaCO3	11.8	12.2	6.07	6.22	6.22
acidity - Acid Neutralising Capacity (a-19A2)	----	10	mole H+ / t	2360	2440	1210	1240	1240
sulfidic - Acid Neutralising Capacity (s-19A2)	----	0.01	% pyrite S	3.78	3.92	1.94	1.99	1.99
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	0.04
Net Acidity (acidity units)	----	10	mole H+ / t	<10	<10	<10	<10	25
Liming Rate	----	1	kg CaCO3/t	<1	<1	<1	<1	2
EA055: Moisture Content								
Moisture Content (dried @ 103°C)	----	1.0	%	52.5	58.9	42.1	38.3	40.4
EA150: Soil Classification based on Particle Size								

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Client sample ID	QAQC7	QAQC6	A127 0-0.5	A127 0.5-1.0	A127 1.0-1.7
			Client sampling date / time	[22-OCT-2013]	[22-OCT-2013]	23-OCT-2013 15:00	23-OCT-2013 15:00	23-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EB1326059-089	EB1326059-090	EB1326059-091	EB1326059-092	EB1326059-093
EA150: Soil Classification based on Particle Size - Continued								
Clay (<2 µm)	----	1	%	32	32	40	----	48
Silt (2-60 µm)	----	1	%	60	63	49	----	44
Sand (0.06-2.00 mm)	----	1	%	8	5	11	----	8
Gravel (>2mm)	----	1	%	<1	<1	<1	----	<1
Cobbles (>6cm)	----	1	%	<1	<1	<1	----	<1
EG005-SD: Total Metals in Sediments by ICP-AES								
Aluminium	7429-90-5	50	mg/kg	18600	19800	15900	17200	20000
Iron	7439-89-6	50	mg/kg	30400	31400	25400	29200	29700
EG020-SD: Total Metals in Sediments by ICPMS								
Antimony	7440-36-0	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Arsenic	7440-38-2	1.00	mg/kg	21.0	20.7	17.5	20.2	17.3
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	35.1	37.7	29.4	34.0	35.0
Copper	7440-50-8	1.0	mg/kg	12.5	12.3	10.4	12.7	13.0
Cobalt	7440-48-4	0.5	mg/kg	10.3	11.0	10.6	12.1	12.9
Lead	7439-92-1	1.0	mg/kg	18.0	18.7	17.1	21.4	23.6
Manganese	7439-96-5	10	mg/kg	829	928	860	1130	999
Nickel	7440-02-0	1.0	mg/kg	18.4	20.7	15.2	17.4	17.9
Selenium	7782-49-2	0.1	mg/kg	2.3	2.3	2.8	3.3	3.8
Silver	7440-22-4	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Vanadium	7440-62-2	2.0	mg/kg	46.2	50.6	35.3	45.6	44.9
Zinc	7440-66-6	1.0	mg/kg	53.0	53.7	36.9	40.4	42.2
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.01	mg/kg	0.03	0.03	0.02	0.02	0.02
EP003: Total Organic Carbon (TOC) in Soil								
Total Organic Carbon	----	0.02	%	1.16	1.14	1.20	0.74	1.25
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	0.9	<0.5	<0.5	<0.5	<0.5
EP090S: Organotin Surrogate								
Tripropyltin	----	0.1	%	91.4	98.8	94.2	101	72.6

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Client sample ID	F150 0-0.43	F150 0.43-0.62	F150 0.62-0.80	G155 0-0.15	I162 0-0.13
			Client sampling date / time	23-OCT-2013 15:00	23-OCT-2013 15:00	23-OCT-2013 15:00	23-OCT-2013 15:00	23-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EB1326059-094	EB1326059-095	EB1326059-096	EB1326059-097	EB1326059-098
EA150: Particle Sizing								
+75µm	----	1	%	10	----	----	----	----
+150µm	----	1	%	8	----	----	----	----
+300µm	----	1	%	7	----	----	----	----
+425µm	----	1	%	6	----	----	----	----
+600µm	----	1	%	5	----	----	----	----
+1180µm	----	1	%	4	----	----	----	----
+2.36mm	----	1	%	2	----	----	----	----
+4.75mm	----	1	%	1	----	----	----	----
+9.5mm	----	1	%	<1	----	----	----	----
+19.0mm	----	1	%	<1	----	----	----	----
+37.5mm	----	1	%	<1	----	----	----	----
+75.0mm	----	1	%	<1	----	----	----	----
EA033-A: Actual Acidity								
pH KCl (23A)	----	0.1	pH Unit	8.3	----	----	----	----
Titratable Actual Acidity (23F)	----	2	mole H+ / t	<2	----	----	----	----
sulfidic - Titratable Actual Acidity (s-23F)	----	0.02	% pyrite S	<0.02	----	----	----	----
EA033-B: Potential Acidity								
Chromium Reducible Sulfur (22B)	----	0.005	% S	2.60	----	----	----	----
acidity - Chromium Reducible Sulfur (a-22B)	----	10	mole H+ / t	1620	----	----	----	----
EA033-C: Acid Neutralising Capacity								
Acid Neutralising Capacity (19A2)	----	0.01	% CaCO3	2.61	----	----	----	----
acidity - Acid Neutralising Capacity (a-19A2)	----	10	mole H+ / t	522	----	----	----	----
sulfidic - Acid Neutralising Capacity (s-19A2)	----	0.01	% pyrite S	0.84	----	----	----	----
EA033-E: Acid Base Accounting								
ANC Fineness Factor	----	0.5	-	1.5	----	----	----	----
Net Acidity (sulfur units)	----	0.02	% S	2.04	----	----	----	----
Net Acidity (acidity units)	----	10	mole H+ / t	1270	----	----	----	----
Liming Rate	----	1	kg CaCO3/t	95	----	----	----	----
EA055: Moisture Content								
Moisture Content (dried @ 103°C)	----	1.0	%	37.7	28.1	23.6	23.8	20.1
EA150: Soil Classification based on Particle Size								

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Client sample ID	F150 0-0.43	F150 0.43-0.62	F150 0.62-0.80	G155 0-0.15	I162 0-0.13
			Client sampling date / time	23-OCT-2013 15:00	23-OCT-2013 15:00	23-OCT-2013 15:00	23-OCT-2013 15:00	23-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EB1326059-094	EB1326059-095	EB1326059-096	EB1326059-097	EB1326059-098
EA150: Soil Classification based on Particle Size - Continued								
Clay (<2 µm)	----	1	%	42	----	----	----	----
Silt (2-60 µm)	----	1	%	48	----	----	----	----
Sand (0.06-2.00 mm)	----	1	%	8	----	----	----	----
Gravel (>2mm)	----	1	%	2	----	----	----	----
Cobbles (>6cm)	----	1	%	<1	----	----	----	----
EG005-SD: Total Metals in Sediments by ICP-AES								
Aluminium	7429-90-5	50	mg/kg	15000	17500	21500	17900	2430
Iron	7439-89-6	50	mg/kg	30500	38300	41300	24900	9630
EG020-SD: Total Metals in Sediments by ICPMS								
Antimony	7440-36-0	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Arsenic	7440-38-2	1.00	mg/kg	16.6	16.6	6.85	5.34	10.1
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	34.8	50.6	49.0	50.8	7.6
Copper	7440-50-8	1.0	mg/kg	8.8	7.1	4.2	9.4	1.9
Cobalt	7440-48-4	0.5	mg/kg	9.4	9.2	5.7	7.4	3.5
Lead	7439-92-1	1.0	mg/kg	17.7	25.9	18.7	11.8	6.2
Manganese	7439-96-5	10	mg/kg	406	455	127	428	1330
Nickel	7440-02-0	1.0	mg/kg	11.7	12.4	11.0	14.8	3.2
Selenium	7782-49-2	0.1	mg/kg	3.8	4.3	4.2	2.0	1.6
Silver	7440-22-4	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Vanadium	7440-62-2	2.0	mg/kg	48.0	63.0	62.4	28.7	16.0
Zinc	7440-66-6	1.0	mg/kg	21.1	9.1	9.0	37.1	7.0
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.01	mg/kg	0.02	0.01	0.04	0.03	<0.01
EK055: Ammonia as N								
Ammonia as N	7664-41-7	1	mg/kg	<1	----	----	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	<0.1	----	----	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	20	mg/kg	290	----	----	----	----
EK062: Total Nitrogen as N (TKN + NOx)								
^ Total Nitrogen as N	----	20	mg/kg	290	----	----	----	----
EK067G: Total Phosphorus as P by Discrete Analyser								

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Client sample ID	F150 0-0.43	F150 0.43-0.62	F150 0.62-0.80	G155 0-0.15	I162 0-0.13
			Client sampling date / time	23-OCT-2013 15:00	23-OCT-2013 15:00	23-OCT-2013 15:00	23-OCT-2013 15:00	23-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EB1326059-094	EB1326059-095	EB1326059-096	EB1326059-097	EB1326059-098
EK067G: Total Phosphorus as P by Discrete Analyser - Continued								
Total Phosphorus as P	----	2	mg/kg	**126**	----	----	----	----
EP003: Total Organic Carbon (TOC) in Soil								
Total Organic Carbon	----	0.02	%	**2.34**	**0.23**	**0.21**	**0.05**	**4.88**
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	----	----	----	----	**6**
C29 - C36 Fraction	----	5	mg/kg	----	----	----	----	<5
^ C10 - C36 Fraction (sum)	----	3	mg/kg	----	----	----	----	**6**
EP080-SD / EP071-SD: Total Recoverable Hydrocarbons								
C6 - C10 Fraction	C6_C10	3	mg/kg	----	----	----	----	<3
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	1330-20-7	0.5	mg/kg	----	----	----	----	<0.5
^ Sum of BTEX	----	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
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)			Client sample ID	F150 0-0.43	F150 0.43-0.62	F150 0.62-0.80	G155 0-0.15	I162 0-0.13
			Client sampling date / time	23-OCT-2013 15:00	23-OCT-2013 15:00	23-OCT-2013 15:00	23-OCT-2013 15:00	23-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EB1326059-094	EB1326059-095	EB1326059-096	EB1326059-097	EB1326059-098
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	----	----	----	----	<0.50
4.4`-DDT	50-29-3	0.50	µg/kg	----	----	----	----	<0.50
^ Sum of DDD + DDE + DDT	----	0.50	µg/kg	----	----	----	----	<0.50
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
cis-Chlordane	5103-71-9	0.25	µg/kg	----	----	----	----	<0.25

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Client sample ID	F150 0-0.43	F150 0.43-0.62	F150 0.62-0.80	G155 0-0.15	I162 0-0.13
			Client sampling date / time	23-OCT-2013 15:00	23-OCT-2013 15:00	23-OCT-2013 15:00	23-OCT-2013 15:00	23-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EB1326059-094	EB1326059-095	EB1326059-096	EB1326059-097	EB1326059-098
EP131A: Organochlorine Pesticides - Continued								
trans-Chlordane	5103-74-2	0.25	µg/kg	----	----	----	----	<0.25
^ Total Chlordane (sum)	----	0.25	µg/kg	----	----	----	----	<0.25
Oxychlordane	27304-13-8	0.50	µg/kg	----	----	----	----	<0.50
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	----	----	----	----	<4
Pyrene	129-00-0	4	µg/kg	----	----	----	----	<4
Benz(a)anthracene	56-55-3	4	µg/kg	----	----	----	----	<4
Chrysene	218-01-9	4	µg/kg	----	----	----	----	<4
Benzo(b)fluoranthene	205-99-2	4	µg/kg	----	----	----	----	<4
Benzo(k)fluoranthene	207-08-9	4	µg/kg	----	----	----	----	<4
Benzo(e)pyrene	192-97-2	4	µg/kg	----	----	----	----	<4
Benzo(a)pyrene	50-32-8	4	µg/kg	----	----	----	----	<4
Perylene	198-55-0	4	µg/kg	----	----	----	----	<4
Benzo(g.h.i)perylene	191-24-2	4	µg/kg	----	----	----	----	<4
Dibenz(a.h)anthracene	53-70-3	4	µg/kg	----	----	----	----	<4
Indeno(1.2.3.cd)pyrene	193-39-5	4	µg/kg	----	----	----	----	<4
Coronene	191-07-1	5	µg/kg	----	----	----	----	<5
^ Sum of PAHs	----	4	µg/kg	----	----	----	----	<4
EP231: Perfluorinated Compounds								
PFOS	1763-23-1	0.0005	mg/kg	----	----	----	----	<0.0005
PFOA	335-67-1	0.0005	mg/kg	----	----	----	----	<0.0005
6:2 Fluorotelomer sulfonate (6:2 FtS)	27619-97-2	0.005	mg/kg	----	----	----	----	<0.005
8:2 Fluorotelomer sulfonate	39108-34-4	0.001	mg/kg	----	----	----	----	<0.001
PFOSA	754-91-6	0.0002	mg/kg	----	----	----	----	<0.0002
N-Me-FOSA	31506-32-8	0.001	mg/kg	----	----	----	----	<0.001
N-Et-FOSA	4151-50-2	0.001	mg/kg	----	----	----	----	<0.001

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Client sample ID	F150 0-0.43	F150 0.43-0.62	F150 0.62-0.80	G155 0-0.15	I162 0-0.13
			Client sampling date / time	23-OCT-2013 15:00	23-OCT-2013 15:00	23-OCT-2013 15:00	23-OCT-2013 15:00	23-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EB1326059-094	EB1326059-095	EB1326059-096	EB1326059-097	EB1326059-098
EP231: Perfluorinated Compounds - Continued								
N-Me-FOSE	2448-09-7	0.001	mg/kg	----	----	----	----	<0.001
N-Et-FOSE	1691-99-2	0.001	mg/kg	----	----	----	----	<0.001
PFBS	375-73-5	0.0002	mg/kg	----	----	----	----	<0.0002
PFHxS	3871-99-6	0.0002	mg/kg	----	----	----	----	<0.0002
PFDcS	67906-42-7	0.0002	mg/kg	----	----	----	----	<0.0002
PFHxA	307-24-4	0.0002	mg/kg	----	----	----	----	<0.0002
PFHpA	375-85-9	0.0002	mg/kg	----	----	----	----	<0.0002
PFNA	375-95-1	0.0002	mg/kg	----	----	----	----	<0.0002
PFDcA	335-76-2	0.0002	mg/kg	----	----	----	----	<0.0002
PFUnA	2058-94-8	0.0002	mg/kg	----	----	----	----	<0.0002
PFDoA	307-55-1	0.0002	mg/kg	----	----	----	----	<0.0002
PFTriA	72629-94-8	0.0002	mg/kg	----	----	----	----	<0.0002
PFTeA	376-06-7	0.001	mg/kg	----	----	----	----	<0.001
EP080-SD: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	----	----	----	----	**109**
Toluene-D8	2037-26-5	0.1	%	----	----	----	----	**95.4**
4-Bromofluorobenzene	460-00-4	0.1	%	----	----	----	----	**122**
EP090S: Organotin Surrogate								
Tripropyltin	----	0.1	%	**59.6**	**105**	**68.8**	**96.3**	**55.4**
EP130S: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.1	%	----	----	----	----	**33.3**
EP131S: OC Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.1	%	----	----	----	----	**45.4**
EP132T: Base/Neutral Extractable Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	----	----	----	----	**85.4**
Anthracene-d10	1719-06-8	0.1	%	----	----	----	----	**111**
4-Terphenyl-d14	1718-51-0	0.1	%	----	----	----	----	**82.9**

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Client sample ID	I162 0.13-0.33	J164 0-0.5	J164 0.5-1.02	I172 0-0.5	I172 0.5-1.0
			Client sampling date / time	23-OCT-2013 15:00	23-OCT-2013 15:00	23-OCT-2013 15:00	23-OCT-2013 15:00	23-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EB1326059-099	EB1326059-100	EB1326059-101	EB1326059-102	EB1326059-103
EA150: Particle Sizing								
+75µm	----	1	%	3	41	6	1	1
+150µm	----	1	%	2	38	2	<1	<1
+300µm	----	1	%	2	35	1	<1	<1
+425µm	----	1	%	2	32	1	<1	<1
+600µm	----	1	%	2	27	<1	<1	<1
+1180µm	----	1	%	1	17	<1	<1	<1
+2.36mm	----	1	%	<1	7	<1	<1	<1
+4.75mm	----	1	%	<1	2	<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
EA033-A: Actual Acidity								
pH KCl (23A)	----	0.1	pH Unit	9.1	8.4	6.8	8.7	8.7
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	0.006	1.77	3.64	0.451	0.466
acidity - Chromium Reducible Sulfur (a-22B)	----	10	mole H+ / t	<10	1100	2270	282	290
EA033-C: Acid Neutralising Capacity								
Acid Neutralising Capacity (19A2)	----	0.01	% CaCO3	27.2	6.59	0.44	7.43	6.97
acidity - Acid Neutralising Capacity (a-19A2)	----	10	mole H+ / t	5430	1320	87	1480	1390
sulfidic - Acid Neutralising Capacity (s-19A2)	----	0.01	% pyrite S	8.70	2.11	0.14	2.38	2.23
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	0.36	3.55	<0.02	<0.02
Net Acidity (acidity units)	----	10	mole H+ / t	<10	226	2210	<10	<10
Liming Rate	----	1	kg CaCO3/t	<1	17	166	<1	<1
EA055: Moisture Content								
Moisture Content (dried @ 103°C)	----	1.0	%	19.6	34.7	26.6	61.0	56.7
EA150: Soil Classification based on Particle Size								

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Client sample ID	I162 0.13-0.33	J164 0-0.5	J164 0.5-1.02	I172 0-0.5	I172 0.5-1.0
			Client sampling date / time	23-OCT-2013 15:00	23-OCT-2013 15:00	23-OCT-2013 15:00	23-OCT-2013 15:00	23-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EB1326059-099	EB1326059-100	EB1326059-101	EB1326059-102	EB1326059-103
EA150: Soil Classification based on Particle Size - Continued								
Clay (<2 µm)	----	1	%	44	24	41	31	44
Silt (2-60 µm)	----	1	%	53	34	50	68	55
Sand (0.06-2.00 mm)	----	1	%	2	35	9	1	1
Gravel (>2mm)	----	1	%	1	7	<1	<1	<1
Cobbles (>6cm)	----	1	%	<1	<1	<1	<1	<1
EG005-SD: Total Metals in Sediments by ICP-AES								
Aluminium	7429-90-5	50	mg/kg	19300	8500	9690	20400	20900
Iron	7439-89-6	50	mg/kg	22000	25600	29200	34900	35500
EG020-SD: Total Metals in Sediments by ICPMS								
Antimony	7440-36-0	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Arsenic	7440-38-2	1.00	mg/kg	3.46	17.7	13.0	26.9	25.2
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	30.3	23.1	28.1	42.5	41.6
Copper	7440-50-8	1.0	mg/kg	5.4	10.1	8.0	24.0	22.5
Cobalt	7440-48-4	0.5	mg/kg	4.4	8.6	8.8	13.1	12.8
Lead	7439-92-1	1.0	mg/kg	12.9	14.9	28.6	23.2	25.0
Manganese	7439-96-5	10	mg/kg	442	336	124	1020	999
Nickel	7440-02-0	1.0	mg/kg	11.3	8.2	5.8	22.3	21.1
Selenium	7782-49-2	0.1	mg/kg	1.2	2.3	2.8	3.2	3.2
Silver	7440-22-4	0.1	mg/kg	0.3	<0.1	<0.1	<0.1	<0.1
Vanadium	7440-62-2	2.0	mg/kg	26.3	41.3	42.7	56.2	55.3
Zinc	7440-66-6	1.0	mg/kg	29.0	16.6	5.3	75.8	76.4
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.01	mg/kg	<0.01	0.01	0.01	0.04	0.04
EK055: Ammonia as N								
Ammonia as N	7664-41-7	1	mg/kg	<1	<1	<1	82	94
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	0.2	<0.1	<0.1	<0.1	<0.1
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	20	mg/kg	90	470	140	1510	1480
EK062: Total Nitrogen as N (TKN + NOx)								
^ Total Nitrogen as N	----	20	mg/kg	90	470	140	1510	1480
EK067G: Total Phosphorus as P by Discrete Analyser								

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Client sample ID	I162 0.13-0.33	J164 0-0.5	J164 0.5-1.02	I172 0-0.5	I172 0.5-1.0
			Client sampling date / time	23-OCT-2013 15:00	23-OCT-2013 15:00	23-OCT-2013 15:00	23-OCT-2013 15:00	23-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EB1326059-099	EB1326059-100	EB1326059-101	EB1326059-102	EB1326059-103
EK067G: Total Phosphorus as P by Discrete Analyser - Continued								
Total Phosphorus as P	----	2	mg/kg	80	143	139	493	438
EP003: Total Organic Carbon (TOC) in Soil								
Total Organic Carbon	----	0.02	%	0.05	2.33	0.43	2.12	2.16
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	3	mg/kg	<3	<3	<3	<3	<3
C10 - C14 Fraction	----	3	mg/kg	<3	<3	<3	8	6
C15 - C28 Fraction	----	3	mg/kg	5	33	5	62	63
C29 - C36 Fraction	----	5	mg/kg	<5	66	<5	45	47
^ C10 - C36 Fraction (sum)	----	3	mg/kg	5	99	5	115	116
EP080-SD / EP071-SD: Total Recoverable Hydrocarbons								
C6 - C10 Fraction	C6_C10	3	mg/kg	<3	<3	<3	<3	<3
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	1330-20-7	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
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	3.0	<0.5	2.7	1.2
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

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Client sample ID	I162 0.13-0.33	J164 0-0.5	J164 0.5-1.02	I172 0-0.5	I172 0.5-1.0
			Client sampling date / time	23-OCT-2013 15:00	23-OCT-2013 15:00	23-OCT-2013 15:00	23-OCT-2013 15:00	23-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EB1326059-099	EB1326059-100	EB1326059-101	EB1326059-102	EB1326059-103
EP130A: Organophosphorus Pesticides (Ultra-trace) - Continued								
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	<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	<0.50
^ Sum of DDD + DDE + DDT	----	0.50	µg/kg	<0.50	<0.50	<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	0.25	µg/kg	<0.25	<0.25	<0.25	<0.25	<0.25

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Client sample ID	I162 0.13-0.33	J164 0-0.5	J164 0.5-1.02	I172 0-0.5	I172 0.5-1.0
			Client sampling date / time	23-OCT-2013 15:00	23-OCT-2013 15:00	23-OCT-2013 15:00	23-OCT-2013 15:00	23-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EB1326059-099	EB1326059-100	EB1326059-101	EB1326059-102	EB1326059-103
EP131A: Organochlorine Pesticides - Continued								
trans-Chlordane	5103-74-2	0.25	µg/kg	<0.25	<0.25	<0.25	<0.25	<0.25
^ Total Chlordane (sum)	----	0.25	µg/kg	<0.25	<0.25	<0.25	<0.25	<0.25
Oxychlordane	27304-13-8	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
EP132B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	5	µg/kg	<5	<5	<5	**8**	**9**
2-Methylnaphthalene	91-57-6	5	µg/kg	<5	<5	<5	<5	<5
Acenaphthylene	208-96-8	4	µg/kg	<4	<4	<4	<5	<5
Acenaphthene	83-32-9	4	µg/kg	<4	<4	<4	<5	**16**
Fluorene	86-73-7	4	µg/kg	<4	<4	<4	<5	<5
Phenanthrene	85-01-8	4	µg/kg	<4	<4	<4	<5	<5
Anthracene	120-12-7	4	µg/kg	<4	<4	<4	<5	<5
Fluoranthene	206-44-0	4	µg/kg	<4	<4	<4	**7**	<5
Pyrene	129-00-0	4	µg/kg	<4	<4	<4	**8**	**20**
Benz(a)anthracene	56-55-3	4	µg/kg	<4	<4	<4	<5	<5
Chrysene	218-01-9	4	µg/kg	<4	<4	<4	<5	<5
Benzo(b)fluoranthene	205-99-2	4	µg/kg	<4	<4	<4	<5	<5
Benzo(k)fluoranthene	207-08-9	4	µg/kg	<4	<4	<4	<5	<5
Benzo(e)pyrene	192-97-2	4	µg/kg	<4	<4	<4	<5	<5
Benzo(a)pyrene	50-32-8	4	µg/kg	<4	<4	<4	<5	<5
Perylene	198-55-0	4	µg/kg	<4	**73**	<4	**36**	**5**
Benzo(g.h.i)perylene	191-24-2	4	µg/kg	<4	<4	<4	<5	<5
Dibenz(a.h)anthracene	53-70-3	4	µg/kg	<4	<4	<4	<5	<5
Indeno(1.2.3.cd)pyrene	193-39-5	4	µg/kg	<4	<4	<4	<5	<5
Coronene	191-07-1	5	µg/kg	<5	<5	<5	<5	<5
^ Sum of PAHs	----	4	µg/kg	<4	**73**	<4	**59**	**50**
EP231: Perfluorinated Compounds								
PFOS	1763-23-1	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
PFOA	335-67-1	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonate (6:2 FtS)	27619-97-2	0.005	mg/kg	<0.005	<0.005	<0.005	<0.005	<0.005
8:2 Fluorotelomer sulfonate	39108-34-4	0.001	mg/kg	<0.001	<0.001	<0.001	<0.001	<0.001
PFOSA	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Me-FOSA	31506-32-8	0.001	mg/kg	<0.001	<0.001	<0.001	<0.001	<0.001
N-Et-FOSA	4151-50-2	0.001	mg/kg	<0.001	<0.001	<0.001	<0.001	<0.001

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Client sample ID	I162 0.13-0.33	J164 0-0.5	J164 0.5-1.02	I172 0-0.5	I172 0.5-1.0
			Client sampling date / time	23-OCT-2013 15:00	23-OCT-2013 15:00	23-OCT-2013 15:00	23-OCT-2013 15:00	23-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EB1326059-099	EB1326059-100	EB1326059-101	EB1326059-102	EB1326059-103
EP231: Perfluorinated Compounds - Continued								
N-Me-FOSE	2448-09-7	0.001	mg/kg	<0.001	<0.001	<0.001	<0.001	<0.001
N-Et-FOSE	1691-99-2	0.001	mg/kg	<0.001	<0.001	<0.001	<0.001	<0.001
PFBS	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
PFHxS	3871-99-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
PFDcS	67906-42-7	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
PFHxA	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
PFHpA	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
PFNA	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**0.0002**
PFDcA	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
PFUnA	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
PFDoA	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
PFTriA	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
PFTeA	376-06-7	0.001	mg/kg	<0.001	<0.001	<0.001	<0.001	<0.001
EP080-SD: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	**95.5**	**102**	**92.5**	**87.8**	**85.4**
Toluene-D8	2037-26-5	0.1	%	**102**	**106**	**91.7**	**91.2**	**92.1**
4-Bromofluorobenzene	460-00-4	0.1	%	**118**	**125**	**112**	**110**	**109**
EP090S: Organotin Surrogate								
Tripropyltin	----	0.1	%	**95.1**	**104**	**114**	**116**	**108**
EP130S: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.1	%	**33.0**	**34.4**	**36.7**	**43.5**	**34.6**
EP131S: OC Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.1	%	**42.8**	**48.3**	**49.4**	**60.0**	**43.8**
EP132T: Base/Neutral Extractable Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**84.6**	**108**	**89.0**	**86.5**	**96.7**
Anthracene-d10	1719-06-8	0.1	%	**93.6**	**108**	**90.3**	**90.1**	**87.0**
4-Terphenyl-d14	1718-51-0	0.1	%	**91.8**	**98.6**	**95.7**	**87.6**	**86.4**

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Client sample ID	B41B 0-0.5	B41B 0.5-0.9	B41A 0-0.5	B41A 0.5-0.9	PWA Pore Water
			Client sampling date / time	22-OCT-2013 15:00	22-OCT-2013 15:00	22-OCT-2013 15:00	22-OCT-2013 15:00	20-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EB1326059-104	EB1326059-105	EB1326059-106	EB1326059-107	EB1326059-108
EA150: Particle Sizing								
+75µm	----	1	%	2	4	4	3	----
+150µm	----	1	%	<1	1	1	<1	----
+300µm	----	1	%	<1	<1	1	<1	----
+425µm	----	1	%	<1	<1	<1	<1	----
+600µm	----	1	%	<1	<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	----
EA033-A: Actual Acidity								
pH KCl (23A)	----	0.1	pH Unit	8.9	8.9	8.9	9.0	----
Titratable Actual Acidity (23F)	----	2	mole H+ / t	<2	<2	<2	<2	----
sulfidic - Titratable Actual Acidity (s-23F)	----	0.02	% pyrite S	<0.02	<0.02	<0.02	<0.02	----
EA033-B: Potential Acidity								
Chromium Reducible Sulfur (22B)	----	0.005	% S	0.209	0.244	0.221	0.210	----
acidity - Chromium Reducible Sulfur (a-22B)	----	10	mole H+ / t	130	152	138	131	----
EA033-C: Acid Neutralising Capacity								
Acid Neutralising Capacity (19A2)	----	0.01	% CaCO3	11.7	12.2	12.3	12.2	----
acidity - Acid Neutralising Capacity (a-19A2)	----	10	mole H+ / t	2340	2450	2460	2430	----
sulfidic - Acid Neutralising Capacity (s-19A2)	----	0.01	% pyrite S	3.76	3.92	3.94	3.90	----
EA033-E: Acid Base Accounting								
ANC Fineness Factor	----	0.5	-	1.5	1.5	1.5	1.5	----
Net Acidity (sulfur units)	----	0.02	% S	<0.02	<0.02	<0.02	<0.02	----
Net Acidity (acidity units)	----	10	mole H+ / t	<10	<10	<10	<10	----
Liming Rate	----	1	kg CaCO3/t	<1	<1	<1	<1	----
EA055: Moisture Content								
Moisture Content (dried @ 103°C)	----	1.0	%	54.5	45.5	52.5	47.6	----
EA150: Soil Classification based on Particle Size								

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Client sample ID	B41B 0-0.5	B41B 0.5-0.9	B41A 0-0.5	B41A 0.5-0.9	PWA Pore Water
			Client sampling date / time	22-OCT-2013 15:00	22-OCT-2013 15:00	22-OCT-2013 15:00	22-OCT-2013 15:00	20-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EB1326059-104	EB1326059-105	EB1326059-106	EB1326059-107	EB1326059-108
EA150: Soil Classification based on Particle Size - Continued								
Clay (<2 µm)	----	1	%	37	33	33	32	----
Silt (2-60 µm)	----	1	%	58	55	55	53	----
Sand (0.06-2.00 mm)	----	1	%	5	12	12	15	----
Gravel (>2mm)	----	1	%	<1	<1	<1	<1	----
Cobbles (>6cm)	----	1	%	<1	<1	<1	<1	----
EG005-SD: Total Metals in Sediments by ICP-AES								
Aluminium	7429-90-5	50	mg/kg	17600	15100	16000	15700	----
Iron	7439-89-6	50	mg/kg	30000	26200	27100	27300	----
EG020-SD: Total Metals in Sediments by ICPMS								
Antimony	7440-36-0	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	----
Arsenic	7440-38-2	1.00	mg/kg	20.7	19.5	20.3	20.1	----
Cadmium	7440-43-9	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	----
Chromium	7440-47-3	1.0	mg/kg	35.7	32.1	33.2	32.9	----
Copper	7440-50-8	1.0	mg/kg	12.3	10.6	11.3	11.0	----
Cobalt	7440-48-4	0.5	mg/kg	10.7	9.6	10.0	10.0	----
Lead	7439-92-1	1.0	mg/kg	18.1	16.6	16.7	16.8	----
Manganese	7439-96-5	10	mg/kg	809	762	821	780	----
Nickel	7440-02-0	1.0	mg/kg	18.5	16.3	16.9	16.7	----
Selenium	7782-49-2	0.1	mg/kg	2.6	2.4	2.5	2.4	----
Silver	7440-22-4	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	----
Vanadium	7440-62-2	2.0	mg/kg	47.8	42.6	44.9	44.0	----
Zinc	7440-66-6	1.0	mg/kg	52.5	45.7	48.6	48.0	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.01	mg/kg	0.03	0.02	0.03	0.03	----
EN82: Porewater Extraction								
Volume	----	1	mL	----	----	----	----	690
EP003: Total Organic Carbon (TOC) in Soil								
Total Organic Carbon	----	0.02	%	1.09	1.12	1.12	0.95	----
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	<0.5	<0.5	<0.5	<0.5	----
EP090S: Organotin Surrogate								

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Client sample ID	B41B 0-0.5	B41B 0.5-0.9	B41A 0-0.5	B41A 0.5-0.9	PWA Pore Water
			Client sampling date / time	22-OCT-2013 15:00	22-OCT-2013 15:00	22-OCT-2013 15:00	22-OCT-2013 15:00	20-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EB1326059-104	EB1326059-105	EB1326059-106	EB1326059-107	EB1326059-108
EP090S: Organotin Surrogate - Continued								
Tripropyltin	----	0.1	%	100	112	106	106	----

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Client sample ID	PWB Pore Water	PWC Pore Water	ELUTRIATE WATER Seawater Blank	PWA Seawater Elutriate	PWB Seawater Elutriate
			Client sampling date / time	21-OCT-2013 15:00	21-OCT-2013 15:00	22-OCT-2013 15:00	20-OCT-2013 15:00	21-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EB1326059-109	EB1326059-110	EB1326059-111	EB1326059-113	EB1326059-114
EN68: Seawater Elutriate Testing Procedure								
Seawater Sampling Date	----	0.1	-	----	----	30/10/13	----	----
Seawater Sampling Date	----	0.1	-	----	----	----	30/10/13	30/10/13
EN82: Porewater Extraction								
Volume	----	1	mL	670	650	----	----	----
EP090: Organotin Compounds (Soluble)								
Tributyltin	56573-85-4	2	ngSn/L	<2	<2	----	----	----
EP090S: Organotin Surrogate								
Tripropyltin	----	0.1	%	85.0	76.6	----	----	----

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Client sample ID	PWC Seawater Elutriate	----	----	----	----
			Client sampling date / time	21-OCT-2013 15:00	----	----	----	----
Compound	CAS Number	LOR	Unit	EB1326059-115	----	----	----	----
EN68: Seawater Elutriate Testing Procedure								
Seawater Sampling Date	----	0.1	-	30/10/13	----	----	----	----
EP090: Organotin Compounds (Soluble)								
Tributyltin	56573-85-4	2	ngSn/L	6	----	----	----	----
EP090S: Organotin Surrogate								
Tripropyltin	----	0.1	%	58.2	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **ELUTRIATE**

Compound	CAS Number	Recovery Limits (%) Low	High
EP090S: Organotin Surrogate			
Tripropyltin	----	24	116

Sub-Matrix: **PORE WATER**

Compound	CAS Number	Recovery Limits (%) Low	High
EP090S: Organotin Surrogate			
Tripropyltin	----	24	116

Sub-Matrix: **SEAWATER**

Compound	CAS Number	Recovery Limits (%) Low	High
EP090S: Organotin Surrogate			
Tripropyltin	----	24	116

Sub-Matrix: **SEDIMENT**

Compound	CAS Number	Recovery Limits (%) Low	High
EP080-SD: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	67	137
Toluene-D8	2037-26-5	74	134
4-Bromofluorobenzene	460-00-4	73	137
EP090S: Organotin Surrogate			
Tripropyltin	----	24	116
Tripropyltin	----	35	130
EP130S: Organophosphorus Pesticide Surrogate			
DEF	78-48-8	14.4	102
EP131S: OC Pesticide Surrogate			
Dibromo-DDE	21655-73-2	7.4	119
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

QUALITY CONTROL REPORT

Work Order	: **EB1326059**	Page	: 1 of 62
Client	: **BMT WBM GROUP LTD**	Laboratory	: Environmental Division Brisbane
Contact	: DR MARKUS BILLERBECK	Contact	: Customer Services
Address	: PO BOX 203 SPRING HILL BRISBANE QLD 4004	Address	: 2 Byth Street Stafford QLD Australia 4053
E-mail	: markus.billerbeck@bmtwbm.com.au	E-mail	: Brisbane.Enviro.Services@alsglobal.com
Telephone	: +61 07 3831 6744	Telephone	: +61 7 3243 7222
Facsimile	: +61 07 3832 3627	Facsimile	: +61 7 3243 7218
Project	: B20180 Cairns EIS	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 25-OCT-2013
Sampler	: Stuart Taylor	Issue Date	: 16-NOV-2013
Order number	: ----		
		No. of samples received	: 118
Quote number	: BN/915/13 V2	No. of samples analysed	: 111

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

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

General Comments

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

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
Andrew Epps	Metals Production Chemist	Brisbane Inorganics
		WB Water Lab Brisbane
Ashesh Patel	Inorganic Chemist	Sydney Inorganics
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Hamish Murray	Supervisor - Soils	Newcastle - Inorganics
Hoa Nguyen	Senior Inorganic Chemist	Sydney Inorganics
Jiah Wallace	Physical Chemistry Section Supervisor	Brisbane Inorganics
Kim McCabe	Senior Inorganic Chemist	Brisbane Acid Sulphate Soils
		Brisbane Inorganics
Matt Frost	Senior Organic Chemist	Brisbane Organics
Pabi Subba	Senior Organic Chemist	Sydney Organics
Phalak Inthaksone	Laboratory Manager - Organics	Sydney Organics
Stephen Hislop	Senior Inorganic Chemist	Brisbane Inorganics

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	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EA033-A: Actual Acidity (QC Lot: 3138013)									
EB1326059-001	C119 0-0.2	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	8.9	8.9	0.0	0% - 20%
EB1326059-011	B7 0-0.50	EA033: sulfidic - Titratable Actual Acidity (s-23F)	----	0.02	% pyrite S	<0.02	<0.02	0.0	No Limit
		EA033: Titratable Actual Acidity (23F)	----	2	mole H+ / t	<2	<2	0.0	No Limit
		EA033: pH KCl (23A)	----	0.1	pH Unit	9.2	9.2	0.0	0% - 20%
EA033-A: Actual Acidity (QC Lot: 3138014)									
EB1326059-022	C30 0-0.5	EA033: sulfidic - Titratable Actual Acidity (s-23F)	----	0.02	% pyrite S	<0.02	<0.02	0.0	No Limit
		EA033: Titratable Actual Acidity (23F)	----	2	mole H+ / t	<2	<2	0.0	No Limit
		EA033: pH KCl (23A)	----	0.1	pH Unit	8.9	8.9	0.0	0% - 20%
EB1326059-032	B108 0.5-1.0	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	8.8	8.8	0.0	0% - 20%
EA033-A: Actual Acidity (QC Lot: 3138015)									
EB1326059-043	B54 0.5-1.0	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	8.9	8.9	0.0	0% - 20%
EB1326059-056	V187 0-0.1	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	8.6	8.7	1.2	0% - 20%
EA033-A: Actual Acidity (QC Lot: 3138016)									
EB1326059-068	B63 0-0.5	EA033: sulfidic - Titratable Actual Acidity (s-23F)	----	0.02	% pyrite S	<0.02	<0.02	0.0	No Limit
		EA033: Titratable Actual Acidity (23F)	----	2	mole H+ / t	<2	<2	0.0	No Limit
		EA033: pH KCl (23A)	----	0.1	pH Unit	8.8	8.8	0.0	0% - 20%
EB1326059-078	B74 0-0.5	EA033: sulfidic - Titratable Actual Acidity (s-23F)	----	0.02	% pyrite S	<0.02	<0.02	0.0	No Limit
		EA033: Titratable Actual Acidity (23F)	----	2	mole H+ / t	<2	<2	0.0	No Limit
		EA033: pH KCl (23A)	----	0.1	pH Unit	8.7	8.8	1.1	0% - 20%
EA033-A: Actual Acidity (QC Lot: 3138017)									
EB1326059-091	A127 0-0.5	EA033: sulfidic - Titratable Actual Acidity (s-23F)	----	0.02	% pyrite S	<0.02	<0.02	0.0	No Limit
		EA033: Titratable Actual Acidity (23F)	----	2	mole H+ / t	<2	<2	0.0	No Limit
		EA033: pH KCl (23A)	----	0.1	pH Unit	8.8	8.8	0.0	0% - 20%
EB1326059-105	B41B 0.5-0.9	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	8.9	8.9	0.0	0% - 20%
EA033-B: Potential Acidity (QC Lot: 3138013)									

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
				Laboratory Duplicate (DUP) Report					
EA033-B: Potential Acidity (QC Lot: 3138013) - continued									
EB1326059-001	C119 0-0.2	EA033: Chromium Reducible Sulfur (22B)	----	0.005	% S	0.308	0.309	0.4	0% - 20%
		EA033: acidity - Chromium Reducible Sulfur (a-22B)	----	10	mole H+ / t	192	193	0.0	0% - 50%
EB1326059-011	B7 0-0.50	EA033: Chromium Reducible Sulfur (22B)	----	0.005	% S	0.193	0.193	0.0	0% - 20%
		EA033: acidity - Chromium Reducible Sulfur (a-22B)	----	10	mole H+ / t	120	121	0.0	0% - 50%
EA033-B: Potential Acidity (QC Lot: 3138014)									
EB1326059-022	C30 0-0.5	EA033: Chromium Reducible Sulfur (22B)	----	0.005	% S	0.197	0.196	0.0	0% - 20%
		EA033: acidity - Chromium Reducible Sulfur (a-22B)	----	10	mole H+ / t	123	122	0.0	0% - 50%
EB1326059-032	B108 0.5-1.0	EA033: Chromium Reducible Sulfur (22B)	----	0.005	% S	0.412	0.411	0.0	0% - 20%
		EA033: acidity - Chromium Reducible Sulfur (a-22B)	----	10	mole H+ / t	257	256	0.0	0% - 20%
EA033-B: Potential Acidity (QC Lot: 3138015)									
EB1326059-043	B54 0.5-1.0	EA033: Chromium Reducible Sulfur (22B)	----	0.005	% S	0.246	0.248	0.5	0% - 20%
		EA033: acidity - Chromium Reducible Sulfur (a-22B)	----	10	mole H+ / t	154	154	0.0	0% - 50%
EB1326059-056	V187 0-0.1	EA033: Chromium Reducible Sulfur (22B)	----	0.005	% S	0.338	0.340	0.4	0% - 20%
		EA033: acidity - Chromium Reducible Sulfur (a-22B)	----	10	mole H+ / t	211	212	0.0	0% - 20%
EA033-B: Potential Acidity (QC Lot: 3138016)									
EB1326059-068	B63 0-0.5	EA033: Chromium Reducible Sulfur (22B)	----	0.005	% S	0.248	0.247	0.6	0% - 20%
		EA033: acidity - Chromium Reducible Sulfur (a-22B)	----	10	mole H+ / t	155	154	0.0	0% - 50%
EB1326059-078	B74 0-0.5	EA033: Chromium Reducible Sulfur (22B)	----	0.005	% S	0.235	0.236	0.0	0% - 20%
		EA033: acidity - Chromium Reducible Sulfur (a-22B)	----	10	mole H+ / t	147	147	0.0	0% - 50%
EA033-B: Potential Acidity (QC Lot: 3138017)									
EB1326059-091	A127 0-0.5	EA033: Chromium Reducible Sulfur (22B)	----	0.005	% S	1.13	1.12	0.3	0% - 20%
		EA033: acidity - Chromium Reducible Sulfur (a-22B)	----	10	mole H+ / t	704	702	0.3	0% - 20%
EB1326059-105	B41B 0.5-0.9	EA033: Chromium Reducible Sulfur (22B)	----	0.005	% S	0.244	0.243	0.0	0% - 20%
		EA033: acidity - Chromium Reducible Sulfur (a-22B)	----	10	mole H+ / t	152	152	0.0	0% - 50%
EA033-C: Acid Neutralising Capacity (QC Lot: 3138013)									
EB1326059-001	C119 0-0.2	EA033: Acid Neutralising Capacity (19A2)	----	0.01	% CaCO3	11.7	11.6	0.2	0% - 20%
		EA033: sulfidic - Acid Neutralising Capacity (s-19A2)	----	0.01	% pyrite S	3.74	3.73	0.0	0% - 20%
		EA033: acidity - Acid Neutralising Capacity (a-19A2)	----	10	mole H+ / t	2330	2330	0.2	0% - 20%

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EA033-C: Acid Neutralising Capacity (QC Lot: 3138013) - continued									
EB1326059-011	B7 0-0.50	EA033: Acid Neutralising Capacity (19A2)	----	0.01	% CaCO3	22.8	22.8	0.3	0% - 20%
		EA033: sulfidic - Acid Neutralising Capacity (s-19A2)	----	0.01	% pyrite S	7.29	7.31	0.3	0% - 20%
		EA033: acidity - Acid Neutralising Capacity (a-19A2)	----	10	mole H+ / t	4550	4560	0.3	0% - 20%
EA033-C: Acid Neutralising Capacity (QC Lot: 3138014)									
EB1326059-022	C30 0-0.5	EA033: Acid Neutralising Capacity (19A2)	----	0.01	% CaCO3	12.4	12.4	0.2	0% - 20%
		EA033: sulfidic - Acid Neutralising Capacity (s-19A2)	----	0.01	% pyrite S	3.97	3.98	0.0	0% - 20%
		EA033: acidity - Acid Neutralising Capacity (a-19A2)	----	10	mole H+ / t	2480	2480	0.2	0% - 20%
EB1326059-032	B108 0.5-1.0	EA033: Acid Neutralising Capacity (19A2)	----	0.01	% CaCO3	10.2	10.1	0.7	0% - 20%
		EA033: sulfidic - Acid Neutralising Capacity (s-19A2)	----	0.01	% pyrite S	3.26	3.23	0.7	0% - 20%
		EA033: acidity - Acid Neutralising Capacity (a-19A2)	----	10	mole H+ / t	2030	2020	0.7	0% - 20%
EA033-C: Acid Neutralising Capacity (QC Lot: 3138015)									
EB1326059-043	B54 0.5-1.0	EA033: Acid Neutralising Capacity (19A2)	----	0.01	% CaCO3	12.1	12.1	0.3	0% - 20%
		EA033: sulfidic - Acid Neutralising Capacity (s-19A2)	----	0.01	% pyrite S	3.87	3.88	0.3	0% - 20%
		EA033: acidity - Acid Neutralising Capacity (a-19A2)	----	10	mole H+ / t	2420	2420	0.3	0% - 20%
EB1326059-056	V187 0-0.1	EA033: Acid Neutralising Capacity (19A2)	----	0.01	% CaCO3	5.82	5.87	0.9	0% - 20%
		EA033: sulfidic - Acid Neutralising Capacity (s-19A2)	----	0.01	% pyrite S	1.86	1.88	0.9	0% - 20%
		EA033: acidity - Acid Neutralising Capacity (a-19A2)	----	10	mole H+ / t	1160	1170	0.9	0% - 20%
EA033-C: Acid Neutralising Capacity (QC Lot: 3138016)									
EB1326059-068	B63 0-0.5	EA033: Acid Neutralising Capacity (19A2)	----	0.01	% CaCO3	10.1	10.2	0.8	0% - 20%
		EA033: sulfidic - Acid Neutralising Capacity (s-19A2)	----	0.01	% pyrite S	3.24	3.27	0.8	0% - 20%
		EA033: acidity - Acid Neutralising Capacity (a-19A2)	----	10	mole H+ / t	2020	2040	0.8	0% - 20%
EB1326059-078	B74 0-0.5	EA033: Acid Neutralising Capacity (19A2)	----	0.01	% CaCO3	10.3	10.3	0.1	0% - 20%
		EA033: sulfidic - Acid Neutralising Capacity (s-19A2)	----	0.01	% pyrite S	3.31	3.30	0.0	0% - 20%
		EA033: acidity - Acid Neutralising Capacity (a-19A2)	----	10	mole H+ / t	2060	2060	0.1	0% - 20%
EA033-C: Acid Neutralising Capacity (QC Lot: 3138017)									
EB1326059-091	A127 0-0.5	EA033: Acid Neutralising Capacity (19A2)	----	0.01	% CaCO3	6.07	5.65	7.2	0% - 20%

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
				Laboratory Duplicate (DUP) Report					
EA033-C: Acid Neutralising Capacity (QC Lot: 3138017) - continued									
EB1326059-091	A127 0-0.5	EA033: sulfidic - Acid Neutralising Capacity (s-19A2)	----	0.01	% pyrite S	1.94	1.81	7.2	0% - 20%
		EA033: acidity - Acid Neutralising Capacity (a-19A2)	----	10	mole H+ / t	1210	1130	7.2	0% - 20%
EB1326059-105	B41B 0.5-0.9	EA033: Acid Neutralising Capacity (19A2)	----	0.01	% CaCO3	12.2	12.0	2.2	0% - 20%
		EA033: sulfidic - Acid Neutralising Capacity (s-19A2)	----	0.01	% pyrite S	3.92	3.84	2.2	0% - 20%
		EA033: acidity - Acid Neutralising Capacity (a-19A2)	----	10	mole H+ / t	2450	2400	2.2	0% - 20%
EA055: Moisture Content (QC Lot: 3130354)									
EB1326059-004	B130 0-0.5	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	53.4	53.9	0.8	0% - 20%
EB1326059-011	B7 0-0.50	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	34.8	34.9	0.0	0% - 20%
EA055: Moisture Content (QC Lot: 3130355)									
EB1326059-025	C94 0.5-1.0	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	54.1	54.9	1.5	0% - 20%
EB1326059-032	B108 0.5-1.0	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	55.0	55.1	0.2	0% - 20%
EA055: Moisture Content (QC Lot: 3130357)									
EB1326059-046	H160 0.02-0.04	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	24.9	24.7	0.6	0% - 20%
EA055: Moisture Content (QC Lot: 3130362)									
EB1326059-056	V187 0-0.1	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	65.4	65.9	0.7	0% - 20%
EB1326059-064	V185 1.0-1.5	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	45.4	44.6	1.9	0% - 20%
EA055: Moisture Content (QC Lot: 3130363)									
EB1326059-077	C72 1.0-2.1	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	47.8	47.7	0.0	0% - 20%
EB1326059-084	B79 1.0-1.8	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	53.1	53.8	1.4	0% - 20%
EA055: Moisture Content (QC Lot: 3130364)									
EB1326059-097	G155 0-0.15	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	23.8	24.7	3.4	0% - 20%
EB1326059-104	B41B 0-0.5	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	54.5	54.7	0.4	0% - 20%
EA055: Moisture Content (QC Lot: 3152107)									
EB1326059-098	I162 0-0.13	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	20.1	21.1	4.8	0% - 20%
EB1327308-016	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	19.7	16.3	18.7	0% - 50%
EG005-SD: Total Metals in Sediments by ICP-AES (QC Lot: 3130385)									
EB1326059-001	C119 0-0.2	EG005-SD: Aluminium	7429-90-5	50	mg/kg	17900	17900	0.06	0% - 20%
		EG005-SD: Iron	7439-89-6	50	mg/kg	27500	27500	0.0	0% - 20%
EB1326059-011	B7 0-0.50	EG005-SD: Aluminium	7429-90-5	50	mg/kg	15300	14100	8.0	0% - 20%
		EG005-SD: Iron	7439-89-6	50	mg/kg	23400	22100	5.6	0% - 20%
EG005-SD: Total Metals in Sediments by ICP-AES (QC Lot: 3130388)									
EB1326059-022	C30 0-0.5	EG005-SD: Aluminium	7429-90-5	50	mg/kg	23300	22600	3.2	0% - 20%
		EG005-SD: Iron	7439-89-6	50	mg/kg	32300	32700	1.2	0% - 20%
EB1326059-032	B108 0.5-1.0	EG005-SD: Aluminium	7429-90-5	50	mg/kg	20000	19900	0.6	0% - 20%
		EG005-SD: Iron	7439-89-6	50	mg/kg	33500	32800	2.0	0% - 20%

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG005-SD: Total Metals in Sediments by ICP-AES (QC Lot: 3130391)									
EB1326059-043	B54 0.5-1.0	EG005-SD: Aluminium	7429-90-5	50	mg/kg	17300	16700	3.4	0% - 20%
		EG005-SD: Iron	7439-89-6	50	mg/kg	29200	28100	3.8	0% - 20%
EB1326059-054	H165A 0-0.2	EG005-SD: Aluminium	7429-90-5	50	mg/kg	20200	17400	15.0	0% - 20%
		EG005-SD: Iron	7439-89-6	50	mg/kg	35500	30800	14.4	0% - 20%
EG005-SD: Total Metals in Sediments by ICP-AES (QC Lot: 3130394)									
EB1326059-064	V185 1.0-1.5	EG005-SD: Aluminium	7429-90-5	50	mg/kg	18800	18400	2.6	0% - 20%
		EG005-SD: Iron	7439-89-6	50	mg/kg	30200	30100	0.4	0% - 20%
EB1326059-074	B41 0.5-0.9	EG005-SD: Aluminium	7429-90-5	50	mg/kg	18700	19500	4.2	0% - 20%
		EG005-SD: Iron	7439-89-6	50	mg/kg	30000	30100	0.5	0% - 20%
EG005-SD: Total Metals in Sediments by ICP-AES (QC Lot: 3130397)									
EB1326059-084	B79 1.0-1.8	EG005-SD: Aluminium	7429-90-5	50	mg/kg	16400	16100	1.9	0% - 20%
		EG005-SD: Iron	7439-89-6	50	mg/kg	28600	29000	1.3	0% - 20%
EB1326059-094	F150 0-0.43	EG005-SD: Aluminium	7429-90-5	50	mg/kg	15000	14800	1.8	0% - 20%
		EG005-SD: Iron	7439-89-6	50	mg/kg	30500	32700	7.0	0% - 20%
EG005-SD: Total Metals in Sediments by ICP-AES (QC Lot: 3130400)									
EB1326059-104	B41B 0-0.5	EG005-SD: Aluminium	7429-90-5	50	mg/kg	17600	17200	2.3	0% - 20%
		EG005-SD: Iron	7439-89-6	50	mg/kg	30000	29700	1.0	0% - 20%
EG005-SD: Total Metals in Sediments by ICP-AES (QC Lot: 3150707)									
EB1326059-051	P180 0-0.05	EG005-SD: Aluminium	7429-90-5	50	mg/kg	18900	19500	2.9	0% - 20%
		EG005-SD: Iron	7439-89-6	50	mg/kg	25600	30200	16.6	0% - 20%
ES1323555-008	Anonymous	EG005-SD: Aluminium	7429-90-5	50	mg/kg	7660	7310	4.6	0% - 20%
		EG005-SD: Iron	7439-89-6	50	mg/kg	13800	13900	0.08	0% - 20%
EG020-SD: Total Metals in Sediments by ICPMS (QC Lot: 3130384)									
EB1326059-001	C119 0-0.2	EG020-SD: Cadmium	7440-43-9	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
		EG020-SD: Selenium	7782-49-2	0.1	mg/kg	1.9	2.1	5.9	0% - 20%
		EG020-SD: Silver	7440-22-4	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
		EG020-SD: Cobalt	7440-48-4	0.5	mg/kg	8.7	8.7	0.0	0% - 50%
		EG020-SD: Antimony	7440-36-0	0.50	mg/kg	<0.50	<0.50	0.0	No Limit
		EG020-SD: Chromium	7440-47-3	1.0	mg/kg	32.6	32.6	0.0	0% - 20%
		EG020-SD: Copper	7440-50-8	1.0	mg/kg	10.5	10.7	1.9	0% - 50%
		EG020-SD: Lead	7439-92-1	1.0	mg/kg	15.8	15.5	2.2	0% - 50%
		EG020-SD: Nickel	7440-02-0	1.0	mg/kg	15.7	15.2	2.7	0% - 50%
		EG020-SD: Zinc	7440-66-6	1.0	mg/kg	43.2	43.0	0.5	0% - 20%
		EG020-SD: Arsenic	7440-38-2	1.00	mg/kg	18.6	18.3	1.4	0% - 50%
		EG020-SD: Manganese	7439-96-5	10	mg/kg	711	706	0.7	0% - 20%
		EG020-SD: Vanadium	7440-62-2	2.0	mg/kg	38.7	38.2	1.3	0% - 50%
EB1326059-011	B7 0-0.50	EG020-SD: Cadmium	7440-43-9	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
		EG020-SD: Selenium	7782-49-2	0.1	mg/kg	1.8	1.8	0.0	0% - 50%
		EG020-SD: Silver	7440-22-4	0.1	mg/kg	<0.1	<0.1	0.0	No Limit

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG020-SD: Total Metals in Sediments by ICPMS (QC Lot: 3130384) - continued									
EB1326059-011	B7 0-0.50	EG020-SD: Cobalt	7440-48-4	0.5	mg/kg	8.0	7.6	5.3	0% - 50%
		EG020-SD: Antimony	7440-36-0	0.50	mg/kg	<0.50	<0.50	0.0	No Limit
		EG020-SD: Chromium	7440-47-3	1.0	mg/kg	28.6	27.1	5.4	0% - 20%
		EG020-SD: Copper	7440-50-8	1.0	mg/kg	6.4	6.2	4.5	No Limit
		EG020-SD: Lead	7439-92-1	1.0	mg/kg	11.8	11.3	4.6	0% - 50%
		EG020-SD: Nickel	7440-02-0	1.0	mg/kg	13.8	12.7	8.2	0% - 50%
		EG020-SD: Zinc	7440-66-6	1.0	mg/kg	33.8	32.0	5.4	0% - 20%
		EG020-SD: Arsenic	7440-38-2	1.00	mg/kg	13.9	13.0	6.4	0% - 50%
		EG020-SD: Manganese	7439-96-5	10	mg/kg	340	328	3.7	0% - 20%
		EG020-SD: Vanadium	7440-62-2	2.0	mg/kg	33.1	30.4	8.4	0% - 50%
EG020-SD: Total Metals in Sediments by ICPMS (QC Lot: 3130387)									
EB1326059-022	C30 0-0.5	EG020-SD: Cadmium	7440-43-9	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
		EG020-SD: Selenium	7782-49-2	0.1	mg/kg	2.2	2.4	8.4	0% - 20%
		EG020-SD: Silver	7440-22-4	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
		EG020-SD: Cobalt	7440-48-4	0.5	mg/kg	10.0	10.5	4.8	0% - 20%
		EG020-SD: Antimony	7440-36-0	0.50	mg/kg	<0.50	<0.50	0.0	No Limit
		EG020-SD: Chromium	7440-47-3	1.0	mg/kg	38.5	39.8	3.4	0% - 20%
		EG020-SD: Copper	7440-50-8	1.0	mg/kg	10.8	11.1	2.1	0% - 50%
		EG020-SD: Lead	7439-92-1	1.0	mg/kg	17.8	18.2	2.6	0% - 50%
		EG020-SD: Nickel	7440-02-0	1.0	mg/kg	19.9	20.1	0.9	0% - 20%
		EG020-SD: Zinc	7440-66-6	1.0	mg/kg	48.5	49.6	2.1	0% - 20%
		EG020-SD: Arsenic	7440-38-2	1.00	mg/kg	19.0	19.4	2.4	0% - 50%
		EG020-SD: Manganese	7439-96-5	10	mg/kg	822	830	1.1	0% - 20%
		EG020-SD: Vanadium	7440-62-2	2.0	mg/kg	46.3	47.2	1.9	0% - 20%
EB1326059-032	B108 0.5-1.0	EG020-SD: Cadmium	7440-43-9	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
		EG020-SD: Selenium	7782-49-2	0.1	mg/kg	2.5	2.5	0.0	0% - 20%
		EG020-SD: Silver	7440-22-4	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
		EG020-SD: Cobalt	7440-48-4	0.5	mg/kg	10.5	10.3	1.6	0% - 20%
		EG020-SD: Antimony	7440-36-0	0.50	mg/kg	<0.50	<0.50	0.0	No Limit
		EG020-SD: Chromium	7440-47-3	1.0	mg/kg	37.7	37.8	0.3	0% - 20%
		EG020-SD: Copper	7440-50-8	1.0	mg/kg	15.0	14.3	4.2	0% - 50%
		EG020-SD: Lead	7439-92-1	1.0	mg/kg	20.0	19.7	1.5	0% - 20%
		EG020-SD: Nickel	7440-02-0	1.0	mg/kg	17.9	17.4	3.2	0% - 50%
		EG020-SD: Zinc	7440-66-6	1.0	mg/kg	55.0	53.6	2.5	0% - 20%
		EG020-SD: Arsenic	7440-38-2	1.00	mg/kg	22.4	22.0	1.4	0% - 20%
		EG020-SD: Manganese	7439-96-5	10	mg/kg	774	751	3.0	0% - 20%
		EG020-SD: Vanadium	7440-62-2	2.0	mg/kg	45.5	44.4	2.5	0% - 20%
EG020-SD: Total Metals in Sediments by ICPMS (QC Lot: 3130390)									
EB1326059-043	B54 0.5-1.0	EG020-SD: Cadmium	7440-43-9	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
		EG020-SD: Selenium	7782-49-2	0.1	mg/kg	3.0	3.0	0.0	0% - 20%

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG020-SD: Total Metals in Sediments by ICPMS (QC Lot: 3130390) - continued									
EB1326059-043	B54 0.5-1.0	EG020-SD: Silver	7440-22-4	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
		EG020-SD: Cobalt	7440-48-4	0.5	mg/kg	9.3	9.1	2.3	0% - 50%
		EG020-SD: Antimony	7440-36-0	0.50	mg/kg	<0.50	<0.50	0.0	No Limit
		EG020-SD: Chromium	7440-47-3	1.0	mg/kg	33.8	33.0	2.3	0% - 20%
		EG020-SD: Copper	7440-50-8	1.0	mg/kg	10.8	10.6	1.9	0% - 50%
		EG020-SD: Lead	7439-92-1	1.0	mg/kg	17.2	17.7	2.7	0% - 50%
		EG020-SD: Nickel	7440-02-0	1.0	mg/kg	15.7	15.6	0.0	0% - 50%
		EG020-SD: Zinc	7440-66-6	1.0	mg/kg	47.8	47.2	1.4	0% - 20%
		EG020-SD: Arsenic	7440-38-2	1.00	mg/kg	19.7	18.8	4.8	0% - 50%
		EG020-SD: Manganese	7439-96-5	10	mg/kg	711	689	3.1	0% - 20%
		EG020-SD: Vanadium	7440-62-2	2.0	mg/kg	43.0	42.4	1.4	0% - 20%
EB1326059-054	H165A 0-0.2	EG020-SD: Cadmium	7440-43-9	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
		EG020-SD: Selenium	7782-49-2	0.1	mg/kg	3.4	2.8	17.2	0% - 20%
		EG020-SD: Silver	7440-22-4	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
		EG020-SD: Cobalt	7440-48-4	0.5	mg/kg	11.4	10.3	10.0	0% - 20%
		EG020-SD: Antimony	7440-36-0	0.50	mg/kg	<0.50	<0.50	0.0	No Limit
		EG020-SD: Chromium	7440-47-3	1.0	mg/kg	38.4	34.8	9.8	0% - 20%
		EG020-SD: Copper	7440-50-8	1.0	mg/kg	19.2	17.0	12.2	0% - 50%
		EG020-SD: Lead	7439-92-1	1.0	mg/kg	21.8	19.7	9.8	0% - 20%
		EG020-SD: Nickel	7440-02-0	1.0	mg/kg	18.7	16.9	9.9	0% - 50%
		EG020-SD: Zinc	7440-66-6	1.0	mg/kg	68.3	61.7	10.3	0% - 20%
		EG020-SD: Arsenic	7440-38-2	1.00	mg/kg	21.4	19.1	11.3	0% - 20%
		EG020-SD: Manganese	7439-96-5	10	mg/kg	796	750	6.0	0% - 20%
		EG020-SD: Vanadium	7440-62-2	2.0	mg/kg	49.7	45.0	9.9	0% - 20%
EG020-SD: Total Metals in Sediments by ICPMS (QC Lot: 3130393)									
EB1326059-064	V185 1.0-1.5	EG020-SD: Cadmium	7440-43-9	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
		EG020-SD: Selenium	7782-49-2	0.1	mg/kg	3.1	3.0	0.0	0% - 20%
		EG020-SD: Silver	7440-22-4	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
		EG020-SD: Cobalt	7440-48-4	0.5	mg/kg	10.3	10.4	1.1	0% - 20%
		EG020-SD: Antimony	7440-36-0	0.50	mg/kg	<0.50	<0.50	0.0	No Limit
		EG020-SD: Chromium	7440-47-3	1.0	mg/kg	35.5	35.1	1.0	0% - 20%
		EG020-SD: Copper	7440-50-8	1.0	mg/kg	10.0	9.8	1.5	0% - 50%
		EG020-SD: Lead	7439-92-1	1.0	mg/kg	15.7	16.0	1.8	0% - 50%
		EG020-SD: Nickel	7440-02-0	1.0	mg/kg	17.6	17.5	0.6	0% - 50%
		EG020-SD: Zinc	7440-66-6	1.0	mg/kg	45.0	44.4	1.5	0% - 20%
		EG020-SD: Arsenic	7440-38-2	1.00	mg/kg	18.5	18.6	0.3	0% - 50%
		EG020-SD: Manganese	7439-96-5	10	mg/kg	427	429	0.5	0% - 20%
		EG020-SD: Vanadium	7440-62-2	2.0	mg/kg	40.2	41.0	1.9	0% - 20%
EB1326059-074	B41 0.5-0.9	EG020-SD: Cadmium	7440-43-9	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
		EG020-SD: Selenium	7782-49-2	0.1	mg/kg	3.1	3.1	0.0	0% - 20%

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG020-SD: Total Metals in Sediments by ICPMS (QC Lot: 3130393) - continued									
EB1326059-074	B41 0.5-0.9	EG020-SD: Silver	7440-22-4	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
		EG020-SD: Cobalt	7440-48-4	0.5	mg/kg	9.9	9.8	0.0	0% - 50%
		EG020-SD: Antimony	7440-36-0	0.50	mg/kg	<0.50	<0.50	0.0	No Limit
		EG020-SD: Chromium	7440-47-3	1.0	mg/kg	35.2	36.5	3.6	0% - 20%
		EG020-SD: Copper	7440-50-8	1.0	mg/kg	11.4	11.5	1.2	0% - 50%
		EG020-SD: Lead	7439-92-1	1.0	mg/kg	19.4	19.8	2.0	0% - 50%
		EG020-SD: Nickel	7440-02-0	1.0	mg/kg	17.5	17.9	2.7	0% - 50%
		EG020-SD: Zinc	7440-66-6	1.0	mg/kg	50.7	52.9	4.2	0% - 20%
		EG020-SD: Arsenic	7440-38-2	1.00	mg/kg	19.6	19.3	1.7	0% - 50%
		EG020-SD: Manganese	7439-96-5	10	mg/kg	756	784	3.6	0% - 20%
		EG020-SD: Vanadium	7440-62-2	2.0	mg/kg	45.3	46.1	1.6	0% - 20%
EG020-SD: Total Metals in Sediments by ICPMS (QC Lot: 3130396)									
EB1326059-084	B79 1.0-1.8	EG020-SD: Cadmium	7440-43-9	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
		EG020-SD: Selenium	7782-49-2	0.1	mg/kg	2.3	2.4	0.0	0% - 20%
		EG020-SD: Silver	7440-22-4	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
		EG020-SD: Cobalt	7440-48-4	0.5	mg/kg	9.5	9.8	3.2	0% - 50%
		EG020-SD: Antimony	7440-36-0	0.50	mg/kg	<0.50	<0.50	0.0	No Limit
		EG020-SD: Chromium	7440-47-3	1.0	mg/kg	31.9	31.7	0.6	0% - 20%
		EG020-SD: Copper	7440-50-8	1.0	mg/kg	13.0	13.0	0.0	0% - 50%
		EG020-SD: Lead	7439-92-1	1.0	mg/kg	16.7	17.6	4.9	0% - 50%
		EG020-SD: Nickel	7440-02-0	1.0	mg/kg	16.6	16.0	3.6	0% - 50%
		EG020-SD: Zinc	7440-66-6	1.0	mg/kg	50.0	50.5	1.1	0% - 20%
		EG020-SD: Arsenic	7440-38-2	1.00	mg/kg	19.3	21.3	9.8	0% - 20%
		EG020-SD: Manganese	7439-96-5	10	mg/kg	724	751	3.6	0% - 20%
		EG020-SD: Vanadium	7440-62-2	2.0	mg/kg	42.1	41.9	0.5	0% - 20%
EB1326059-094	F150 0-0.43	EG020-SD: Cadmium	7440-43-9	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
		EG020-SD: Selenium	7782-49-2	0.1	mg/kg	3.8	3.7	0.0	0% - 20%
		EG020-SD: Silver	7440-22-4	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
		EG020-SD: Cobalt	7440-48-4	0.5	mg/kg	9.4	11.2	17.1	0% - 20%
		EG020-SD: Antimony	7440-36-0	0.50	mg/kg	<0.50	<0.50	0.0	No Limit
		EG020-SD: Chromium	7440-47-3	1.0	mg/kg	34.8	33.6	3.6	0% - 20%
		EG020-SD: Copper	7440-50-8	1.0	mg/kg	8.8	10.6	17.7	0% - 50%
		EG020-SD: Lead	7439-92-1	1.0	mg/kg	17.7	18.8	5.7	0% - 50%
		EG020-SD: Nickel	7440-02-0	1.0	mg/kg	11.7	12.8	9.6	0% - 50%
		EG020-SD: Zinc	7440-66-6	1.0	mg/kg	21.1	23.1	9.1	0% - 20%
		EG020-SD: Arsenic	7440-38-2	1.00	mg/kg	16.6	19.1	13.8	0% - 50%
		EG020-SD: Manganese	7439-96-5	10	mg/kg	406	484	17.5	0% - 20%
		EG020-SD: Vanadium	7440-62-2	2.0	mg/kg	48.0	56.3	16.0	0% - 20%
EG020-SD: Total Metals in Sediments by ICPMS (QC Lot: 3130399)									
EB1326059-104	B41B 0-0.5	EG020-SD: Cadmium	7440-43-9	0.1	mg/kg	<0.1	<0.1	0.0	No Limit

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG020-SD: Total Metals in Sediments by ICPMS (QC Lot: 3130399) - continued									
EB1326059-104	B41B 0-0.5	EG020-SD: Selenium	7782-49-2	0.1	mg/kg	2.6	2.3	10.3	0% - 20%
		EG020-SD: Silver	7440-22-4	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
		EG020-SD: Cobalt	7440-48-4	0.5	mg/kg	10.7	10.6	0.0	0% - 20%
		EG020-SD: Antimony	7440-36-0	0.50	mg/kg	<0.50	<0.50	0.0	No Limit
		EG020-SD: Chromium	7440-47-3	1.0	mg/kg	35.7	35.4	1.0	0% - 20%
		EG020-SD: Copper	7440-50-8	1.0	mg/kg	12.3	12.2	0.9	0% - 50%
		EG020-SD: Lead	7439-92-1	1.0	mg/kg	18.1	18.0	0.0	0% - 50%
		EG020-SD: Nickel	7440-02-0	1.0	mg/kg	18.5	18.0	2.6	0% - 50%
		EG020-SD: Zinc	7440-66-6	1.0	mg/kg	52.5	51.9	1.0	0% - 20%
		EG020-SD: Arsenic	7440-38-2	1.00	mg/kg	20.7	20.2	2.2	0% - 20%
		EG020-SD: Manganese	7439-96-5	10	mg/kg	809	808	0.0	0% - 20%
		EG020-SD: Vanadium	7440-62-2	2.0	mg/kg	47.8	47.0	1.8	0% - 20%
EG020-SD: Total Metals in Sediments by ICPMS (QC Lot: 3150706)									
EB1326059-051	P180 0-0.05	EG020-SD: Cadmium	7440-43-9	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
		EG020-SD: Selenium	7782-49-2	0.1	mg/kg	1.2	1.2	0.0	0% - 50%
		EG020-SD: Silver	7440-22-4	0.1	mg/kg	0.4	0.4	0.0	No Limit
		EG020-SD: Cobalt	7440-48-4	0.5	mg/kg	18.2	18.1	0.0	0% - 20%
		EG020-SD: Antimony	7440-36-0	0.50	mg/kg	<0.50	<0.50	0.0	No Limit
		EG020-SD: Chromium	7440-47-3	1.0	mg/kg	33.3	35.0	4.8	0% - 20%
		EG020-SD: Copper	7440-50-8	1.0	mg/kg	11.3	12.4	9.4	0% - 50%
		EG020-SD: Lead	7439-92-1	1.0	mg/kg	20.8	21.6	4.1	0% - 20%
		EG020-SD: Nickel	7440-02-0	1.0	mg/kg	18.2	14.8	20.8	0% - 50%
		EG020-SD: Zinc	7440-66-6	1.0	mg/kg	37.5	41.8	10.9	0% - 20%
		EG020-SD: Arsenic	7440-38-2	1.00	mg/kg	22.4	18.7	18.2	0% - 20%
		EG020-SD: Manganese	7439-96-5	10	mg/kg	1220	1240	1.3	0% - 20%
		EG020-SD: Vanadium	7440-62-2	2.0	mg/kg	36.3	42.2	15.0	0% - 20%
ES1323555-008	Anonymous	EG020-SD: Cadmium	7440-43-9	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
		EG020-SD: Selenium	7782-49-2	0.1	mg/kg	0.8	0.8	0.0	No Limit
		EG020-SD: Silver	7440-22-4	0.1	mg/kg	0.2	0.1	0.0	No Limit
		EG020-SD: Cobalt	7440-48-4	0.5	mg/kg	5.1	5.3	3.2	0% - 50%
		EG020-SD: Antimony	7440-36-0	0.50	mg/kg	<0.50	<0.50	0.0	No Limit
		EG020-SD: Chromium	7440-47-3	1.0	mg/kg	22.0	22.9	4.0	0% - 20%
		EG020-SD: Copper	7440-50-8	1.0	mg/kg	7.3	7.2	0.0	No Limit
		EG020-SD: Lead	7439-92-1	1.0	mg/kg	8.1	8.1	0.0	No Limit
		EG020-SD: Nickel	7440-02-0	1.0	mg/kg	13.7	13.5	1.5	0% - 50%
		EG020-SD: Zinc	7440-66-6	1.0	mg/kg	33.8	34.3	1.4	0% - 20%
		EG020-SD: Arsenic	7440-38-2	1.00	mg/kg	9.43	9.90	4.8	No Limit
		EG020-SD: Manganese	7439-96-5	10	mg/kg	109	107	2.2	0% - 50%
		EG020-SD: Vanadium	7440-62-2	2.0	mg/kg	25.7	26.6	3.5	0% - 50%
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3130383)									

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3130383) - continued									
EB1326059-001	C119 0-0.2	EG035T-LL: Mercury	7439-97-6	0.01	mg/kg	0.02	0.02	0.0	0% - 20%
EB1326059-011	B7 0-0.50	EG035T-LL: Mercury	7439-97-6	0.01	mg/kg	0.01	<0.01	0.0	0% - 20%
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3130386)									
EB1326059-022	C30 0-0.5	EG035T-LL: Mercury	7439-97-6	0.01	mg/kg	0.02	0.02	0.0	0% - 20%
EB1326059-032	B108 0.5-1.0	EG035T-LL: Mercury	7439-97-6	0.01	mg/kg	0.02	0.02	0.0	0% - 20%
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3130389)									
EB1326059-043	B54 0.5-1.0	EG035T-LL: Mercury	7439-97-6	0.01	mg/kg	0.02	0.02	0.0	0% - 20%
EB1326059-054	H165A 0-0.2	EG035T-LL: Mercury	7439-97-6	0.01	mg/kg	0.03	0.03	0.0	0% - 20%
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3130392)									
EB1326059-064	V185 1.0-1.5	EG035T-LL: Mercury	7439-97-6	0.01	mg/kg	0.62	0.63	0.0	0% - 20%
EB1326059-074	B41 0.5-0.9	EG035T-LL: Mercury	7439-97-6	0.01	mg/kg	0.03	0.03	0.0	0% - 20%
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3130395)									
EB1326059-084	B79 1.0-1.8	EG035T-LL: Mercury	7439-97-6	0.01	mg/kg	0.03	0.03	0.0	0% - 20%
EB1326059-094	F150 0-0.43	EG035T-LL: Mercury	7439-97-6	0.01	mg/kg	0.02	0.02	0.0	0% - 20%
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3130398)									
EB1326059-104	B41B 0-0.5	EG035T-LL: Mercury	7439-97-6	0.01	mg/kg	0.03	0.02	0.0	0% - 20%
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3150705)									
EB1326059-051	P180 0-0.05	EG035T-LL: Mercury	7439-97-6	0.01	mg/kg	<0.01	<0.01	0.0	No Limit
ES1323555-008	Anonymous	EG035T-LL: Mercury	7439-97-6	0.01	mg/kg	0.03	0.04	0.0	No Limit
EK055: Ammonia as N (QC Lot: 3134401)									
EB1326059-001	C119 0-0.2	EK055-SD: Ammonia as N	7664-41-7	1	mg/kg	51	50	2.4	0% - 20%
EB1326059-017	C29 0-0.5	EK055-SD: Ammonia as N	7664-41-7	1	mg/kg	22	24	9.1	0% - 20%
EK055: Ammonia as N (QC Lot: 3134403)									
EB1326059-042	B54 0-0.5	EK055-SD: Ammonia as N	7664-41-7	1	mg/kg	44	46	4.3	0% - 20%
EB1326059-056	V187 0-0.1	EK055-SD: Ammonia as N	7664-41-7	1	mg/kg	8	6	25.0	No Limit
EK055: Ammonia as N (QC Lot: 3134405)									
EB1326059-072	QAQC4	EK055-SD: Ammonia as N	7664-41-7	1	mg/kg	<1	<1	0.0	No Limit
EB1326059-102	I172 0-0.5	EK055-SD: Ammonia as N	7664-41-7	1	mg/kg	82	87	5.4	0% - 20%
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 3130372)									
EB1326059-001	C119 0-0.2	EK059G: Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EB1326059-017	C29 0-0.5	EK059G: Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 3130373)									
EB1326059-042	B54 0-0.5	EK059G: Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EB1326059-056	V187 0-0.1	EK059G: Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 3130382)									
EB1326059-072	QAQC4	EK059G: Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EB1326059-102	I172 0-0.5	EK059G: Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 3150736)									

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 3150736) - continued									
EB1326059-051	P180 0-0.05	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: 3130369)									
EB1326059-072	QAQC4	EK061G: Total Kjeldahl Nitrogen as N	----	20	mg/kg	660	610	7.4	0% - 20%
EB1326059-102	I172 0-0.5	EK061G: Total Kjeldahl Nitrogen as N	----	20	mg/kg	1510	1520	1.0	0% - 20%
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 3130620)									
EB1326059-001	C119 0-0.2	EK061G: Total Kjeldahl Nitrogen as N	----	20	mg/kg	1020	960	6.1	0% - 20%
EB1326059-017	C29 0-0.5	EK061G: Total Kjeldahl Nitrogen as N	----	20	mg/kg	780	750	3.1	0% - 20%
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 3130622)									
EB1326059-042	B54 0-0.5	EK061G: Total Kjeldahl Nitrogen as N	----	20	mg/kg	1190	1130	5.6	0% - 20%
EB1326059-056	V187 0-0.1	EK061G: Total Kjeldahl Nitrogen as N	----	20	mg/kg	1540	1600	4.3	0% - 20%
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 3149190)									
EB1326059-051	P180 0-0.05	EK061G: Total Kjeldahl Nitrogen as N	----	20	mg/kg	160	240	42.5	0% - 50%
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 3130370)									
EB1326059-072	QAQC4	EK067G: Total Phosphorus as P	----	2	mg/kg	213	235	9.5	0% - 20%
EB1326059-102	I172 0-0.5	EK067G: Total Phosphorus as P	----	2	mg/kg	493	466	5.7	0% - 20%
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 3130621)									
EB1326059-001	C119 0-0.2	EK067G: Total Phosphorus as P	----	2	mg/kg	370	377	1.7	0% - 20%
EB1326059-017	C29 0-0.5	EK067G: Total Phosphorus as P	----	2	mg/kg	419	475	12.6	0% - 20%
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 3130623)									
EB1326059-042	B54 0-0.5	EK067G: Total Phosphorus as P	----	2	mg/kg	469	445	5.2	0% - 20%
EB1326059-056	V187 0-0.1	EK067G: Total Phosphorus as P	----	2	mg/kg	499	532	6.3	0% - 20%
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 3149191)									
EB1326059-051	P180 0-0.05	EK067G: Total Phosphorus as P	----	2	mg/kg	217	218	0.7	0% - 20%
EP003: Total Organic Carbon (TOC) in Soil (QC Lot: 3132149)									
EB1326059-001	C119 0-0.2	EP003: Total Organic Carbon	----	0.02	%	1.19	1.20	0.0	0% - 20%
EB1326059-011	B7 0-0.50	EP003: Total Organic Carbon	----	0.02	%	0.40	0.40	0.0	0% - 20%
EP003: Total Organic Carbon (TOC) in Soil (QC Lot: 3132150)									
EB1326059-022	C30 0-0.5	EP003: Total Organic Carbon	----	0.02	%	0.86	0.87	0.0	0% - 20%
EB1326059-032	B108 0.5-1.0	EP003: Total Organic Carbon	----	0.02	%	1.48	1.53	3.3	0% - 20%
EP003: Total Organic Carbon (TOC) in Soil (QC Lot: 3132151)									
EB1326059-043	B54 0.5-1.0	EP003: Total Organic Carbon	----	0.02	%	0.98	1.00	1.6	0% - 20%
EB1326059-053	H165 0-0.2	EP003: Total Organic Carbon	----	0.02	%	2.07	2.01	2.8	0% - 20%
EP003: Total Organic Carbon (TOC) in Soil (QC Lot: 3132152)									
EB1326059-064	V185 1.0-1.5	EP003: Total Organic Carbon	----	0.02	%	1.54	1.53	0.0	0% - 20%
EB1326059-074	B41 0.5-0.9	EP003: Total Organic Carbon	----	0.02	%	1.22	1.22	0.0	0% - 20%
EP003: Total Organic Carbon (TOC) in Soil (QC Lot: 3132153)									
EB1326059-085	C82 0-0.5	EP003: Total Organic Carbon	----	0.02	%	1.44	1.44	0.0	0% - 20%
EB1326059-095	F150 0.43-0.62	EP003: Total Organic Carbon	----	0.02	%	0.23	0.23	0.0	0% - 50%

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP003: Total Organic Carbon (TOC) in Soil (QC Lot: 3132155)									
EB1326059-105	B41B 0.5-0.9	EP003: Total Organic Carbon	----	0.02	%	1.12	1.09	2.2	0% - 20%
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons (QC Lot: 3133345)									
EB1326059-047	K167 0-0.25	EP071-SD: C10 - C14 Fraction	----	3	mg/kg	<3	<3	0.0	No Limit
		EP071-SD: C15 - C28 Fraction	----	3	mg/kg	12	12	0.0	No Limit
		EP071-SD: C29 - C36 Fraction	----	5	mg/kg	31	45	36.3	No Limit
EB1326059-058	V187A 0-0.2	EP071-SD: C10 - C14 Fraction	----	3	mg/kg	4	3	0.0	No Limit
		EP071-SD: C15 - C28 Fraction	----	3	mg/kg	25	26	4.4	No Limit
		EP071-SD: C29 - C36 Fraction	----	5	mg/kg	31	34	8.4	No Limit
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons (QC Lot: 3133347)									
EB1326059-099	I162 0.13-0.33	EP071-SD: C10 - C14 Fraction	----	3	mg/kg	<3	<3	0.0	No Limit
		EP071-SD: C15 - C28 Fraction	----	3	mg/kg	5	5	0.0	No Limit
		EP071-SD: C29 - C36 Fraction	----	5	mg/kg	<5	<5	0.0	No Limit
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons (QC Lot: 3134489)									
EB1326059-047	K167 0-0.25	EP080-SD: C6 - C9 Fraction	----	3	mg/kg	<3	<3	0.0	No Limit
EB1326059-058	V187A 0-0.2	EP080-SD: C6 - C9 Fraction	----	3	mg/kg	<3	<3	0.0	No Limit
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons (QC Lot: 3134495)									
EB1326059-099	I162 0.13-0.33	EP080-SD: C6 - C9 Fraction	----	3	mg/kg	<3	<3	0.0	No Limit
EP080-SD: BTEXN (QC Lot: 3134489)									
EB1326059-047	K167 0-0.25	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
EB1326059-058	V187A 0-0.2	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: BTEXN (QC Lot: 3134495)									
EB1326059-099	I162 0.13-0.33	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
EP090: Organotin Compounds (QC Lot: 3130266)									
EB1326059-001	C119 0-0.2	EP090: Tributyltin	56573-85-4	0.5	µgSn/kg	<0.5	<0.5	0.0	No Limit

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP090: Organotin Compounds (QC Lot: 3130266) - continued									
EB1326059-001	C119 0-0.2	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
EB1326059-011	B7 0-0.50	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: 3130267)									
EB1326059-020	B25 0.2-0.3	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
EB1326059-031	B108 0-0.5	EP090: Tributyltin	56573-85-4	0.5	µgSn/kg	0.6	0.6	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: 3130271)									
EB1326059-040	C53 0.5-0.9	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
EB1326059-051	P180 0-0.05	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	2	<1	66.7	No Limit
		EP090: Dibutyltin	1002-53-5	1	µgSn/kg	<1	<1	0.0	No Limit
EP090: Organotin Compounds (QC Lot: 3130275)									
EB1326059-061	QAQC3	EP090: Tributyltin	56573-85-4	0.5	µgSn/kg	1.2	1.4	14.0	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
EB1326059-071	QAQC5	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: 3130279)									
EB1326059-080	B74 1.0-1.9	EP090: Tributyltin	56573-85-4	0.5	µgSn/kg	0.6	<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
EB1326059-090	QAQC6	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: 3130282)									
EB1326059-102	I172 0-0.5	EP090: Tributyltin	56573-85-4	0.5	µgSn/kg	2.7	2.1	22.8	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: 3133326)									
EB1326059-047	K167 0-0.25	EP130: Bromophos-ethyl	4824-78-6	10	µg/kg	<10	<10	0.0	No Limit

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP130A: Organophosphorus Pesticides (Ultra-trace) (QC Lot: 3133326) - continued									
EB1326059-047	K167 0-0.25	EP130: Carbophenothion	786-19-6	10	µg/kg	<10	<10	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
		EP130: Chlorfenvinphos (E)	18708-86-6	10.0	µg/kg	<10.0	<10.0	0.0	No Limit
EB1326059-058	V187A 0-0.2	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 (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
		EP130: Chlorfenvinphos (E)	18708-86-6	10.0	µg/kg	<10.0	<10.0	0.0	No Limit
EP130A: Organophosphorus Pesticides (Ultra-trace) (QC Lot: 3133354)									

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP130A: Organophosphorus Pesticides (Ultra-trace) (QC Lot: 3133354) - continued									
EB1326059-099	I162 0.13-0.33	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 (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
		EP130: Chlorfenvinphos (E)	18708-86-6	10.0	µg/kg	<10.0	<10.0	0.0	No Limit
EP131A: Organochlorine Pesticides (QC Lot: 3133327)									
EB1326059-047	K167 0-0.25	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	<0.25	<0.25	0.0	No Limit
		EP131A: trans-Chlordane	5103-74-2	0.25	µg/kg	<0.25	<0.25	0.0	No Limit
		EP131A: Total Chlordane (sum)	----	0.25	µg/kg	<0.25	<0.25	0.0	No Limit
		EP131A: Aldrin	309-00-2	0.50	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: alpha-BHC	319-84-6	0.50	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: beta-BHC	319-85-7	0.50	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: delta-BHC	319-86-8	0.50	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: 4.4`-DDD	72-54-8	0.50	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: 4.4`-DDE	72-55-9	0.50	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: 4.4`-DDT	50-29-3	0.50	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Sum of DDD + DDE + DDT	----	0.50	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Dieldrin	60-57-1	0.50	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: alpha-Endosulfan	959-98-8	0.50	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: beta-Endosulfan	33213-65-9	0.50	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Endosulfan sulfate	1031-07-8	0.50	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Endosulfan (sum)	115-29-7	0.50	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Endrin	72-20-8	0.50	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Endrin aldehyde	7421-93-4	0.50	µg/kg	<0.50	<0.50	0.0	No Limit

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP131A: Organochlorine Pesticides (QC Lot: 3133327) - continued									
EB1326059-047	K167 0-0.25	EP131A: Endrin ketone	53494-70-5	0.50	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Heptachlor	76-44-8	0.50	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Heptachlor epoxide	1024-57-3	0.50	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Hexachlorobenzene (HCB)	118-74-1	0.50	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Methoxychlor	72-43-5	0.50	µg/kg	<0.50	<0.50	0.0	No Limit
EB1326059-058	V187A 0-0.2	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	<0.25	<0.25	0.0	No Limit
		EP131A: trans-Chlordane	5103-74-2	0.25	µg/kg	<0.25	<0.25	0.0	No Limit
		EP131A: Total Chlordane (sum)	----	0.25	µg/kg	<0.25	<0.25	0.0	No Limit
		EP131A: Aldrin	309-00-2	0.50	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: alpha-BHC	319-84-6	0.50	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: beta-BHC	319-85-7	0.50	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: delta-BHC	319-86-8	0.50	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: 4.4`-DDD	72-54-8	0.50	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: 4.4`-DDE	72-55-9	0.50	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: 4.4`-DDT	50-29-3	0.50	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Sum of DDD + DDE + DDT	----	0.50	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Dieldrin	60-57-1	0.50	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: alpha-Endosulfan	959-98-8	0.50	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: beta-Endosulfan	33213-65-9	0.50	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Endosulfan sulfate	1031-07-8	0.50	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Endosulfan (sum)	115-29-7	0.50	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Endrin	72-20-8	0.50	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Endrin aldehyde	7421-93-4	0.50	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Endrin ketone	53494-70-5	0.50	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Heptachlor	76-44-8	0.50	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Heptachlor epoxide	1024-57-3	0.50	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Hexachlorobenzene (HCB)	118-74-1	0.50	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Methoxychlor	72-43-5	0.50	µg/kg	<0.50	<0.50	0.0	No Limit
EP131A: Organochlorine Pesticides (QC Lot: 3133355)									
EB1326059-099	I162 0.13-0.33	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	<0.25	<0.25	0.0	No Limit
		EP131A: trans-Chlordane	5103-74-2	0.25	µg/kg	<0.25	<0.25	0.0	No Limit
		EP131A: Total Chlordane (sum)	----	0.25	µg/kg	<0.25	<0.25	0.0	No Limit
		EP131A: Aldrin	309-00-2	0.50	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: alpha-BHC	319-84-6	0.50	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: beta-BHC	319-85-7	0.50	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: delta-BHC	319-86-8	0.50	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: 4.4`-DDD	72-54-8	0.50	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: 4.4`-DDE	72-55-9	0.50	µg/kg	<0.50	<0.50	0.0	No Limit

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP131A: Organochlorine Pesticides (QC Lot: 3133355) - continued									
EB1326059-099	I162 0.13-0.33	EP131A: 4.4`-DDT	50-29-3	0.50	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Sum of DDD + DDE + DDT	----	0.50	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Dieldrin	60-57-1	0.50	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: alpha-Endosulfan	959-98-8	0.50	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: beta-Endosulfan	33213-65-9	0.50	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Endosulfan sulfate	1031-07-8	0.50	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Endosulfan (sum)	115-29-7	0.50	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Endrin	72-20-8	0.50	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Endrin aldehyde	7421-93-4	0.50	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Endrin ketone	53494-70-5	0.50	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Heptachlor	76-44-8	0.50	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Heptachlor epoxide	1024-57-3	0.50	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Hexachlorobenzene (HCB)	118-74-1	0.50	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Methoxychlor	72-43-5	0.50	µg/kg	<0.50	<0.50	0.0	No Limit
EP132B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3133344)									
EB1326059-047	K167 0-0.25	EP132B-SD: Acenaphthylene	208-96-8	4	µg/kg	<4	<4	0.0	No Limit
		EP132B-SD: Acenaphthene	83-32-9	4	µg/kg	22	16	30.5	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	<4	<4	0.0	No Limit
		EP132B-SD: Pyrene	129-00-0	4	µg/kg	25	20	25.4	No Limit
		EP132B-SD: Benz(a)anthracene	56-55-3	4	µg/kg	<4	<4	0.0	No Limit
		EP132B-SD: Chrysene	218-01-9	4	µg/kg	<4	<4	0.0	No Limit
		EP132B-SD: Benzo(b)fluoranthene	205-99-2	4	µg/kg	<4	<4	0.0	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	<4	<4	0.0	No Limit
		EP132B-SD: Benzo(a)pyrene	50-32-8	4	µg/kg	<4	<4	0.0	No Limit
		EP132B-SD: Perylene	198-55-0	4	µg/kg	121	106	13.4	0% - 20%
		EP132B-SD: Benzo(g.h.i)perylene	191-24-2	4	µg/kg	<4	<4	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	<4	<4	0.0	No Limit
		EP132B-SD: Sum of PAHs	----	4	µg/kg	168	142	16.8	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
EB1326059-058	V187A 0-0.2	EP132B-SD: Acenaphthylene	208-96-8	4	µg/kg	<5	<5	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	<5	<5	0.0	No Limit

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
				Laboratory Duplicate (DUP) Report					
EP132B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3133344) - continued									
EB1326059-058	V187A 0-0.2	EP132B-SD: Anthracene	120-12-7	4	µg/kg	<5	<5	0.0	No Limit
		EP132B-SD: Fluoranthene	206-44-0	4	µg/kg	<5	<5	0.0	No Limit
		EP132B-SD: Pyrene	129-00-0	4	µg/kg	<5	5	0.0	No Limit
		EP132B-SD: Benz(a)anthracene	56-55-3	4	µg/kg	<5	<5	0.0	No Limit
		EP132B-SD: Chrysene	218-01-9	4	µg/kg	<5	<5	0.0	No Limit
		EP132B-SD: Benzo(b)fluoranthene	205-99-2	4	µg/kg	<5	<5	0.0	No Limit
		EP132B-SD: Benzo(k)fluoranthene	207-08-9	4	µg/kg	<5	<5	0.0	No Limit
		EP132B-SD: Benzo(e)pyrene	192-97-2	4	µg/kg	<5	<5	0.0	No Limit
		EP132B-SD: Benzo(a)pyrene	50-32-8	4	µg/kg	<5	<5	0.0	No Limit
		EP132B-SD: Perylene	198-55-0	4	µg/kg	7	6	0.0	No Limit
		EP132B-SD: Benzo(g.h.i)perylene	191-24-2	4	µg/kg	<5	<5	0.0	No Limit
		EP132B-SD: Dibenz(a.h)anthracene	53-70-3	4	µg/kg	<5	<5	0.0	No Limit
		EP132B-SD: Indeno(1.2.3.cd)pyrene	193-39-5	4	µg/kg	<5	<5	0.0	No Limit
		EP132B-SD: Sum of PAHs	----	4	µg/kg	7	11	44.4	No Limit
		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
EP132B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3133346)									
EB1326059-099	I162 0.13-0.33	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	<4	<4	0.0	No Limit
		EP132B-SD: Pyrene	129-00-0	4	µg/kg	<4	<4	0.0	No Limit
		EP132B-SD: Benz(a)anthracene	56-55-3	4	µg/kg	<4	<4	0.0	No Limit
		EP132B-SD: Chrysene	218-01-9	4	µg/kg	<4	<4	0.0	No Limit
		EP132B-SD: Benzo(b)fluoranthene	205-99-2	4	µg/kg	<4	<4	0.0	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	<4	<4	0.0	No Limit
		EP132B-SD: Benzo(a)pyrene	50-32-8	4	µg/kg	<4	<4	0.0	No Limit
		EP132B-SD: Perylene	198-55-0	4	µg/kg	<4	<4	0.0	No Limit
		EP132B-SD: Benzo(g.h.i)perylene	191-24-2	4	µg/kg	<4	<4	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	<4	<4	0.0	No Limit
		EP132B-SD: Sum of PAHs	----	4	µg/kg	<4	<4	0.0	No Limit
		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
EP231: Perfluorinated Compounds (QC Lot: 3132898)									

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP231: Perfluorinated Compounds (QC Lot: 3132898) - continued									
EB1326059-047	K167 0-0.25	EP231: PFOS	1763-23-1	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231: PFOA	335-67-1	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231: 6:2 Fluorotelomer sulfonate (6:2 FtS)	27619-97-2	0.005	mg/kg	0.007	<0.005	36.6	No Limit
EB1326059-059	V187B 0-0.2	EP231: PFOS	1763-23-1	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231: PFOA	335-67-1	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231: 6:2 Fluorotelomer sulfonate (6:2 FtS)	27619-97-2	0.005	mg/kg	<0.005	<0.005	0.0	No Limit
EP231: Perfluorinated Compounds (QC Lot: 3132899)									
EB1326059-047	K167 0-0.25	EP231-PFC: PFOSA	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231-PFC: PFBS	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231-PFC: PFHxS	3871-99-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231-PFC: PFDcS	67906-42-7	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231-PFC: PFHxA	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231-PFC: PFHpA	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231-PFC: PFNA	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231-PFC: PFDcA	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231-PFC: PFUnA	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231-PFC: PFDoA	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231-PFC: PFTriA	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231-PFC: 8:2 Fluorotelomer sulfonate	39108-34-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
		EP231-PFC: N-Me-FOSA	31506-32-8	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
		EP231-PFC: N-Et-FOSA	4151-50-2	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
		EP231-PFC: N-Me-FOSE	2448-09-7	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
		EP231-PFC: N-Et-FOSE	1691-99-2	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
		EP231-PFC: PFTeA	376-06-7	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EB1326059-059	V187B 0-0.2	EP231-PFC: PFOSA	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231-PFC: PFBS	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231-PFC: PFHxS	3871-99-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231-PFC: PFDcS	67906-42-7	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231-PFC: PFHxA	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231-PFC: PFHpA	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231-PFC: PFNA	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231-PFC: PFDcA	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231-PFC: PFUnA	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231-PFC: PFDoA	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231-PFC: PFTriA	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231-PFC: 8:2 Fluorotelomer sulfonate	39108-34-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
		EP231-PFC: N-Me-FOSA	31506-32-8	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
		EP231-PFC: N-Et-FOSA	4151-50-2	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
		EP231-PFC: N-Me-FOSE	2448-09-7	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
		EP231-PFC: N-Et-FOSE	1691-99-2	0.001	mg/kg	<0.001	<0.001	0.0	No Limit

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
				Laboratory Duplicate (DUP) Report					
EP231: Perfluorinated Compounds (QC Lot: 3132899) - continued									
EB1326059-059	V187B 0-0.2	EP231-PFC: PFTeA	376-06-7	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231: Perfluorinated Compounds (QC Lot: 3132902)									
EB1326059-099	I162 0.13-0.33	EP231: PFOS	1763-23-1	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231: PFOA	335-67-1	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231: 6:2 Fluorotelomer sulfonate (6:2 FtS)	27619-97-2	0.005	mg/kg	<0.005	<0.005	0.0	No Limit
EP231: Perfluorinated Compounds (QC Lot: 3132903)									
EB1326059-099	I162 0.13-0.33	EP231-PFC: PFOSA	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231-PFC: PFBS	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231-PFC: PFHxS	3871-99-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231-PFC: PFDcS	67906-42-7	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231-PFC: PFHxA	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231-PFC: PFHpA	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231-PFC: PFNA	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231-PFC: PFDcA	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231-PFC: PFUnA	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231-PFC: PFDoA	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231-PFC: PFTriA	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231-PFC: 8:2 Fluorotelomer sulfonate	39108-34-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
		EP231-PFC: N-Me-FOSA	31506-32-8	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
		EP231-PFC: N-Et-FOSA	4151-50-2	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
		EP231-PFC: N-Me-FOSE	2448-09-7	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
		EP231-PFC: N-Et-FOSE	1691-99-2	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
		EP231-PFC: PFTeA	376-06-7	0.001	mg/kg	<0.001	<0.001	0.0	No Limit

Sub-Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
				Laboratory Duplicate (DUP) Report					
EG035F: Dissolved Mercury by FIMS (QC Lot: 3156655)									
EB1326059-108	PWA Pore Water	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3157861)									
EB1326059-108	PWA Pore Water	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS (QC Lot: 3157841)									
EB1326059-111	ELUTRIATE WATER Seawater Blank	EG093A-F: Silver	7440-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EG093A-F: Cadmium	7440-43-9	0.2	µg/L	<0.2	<0.2	0.0	No Limit
		EG093A-F: Lead	7439-92-1	0.2	µg/L	<0.2	<0.2	0.0	No Limit
		EG093A-F: Antimony	7440-36-0	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EG093A-F: Arsenic	7440-38-2	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EG093A-F: Chromium	7440-47-3	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EG093A-F: Nickel	7440-02-0	0.5	µg/L	<0.5	1.0	63.4	No Limit
		EG093A-F: Copper	7440-50-8	1	µg/L	<1	<1	0.0	No Limit

Sub-Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS (QC Lot: 3157841) - continued									
EB1326059-111	ELUTRIATE WATER Seawater Blank	EG093A-F: Aluminium	7429-90-5	5	µg/L	<5	<5	0.0	No Limit
		EG093A-F: Zinc	7440-66-6	5	µg/L	<5	<5	0.0	No Limit
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS (QC Lot: 3160736)									
EB1326059-108	PWA Pore Water	EG093A-F: Silver	7440-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EG093A-F: Cadmium	7440-43-9	0.2	µg/L	<0.2	<0.2	0.0	No Limit
		EG093A-F: Lead	7439-92-1	0.2	µg/L	<0.2	<0.2	0.0	No Limit
		EG093A-F: Antimony	7440-36-0	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EG093A-F: Arsenic	7440-38-2	0.5	µg/L	5.5	5.4	1.9	0% - 50%
		EG093A-F: Chromium	7440-47-3	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EG093A-F: Nickel	7440-02-0	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EG093A-F: Copper	7440-50-8	1	µg/L	<1	<1	0.0	No Limit
		EG093A-F: Aluminium	7429-90-5	5	µg/L	5	26	132	No Limit
		EG093A-F: Zinc	7440-66-6	5	µg/L	<5	<5	0.0	No Limit
EG093T: Total Metals in Saline Water by ORC-ICPMS (QC Lot: 3157847)									
EB1326059-111	ELUTRIATE WATER Seawater Blank	EG093A-T: Silver	7440-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EG093A-T: Cadmium	7440-43-9	0.2	µg/L	<0.2	<0.2	0.0	No Limit
		EG093A-T: Lead	7439-92-1	0.2	µg/L	<0.2	<0.2	0.0	No Limit
		EG093A-T: Antimony	7440-36-0	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EG093A-T: Arsenic	7440-38-2	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EG093A-T: Chromium	7440-47-3	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EG093A-T: Nickel	7440-02-0	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EG093A-T: Copper	7440-50-8	1	µg/L	<1	<1	0.0	No Limit
		EG093A-T: Aluminium	7429-90-5	5	µg/L	<5	<5	0.0	No Limit
		EG093A-T: Zinc	7440-66-6	5	µg/L	<5	<5	0.0	No Limit
EG093T: Total Metals in Saline Water by ORC-ICPMS (QC Lot: 3158866)									
EB1326059-108	PWA Pore Water	EG093A-T: Silver	7440-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EG093A-T: Cadmium	7440-43-9	0.2	µg/L	<0.2	<0.2	0.0	No Limit
		EG093A-T: Lead	7439-92-1	0.2	µg/L	5.7	5.7	0.0	0% - 20%
		EG093A-T: Antimony	7440-36-0	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EG093A-T: Arsenic	7440-38-2	0.5	µg/L	14.4	14.0	3.0	0% - 20%
		EG093A-T: Chromium	7440-47-3	0.5	µg/L	12.4	11.8	4.4	0% - 20%
		EG093A-T: Nickel	7440-02-0	0.5	µg/L	7.4	6.9	6.7	0% - 50%
		EG093A-T: Copper	7440-50-8	1	µg/L	6	6	0.0	No Limit
		EG093A-T: Aluminium	7429-90-5	5	µg/L	7800	7400	5.3	0% - 20%
		EG093A-T: Zinc	7440-66-6	5	µg/L	25	24	5.0	No Limit
EG093T: Total Metals in Saline Water by ORC-ICPMS (QC Lot: 3160738)									
EB1326059-109	PWB Pore Water	EG093A-T: Silver	7440-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EG093A-T: Cadmium	7440-43-9	0.2	µg/L	<0.2	<0.2	0.0	No Limit

Sub-Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
				Laboratory Duplicate (DUP) Report					
EG093T: Total Metals in Saline Water by ORC-ICPMS (QC Lot: 3160738) - continued									
EB1326059-109	PWB Pore Water	EG093A-T: Lead	7439-92-1	0.2	µg/L	4.9	4.9	0.0	0% - 20%
		EG093A-T: Antimony	7440-36-0	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EG093A-T: Arsenic	7440-38-2	0.5	µg/L	7.8	7.8	0.0	0% - 50%
		EG093A-T: Chromium	7440-47-3	0.5	µg/L	5.8	5.8	0.0	0% - 50%
		EG093A-T: Nickel	7440-02-0	0.5	µg/L	4.9	4.9	0.0	No Limit
		EG093A-T: Copper	7440-50-8	1	µg/L	2	2	0.0	No Limit
		EG093A-T: Aluminium	7429-90-5	5	µg/L	5230	5230	0.0	0% - 20%
		EG093A-T: Zinc	7440-66-6	5	µg/L	19	19	0.0	No Limit
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 3133519)									
EB1326059-108	PWA Pore Water	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	1.64	1.67	1.5	0% - 20%
EB1326366-012	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	170	169	0.9	0% - 20%
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 3134803)									
EB1326059-109	PWB Pore Water	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	1.37	1.36	0.0	0% - 20%
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 3140408)									
EB1326059-111	ELUTRIATE WATER Seawater Blank	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.05	<0.05	0.0	No Limit
EB1326764-009	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	4.24	4.22	0.6	0% - 20%
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 3129710)									
EB1326059-111	ELUTRIATE WATER Seawater Blank	EK057G: Nitrite as N	----	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 3134396)									
EB1326059-108	PWA Pore Water	EK057G: Nitrite as N	----	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 3135172)									
EB1326059-109	PWB Pore Water	EK057G: Nitrite as N	----	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EB1326467-001	Anonymous	EK057G: Nitrite as N	----	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 3133518)									
EB1326059-108	PWA Pore Water	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EB1326366-012	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 3134802)									
EB1326059-109	PWB Pore Water	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EB1326431-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.01	0.01	0.0	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 3140407)									
EB1326059-111	ELUTRIATE WATER Seawater Blank	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EB1326764-009	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.74	0.68	7.2	0% - 20%
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 3146952)									
EB1326059-108	PWA Pore Water	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	2.2	2.2	0.0	0% - 20%
EB1326660-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.3	0.3	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 3146953)									
EB1326059-108	PWA Pore Water	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.13	0.13	0.0	0% - 50%
EB1326660-001	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.05	0.04	24.8	No Limit
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 3129711)									
EB1326059-111	ELUTRIATE WATER Seawater Blank	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 3134397)									
EB1326059-108	PWA Pore Water	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	0.07	0.07	0.0	No Limit
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 3135173)									
EB1326059-109	PWB Pore Water	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	0.04	0.04	0.0	No Limit
EP208: Phenylurea Herbicides (QC Lot: 3141729)									
EB1326059-108	PWA Pore Water	EP208: Diuron	330-54-1	5.0	µg/L	<5.0	<5.0	0.0	No Limit

Method Blank (MB) and Laboratory Control Spike (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 (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EA033-A: Actual Acidity (QCLot: 3138013)								
EA033: pH KCl (23A)	----	0.1	pH Unit	----	4.50 pH Unit	95.6	70	130
EA033: Titratable Actual Acidity (23F)	----	2	mole H+ / t	<2	25.2 mole H+ / t	102	70	130
EA033: sulfidic - Titratable Actual Acidity (s-23F)	----	0.02	% pyrite S	<0.02	----	----	----	----
EA033-A: Actual Acidity (QCLot: 3138014)								
EA033: pH KCl (23A)	----	0.1	pH Unit	----	4.50 pH Unit	95.6	70	130
EA033: Titratable Actual Acidity (23F)	----	2	mole H+ / t	<2	25.2 mole H+ / t	105	70	130
EA033: sulfidic - Titratable Actual Acidity (s-23F)	----	0.02	% pyrite S	<0.02	----	----	----	----
EA033-A: Actual Acidity (QCLot: 3138015)								
EA033: pH KCl (23A)	----	0.1	pH Unit	----	4.50 pH Unit	95.6	70	130
EA033: Titratable Actual Acidity (23F)	----	2	mole H+ / t	<2	25.2 mole H+ / t	109	70	130
EA033: sulfidic - Titratable Actual Acidity (s-23F)	----	0.02	% pyrite S	<0.02	----	----	----	----
EA033-A: Actual Acidity (QCLot: 3138016)								
EA033: pH KCl (23A)	----	0.1	pH Unit	----	4.50 pH Unit	95.6	70	130
EA033: Titratable Actual Acidity (23F)	----	2	mole H+ / t	<2	25.2 mole H+ / t	112	70	130
EA033: sulfidic - Titratable Actual Acidity (s-23F)	----	0.02	% pyrite S	<0.02	----	----	----	----
EA033-A: Actual Acidity (QCLot: 3138017)								
EA033: pH KCl (23A)	----	0.1	pH Unit	----	4.50 pH Unit	95.6	70	130
EA033: Titratable Actual Acidity (23F)	----	2	mole H+ / t	<2	25.2 mole H+ / t	112	70	130
EA033: sulfidic - Titratable Actual Acidity (s-23F)	----	0.02	% pyrite S	<0.02	----	----	----	----
EA033-B: Potential Acidity (QCLot: 3138013)								
EA033: Chromium Reducible Sulfur (22B)	----	0.005	% S	<0.005	0.24 % S	95.7	70	130
EA033: acidity - Chromium Reducible Sulfur (a-22B)	----	10	mole H+ / t	<10	----	----	----	----
EA033-B: Potential Acidity (QCLot: 3138014)								
EA033: Chromium Reducible Sulfur (22B)	----	0.005	% S	<0.005	0.24 % S	96.6	70	130
EA033: acidity - Chromium Reducible Sulfur (a-22B)	----	10	mole H+ / t	<10	----	----	----	----
EA033-B: Potential Acidity (QCLot: 3138015)								
EA033: Chromium Reducible Sulfur (22B)	----	0.005	% S	<0.005	0.24 % S	96.3	70	130
EA033: acidity - Chromium Reducible Sulfur (a-22B)	----	10	mole H+ / t	<10	----	----	----	----
EA033-B: Potential Acidity (QCLot: 3138016)								
EA033: Chromium Reducible Sulfur (22B)	----	0.005	% S	<0.005	0.24 % S	98.1	70	130
EA033: acidity - Chromium Reducible Sulfur (a-22B)	----	10	mole H+ / t	<10	----	----	----	----
EA033-B: Potential Acidity (QCLot: 3138017)								
EA033: Chromium Reducible Sulfur (22B)	----	0.005	% S	<0.005	0.24 % S	96.7	70	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	Recovery Limits (%) Low	Recovery Limits (%) High
EA033-B: Potential Acidity (QCLot: 3138017) - continued								
EA033: acidity - Chromium Reducible Sulfur (a-22B)	----	10	mole H+ / t	<10	----	----	----	----
EA033-C: Acid Neutralising Capacity (QCLot: 3138013)								
EA033: Acid Neutralising Capacity (19A2)	----	0.01	% CaCO3	<0.01	10 % CaCO3	105	70	130
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	----	----	----	----
EA033-C: Acid Neutralising Capacity (QCLot: 3138014)								
EA033: Acid Neutralising Capacity (19A2)	----	0.01	% CaCO3	<0.01	10 % CaCO3	104	70	130
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	----	----	----	----
EA033-C: Acid Neutralising Capacity (QCLot: 3138015)								
EA033: Acid Neutralising Capacity (19A2)	----	0.01	% CaCO3	<0.01	10 % CaCO3	104	70	130
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	----	----	----	----
EA033-C: Acid Neutralising Capacity (QCLot: 3138016)								
EA033: Acid Neutralising Capacity (19A2)	----	0.01	% CaCO3	<0.01	10 % CaCO3	101	70	130
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	----	----	----	----
EA033-C: Acid Neutralising Capacity (QCLot: 3138017)								
EA033: Acid Neutralising Capacity (19A2)	----	0.01	% CaCO3	<0.01	10 % CaCO3	105	70	130
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	----	----	----	----
EG005-SD: Total Metals in Sediments by ICP-AES (QCLot: 3130385)								
EG005-SD: Aluminium	7429-90-5	50	mg/kg	<50	----	----	----	----
EG005-SD: Iron	7439-89-6	50	mg/kg	<50	----	----	----	----
EG005-SD: Total Metals in Sediments by ICP-AES (QCLot: 3130388)								
EG005-SD: Aluminium	7429-90-5	50	mg/kg	<50	----	----	----	----
EG005-SD: Iron	7439-89-6	50	mg/kg	<50	----	----	----	----
EG005-SD: Total Metals in Sediments by ICP-AES (QCLot: 3130391)								
EG005-SD: Aluminium	7429-90-5	50	mg/kg	<50	----	----	----	----
EG005-SD: Iron	7439-89-6	50	mg/kg	<50	----	----	----	----
EG005-SD: Total Metals in Sediments by ICP-AES (QCLot: 3130394)								
EG005-SD: Aluminium	7429-90-5	50	mg/kg	<50	----	----	----	----
EG005-SD: Iron	7439-89-6	50	mg/kg	<50	----	----	----	----
EG005-SD: Total Metals in Sediments by ICP-AES (QCLot: 3130397)								
EG005-SD: Aluminium	7429-90-5	50	mg/kg	<50	----	----	----	----
EG005-SD: Iron	7439-89-6	50	mg/kg	<50	----	----	----	----
EG005-SD: Total Metals in Sediments by ICP-AES (QCLot: 3130400)								

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low	Recovery Limits (%) High
EG005-SD: Total Metals in Sediments by ICP-AES (QCLot: 3130400) - continued								
EG005-SD: Aluminium	7429-90-5	50	mg/kg	<50	----	----	----	----
EG005-SD: Iron	7439-89-6	50	mg/kg	<50	----	----	----	----
EG005-SD: Total Metals in Sediments by ICP-AES (QCLot: 3150707)								
EG005-SD: Aluminium	7429-90-5	50	mg/kg	<50	6134 mg/kg	127	70	130
EG005-SD: Iron	7439-89-6	50	mg/kg	<50	8400 mg/kg	100	70	130
EG020-SD: Total Metals in Sediments by ICPMS (QCLot: 3130384)								
EG020-SD: Antimony	7440-36-0	0.5	mg/kg	<0.50	----	----	----	----
EG020-SD: Arsenic	7440-38-2	1.0	mg/kg	<1.00	21.7 mg/kg	110	80	126
EG020-SD: Cadmium	7440-43-9	0.1	mg/kg	<0.1	4.64 mg/kg	106	87	122
EG020-SD: Chromium	7440-47-3	1.0	mg/kg	<1.0	43.9 mg/kg	108	79	129
EG020-SD: Copper	7440-50-8	1.0	mg/kg	<1.0	32.0 mg/kg	113	80	118
EG020-SD: Cobalt	7440-48-4	0.5	mg/kg	<0.5	----	----	----	----
EG020-SD: Lead	7439-92-1	1.0	mg/kg	<1.0	40.0 mg/kg	107	81	119
EG020-SD: Manganese	7439-96-5	10	mg/kg	<10	----	----	----	----
EG020-SD: Nickel	7440-02-0	1.0	mg/kg	<1.0	55.1 mg/kg	109	77	123
EG020-SD: Selenium	7782-49-2	0.1	mg/kg	<0.1	----	----	----	----
EG020-SD: Silver	7440-22-4	0.1	mg/kg	<0.1	----	----	----	----
EG020-SD: Vanadium	7440-62-2	2	mg/kg	<2.0	----	----	----	----
EG020-SD: Zinc	7440-66-6	1.0	mg/kg	<1.0	60.8 mg/kg	104	71	127
EG020-SD: Total Metals in Sediments by ICPMS (QCLot: 3130387)								
EG020-SD: Antimony	7440-36-0	0.5	mg/kg	<0.50	----	----	----	----
EG020-SD: Arsenic	7440-38-2	1.0	mg/kg	<1.00	21.7 mg/kg	112	80	126
EG020-SD: Cadmium	7440-43-9	0.1	mg/kg	<0.1	4.64 mg/kg	110	87	122
EG020-SD: Chromium	7440-47-3	1.0	mg/kg	<1.0	43.9 mg/kg	118	79	129
EG020-SD: Copper	7440-50-8	1.0	mg/kg	<1.0	32.0 mg/kg	100	80	118
EG020-SD: Cobalt	7440-48-4	0.5	mg/kg	<0.5	----	----	----	----
EG020-SD: Lead	7439-92-1	1.0	mg/kg	<1.0	40.0 mg/kg	110	81	119
EG020-SD: Manganese	7439-96-5	10	mg/kg	<10	----	----	----	----
EG020-SD: Nickel	7440-02-0	1.0	mg/kg	<1.0	55.1 mg/kg	113	77	123
EG020-SD: Selenium	7782-49-2	0.1	mg/kg	<0.1	----	----	----	----
EG020-SD: Silver	7440-22-4	0.1	mg/kg	<0.1	----	----	----	----
EG020-SD: Vanadium	7440-62-2	2	mg/kg	<2.0	----	----	----	----
EG020-SD: Zinc	7440-66-6	1.0	mg/kg	<1.0	60.8 mg/kg	105	71	127
EG020-SD: Total Metals in Sediments by ICPMS (QCLot: 3130390)								
EG020-SD: Antimony	7440-36-0	0.5	mg/kg	<0.50	----	----	----	----
EG020-SD: Arsenic	7440-38-2	1.0	mg/kg	<1.00	21.7 mg/kg	99.3	80	126
EG020-SD: Cadmium	7440-43-9	0.1	mg/kg	<0.1	4.64 mg/kg	104	87	122
EG020-SD: Chromium	7440-47-3	1.0	mg/kg	<1.0	43.9 mg/kg	96.7	79	129

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low	Recovery Limits (%) High
EG020-SD: Total Metals in Sediments by ICPMS (QCLot: 3130390) - continued								
EG020-SD: Copper	7440-50-8	1.0	mg/kg	<1.0	32.0 mg/kg	97.1	80	118
EG020-SD: Cobalt	7440-48-4	0.5	mg/kg	<0.5	----	----	----	----
EG020-SD: Lead	7439-92-1	1.0	mg/kg	<1.0	40.0 mg/kg	104	81	119
EG020-SD: Manganese	7439-96-5	10	mg/kg	<10	----	----	----	----
EG020-SD: Nickel	7440-02-0	1.0	mg/kg	<1.0	55.1 mg/kg	108	77	123
EG020-SD: Selenium	7782-49-2	0.1	mg/kg	<0.1	----	----	----	----
EG020-SD: Silver	7440-22-4	0.1	mg/kg	<0.1	----	----	----	----
EG020-SD: Vanadium	7440-62-2	2	mg/kg	<2.0	----	----	----	----
EG020-SD: Zinc	7440-66-6	1.0	mg/kg	<1.0	60.8 mg/kg	112	71	127
EG020-SD: Total Metals in Sediments by ICPMS (QCLot: 3130393)								
EG020-SD: Antimony	7440-36-0	0.5	mg/kg	<0.50	----	----	----	----
EG020-SD: Arsenic	7440-38-2	1.0	mg/kg	<1.00	21.7 mg/kg	108	80	126
EG020-SD: Cadmium	7440-43-9	0.1	mg/kg	<0.1	4.64 mg/kg	107	87	122
EG020-SD: Chromium	7440-47-3	1.0	mg/kg	<1.0	43.9 mg/kg	108	79	129
EG020-SD: Copper	7440-50-8	1.0	mg/kg	<1.0	32.0 mg/kg	113	80	118
EG020-SD: Cobalt	7440-48-4	0.5	mg/kg	<0.5	----	----	----	----
EG020-SD: Lead	7439-92-1	1.0	mg/kg	<1.0	40.0 mg/kg	110	81	119
EG020-SD: Manganese	7439-96-5	10	mg/kg	<10	----	----	----	----
EG020-SD: Nickel	7440-02-0	1.0	mg/kg	<1.0	55.1 mg/kg	114	77	123
EG020-SD: Selenium	7782-49-2	0.1	mg/kg	<0.1	----	----	----	----
EG020-SD: Silver	7440-22-4	0.1	mg/kg	<0.1	----	----	----	----
EG020-SD: Vanadium	7440-62-2	2	mg/kg	<2.0	----	----	----	----
EG020-SD: Zinc	7440-66-6	1.0	mg/kg	<1.0	60.8 mg/kg	113	71	127
EG020-SD: Total Metals in Sediments by ICPMS (QCLot: 3130396)								
EG020-SD: Antimony	7440-36-0	0.5	mg/kg	<0.50	----	----	----	----
EG020-SD: Arsenic	7440-38-2	1.0	mg/kg	<1.00	21.7 mg/kg	111	80	126
EG020-SD: Cadmium	7440-43-9	0.1	mg/kg	<0.1	4.64 mg/kg	110	87	122
EG020-SD: Chromium	7440-47-3	1.0	mg/kg	<1.0	43.9 mg/kg	105	79	129
EG020-SD: Copper	7440-50-8	1.0	mg/kg	<1.0	32.0 mg/kg	106	80	118
EG020-SD: Cobalt	7440-48-4	0.5	mg/kg	<0.5	----	----	----	----
EG020-SD: Lead	7439-92-1	1.0	mg/kg	<1.0	40.0 mg/kg	107	81	119
EG020-SD: Manganese	7439-96-5	10	mg/kg	<10	----	----	----	----
EG020-SD: Nickel	7440-02-0	1.0	mg/kg	<1.0	55.1 mg/kg	114	77	123
EG020-SD: Selenium	7782-49-2	0.1	mg/kg	<0.1	----	----	----	----
EG020-SD: Silver	7440-22-4	0.1	mg/kg	<0.1	----	----	----	----
EG020-SD: Vanadium	7440-62-2	2	mg/kg	<2.0	----	----	----	----
EG020-SD: Zinc	7440-66-6	1.0	mg/kg	<1.0	60.8 mg/kg	114	71	127
EG020-SD: Total Metals in Sediments by ICPMS (QCLot: 3130399)								
EG020-SD: Antimony	7440-36-0	0.5	mg/kg	<0.50	----	----	----	----

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low	Recovery Limits (%) High
EG020-SD: Total Metals in Sediments by ICPMS (QCLot: 3130399) - continued								
EG020-SD: Arsenic	7440-38-2	1.0	mg/kg	<1.00	21.7 mg/kg	114	80	126
EG020-SD: Cadmium	7440-43-9	0.1	mg/kg	<0.1	4.64 mg/kg	110	87	122
EG020-SD: Chromium	7440-47-3	1.0	mg/kg	<1.0	43.9 mg/kg	104	79	129
EG020-SD: Copper	7440-50-8	1.0	mg/kg	<1.0	32.0 mg/kg	111	80	118
EG020-SD: Cobalt	7440-48-4	0.5	mg/kg	<0.5	----	----	----	----
EG020-SD: Lead	7439-92-1	1.0	mg/kg	<1.0	40.0 mg/kg	112	81	119
EG020-SD: Manganese	7439-96-5	10	mg/kg	<10	----	----	----	----
EG020-SD: Nickel	7440-02-0	1.0	mg/kg	<1.0	55.1 mg/kg	114	77	123
EG020-SD: Selenium	7782-49-2	0.1	mg/kg	<0.1	----	----	----	----
EG020-SD: Silver	7440-22-4	0.1	mg/kg	<0.1	----	----	----	----
EG020-SD: Vanadium	7440-62-2	2	mg/kg	<2.0	----	----	----	----
EG020-SD: Zinc	7440-66-6	1.0	mg/kg	<1.0	60.8 mg/kg	113	71	127
EG020-SD: Total Metals in Sediments by ICPMS (QCLot: 3150706)								
EG020-SD: Antimony	7440-36-0	0.5	mg/kg	<0.50	4.6 mg/kg	124	70	130
EG020-SD: Arsenic	7440-38-2	1.0	mg/kg	<1.00	21.7 mg/kg	107	81	139
EG020-SD: Cadmium	7440-43-9	0.1	mg/kg	<0.1	4.64 mg/kg	103	82	126
EG020-SD: Chromium	7440-47-3	1.0	mg/kg	<1.0	43.9 mg/kg	114	67	129
EG020-SD: Copper	7440-50-8	1.0	mg/kg	<1.0	32 mg/kg	114	80	136
EG020-SD: Cobalt	7440-48-4	0.5	mg/kg	----	16 mg/kg	108	76	132
		10	mg/kg	<10.0	----	----	----	----
EG020-SD: Lead	7439-92-1	1.0	mg/kg	<1.0	40 mg/kg	123	75	131
EG020-SD: Manganese	7439-96-5	10	mg/kg	<10	130 mg/kg	118	77	133
EG020-SD: Nickel	7440-02-0	1.0	mg/kg	<1.0	55 mg/kg	116	76	128
EG020-SD: Selenium	7782-49-2	0.1	mg/kg	<0.1	5.37 mg/kg	120	72	134
EG020-SD: Silver	7440-22-4	0.1	mg/kg	<0.1	----	----	----	----
EG020-SD: Vanadium	7440-62-2	2	mg/kg	<2.0	29.6 mg/kg	112	87	131
EG020-SD: Zinc	7440-66-6	1.0	mg/kg	<1.0	60.8 mg/kg	113	83	137
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3130383)								
EG035T-LL: Mercury	7439-97-6	0.01	mg/kg	<0.01	0.111 mg/kg	99.9	70	114
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3130386)								
EG035T-LL: Mercury	7439-97-6	0.01	mg/kg	<0.01	0.111 mg/kg	84.3	70	114
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3130389)								
EG035T-LL: Mercury	7439-97-6	0.01	mg/kg	<0.01	0.111 mg/kg	88.4	70	114
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3130392)								
EG035T-LL: Mercury	7439-97-6	0.01	mg/kg	<0.01	0.111 mg/kg	94.0	70	114
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3130395)								
EG035T-LL: Mercury	7439-97-6	0.01	mg/kg	<0.01	0.111 mg/kg	102	70	114
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3130398)								

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3130398) - continued								
EG035T-LL: Mercury	7439-97-6	0.01	mg/kg	<0.01	0.111 mg/kg	83.0	70	114
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3150705)								
EG035T-LL: Mercury	7439-97-6	0.01	mg/kg	<0.01	0.110 mg/kg	104	72	116
EK055: Ammonia as N (QCLot: 3134401)								
EK055-SD: Ammonia as N	7664-41-7	1	mg/kg	<1	20 mg/kg	78.6	60	118
EK055: Ammonia as N (QCLot: 3134403)								
EK055-SD: Ammonia as N	7664-41-7	1	mg/kg	<1	20 mg/kg	87.6	60	118
EK055: Ammonia as N (QCLot: 3134405)								
EK055-SD: Ammonia as N	7664-41-7	1	mg/kg	<1	20 mg/kg	86.1	60	118
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 3130372)								
EK059G: Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	<0.1	2.50 mg/kg	110	90	115
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 3130373)								
EK059G: Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	<0.1	2.50 mg/kg	110	90	115
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 3130382)								
EK059G: Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	<0.1	2.50 mg/kg	109	90	115
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 3150736)								
EK059G: Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	<0.1	2.5 mg/kg	96.6	89	115
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 3130369)								
EK061G: Total Kjeldahl Nitrogen as N	----	20	mg/kg	<20	1000 mg/kg	84.0	70	118
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 3130620)								
EK061G: Total Kjeldahl Nitrogen as N	----	20	mg/kg	<20	1000 mg/kg	82.9	70	118
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 3130622)								
EK061G: Total Kjeldahl Nitrogen as N	----	20	mg/kg	<20	1000 mg/kg	81.0	70	118
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 3149190)								
EK061G: Total Kjeldahl Nitrogen as N	----	20	mg/kg	<20	500 mg/kg	83.0	70	127
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 3130370)								
EK067G: Total Phosphorus as P	----	2	mg/kg	<2	442 mg/kg	97.4	75	117
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 3130621)								
EK067G: Total Phosphorus as P	----	2	mg/kg	<2	442 mg/kg	92.1	75	117
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 3130623)								
EK067G: Total Phosphorus as P	----	2	mg/kg	<2	442 mg/kg	91.7	75	117
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 3149191)								
EK067G: Total Phosphorus as P	----	2	mg/kg	<2	442 mg/kg	98.0	69	124
EP003: Total Organic Carbon (TOC) in Soil (QCLot: 3132149)								
EP003: Total Organic Carbon	----	0.02	%	<0.02	1.94 %	98.2	70	130
EP003: Total Organic Carbon (TOC) in Soil (QCLot: 3132150)								

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low	Recovery Limits (%) High
EP003: Total Organic Carbon (TOC) in Soil (QCLot: 3132150) - continued								
EP003: Total Organic Carbon	----	0.02	%	<0.02	0.44 %	101	70	130
EP003: Total Organic Carbon (TOC) in Soil (QCLot: 3132151)								
EP003: Total Organic Carbon	----	0.02	%	<0.02	1.94 %	97.8	70	130
EP003: Total Organic Carbon (TOC) in Soil (QCLot: 3132152)								
EP003: Total Organic Carbon	----	0.02	%	<0.02	1.94 %	102	70	130
EP003: Total Organic Carbon (TOC) in Soil (QCLot: 3132153)								
EP003: Total Organic Carbon	----	0.02	%	<0.02	1.94 %	102	70	130
EP003: Total Organic Carbon (TOC) in Soil (QCLot: 3132155)								
EP003: Total Organic Carbon	----	0.02	%	<0.02	0.11 %	103	70	130
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons (QCLot: 3133345)								
EP071-SD: C10 - C14 Fraction	----	3	mg/kg	<3	5 mg/kg	94.0	78	118
EP071-SD: C15 - C28 Fraction	----	3	mg/kg	<3	7.5 mg/kg	104	84	118
EP071-SD: C29 - C36 Fraction	----	5	mg/kg	<5	5 mg/kg	96.0	73	119
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons (QCLot: 3133347)								
EP071-SD: C10 - C14 Fraction	----	3	mg/kg	<3	5 mg/kg	96.0	78	118
EP071-SD: C15 - C28 Fraction	----	3	mg/kg	<3	7.5 mg/kg	102	84	118
EP071-SD: C29 - C36 Fraction	----	5	mg/kg	<5	5 mg/kg	90.0	73	119
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons (QCLot: 3134489)								
EP080-SD: C6 - C9 Fraction	----	3	mg/kg	<3	6.2 mg/kg	84.6	61	133
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons (QCLot: 3134495)								
EP080-SD: C6 - C9 Fraction	----	3	mg/kg	<3	6.2 mg/kg	91.2	61	133
EP080-SD: BTEXN (QCLot: 3134489)								
EP080-SD: Benzene	71-43-2	0.2	mg/kg	<0.2	0.2 mg/kg	108	66	122
EP080-SD: Toluene	108-88-3	0.2	mg/kg	<0.2	0.2 mg/kg	108	69	122
EP080-SD: Ethylbenzene	100-41-4	0.2	mg/kg	<0.2	0.2 mg/kg	111	66	126
EP080-SD: meta- & para-Xylene	108-38-3 106-42-3	0.2	mg/kg	<0.2	0.4 mg/kg	112	59	129
EP080-SD: ortho-Xylene	95-47-6	0.2	mg/kg	<0.2	0.2 mg/kg	110	66	126
EP080-SD: BTEXN (QCLot: 3134495)								
EP080-SD: Benzene	71-43-2	0.2	mg/kg	<0.2	0.2 mg/kg	113	66	122
EP080-SD: Toluene	108-88-3	0.2	mg/kg	<0.2	0.2 mg/kg	115	69	122
EP080-SD: Ethylbenzene	100-41-4	0.2	mg/kg	<0.2	0.2 mg/kg	116	66	126
EP080-SD: meta- & para-Xylene	108-38-3 106-42-3	0.2	mg/kg	<0.2	0.4 mg/kg	116	59	129
EP080-SD: ortho-Xylene	95-47-6	0.2	mg/kg	<0.2	0.2 mg/kg	119	66	126
EP090: Organotin Compounds (QCLot: 3130266)								
EP090: Monobutyltin	78763-54-9	1.0	µgSn/kg	<1	1.25 µgSn/kg	115	36	118

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low	Recovery Limits (%) High
EP090: Organotin Compounds (QCLot: 3130266) - continued								
EP090: Dibutyltin	1002-53-5	1.0	µgSn/kg	<1	1.25 µgSn/kg	91.1	47	123
EP090: Tributyltin	56573-85-4	0.5	µgSn/kg	<0.5	1.25 µgSn/kg	106	52	134
EP090: Organotin Compounds (QCLot: 3130267)								
EP090: Monobutyltin	78763-54-9	1.0	µgSn/kg	<1	1.25 µgSn/kg	47.0	36	118
EP090: Dibutyltin	1002-53-5	1.0	µgSn/kg	<1	1.25 µgSn/kg	69.0	47	123
EP090: Tributyltin	56573-85-4	0.5	µgSn/kg	<0.5	1.25 µgSn/kg	96.2	52	134
EP090: Organotin Compounds (QCLot: 3130271)								
EP090: Monobutyltin	78763-54-9	1.0	µgSn/kg	<1	1.25 µgSn/kg	104	36	118
EP090: Dibutyltin	1002-53-5	1.0	µgSn/kg	<1	1.25 µgSn/kg	98.9	47	123
EP090: Tributyltin	56573-85-4	0.5	µgSn/kg	<0.5	1.25 µgSn/kg	97.0	52	134
EP090: Organotin Compounds (QCLot: 3130275)								
EP090: Monobutyltin	78763-54-9	1.0	µgSn/kg	<1	1.25 µgSn/kg	104	36	118
EP090: Dibutyltin	1002-53-5	1.0	µgSn/kg	<1	1.25 µgSn/kg	92.1	47	123
EP090: Tributyltin	56573-85-4	0.5	µgSn/kg	<0.5	1.25 µgSn/kg	118	52	134
EP090: Organotin Compounds (QCLot: 3130279)								
EP090: Monobutyltin	78763-54-9	1.0	µgSn/kg	<1	1.25 µgSn/kg	110	36	118
EP090: Dibutyltin	1002-53-5	1.0	µgSn/kg	<1	1.25 µgSn/kg	109	47	123
EP090: Tributyltin	56573-85-4	0.5	µgSn/kg	<0.5	1.25 µgSn/kg	126	52	134
EP090: Organotin Compounds (QCLot: 3130282)								
EP090: Monobutyltin	78763-54-9	1.0	µgSn/kg	<1	1.25 µgSn/kg	113	36	118
EP090: Dibutyltin	1002-53-5	1.0	µgSn/kg	<1	1.25 µgSn/kg	107	47	123
EP090: Tributyltin	56573-85-4	0.5	µgSn/kg	<0.5	1.25 µgSn/kg	123	52	134
EP090: Organotin Compounds (QCLot: 3142809)								
EP090: Monobutyltin	78763-54-9	1.0	µgSn/kg	<1	1.25 µgSn/kg	103	36	118
EP090: Dibutyltin	1002-53-5	1.0	µgSn/kg	<1	1.25 µgSn/kg	101	47	123
EP090: Tributyltin	56573-85-4	0.5	µgSn/kg	<0.5	1.25 µgSn/kg	119	52	134
EP130A: Organophosphorus Pesticides (Ultra-trace) (QCLot: 3133326)								
EP130: Bromophos-ethyl	4824-78-6	10	µg/kg	<10	50 µg/kg	76.3	45	139
EP130: Carbophenothion	786-19-6	10	µg/kg	<10	50 µg/kg	71.5	47	117
EP130: Chlorfenvinphos (E)	18708-86-6	10	µg/kg	<10.0	5 µg/kg	104	48	156
EP130: Chlorfenvinphos (Z)	18708-87-7	10	µg/kg	<10	50 µg/kg	105	62	136
EP130: Chlorpyrifos	2921-88-2	10	µg/kg	<10	50 µg/kg	99.2	57	137
EP130: Chlorpyrifos-methyl	5598-13-0	10	µg/kg	<10	50 µg/kg	72.2	57	121
EP130: Demeton-S-methyl	919-86-8	10	µg/kg	<10	50 µg/kg	74.9	20.4	142
EP130: Diazinon	333-41-5	10	µg/kg	<10	50 µg/kg	82.5	57	121
EP130: Dichlorvos	62-73-7	10	µg/kg	<10	50 µg/kg	98.8	47	115
EP130: Dimethoate	60-51-5	10	µg/kg	<10	50 µg/kg	119	55	133
EP130: Ethion	563-12-2	10	µg/kg	<10	50 µg/kg	88.6	54	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	Recovery Limits (%): Low	Recovery Limits (%): High
EP130A: Organophosphorus Pesticides (Ultra-trace) (QCLot: 3133326) - continued								
EP130: Fenamiphos	22224-92-6	10	µg/kg	<10	50 µg/kg	86.4	57	131
EP130: Fenthion	55-38-9	10	µg/kg	<10	50 µg/kg	92.1	38	130
EP130: Malathion	121-75-5	10	µg/kg	<10	50 µg/kg	110	62	138
EP130: Azinphos Methyl	86-50-0	10	µg/kg	<10	50 µg/kg	73.4	33	137
EP130: Monocrotophos	6923-22-4	10	µg/kg	<10	50 µg/kg	107	50	148
EP130: Parathion	56-38-2	10	µg/kg	<10	50 µg/kg	109	64	140
EP130: Parathion-methyl	298-00-0	10	µg/kg	<10	50 µg/kg	109	56	136
EP130: Pirimphos-ethyl	23505-41-1	10	µg/kg	<10	50 µg/kg	82.3	50	132
EP130: Prothiofos	34643-46-4	10	µg/kg	<10	50 µg/kg	86.5	55	135
EP130A: Organophosphorus Pesticides (Ultra-trace) (QCLot: 3133354)								
EP130: Bromophos-ethyl	4824-78-6	10	µg/kg	<10	50 µg/kg	70.1	45	139
EP130: Carbophenothion	786-19-6	10	µg/kg	<10	50 µg/kg	73.6	47	117
EP130: Chlorfenvinphos (E)	18708-86-6	10	µg/kg	<10.0	5 µg/kg	95.9	48	156
EP130: Chlorfenvinphos (Z)	18708-87-7	10	µg/kg	<10	50 µg/kg	98.2	62	136
EP130: Chlorpyrifos	2921-88-2	10	µg/kg	<10	50 µg/kg	97.7	57	137
EP130: Chlorpyrifos-methyl	5598-13-0	10	µg/kg	<10	50 µg/kg	79.2	57	121
EP130: Demeton-S-methyl	919-86-8	10	µg/kg	<10	50 µg/kg	107	20.4	142
EP130: Diazinon	333-41-5	10	µg/kg	<10	50 µg/kg	83.9	57	121
EP130: Dichlorvos	62-73-7	10	µg/kg	<10	50 µg/kg	94.8	47	115
EP130: Dimethoate	60-51-5	10	µg/kg	<10	50 µg/kg	110	55	133
EP130: Ethion	563-12-2	10	µg/kg	<10	50 µg/kg	84.4	54	130
EP130: Fenamiphos	22224-92-6	10	µg/kg	<10	50 µg/kg	78.9	57	131
EP130: Fenthion	55-38-9	10	µg/kg	<10	50 µg/kg	88.6	38	130
EP130: Malathion	121-75-5	10	µg/kg	<10	50 µg/kg	106	62	138
EP130: Azinphos Methyl	86-50-0	10	µg/kg	<10	50 µg/kg	77.0	33	137
EP130: Monocrotophos	6923-22-4	10	µg/kg	<10	50 µg/kg	120	50	148
EP130: Parathion	56-38-2	10	µg/kg	<10	50 µg/kg	107	64	140
EP130: Parathion-methyl	298-00-0	10	µg/kg	<10	50 µg/kg	108	56	136
EP130: Pirimphos-ethyl	23505-41-1	10	µg/kg	<10	50 µg/kg	78.0	50	132
EP130: Prothiofos	34643-46-4	10	µg/kg	<10	50 µg/kg	81.6	55	135
EP131A: Organochlorine Pesticides (QCLot: 3133327)								
EP131A: Aldrin	309-00-2	0.5	µg/kg	<0.50	5 µg/kg	126	38	150
EP131A: alpha-BHC	319-84-6	0.5	µg/kg	<0.50	5 µg/kg	92.0	17.6	156
EP131A: beta-BHC	319-85-7	0.5	µg/kg	<0.50	5 µg/kg	56.2	30.5	152
EP131A: delta-BHC	319-86-8	0.5	µg/kg	<0.50	5 µg/kg	98.4	37	151
EP131A: 4.4`-DDD	72-54-8	0.5	µg/kg	<0.50	5 µg/kg	96.9	25.9	150
EP131A: 4.4`-DDE	72-55-9	0.5	µg/kg	<0.50	5 µg/kg	84.5	35	129
EP131A: 4.4`-DDT	50-29-3	0.5	µg/kg	<0.50	5 µg/kg	83.8	23.4	163
EP131A: Sum of DDD + DDE + DDT	----	0.5	µg/kg	<0.50	----	----	----	----

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low	Recovery Limits (%) High
EP131A: Organochlorine Pesticides (QCLot: 3133327) - continued								
EP131A: Dieldrin	60-57-1	0.5	µg/kg	<0.50	5 µg/kg	84.7	30.2	140
EP131A: alpha-Endosulfan	959-98-8	0.5	µg/kg	<0.50	5 µg/kg	85.1	38	140
EP131A: beta-Endosulfan	33213-65-9	0.5	µg/kg	<0.50	5 µg/kg	83.6	32	152
EP131A: Endosulfan sulfate	1031-07-8	0.5	µg/kg	<0.50	5 µg/kg	87.6	36	162
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	77.6	25.8	166
EP131A: Endrin aldehyde	7421-93-4	0.5	µg/kg	<0.50	5 µg/kg	81.1	20.1	116
EP131A: Endrin ketone	53494-70-5	0.5	µg/kg	<0.50	5 µg/kg	74.2	13.4	151
EP131A: Heptachlor	76-44-8	0.5	µg/kg	<0.50	5 µg/kg	110	39	173
EP131A: Heptachlor epoxide	1024-57-3	0.5	µg/kg	<0.50	5 µg/kg	93.5	34	148
EP131A: Hexachlorobenzene (HCB)	118-74-1	0.5	µg/kg	<0.50	5 µg/kg	87.0	26.1	152
EP131A: gamma-BHC	58-89-9	0.5	µg/kg	<0.50	5 µg/kg	87.0	31.2	159
EP131A: Methoxychlor	72-43-5	0.5	µg/kg	<0.50	5 µg/kg	86.3	36	160
EP131A: cis-Chlordane	5103-71-9	0.5	µg/kg	<0.50	5 µg/kg	88.4	36	142
EP131A: trans-Chlordane	5103-74-2	0.5	µg/kg	<0.50	5 µg/kg	94.7	29.5	138
EP131A: Total Chlordane (sum)	----	0.5	µg/kg	<0.50	----	----	----	----
EP131A: Organochlorine Pesticides (QCLot: 3133355)								
EP131A: Aldrin	309-00-2	0.5	µg/kg	<0.50	5 µg/kg	118	38	150
EP131A: alpha-BHC	319-84-6	0.5	µg/kg	<0.50	5 µg/kg	96.6	17.6	156
EP131A: beta-BHC	319-85-7	0.5	µg/kg	<0.50	5 µg/kg	61.5	30.5	152
EP131A: delta-BHC	319-86-8	0.5	µg/kg	<0.50	5 µg/kg	101	37	151
EP131A: 4.4`-DDD	72-54-8	0.5	µg/kg	<0.50	5 µg/kg	111	25.9	150
EP131A: 4.4`-DDE	72-55-9	0.5	µg/kg	<0.50	5 µg/kg	88.0	35	129
EP131A: 4.4`-DDT	50-29-3	0.5	µg/kg	<0.50	5 µg/kg	139	23.4	163
EP131A: Sum of DDD + DDE + DDT	----	0.5	µg/kg	<0.50	----	----	----	----
EP131A: Dieldrin	60-57-1	0.5	µg/kg	<0.50	5 µg/kg	73.7	30.2	140
EP131A: alpha-Endosulfan	959-98-8	0.5	µg/kg	<0.50	5 µg/kg	88.0	38	140
EP131A: beta-Endosulfan	33213-65-9	0.5	µg/kg	<0.50	5 µg/kg	90.7	32	152
EP131A: Endosulfan sulfate	1031-07-8	0.5	µg/kg	<0.50	5 µg/kg	87.7	36	162
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	117	25.8	166
EP131A: Endrin aldehyde	7421-93-4	0.5	µg/kg	<0.50	5 µg/kg	60.0	20.1	116
EP131A: Endrin ketone	53494-70-5	0.5	µg/kg	<0.50	5 µg/kg	92.0	13.4	151
EP131A: Heptachlor	76-44-8	0.5	µg/kg	<0.50	5 µg/kg	128	39	173
EP131A: Heptachlor epoxide	1024-57-3	0.5	µg/kg	<0.50	5 µg/kg	99.2	34	148
EP131A: Hexachlorobenzene (HCB)	118-74-1	0.5	µg/kg	<0.50	5 µg/kg	88.0	26.1	152
EP131A: gamma-BHC	58-89-9	0.5	µg/kg	<0.50	5 µg/kg	101	31.2	159
EP131A: Methoxychlor	72-43-5	0.5	µg/kg	<0.50	5 µg/kg	134	36	160
EP131A: cis-Chlordane	5103-71-9	0.5	µg/kg	<0.50	5 µg/kg	84.1	36	142

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low	Recovery Limits (%) High
EP131A: Organochlorine Pesticides (QCLot: 3133355) - continued								
EP131A: trans-Chlordane	5103-74-2	0.5	µg/kg	<0.50	5 µg/kg	100	29.5	138
EP131A: Total Chlordane (sum)	----	0.5	µg/kg	<0.50	----	----	----	----
EP132B: Polynuclear Aromatic Hydrocarbons (QCLot: 3133344)								
EP132B-SD: Naphthalene	91-20-3	5	µg/kg	<5	25 µg/kg	88.4	67	133
EP132B-SD: 2-Methylnaphthalene	91-57-6	5	µg/kg	<5	25 µg/kg	105	63	135
EP132B-SD: Acenaphthylene	208-96-8	4	µg/kg	<4	25 µg/kg	104	68	132
EP132B-SD: Acenaphthene	83-32-9	4	µg/kg	<4	25 µg/kg	104	67	133
EP132B-SD: Fluorene	86-73-7	4	µg/kg	<4	25 µg/kg	114	69	131
EP132B-SD: Phenanthrene	85-01-8	4	µg/kg	<4	25 µg/kg	121	66	138
EP132B-SD: Anthracene	120-12-7	4	µg/kg	<4	25 µg/kg	122	67	133
EP132B-SD: Fluoranthene	206-44-0	4	µg/kg	<4	25 µg/kg	112	64	130
EP132B-SD: Pyrene	129-00-0	4	µg/kg	<4	25 µg/kg	120	67	133
EP132B-SD: Benz(a)anthracene	56-55-3	4	µg/kg	<4	25 µg/kg	113	65	133
EP132B-SD: Chrysene	218-01-9	4	µg/kg	<4	25 µg/kg	117	70	134
EP132B-SD: Benzo(b)fluoranthene	205-99-2	4	µg/kg	<4	25 µg/kg	88.3	63	133
EP132B-SD: Benzo(k)fluoranthene	207-08-9	4	µg/kg	<4	25 µg/kg	118	67	133
EP132B-SD: Benzo(e)pyrene	192-97-2	4	µg/kg	<4	25 µg/kg	96.9	64	130
EP132B-SD: Benzo(a)pyrene	50-32-8	4	µg/kg	<4	25 µg/kg	99.4	72	130
EP132B-SD: Perylene	198-55-0	4	µg/kg	<4	25 µg/kg	103	70	132
EP132B-SD: Benzo(g.h.i)perylene	191-24-2	4	µg/kg	<4	25 µg/kg	103	65	127
EP132B-SD: Dibenz(a.h)anthracene	53-70-3	4	µg/kg	<4	25 µg/kg	99.5	67	135
EP132B-SD: Indeno(1.2.3.cd)pyrene	193-39-5	4	µg/kg	<4	25 µg/kg	95.4	62	126
EP132B-SD: Coronene	191-07-1	5	µg/kg	<5	25 µg/kg	82.6	66	134
EP132B-SD: Sum of PAHs	----	4	µg/kg	<4	----	----	----	----
EP132B: Polynuclear Aromatic Hydrocarbons (QCLot: 3133346)								
EP132B-SD: Naphthalene	91-20-3	5	µg/kg	<5	25 µg/kg	103	67	133
EP132B-SD: 2-Methylnaphthalene	91-57-6	5	µg/kg	<5	25 µg/kg	107	63	135
EP132B-SD: Acenaphthylene	208-96-8	4	µg/kg	<4	25 µg/kg	110	68	132
EP132B-SD: Acenaphthene	83-32-9	4	µg/kg	<4	25 µg/kg	111	67	133
EP132B-SD: Fluorene	86-73-7	4	µg/kg	<4	25 µg/kg	103	69	131
EP132B-SD: Phenanthrene	85-01-8	4	µg/kg	<4	25 µg/kg	114	66	138
EP132B-SD: Anthracene	120-12-7	4	µg/kg	<4	25 µg/kg	114	67	133
EP132B-SD: Fluoranthene	206-44-0	4	µg/kg	<4	25 µg/kg	107	64	130
EP132B-SD: Pyrene	129-00-0	4	µg/kg	<4	25 µg/kg	115	67	133
EP132B-SD: Benz(a)anthracene	56-55-3	4	µg/kg	<4	25 µg/kg	113	65	133
EP132B-SD: Chrysene	218-01-9	4	µg/kg	<4	25 µg/kg	118	70	134
EP132B-SD: Benzo(b)fluoranthene	205-99-2	4	µg/kg	<4	25 µg/kg	111	63	133
EP132B-SD: Benzo(k)fluoranthene	207-08-9	4	µg/kg	<4	25 µg/kg	113	67	133
EP132B-SD: Benzo(e)pyrene	192-97-2	4	µg/kg	<4	25 µg/kg	112	64	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	Recovery Limits (%) Low	Recovery Limits (%) High
EP132B: Polynuclear Aromatic Hydrocarbons (QCLot: 3133346) - continued								
EP132B-SD: Benzo(a)pyrene	50-32-8	4	µg/kg	<4	25 µg/kg	113	72	130
EP132B-SD: Perylene	198-55-0	4	µg/kg	<4	25 µg/kg	124	70	132
EP132B-SD: Benzo(g.h.i)perylene	191-24-2	4	µg/kg	<4	25 µg/kg	122	65	127
EP132B-SD: Dibenz(a.h)anthracene	53-70-3	4	µg/kg	<4	25 µg/kg	117	67	135
EP132B-SD: Indeno(1.2.3.cd)pyrene	193-39-5	4	µg/kg	<4	25 µg/kg	112	62	126
EP132B-SD: Coronene	191-07-1	5	µg/kg	<5	25 µg/kg	97.0	66	134
EP132B-SD: Sum of PAHs	----	4	µg/kg	<4	----	----	----	----
EP231: Perfluorinated Compounds (QCLot: 3132898)								
EP231: PFOS	1763-23-1	0.0005	mg/kg	<0.0005	0.0025 mg/kg	90.4	54	146
EP231: PFOA	335-67-1	0.0005	mg/kg	<0.0005	0.0025 mg/kg	87.2	54	134
EP231: 6:2 Fluorotelomer Sulfonate (6:2 FtS)	27619-97-2	0.005	mg/kg	<0.005	0.0125 mg/kg	92.2	56	138
EP231: Perfluorinated Compounds (QCLot: 3132899)								
EP231-PFC: 8:2 FtS	39108-34-4	0.001	mg/kg	<0.001	0.0125 mg/kg	124	60	130
EP231-PFC: PFOSA	754-91-6	0.0002	mg/kg	<0.0002	0.0025 mg/kg	109	60	130
EP231-PFC: N-Me-FOSA	31506-32-8	0.001	mg/kg	<0.001	0.0125 mg/kg	129	60	130
EP231-PFC: N-Et-FOSA	4151-50-2	0.001	mg/kg	<0.001	0.0125 mg/kg	71.0	60	130
EP231-PFC: N-Me-FOSE	2448-09-7	0.001	mg/kg	<0.001	0.0125 mg/kg	124	60	130
EP231-PFC: N-Et-FOSE	1691-99-2	0.001	mg/kg	<0.001	0.0125 mg/kg	106	60	130
EP231-PFC: PFBS	375-73-5	0.0002	mg/kg	<0.0002	0.0025 mg/kg	92.8	60	130
EP231-PFC: PFHxS	3871-99-6	0.0002	mg/kg	<0.0002	0.0025 mg/kg	88.0	60	130
EP231-PFC: PFDcS	67906-42-7	0.0002	mg/kg	<0.0002	0.0025 mg/kg	108	60	130
EP231-PFC: PFHxA	307-24-4	0.0002	mg/kg	<0.0002	0.0025 mg/kg	78.7	60	130
EP231-PFC: PFHpA	375-85-9	0.0002	mg/kg	<0.0002	0.0025 mg/kg	82.4	60	130
EP231-PFC: PFNA	375-95-1	0.0002	mg/kg	<0.0002	0.0025 mg/kg	99.2	60	130
EP231-PFC: PFDcA	335-76-2	0.0002	mg/kg	<0.0002	0.0025 mg/kg	74.4	60	130
EP231-PFC: PFUnA	2058-94-8	0.0002	mg/kg	<0.0002	0.0025 mg/kg	128	60	130
EP231-PFC: PFDoA	307-55-1	0.0002	mg/kg	<0.0002	0.0025 mg/kg	112	60	130
EP231-PFC: PFTriA	72629-94-8	0.0002	mg/kg	<0.0002	0.0025 mg/kg	69.8	60	130
EP231-PFC: PFTeA	376-06-7	0.001	mg/kg	<0.001	0.0125 mg/kg	74.6	60	130
EP231: Perfluorinated Compounds (QCLot: 3132902)								
EP231: PFOS	1763-23-1	0.0005	mg/kg	<0.0005	0.0025 mg/kg	100	54	146
EP231: PFOA	335-67-1	0.0005	mg/kg	<0.0005	0.0025 mg/kg	70.8	54	134
EP231: 6:2 Fluorotelomer Sulfonate (6:2 FtS)	27619-97-2	0.005	mg/kg	<0.005	0.0125 mg/kg	71.9	56	138
EP231: Perfluorinated Compounds (QCLot: 3132903)								
EP231-PFC: 8:2 FtS	39108-34-4	0.001	mg/kg	<0.001	0.0125 mg/kg	96.0	60	130
EP231-PFC: PFOSA	754-91-6	0.0002	mg/kg	<0.0002	0.0025 mg/kg	100	60	130
EP231-PFC: N-Me-FOSA	31506-32-8	0.001	mg/kg	<0.001	0.0125 mg/kg	122	60	130
EP231-PFC: N-Et-FOSA	4151-50-2	0.001	mg/kg	<0.001	0.0125 mg/kg	70.9	60	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	Recovery Limits (%) Low	Recovery Limits (%) High
EP231: Perfluorinated Compounds (QCLot: 3132903) - continued								
EP231-PFC: N-Me-FOSE	2448-09-7	0.001	mg/kg	<0.001	0.0125 mg/kg	126	60	130
EP231-PFC: N-Et-FOSE	1691-99-2	0.001	mg/kg	<0.001	0.0125 mg/kg	102	60	130
EP231-PFC: PFBS	375-73-5	0.0002	mg/kg	<0.0002	0.0025 mg/kg	103	60	130
EP231-PFC: PFHxS	3871-99-6	0.0002	mg/kg	<0.0002	0.0025 mg/kg	92.4	60	130
EP231-PFC: PFDcS	67906-42-7	0.0002	mg/kg	<0.0002	0.0025 mg/kg	106	60	130
EP231-PFC: PFHxA	307-24-4	0.0002	mg/kg	<0.0002	0.0025 mg/kg	95.6	60	130
EP231-PFC: PFHpA	375-85-9	0.0002	mg/kg	<0.0002	0.0025 mg/kg	98.0	60	130
EP231-PFC: PFNA	375-95-1	0.0002	mg/kg	<0.0002	0.0025 mg/kg	108	60	130
EP231-PFC: PFDcA	335-76-2	0.0002	mg/kg	<0.0002	0.0025 mg/kg	70.0	60	130
EP231-PFC: PFUnA	2058-94-8	0.0002	mg/kg	<0.0002	0.0025 mg/kg	78.0	60	130
EP231-PFC: PFDoA	307-55-1	0.0002	mg/kg	<0.0002	0.0025 mg/kg	111	60	130
EP231-PFC: PFTriA	72629-94-8	0.0002	mg/kg	<0.0002	0.0025 mg/kg	72.8	60	130
EP231-PFC: PFTeA	376-06-7	0.001	mg/kg	<0.001	0.0125 mg/kg	61.4	60	130

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low	Recovery Limits (%) High
EG035F: Dissolved Mercury by FIMS (QCLot: 3156655)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.010 mg/L	98.9	84	118
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3157861)								
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.0100 mg/L	99.2	83	119
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS (QCLot: 3157841)								
EG093A-F: Aluminium	7429-90-5	5	µg/L	<5	50 µg/L	100	85	118
EG093A-F: Antimony	7440-36-0	0.5	µg/L	<0.5	10 µg/L	89.8	87	115
EG093A-F: Arsenic	7440-38-2	0.5	µg/L	<0.5	10 µg/L	93.7	87	116
EG093A-F: Cadmium	7440-43-9	0.2	µg/L	<0.2	10 µg/L	95.6	88	114
EG093A-F: Chromium	7440-47-3	0.5	µg/L	<0.5	10 µg/L	92.9	86	115
EG093A-F: Copper	7440-50-8	1	µg/L	<1	20 µg/L	98.2	89	116
EG093A-F: Lead	7439-92-1	0.2	µg/L	<0.2	10 µg/L	97.6	86	117
EG093A-F: Nickel	7440-02-0	0.5	µg/L	<0.5	10 µg/L	98.5	87	117
EG093A-F: Silver	7440-22-4	0.1	µg/L	<0.1	10 µg/L	93.6	70	127
EG093A-F: Zinc	7440-66-6	5	µg/L	<5	20 µg/L	95.7	81	120
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS (QCLot: 3160736)								
EG093A-F: Aluminium	7429-90-5	5	µg/L	<5	50 µg/L	103	85	118
EG093A-F: Antimony	7440-36-0	0.5	µg/L	<0.5	10 µg/L	96.0	87	115
EG093A-F: Arsenic	7440-38-2	0.5	µg/L	<0.5	10 µg/L	98.8	87	116
EG093A-F: Cadmium	7440-43-9	0.2	µg/L	<0.2	10 µg/L	99.4	88	114
EG093A-F: Chromium	7440-47-3	0.5	µg/L	<0.5	10 µg/L	92.8	86	115
EG093A-F: Copper	7440-50-8	1	µg/L	<1	20 µg/L	103	89	116

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS (QCLot: 3160736) - continued								
EG093A-F: Lead	7439-92-1	0.2	µg/L	<0.2	10 µg/L	104	86	117
EG093A-F: Nickel	7440-02-0	0.5	µg/L	<0.5	10 µg/L	97.5	87	117
EG093A-F: Silver	7440-22-4	0.1	µg/L	<0.1	10 µg/L	103	70	127
EG093A-F: Zinc	7440-66-6	5	µg/L	<5	20 µg/L	98.0	81	120
EG093T: Total Metals in Saline Water by ORC-ICPMS (QCLot: 3157847)								
EG093A-T: Aluminium	7429-90-5	5	µg/L	<5	50 µg/L	98.2	85	125
EG093A-T: Antimony	7440-36-0	0.5	µg/L	<0.5	10 µg/L	86.2	82	116
EG093A-T: Arsenic	7440-38-2	0.5	µg/L	<0.5	10 µg/L	89.4	86	117
EG093A-T: Cadmium	7440-43-9	0.2	µg/L	<0.2	10 µg/L	86.1	84	115
EG093A-T: Chromium	7440-47-3	0.5	µg/L	<0.5	10 µg/L	96.3	92	120
EG093A-T: Copper	7440-50-8	1	µg/L	<1	20 µg/L	97.8	93	119
EG093A-T: Lead	7439-92-1	0.2	µg/L	<0.2	10 µg/L	96.7	89	120
EG093A-T: Nickel	7440-02-0	0.5	µg/L	<0.5	10 µg/L	97.1	90	120
EG093A-T: Silver	7440-22-4	0.1	µg/L	<0.1	10 µg/L	83.4	71	127
EG093A-T: Zinc	7440-66-6	5	µg/L	<5	20 µg/L	122	81	124
EG093T: Total Metals in Saline Water by ORC-ICPMS (QCLot: 3158866)								
EG093A-T: Aluminium	7429-90-5	5	µg/L	<5	50 µg/L	95.7	85	125
EG093A-T: Antimony	7440-36-0	0.5	µg/L	<0.5	10 µg/L	84.4	82	116
EG093A-T: Arsenic	7440-38-2	0.5	µg/L	<0.5	10 µg/L	93.3	86	117
EG093A-T: Cadmium	7440-43-9	0.2	µg/L	<0.2	10 µg/L	88.6	84	115
EG093A-T: Chromium	7440-47-3	0.5	µg/L	<0.5	10 µg/L	92.1	92	120
EG093A-T: Copper	7440-50-8	1	µg/L	<1	20 µg/L	99.0	93	119
EG093A-T: Lead	7439-92-1	0.2	µg/L	<0.2	10 µg/L	89.8	89	120
EG093A-T: Nickel	7440-02-0	0.5	µg/L	<0.5	10 µg/L	93.9	90	120
EG093A-T: Silver	7440-22-4	0.1	µg/L	<0.1	10 µg/L	94.0	71	127
EG093A-T: Zinc	7440-66-6	5	µg/L	<5	20 µg/L	93.4	81	124
EG093T: Total Metals in Saline Water by ORC-ICPMS (QCLot: 3160738)								
EG093A-T: Aluminium	7429-90-5	5	µg/L	<5	50 µg/L	100	85	125
EG093A-T: Antimony	7440-36-0	0.5	µg/L	<0.5	10 µg/L	88.6	82	116
EG093A-T: Arsenic	7440-38-2	0.5	µg/L	<0.5	10 µg/L	98.0	86	117
EG093A-T: Cadmium	7440-43-9	0.2	µg/L	<0.2	10 µg/L	93.0	84	115
EG093A-T: Chromium	7440-47-3	0.5	µg/L	<0.5	10 µg/L	95.9	92	120
EG093A-T: Copper	7440-50-8	1	µg/L	<1	20 µg/L	94.9	93	119
EG093A-T: Lead	7439-92-1	0.2	µg/L	<0.2	10 µg/L	94.3	89	120
EG093A-T: Nickel	7440-02-0	0.5	µg/L	<0.5	10 µg/L	93.6	90	120
EG093A-T: Silver	7440-22-4	0.1	µg/L	<0.1	10 µg/L	98.7	71	127
EG093A-T: Zinc	7440-66-6	5	µg/L	<5	20 µg/L	98.1	81	124
EK055G: Ammonia as N by Discrete Analyser (QCLot: 3133519)								

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low	Recovery Limits (%) High
EK055G: Ammonia as N by Discrete Analyser (QCLot: 3133519) - continued								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	1.0 mg/L	102	84	116
EK055G: Ammonia as N by Discrete Analyser (QCLot: 3134803)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	1.0 mg/L	100	84	116
EK055G: Ammonia as N by Discrete Analyser (QCLot: 3140408)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	1.0 mg/L	88.7	84	116
EK057G: Nitrite as N by Discrete Analyser (QCLot: 3129710)								
EK057G: Nitrite as N	----	0.01	mg/L	<0.01	0.5 mg/L	103	83	111
EK057G: Nitrite as N by Discrete Analyser (QCLot: 3134396)								
EK057G: Nitrite as N	----	0.01	mg/L	<0.01	0.5 mg/L	101	83	111
EK057G: Nitrite as N by Discrete Analyser (QCLot: 3135172)								
EK057G: Nitrite as N	----	0.01	mg/L	<0.01	0.5 mg/L	104	83	111
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 3133518)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	101	89	115
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 3134802)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	102	89	115
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 3140407)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	104	89	115
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 3146952)								
EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	10.0 mg/L	91.2	70	113
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 3146953)								
EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	4.42 mg/L	97.9	77	117
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 3129711)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	103	88	115
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 3134397)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	110	88	115
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 3135173)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	109	88	115
EP090: Organotin Compounds (Soluble) (QCLot: 3130139)								
EP090S: Tributyltin	56573-85-4	2	ngSn/L	<2	147 ngSn/L	71.8	24.1	115
EP090: Organotin Compounds (Soluble) (QCLot: 3134705)								
EP090S: Tributyltin	56573-85-4	2	ngSn/L	<2	147 ngSn/L	75.3	24.1	115
EP208: Phenylurea Herbicides (QCLot: 3141729)								
EP208: Diuron	330-54-1	5	µg/L	<5.0	5 µg/L	90.6	68	140

Matrix Spike (MS) Report

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

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG020-SD: Total Metals in Sediments by ICPMS (QCLot: 3130384)							
EB1326059-002	C119A 0-0.2	EG020-SD: Arsenic	7440-38-2	50 mg/kg	104	70	130
		EG020-SD: Cadmium	7440-43-9	25 mg/kg	104	70	130
		EG020-SD: Chromium	7440-47-3	50 mg/kg	105	70	130
		EG020-SD: Copper	7440-50-8	50 mg/kg	105	70	130
		EG020-SD: Cobalt	7440-48-4	50 mg/kg	116	70	130
		EG020-SD: Lead	7439-92-1	50 mg/kg	104	70	130
		EG020-SD: Manganese	7439-96-5	50 mg/kg	# Not Determined	70	130
		EG020-SD: Nickel	7440-02-0	50 mg/kg	102	70	130
		EG020-SD: Vanadium	7440-62-2	50 mg/kg	105	70	130
		EG020-SD: Zinc	7440-66-6	50 mg/kg	97.7	70	130
EG020-SD: Total Metals in Sediments by ICPMS (QCLot: 3130387)							
EB1326059-023	C30 0.5-1.0	EG020-SD: Arsenic	7440-38-2	50 mg/kg	102	70	130
		EG020-SD: Cadmium	7440-43-9	25 mg/kg	104	70	130
		EG020-SD: Chromium	7440-47-3	50 mg/kg	112	70	130
		EG020-SD: Copper	7440-50-8	50 mg/kg	106	70	130
		EG020-SD: Cobalt	7440-48-4	50 mg/kg	106	70	130
		EG020-SD: Lead	7439-92-1	50 mg/kg	110	70	130
		EG020-SD: Manganese	7439-96-5	50 mg/kg	# Not Determined	70	130
		EG020-SD: Nickel	7440-02-0	50 mg/kg	97.2	70	130
		EG020-SD: Vanadium	7440-62-2	50 mg/kg	112	70	130
		EG020-SD: Zinc	7440-66-6	50 mg/kg	94.5	70	130
EG020-SD: Total Metals in Sediments by ICPMS (QCLot: 3130390)							
EB1326059-044	B54 1.0-1.1	EG020-SD: Arsenic	7440-38-2	50 mg/kg	96.5	70	130
		EG020-SD: Cadmium	7440-43-9	25 mg/kg	103	70	130
		EG020-SD: Chromium	7440-47-3	50 mg/kg	110	70	130
		EG020-SD: Copper	7440-50-8	50 mg/kg	101	70	130
		EG020-SD: Cobalt	7440-48-4	50 mg/kg	107	70	130
		EG020-SD: Lead	7439-92-1	50 mg/kg	106	70	130
		EG020-SD: Manganese	7439-96-5	50 mg/kg	# Not Determined	70	130
		EG020-SD: Nickel	7440-02-0	50 mg/kg	98.0	70	130
		EG020-SD: Vanadium	7440-62-2	50 mg/kg	118	70	130
		EG020-SD: Zinc	7440-66-6	50 mg/kg	97.8	70	130
EG020-SD: Total Metals in Sediments by ICPMS (QCLot: 3130393)							
EB1326059-065	V185 1.5-2.0	EG020-SD: Arsenic	7440-38-2	50 mg/kg	86.8	70	130

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%) MS	Recovery Limits (%) Low	High
EG020-SD: Total Metals in Sediments by ICPMS (QCLot: 3130393) - continued							
EB1326059-065	V185 1.5-2.0	EG020-SD: Cadmium	7440-43-9	25 mg/kg	104	70	130
		EG020-SD: Chromium	7440-47-3	50 mg/kg	104	70	130
		EG020-SD: Copper	7440-50-8	50 mg/kg	105	70	130
		EG020-SD: Cobalt	7440-48-4	50 mg/kg	108	70	130
		EG020-SD: Lead	7439-92-1	50 mg/kg	109	70	130
		EG020-SD: Manganese	7439-96-5	50 mg/kg	# Not Determined	70	130
		EG020-SD: Nickel	7440-02-0	50 mg/kg	99.2	70	130
		EG020-SD: Vanadium	7440-62-2	50 mg/kg	107	70	130
		EG020-SD: Zinc	7440-66-6	50 mg/kg	97.3	70	130
EG020-SD: Total Metals in Sediments by ICPMS (QCLot: 3130396)							
EB1326059-085	C82 0-0.5	EG020-SD: Arsenic	7440-38-2	50 mg/kg	107	70	130
		EG020-SD: Cadmium	7440-43-9	25 mg/kg	107	70	130
		EG020-SD: Chromium	7440-47-3	50 mg/kg	108	70	130
		EG020-SD: Copper	7440-50-8	50 mg/kg	107	70	130
		EG020-SD: Cobalt	7440-48-4	50 mg/kg	111	70	130
		EG020-SD: Lead	7439-92-1	50 mg/kg	106	70	130
		EG020-SD: Manganese	7439-96-5	50 mg/kg	# Not Determined	70	130
		EG020-SD: Nickel	7440-02-0	50 mg/kg	103	70	130
		EG020-SD: Vanadium	7440-62-2	50 mg/kg	115	70	130
		EG020-SD: Zinc	7440-66-6	50 mg/kg	103	70	130
EG020-SD: Total Metals in Sediments by ICPMS (QCLot: 3130399)							
EB1326059-105	B41B 0.5-0.9	EG020-SD: Arsenic	7440-38-2	50 mg/kg	103	70	130
		EG020-SD: Cadmium	7440-43-9	25 mg/kg	106	70	130
		EG020-SD: Chromium	7440-47-3	50 mg/kg	103	70	130
		EG020-SD: Copper	7440-50-8	50 mg/kg	107	70	130
		EG020-SD: Cobalt	7440-48-4	50 mg/kg	113	70	130
		EG020-SD: Lead	7439-92-1	50 mg/kg	102	70	130
		EG020-SD: Manganese	7439-96-5	50 mg/kg	# Not Determined	70	130
		EG020-SD: Nickel	7440-02-0	50 mg/kg	101	70	130
		EG020-SD: Vanadium	7440-62-2	50 mg/kg	112	70	130
		EG020-SD: Zinc	7440-66-6	50 mg/kg	96.9	70	130
EG020-SD: Total Metals in Sediments by ICPMS (QCLot: 3150706)							
EB1326059-061	QAQC3	EG020-SD: Arsenic	7440-38-2	50 mg/kg	116	70	130
		EG020-SD: Cadmium	7440-43-9	50 mg/kg	107	70	130
		EG020-SD: Copper	7440-50-8	250 mg/kg	90.0	70	130
		EG020-SD: Lead	7439-92-1	250 mg/kg	74.2	70	130

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%) MS	Recovery Limits (%) Low	High
EG020-SD: Total Metals in Sediments by ICPMS (QCLot: 3150706) - continued							
EB1326059-061	QAQC3	EG020-SD: Nickel	7440-02-0	50 mg/kg	115	70	130
		EG020-SD: Zinc	7440-66-6	125 mg/kg	124	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3130383)							
EB1326059-002	C119A 0-0.2	EG035T-LL: Mercury	7439-97-6	0.5 mg/kg	84.6	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3130386)							
EB1326059-023	C30 0.5-1.0	EG035T-LL: Mercury	7439-97-6	0.5 mg/kg	101	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3130389)							
EB1326059-044	B54 1.0-1.1	EG035T-LL: Mercury	7439-97-6	0.5 mg/kg	98.4	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3130392)							
EB1326059-065	V185 1.5-2.0	EG035T-LL: Mercury	7439-97-6	0.5 mg/kg	103	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3130395)							
EB1326059-085	C82 0-0.5	EG035T-LL: Mercury	7439-97-6	0.5 mg/kg	111	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3130398)							
EB1326059-105	B41B 0.5-0.9	EG035T-LL: Mercury	7439-97-6	0.5 mg/kg	108	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3150705)							
EB1326059-051	P180 0-0.05	EG035T-LL: Mercury	7439-97-6	0.5 mg/kg	118	70	130
EK055: Ammonia as N (QCLot: 3134401)							
EB1326059-002	C119A 0-0.2	EK055-SD: Ammonia as N	7664-41-7	20 mg/kg	102	70	130
EK055: Ammonia as N (QCLot: 3134403)							
EB1326059-047	K167 0-0.25	EK055-SD: Ammonia as N	7664-41-7	20 mg/kg	75.7	70	130
EK055: Ammonia as N (QCLot: 3134405)							
EB1326059-075	C72 0-0.5	EK055-SD: Ammonia as N	7664-41-7	20 mg/kg	83.1	70	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 3130372)							
EB1326059-002	C119A 0-0.2	EK059G: Nitrite + Nitrate as N (Sol.)	----	2.0 mg/kg	110	70	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 3130373)							
EB1326059-047	K167 0-0.25	EK059G: Nitrite + Nitrate as N (Sol.)	----	2.0 mg/kg	96.2	70	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 3130382)							
EB1326059-075	C72 0-0.5	EK059G: Nitrite + Nitrate as N (Sol.)	----	2.0 mg/kg	100	70	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 3150736)							
EB1326059-051	P180 0-0.05	EK059G: Nitrite + Nitrate as N (Sol.)	----	2.5 mg/kg	99.4	70	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 3130369)							
EB1326059-075	C72 0-0.5	EK061G: Total Kjeldahl Nitrogen as N	----	500 mg/kg	91.8	70	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 3130620)							

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%) MS	Recovery Limits (%) Low	High
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 3130620) - continued							
EB1326059-002	C119A 0-0.2	EK061G: Total Kjeldahl Nitrogen as N	----	500 mg/kg	111	70	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 3130622)							
EB1326059-047	K167 0-0.25	EK061G: Total Kjeldahl Nitrogen as N	----	500 mg/kg	89.7	70	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 3149190)							
EB1326059-051	P180 0-0.05	EK061G: Total Kjeldahl Nitrogen as N	----	500 mg/kg	78.6	70	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 3130370)							
EB1326059-075	C72 0-0.5	EK067G: Total Phosphorus as P	----	100 mg/kg	90.3	70	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 3130621)							
EB1326059-002	C119A 0-0.2	EK067G: Total Phosphorus as P	----	100 mg/kg	122	70	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 3130623)							
EB1326059-047	K167 0-0.25	EK067G: Total Phosphorus as P	----	100 mg/kg	115	70	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 3149191)							
EB1326059-051	P180 0-0.05	EK067G: Total Phosphorus as P	----	100 mg/kg	72.6	70	130
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons (QCLot: 3133345)							
EB1326059-047	K167 0-0.25	EP071-SD: C10 - C14 Fraction	----	19.75 mg/kg	73.7	70	130
		EP071-SD: C15 - C28 Fraction	----	87.25 mg/kg	81.9	70	130
		EP071-SD: C29 - C36 Fraction	----	60 mg/kg	80.9	70	130
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons (QCLot: 3133347)							
EB1326059-099	I162 0.13-0.33	EP071-SD: C10 - C14 Fraction	----	19.75 mg/kg	73.7	70	130
		EP071-SD: C15 - C28 Fraction	----	87.25 mg/kg	77.9	70	130
		EP071-SD: C29 - C36 Fraction	----	60 mg/kg	106	70	130
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons (QCLot: 3134489)							
EB1326059-047	K167 0-0.25	EP080-SD: C6 - C9 Fraction	----	6.5 mg/kg	98.9	70	130
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons (QCLot: 3134495)							
EB1326059-099	I162 0.13-0.33	EP080-SD: C6 - C9 Fraction	----	6.5 mg/kg	82.3	70	130
EP080-SD: BTEXN (QCLot: 3134489)							
EB1326059-047	K167 0-0.25	EP080-SD: Benzene	71-43-2	0.5 mg/kg	85.3	70	130
		EP080-SD: Toluene	108-88-3	0.5 mg/kg	88.4	70	130
		EP080-SD: Ethylbenzene	100-41-4	0.5 mg/kg	98.0	70	130
		EP080-SD: meta- & para-Xylene	108-38-3 106-42-3	0.5 mg/kg	101	70	130
		EP080-SD: ortho-Xylene	95-47-6	0.5 mg/kg	102	70	130
EP080-SD: BTEXN (QCLot: 3134495)							
EB1326059-099	I162 0.13-0.33	EP080-SD: Benzene	71-43-2	0.5 mg/kg	72.5	70	130
		EP080-SD: Toluene	108-88-3	0.5 mg/kg	74.1	70	130

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%) MS	Recovery Limits (%) Low	High
EP080-SD: BTEXN (QCLot: 3134495) - continued							
EB1326059-099	I162 0.13-0.33	EP080-SD: Ethylbenzene	100-41-4	0.5 mg/kg	77.9	70	130
		EP080-SD: meta- & para-Xylene	108-38-3 106-42-3	0.5 mg/kg	80.0	70	130
		EP080-SD: ortho-Xylene	95-47-6	0.5 mg/kg	84.3	70	130
EP090: Organotin Compounds (QCLot: 3130266)							
EB1326059-002	C119A 0-0.2	EP090: Monobutyltin	78763-54-9	1.25 µgSn/kg	# 13.1	35	130
		EP090: Dibutyltin	1002-53-5	1.25 µgSn/kg	65.3	20	130
		EP090: Tributyltin	56573-85-4	1.25 µgSn/kg	97.9	20	130
EP090: Organotin Compounds (QCLot: 3130267)							
EB1326059-022	C30 0-0.5	EP090: Monobutyltin	78763-54-9	1.25 µgSn/kg	# 15.4	35	130
		EP090: Dibutyltin	1002-53-5	1.25 µgSn/kg	79.8	20	130
		EP090: Tributyltin	56573-85-4	1.25 µgSn/kg	127	20	130
EP090: Organotin Compounds (QCLot: 3130271)							
EB1326059-042	B54 0-0.5	EP090: Monobutyltin	78763-54-9	1.25 µgSn/kg	# 15.7	35	130
		EP090: Dibutyltin	1002-53-5	1.25 µgSn/kg	96.9	20	130
		EP090: Tributyltin	56573-85-4	1.25 µgSn/kg	96.7	20	130
EP090: Organotin Compounds (QCLot: 3130275)							
EB1326059-062	V185 0-0.5	EP090: Monobutyltin	78763-54-9	1.25 µgSn/kg	# 4.0	35	130
		EP090: Dibutyltin	1002-53-5	1.25 µgSn/kg	35.5	20	130
		EP090: Tributyltin	56573-85-4	1.25 µgSn/kg	90.8	20	130
EP090: Organotin Compounds (QCLot: 3130279)							
EB1326059-081	B74 1.9-2.0	EP090: Monobutyltin	78763-54-9	1.25 µgSn/kg	# 2.5	35	130
		EP090: Dibutyltin	1002-53-5	1.25 µgSn/kg	# 13.0	20	130
		EP090: Tributyltin	56573-85-4	1.25 µgSn/kg	126	20	130
EP090: Organotin Compounds (QCLot: 3130282)							
EB1326059-101	J164 0.5-1.02	EP090: Monobutyltin	78763-54-9	1.25 µgSn/kg	# 8.1	35	130
		EP090: Dibutyltin	1002-53-5	1.25 µgSn/kg	77.5	20	130
		EP090: Tributyltin	56573-85-4	1.25 µgSn/kg	127	20	130
EP130A: Organophosphorus Pesticides (Ultra-trace) (QCLot: 3133326)							
EB1326059-047	K167 0-0.25	EP130: Bromophos-ethyl	4824-78-6	50 µg/kg	67.5	36	144
		EP130: Carbophenothion	786-19-6	50 µg/kg	69.2	38	120
		EP130: Chlorfenvinphos (E)	18708-86-6	5 µg/kg	76.7	49	157
		EP130: Chlorfenvinphos (Z)	18708-87-7	50 µg/kg	63.6	53	145
		EP130: Chlorpyrifos	2921-88-2	50 µg/kg	63.1	60	140
		EP130: Chlorpyrifos-methyl	5598-13-0	50 µg/kg	66.6	56	126
		EP130: Demeton-S-methyl	919-86-8	50 µg/kg	55.2	9.7	148
		EP130: Diazinon	333-41-5	50 µg/kg	66.3	60	122

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%) MS	Recovery Limits (%) Low	High
EP130A: Organophosphorus Pesticides (Ultra-trace) (QCLot: 3133326) - continued							
EB1326059-047	K167 0-0.25	EP130: Dichlorvos	62-73-7	50 µg/kg	62.6	33	123
		EP130: Dimethoate	60-51-5	50 µg/kg	67.7	36	142
		EP130: Ethion	563-12-2	50 µg/kg	66.8	48	136
		EP130: Fenamiphos	22224-92-6	50 µg/kg	64.5	42	136
		EP130: Fenthion	55-38-9	50 µg/kg	64.1	35	131
		EP130: Malathion	121-75-5	50 µg/kg	65.4	55	141
		EP130: Azinphos Methyl	86-50-0	50 µg/kg	67.0	23.5	132
		EP130: Monocrotophos	6923-22-4	50 µg/kg	69.5	35	153
		EP130: Parathion	56-38-2	50 µg/kg	67.1	57	147
		EP130: Parathion-methyl	298-00-0	50 µg/kg	66.4	48	140
		EP130: Pirimphos-ethyl	23505-41-1	50 µg/kg	59.0	45	137
		EP130: Prothiofos	34643-46-4	50 µg/kg	64.6	51	137
EP130A: Organophosphorus Pesticides (Ultra-trace) (QCLot: 3133354)							
EB1326059-099	I162 0.13-0.33	EP130: Bromophos-ethyl	4824-78-6	50 µg/kg	81.9	36	144
		EP130: Carbophenothion	786-19-6	50 µg/kg	69.9	38	120
		EP130: Chlorfenvinphos (E)	18708-86-6	5 µg/kg	120	49	157
		EP130: Chlorfenvinphos (Z)	18708-87-7	50 µg/kg	65.4	53	145
		EP130: Chlorpyrifos	2921-88-2	50 µg/kg	77.5	60	140
		EP130: Chlorpyrifos-methyl	5598-13-0	50 µg/kg	63.7	56	126
		EP130: Demeton-S-methyl	919-86-8	50 µg/kg	63.2	9.7	148
		EP130: Diazinon	333-41-5	50 µg/kg	73.8	60	122
		EP130: Dichlorvos	62-73-7	50 µg/kg	68.7	33	123
		EP130: Dimethoate	60-51-5	50 µg/kg	84.7	36	142
		EP130: Ethion	563-12-2	50 µg/kg	69.1	48	136
		EP130: Fenamiphos	22224-92-6	50 µg/kg	71.8	42	136
		EP130: Fenthion	55-38-9	50 µg/kg	74.0	35	131
		EP130: Malathion	121-75-5	50 µg/kg	82.0	55	141
		EP130: Azinphos Methyl	86-50-0	50 µg/kg	79.4	23.5	132
		EP130: Monocrotophos	6923-22-4	50 µg/kg	73.0	35	153
		EP130: Parathion	56-38-2	50 µg/kg	89.2	57	147
		EP130: Parathion-methyl	298-00-0	50 µg/kg	84.9	48	140
		EP130: Pirimphos-ethyl	23505-41-1	50 µg/kg	81.6	45	137
		EP130: Prothiofos	34643-46-4	50 µg/kg	85.0	51	137
EP131A: Organochlorine Pesticides (QCLot: 3133327)							
EB1326059-047	K167 0-0.25	EP131A: Aldrin	309-00-2	5 µg/kg	65.4	23.4	153
		EP131A: alpha-BHC	319-84-6	5 µg/kg	52.5	17.6	156
		EP131A: beta-BHC	319-85-7	5 µg/kg	48.8	24.9	153
		EP131A: delta-BHC	319-86-8	5 µg/kg	64.5	25.2	147
		EP131A: 4.4`-DDD	72-54-8	5 µg/kg	62.7	25.9	150

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%) MS	Recovery Limits (%) Low	High
EP131A: Organochlorine Pesticides (QCLot: 3133327) - continued							
EB1326059-047	K167 0-0.25	EP131A: 4.4`-DDE	72-55-9	5 µg/kg	54.3	31.2	125
		EP131A: 4.4`-DDT	50-29-3	5 µg/kg	71.1	23.4	163
		EP131A: Dieldrin	60-57-1	5 µg/kg	47.2	30.2	140
		EP131A: alpha-Endosulfan	959-98-8	5 µg/kg	56.5	28.8	135
		EP131A: beta-Endosulfan	33213-65-9	5 µg/kg	62.1	22.6	141
		EP131A: Endosulfan sulfate	1031-07-8	5 µg/kg	77.7	16.1	156
		EP131A: Endrin	72-20-8	5 µg/kg	93.2	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	67.3	13.4	151
		EP131A: Heptachlor	76-44-8	5 µg/kg	102	23.8	170
		EP131A: Heptachlor epoxide	1024-57-3	5 µg/kg	61.0	28.3	140
		EP131A: Hexachlorobenzene (HCB)	118-74-1	5 µg/kg	50.4	17.7	144
		EP131A: gamma-BHC	58-89-9	5 µg/kg	61.0	21.8	158
		EP131A: Methoxychlor	72-43-5	5 µg/kg	77.0	24.4	158
		EP131A: cis-Chlordane	5103-71-9	5 µg/kg	60.7	27.3	139
		EP131A: trans-Chlordane	5103-74-2	5 µg/kg	64.1	29.5	138
EP131A: Organochlorine Pesticides (QCLot: 3133355)							
EB1326059-099	I162 0.13-0.33	EP131A: Aldrin	309-00-2	5 µg/kg	88.5	23.4	153
		EP131A: alpha-BHC	319-84-6	5 µg/kg	64.6	17.6	156
		EP131A: beta-BHC	319-85-7	5 µg/kg	38.6	24.9	153
		EP131A: delta-BHC	319-86-8	5 µg/kg	79.4	25.2	147
		EP131A: 4.4`-DDD	72-54-8	5 µg/kg	78.5	25.9	150
		EP131A: 4.4`-DDE	72-55-9	5 µg/kg	68.2	31.2	125
		EP131A: 4.4`-DDT	50-29-3	5 µg/kg	74.5	23.4	163
		EP131A: Dieldrin	60-57-1	5 µg/kg	73.2	30.2	140
		EP131A: alpha-Endosulfan	959-98-8	5 µg/kg	70.7	28.8	135
		EP131A: beta-Endosulfan	33213-65-9	5 µg/kg	76.2	22.6	141
		EP131A: Endosulfan sulfate	1031-07-8	5 µg/kg	91.5	16.1	156
		EP131A: Endrin	72-20-8	5 µg/kg	112	17.7	162
		EP131A: Endrin aldehyde	7421-93-4	5 µg/kg	72.2	20.1	116
		EP131A: Endrin ketone	53494-70-5	5 µg/kg	80.6	13.4	151
		EP131A: Heptachlor	76-44-8	5 µg/kg	117	23.8	170
		EP131A: Heptachlor epoxide	1024-57-3	5 µg/kg	76.1	28.3	140
		EP131A: Hexachlorobenzene (HCB)	118-74-1	5 µg/kg	55.8	17.7	144
		EP131A: gamma-BHC	58-89-9	5 µg/kg	76.0	21.8	158
		EP131A: Methoxychlor	72-43-5	5 µg/kg	90.9	24.4	158
		EP131A: cis-Chlordane	5103-71-9	5 µg/kg	76.0	27.3	139
		EP131A: trans-Chlordane	5103-74-2	5 µg/kg	73.9	29.5	138
EP132B: Polynuclear Aromatic Hydrocarbons (QCLot: 3133344)							

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%) MS	Recovery Limits (%) Low	High
EP132B: Polynuclear Aromatic Hydrocarbons (QCLot: 3133344) - continued							
EB1326059-047	K167 0-0.25	EP132B-SD: Naphthalene	91-20-3	25 µg/kg	102	70	130
		EP132B-SD: 2-Methylnaphthalene	91-57-6	25 µg/kg	106	70	130
		EP132B-SD: Acenaphthylene	208-96-8	25 µg/kg	92.7	70	130
		EP132B-SD: Acenaphthene	83-32-9	25 µg/kg	106	70	130
		EP132B-SD: Fluorene	86-73-7	25 µg/kg	102	70	130
		EP132B-SD: Phenanthrene	85-01-8	25 µg/kg	110	70	130
		EP132B-SD: Anthracene	120-12-7	25 µg/kg	104	70	130
		EP132B-SD: Fluoranthene	206-44-0	25 µg/kg	82.5	70	130
		EP132B-SD: Pyrene	129-00-0	25 µg/kg	98.2	70	130
		EP132B-SD: Benz(a)anthracene	56-55-3	25 µg/kg	101	70	130
		EP132B-SD: Chrysene	218-01-9	25 µg/kg	84.1	70	130
		EP132B-SD: Benzo(b)fluoranthene	205-99-2	25 µg/kg	85.3	70	130
		EP132B-SD: Benzo(k)fluoranthene	207-08-9	25 µg/kg	76.7	70	130
		EP132B-SD: Benzo(e)pyrene	192-97-2	25 µg/kg	84.5	70	130
		EP132B-SD: Benzo(a)pyrene	50-32-8	25 µg/kg	83.1	70	130
		EP132B-SD: Perylene	198-55-0	25 µg/kg	106	70	130
		EP132B-SD: Benzo(g.h.i)perylene	191-24-2	25 µg/kg	93.5	70	130
		EP132B-SD: Dibenz(a.h)anthracene	53-70-3	25 µg/kg	102	70	130
		EP132B-SD: Indeno(1.2.3.cd)pyrene	193-39-5	25 µg/kg	96.7	70	130
		EP132B-SD: Coronene	191-07-1	25 µg/kg	88.2	70	130
EP132B: Polynuclear Aromatic Hydrocarbons (QCLot: 3133346)							
EB1326059-099	I162 0.13-0.33	EP132B-SD: Naphthalene	91-20-3	25 µg/kg	82.2	70	130
		EP132B-SD: 2-Methylnaphthalene	91-57-6	25 µg/kg	82.6	70	130
		EP132B-SD: Acenaphthylene	208-96-8	25 µg/kg	90.7	70	130
		EP132B-SD: Acenaphthene	83-32-9	25 µg/kg	86.8	70	130
		EP132B-SD: Fluorene	86-73-7	25 µg/kg	81.7	70	130
		EP132B-SD: Phenanthrene	85-01-8	25 µg/kg	89.5	70	130
		EP132B-SD: Anthracene	120-12-7	25 µg/kg	84.8	70	130
		EP132B-SD: Fluoranthene	206-44-0	25 µg/kg	80.7	70	130
		EP132B-SD: Pyrene	129-00-0	25 µg/kg	88.3	70	130
		EP132B-SD: Benz(a)anthracene	56-55-3	25 µg/kg	100	70	130
		EP132B-SD: Chrysene	218-01-9	25 µg/kg	113	70	130
		EP132B-SD: Benzo(b)fluoranthene	205-99-2	25 µg/kg	85.6	70	130
		EP132B-SD: Benzo(k)fluoranthene	207-08-9	25 µg/kg	99.2	70	130
		EP132B-SD: Benzo(e)pyrene	192-97-2	25 µg/kg	95.1	70	130
		EP132B-SD: Benzo(a)pyrene	50-32-8	25 µg/kg	98.9	70	130
		EP132B-SD: Perylene	198-55-0	25 µg/kg	103	70	130
		EP132B-SD: Benzo(g.h.i)perylene	191-24-2	25 µg/kg	110	70	130
		EP132B-SD: Dibenz(a.h)anthracene	53-70-3	25 µg/kg	107	70	130

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%) MS	Recovery Limits (%) Low	High
EP132B: Polynuclear Aromatic Hydrocarbons (QCLot: 3133346) - continued							
EB1326059-099	I162 0.13-0.33	EP132B-SD: Indeno(1.2.3.cd)pyrene	193-39-5	25 µg/kg	102	70	130
		EP132B-SD: Coronene	191-07-1	25 µg/kg	94.1	70	130
EP231: Perfluorinated Compounds (QCLot: 3132898)							
EB1326059-047	K167 0-0.25	EP231: PFOS	1763-23-1	0.0025 mg/kg	99.2	54	146
		EP231: PFOA	335-67-1	0.0025 mg/kg	88.0	54	134
		EP231: 6:2 Fluorotelomer sulfonate (6:2 FtS)	27619-97-2	0.0125 mg/kg	102	56	138
EP231: Perfluorinated Compounds (QCLot: 3132899)							
EB1326059-047	K167 0-0.25	EP231-PFC: 8:2 Fluorotelomer sulfonate	39108-34-4	0.0125 mg/kg	126	60	130
		EP231-PFC: PFOSA	754-91-6	0.0025 mg/kg	105	60	130
		EP231-PFC: N-Me-FOSA	31506-32-8	0.0125 mg/kg	119	60	130
		EP231-PFC: N-Et-FOSA	4151-50-2	0.0125 mg/kg	# 57.3	60	130
		EP231-PFC: N-Me-FOSE	2448-09-7	0.0125 mg/kg	126	60	130
		EP231-PFC: N-Et-FOSE	1691-99-2	0.0125 mg/kg	70.6	60	130
		EP231-PFC: PFBS	375-73-5	0.0025 mg/kg	96.8	60	130
		EP231-PFC: PFHxS	3871-99-6	0.0025 mg/kg	92.8	60	130
		EP231-PFC: PFDcS	67906-42-7	0.0025 mg/kg	94.4	60	130
		EP231-PFC: PFHxA	307-24-4	0.0025 mg/kg	95.2	60	130
		EP231-PFC: PFHpA	375-85-9	0.0025 mg/kg	96.8	60	130
		EP231-PFC: PFNA	375-95-1	0.0025 mg/kg	110	60	130
		EP231-PFC: PFDcA	335-76-2	0.0025 mg/kg	72.2	60	130
		EP231-PFC: PFUnA	2058-94-8	0.0025 mg/kg	119	60	130
		EP231-PFC: PFDoA	307-55-1	0.0025 mg/kg	117	60	130
		EP231-PFC: PFTriA	72629-94-8	0.0025 mg/kg	79.8	60	130
		EP231-PFC: PFTeA	376-06-7	0.0125 mg/kg	71.0	60	130
EP231: Perfluorinated Compounds (QCLot: 3132902)							
EB1326059-099	I162 0.13-0.33	EP231: PFOS	1763-23-1	0.0025 mg/kg	96.4	54	146
		EP231: PFOA	335-67-1	0.0025 mg/kg	82.8	54	134
		EP231: 6:2 Fluorotelomer sulfonate (6:2 FtS)	27619-97-2	0.0125 mg/kg	80.0	56	138
EP231: Perfluorinated Compounds (QCLot: 3132903)							
EB1326059-099	I162 0.13-0.33	EP231-PFC: 8:2 Fluorotelomer sulfonate	39108-34-4	0.0125 mg/kg	110	60	130
		EP231-PFC: PFOSA	754-91-6	0.0025 mg/kg	85.2	60	130
		EP231-PFC: N-Me-FOSA	31506-32-8	0.0125 mg/kg	122	60	130
		EP231-PFC: N-Et-FOSA	4151-50-2	0.0125 mg/kg	72.5	60	130
		EP231-PFC: N-Me-FOSE	2448-09-7	0.0125 mg/kg	122	60	130
		EP231-PFC: N-Et-FOSE	1691-99-2	0.0125 mg/kg	81.6	60	130
		EP231-PFC: PFBS	375-73-5	0.0025 mg/kg	90.8	60	130
		EP231-PFC: PFHxS	3871-99-6	0.0025 mg/kg	91.6	60	130
		EP231-PFC: PFDcS	67906-42-7	0.0025 mg/kg	101	60	130

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%) MS	Recovery Limits (%) Low	High
EP231: Perfluorinated Compounds (QCLot: 3132903) - continued							
EB1326059-099	I162 0.13-0.33	EP231-PFC: PFHxA	307-24-4	0.0025 mg/kg	98.0	60	130
		EP231-PFC: PFHpA	375-85-9	0.0025 mg/kg	102	60	130
		EP231-PFC: PFNA	375-95-1	0.0025 mg/kg	111	60	130
		EP231-PFC: PFDcA	335-76-2	0.0025 mg/kg	72.4	60	130
		EP231-PFC: PFUnA	2058-94-8	0.0025 mg/kg	115	60	130
		EP231-PFC: PFDoA	307-55-1	0.0025 mg/kg	114	60	130
		EP231-PFC: PFTriA	72629-94-8	0.0025 mg/kg	71.6	60	130
		EP231-PFC: PFTeA	376-06-7	0.0125 mg/kg	83.2	60	130

Sub-Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%) MS	Recovery Limits (%) Low	High
EG035F: Dissolved Mercury by FIMS (QCLot: 3156655)							
EB1326059-109	PWB Pore Water	EG035F: Mercury	7439-97-6	0.010 mg/L	95.1	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3157861)							
EB1326059-114	PWB Seawater Elutriate	EG035T: Mercury	7439-97-6	0.010 mg/L	107	70	130
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS (QCLot: 3157841)							
EB1326059-113	PWA Seawater Elutriate	EG093A-F: Arsenic	7440-38-2	25 µg/L	126	70	130
		EG093A-F: Cadmium	7440-43-9	25 µg/L	113	70	130
		EG093A-F: Chromium	7440-47-3	25 µg/L	96.5	70	130
		EG093A-F: Copper	7440-50-8	50 µg/L	112	70	130
		EG093A-F: Lead	7439-92-1	25 µg/L	113	70	130
		EG093A-F: Nickel	7440-02-0	25 µg/L	121	70	130
		EG093A-F: Zinc	7440-66-6	50 µg/L	103	70	130
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS (QCLot: 3160736)							
EB1326059-109	PWB Pore Water	EG093A-F: Arsenic	7440-38-2	50 µg/L	94.1	70	130
		EG093A-F: Cadmium	7440-43-9	50 µg/L	98.0	70	130
		EG093A-F: Chromium	7440-47-3	50 µg/L	105	70	130
		EG093A-F: Copper	7440-50-8	100 µg/L	101	70	130
		EG093A-F: Lead	7439-92-1	50 µg/L	98.6	70	130
		EG093A-F: Nickel	7440-02-0	50 µg/L	99.8	70	130
		EG093A-F: Zinc	7440-66-6	100 µg/L	107	70	130
EG093T: Total Metals in Saline Water by ORC-ICPMS (QCLot: 3157847)							
EB1326059-113	PWA Seawater Elutriate	EG093A-T: Arsenic	7440-38-2	50 µg/L	95.8	70	130
		EG093A-T: Cadmium	7440-43-9	50 µg/L	91.4	70	130
		EG093A-T: Chromium	7440-47-3	50 µg/L	93.1	70	130
		EG093A-T: Copper	7440-50-8	100 µg/L	97.5	70	130
		EG093A-T: Lead	7439-92-1	50 µg/L	95.4	70	130

Sub-Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%) MS	Recovery Limits (%) Low	High
EG093T: Total Metals in Saline Water by ORC-ICPMS (QCLot: 3157847) - continued							
EB1326059-113	PWA Seawater Elutriate	EG093A-T: Nickel	7440-02-0	50 µg/L	98.9	70	130
		EG093A-T: Zinc	7440-66-6	100 µg/L	88.8	70	130
EG093T: Total Metals in Saline Water by ORC-ICPMS (QCLot: 3160738)							
EB1326059-109	PWB Pore Water	EG093A-T: Arsenic	7440-38-2	50 µg/L	104	70	130
		EG093A-T: Cadmium	7440-43-9	50 µg/L	102	70	130
		EG093A-T: Chromium	7440-47-3	50 µg/L	104	70	130
		EG093A-T: Copper	7440-50-8	100 µg/L	101	70	130
		EG093A-T: Lead	7439-92-1	50 µg/L	99.9	70	130
		EG093A-T: Nickel	7440-02-0	50 µg/L	104	70	130
		EG093A-T: Zinc	7440-66-6	100 µg/L	100	70	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 3133519)							
EB1326059-110	PWC Pore Water	EK055G: Ammonia as N	7664-41-7	0.4 mg/L	90.4	70	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 3134803)							
EB1326059-115	PWC Seawater Elutriate	EK055G: Ammonia as N	7664-41-7	0.4 mg/L	106	70	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 3140408)							
EB1326238-001	Anonymous	EK055G: Ammonia as N	7664-41-7	0.4 mg/L	102	70	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 3134396)							
EB1326059-110	PWC Pore Water	EK057G: Nitrite as N	----	0.4 mg/L	120	70	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 3135172)							
EB1326059-115	PWC Seawater Elutriate	EK057G: Nitrite as N	----	0.4 mg/L	114	70	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 3133518)							
EB1326059-110	PWC Pore Water	EK059G: Nitrite + Nitrate as N	----	0.4 mg/L	91.8	70	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 3134802)							
EB1326059-115	PWC Seawater Elutriate	EK059G: Nitrite + Nitrate as N	----	0.4 mg/L	116	70	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 3140407)							
EB1326238-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.4 mg/L	98.2	70	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 3146952)							
EB1326059-109	PWB Pore Water	EK061G: Total Kjeldahl Nitrogen as N	----	5 mg/L	101	70	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 3146953)							
EB1326059-109	PWB Pore Water	EK067G: Total Phosphorus as P	----	1.0 mg/L	110	70	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 3134397)							
EB1326059-110	PWC Pore Water	EK071G: Reactive Phosphorus as P	14265-44-2	0.4 mg/L	112	70	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 3135173)							
EB1326059-115	PWC Seawater Elutriate	EK071G: Reactive Phosphorus as P	14265-44-2	0.4 mg/L	104	70	130

Sub-Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%) MS	Recovery Limits (%) Low	Recovery Limits (%) High
EP208: Phenylurea Herbicides (QCLot: 3141729)							
EB1326059-108	PWA Pore Water	EP208: Diuron	330-54-1	5 µg/L	97.0	70.8	129

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

The quality control term Matrix Spike (MS) and Matrix Spike Duplicate (MSD) refers to intralaboratory split samples spiked with a representative set of target analytes. The purpose of these QC parameters are 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	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration	Spike Recovery (%) MS	Spike Recovery (%) MSD	Recovery Limits (%) Low	Recovery Limits (%) High	RPDs (%) Value	RPDs (%) Control Limit
EP090: Organotin Compounds (QCLot: 3130266)										
EB1326059-002	C119A 0-0.2	EP090: Monobutyltin	78763-54-9	1.25 µgSn/kg	# 13.1	----	35	130	----	----
		EP090: Dibutyltin	1002-53-5	1.25 µgSn/kg	65.3	----	20	130	----	----
		EP090: Tributyltin	56573-85-4	1.25 µgSn/kg	97.9	----	20	130	----	----
EP090: Organotin Compounds (QCLot: 3130267)										
EB1326059-022	C30 0-0.5	EP090: Monobutyltin	78763-54-9	1.25 µgSn/kg	# 15.4	----	35	130	----	----
		EP090: Dibutyltin	1002-53-5	1.25 µgSn/kg	79.8	----	20	130	----	----
		EP090: Tributyltin	56573-85-4	1.25 µgSn/kg	127	----	20	130	----	----
EP090: Organotin Compounds (QCLot: 3130271)										
EB1326059-042	B54 0-0.5	EP090: Monobutyltin	78763-54-9	1.25 µgSn/kg	# 15.7	----	35	130	----	----
		EP090: Dibutyltin	1002-53-5	1.25 µgSn/kg	96.9	----	20	130	----	----
		EP090: Tributyltin	56573-85-4	1.25 µgSn/kg	96.7	----	20	130	----	----
EP090: Organotin Compounds (QCLot: 3130275)										
EB1326059-062	V185 0-0.5	EP090: Monobutyltin	78763-54-9	1.25 µgSn/kg	# 4.0	----	35	130	----	----
		EP090: Dibutyltin	1002-53-5	1.25 µgSn/kg	35.5	----	20	130	----	----
		EP090: Tributyltin	56573-85-4	1.25 µgSn/kg	90.8	----	20	130	----	----
EP090: Organotin Compounds (QCLot: 3130279)										
EB1326059-081	B74 1.9-2.0	EP090: Monobutyltin	78763-54-9	1.25 µgSn/kg	# 2.5	----	35	130	----	----
		EP090: Dibutyltin	1002-53-5	1.25 µgSn/kg	# 13.0	----	20	130	----	----
		EP090: Tributyltin	56573-85-4	1.25 µgSn/kg	126	----	20	130	----	----
EP090: Organotin Compounds (QCLot: 3130282)										
EB1326059-101	J164 0.5-1.02	EP090: Monobutyltin	78763-54-9	1.25 µgSn/kg	# 8.1	----	35	130	----	----
		EP090: Dibutyltin	1002-53-5	1.25 µgSn/kg	77.5	----	20	130	----	----
		EP090: Tributyltin	56573-85-4	1.25 µgSn/kg	127	----	20	130	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 3130369)										
EB1326059-075	C72 0-0.5	EK061G: Total Kjeldahl Nitrogen as N	----	500 mg/kg	91.8	----	70	130	----	----
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 3130370)										
EB1326059-075	C72 0-0.5	EK067G: Total Phosphorus as P	----	100 mg/kg	90.3	----	70	130	----	----

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration	Spike Recovery (%): MS	Spike Recovery (%): MSD	Recovery Limits (%): Low	Recovery Limits (%): High	RPDs (%): Value	RPDs (%): Control Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 3130372)										
EB1326059-002	C119A 0-0.2	EK059G: Nitrite + Nitrate as N (Sol.)	----	2.0 mg/kg	110	----	70	130	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 3130373)										
EB1326059-047	K167 0-0.25	EK059G: Nitrite + Nitrate as N (Sol.)	----	2.0 mg/kg	96.2	----	70	130	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 3130382)										
EB1326059-075	C72 0-0.5	EK059G: Nitrite + Nitrate as N (Sol.)	----	2.0 mg/kg	100	----	70	130	----	----
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3130383)										
EB1326059-002	C119A 0-0.2	EG035T-LL: Mercury	7439-97-6	0.5 mg/kg	84.6	----	70	130	----	----
EG020-SD: Total Metals in Sediments by ICPMS (QCLot: 3130384)										
EB1326059-002	C119A 0-0.2	EG020-SD: Arsenic	7440-38-2	50 mg/kg	104	----	70	130	----	----
		EG020-SD: Cadmium	7440-43-9	25 mg/kg	104	----	70	130	----	----
		EG020-SD: Chromium	7440-47-3	50 mg/kg	105	----	70	130	----	----
		EG020-SD: Copper	7440-50-8	50 mg/kg	105	----	70	130	----	----
		EG020-SD: Cobalt	7440-48-4	50 mg/kg	116	----	70	130	----	----
		EG020-SD: Lead	7439-92-1	50 mg/kg	104	----	70	130	----	----
		EG020-SD: Manganese	7439-96-5	50 mg/kg	# Not Determined	----	70	130	----	----
		EG020-SD: Nickel	7440-02-0	50 mg/kg	102	----	70	130	----	----
		EG020-SD: Vanadium	7440-62-2	50 mg/kg	105	----	70	130	----	----
		EG020-SD: Zinc	7440-66-6	50 mg/kg	97.7	----	70	130	----	----
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3130386)										
EB1326059-023	C30 0.5-1.0	EG035T-LL: Mercury	7439-97-6	0.5 mg/kg	101	----	70	130	----	----
EG020-SD: Total Metals in Sediments by ICPMS (QCLot: 3130387)										
EB1326059-023	C30 0.5-1.0	EG020-SD: Arsenic	7440-38-2	50 mg/kg	102	----	70	130	----	----
		EG020-SD: Cadmium	7440-43-9	25 mg/kg	104	----	70	130	----	----
		EG020-SD: Chromium	7440-47-3	50 mg/kg	112	----	70	130	----	----
		EG020-SD: Copper	7440-50-8	50 mg/kg	106	----	70	130	----	----
		EG020-SD: Cobalt	7440-48-4	50 mg/kg	106	----	70	130	----	----
		EG020-SD: Lead	7439-92-1	50 mg/kg	110	----	70	130	----	----
		EG020-SD: Manganese	7439-96-5	50 mg/kg	# Not Determined	----	70	130	----	----
		EG020-SD: Nickel	7440-02-0	50 mg/kg	97.2	----	70	130	----	----
		EG020-SD: Vanadium	7440-62-2	50 mg/kg	112	----	70	130	----	----
		EG020-SD: Zinc	7440-66-6	50 mg/kg	94.5	----	70	130	----	----
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3130389)										
EB1326059-044	B54 1.0-1.1	EG035T-LL: Mercury	7439-97-6	0.5 mg/kg	98.4	----	70	130	----	----
EG020-SD: Total Metals in Sediments by ICPMS (QCLot: 3130390)										
EB1326059-044	B54 1.0-1.1	EG020-SD: Arsenic	7440-38-2	50 mg/kg	96.5	----	70	130	----	----
		EG020-SD: Cadmium	7440-43-9	25 mg/kg	103	----	70	130	----	----

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration	Spike Recovery (%): MS	Spike Recovery (%): MSD	Recovery Limits (%): Low	Recovery Limits (%): High	RPDs (%): Value	RPDs (%): Control Limit
EG020-SD: Total Metals in Sediments by ICPMS (QCLot: 3130390) - continued										
EB1326059-044	B54 1.0-1.1	EG020-SD: Chromium	7440-47-3	50 mg/kg	110	----	70	130	----	----
		EG020-SD: Copper	7440-50-8	50 mg/kg	101	----	70	130	----	----
		EG020-SD: Cobalt	7440-48-4	50 mg/kg	107	----	70	130	----	----
		EG020-SD: Lead	7439-92-1	50 mg/kg	106	----	70	130	----	----
		EG020-SD: Manganese	7439-96-5	50 mg/kg	# Not Determined	----	70	130	----	----
		EG020-SD: Nickel	7440-02-0	50 mg/kg	98.0	----	70	130	----	----
		EG020-SD: Vanadium	7440-62-2	50 mg/kg	118	----	70	130	----	----
		EG020-SD: Zinc	7440-66-6	50 mg/kg	97.8	----	70	130	----	----
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3130392)										
EB1326059-065	V185 1.5-2.0	EG035T-LL: Mercury	7439-97-6	0.5 mg/kg	103	----	70	130	----	----
EG020-SD: Total Metals in Sediments by ICPMS (QCLot: 3130393)										
EB1326059-065	V185 1.5-2.0	EG020-SD: Arsenic	7440-38-2	50 mg/kg	86.8	----	70	130	----	----
		EG020-SD: Cadmium	7440-43-9	25 mg/kg	104	----	70	130	----	----
		EG020-SD: Chromium	7440-47-3	50 mg/kg	104	----	70	130	----	----
		EG020-SD: Copper	7440-50-8	50 mg/kg	105	----	70	130	----	----
		EG020-SD: Cobalt	7440-48-4	50 mg/kg	108	----	70	130	----	----
		EG020-SD: Lead	7439-92-1	50 mg/kg	109	----	70	130	----	----
		EG020-SD: Manganese	7439-96-5	50 mg/kg	# Not Determined	----	70	130	----	----
		EG020-SD: Nickel	7440-02-0	50 mg/kg	99.2	----	70	130	----	----
		EG020-SD: Vanadium	7440-62-2	50 mg/kg	107	----	70	130	----	----
		EG020-SD: Zinc	7440-66-6	50 mg/kg	97.3	----	70	130	----	----
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3130395)										
EB1326059-085	C82 0-0.5	EG035T-LL: Mercury	7439-97-6	0.5 mg/kg	111	----	70	130	----	----
EG020-SD: Total Metals in Sediments by ICPMS (QCLot: 3130396)										
EB1326059-085	C82 0-0.5	EG020-SD: Arsenic	7440-38-2	50 mg/kg	107	----	70	130	----	----
		EG020-SD: Cadmium	7440-43-9	25 mg/kg	107	----	70	130	----	----
		EG020-SD: Chromium	7440-47-3	50 mg/kg	108	----	70	130	----	----
		EG020-SD: Copper	7440-50-8	50 mg/kg	107	----	70	130	----	----
		EG020-SD: Cobalt	7440-48-4	50 mg/kg	111	----	70	130	----	----
		EG020-SD: Lead	7439-92-1	50 mg/kg	106	----	70	130	----	----
		EG020-SD: Manganese	7439-96-5	50 mg/kg	# Not Determined	----	70	130	----	----
		EG020-SD: Nickel	7440-02-0	50 mg/kg	103	----	70	130	----	----
		EG020-SD: Vanadium	7440-62-2	50 mg/kg	115	----	70	130	----	----
		EG020-SD: Zinc	7440-66-6	50 mg/kg	103	----	70	130	----	----
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3130398)										
EB1326059-105	B41B 0.5-0.9	EG035T-LL: Mercury	7439-97-6	0.5 mg/kg	108	----	70	130	----	----

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration	Spike Recovery (%): MS	Spike Recovery (%): MSD	Recovery Limits (%): Low	Recovery Limits (%): High	RPDs (%): Value	RPDs (%): Control Limit
EG020-SD: Total Metals in Sediments by ICPMS (QCLot: 3130399)										
EB1326059-105	B41B 0.5-0.9	EG020-SD: Arsenic	7440-38-2	50 mg/kg	103	----	70	130	----	----
		EG020-SD: Cadmium	7440-43-9	25 mg/kg	106	----	70	130	----	----
		EG020-SD: Chromium	7440-47-3	50 mg/kg	103	----	70	130	----	----
		EG020-SD: Copper	7440-50-8	50 mg/kg	107	----	70	130	----	----
		EG020-SD: Cobalt	7440-48-4	50 mg/kg	113	----	70	130	----	----
		EG020-SD: Lead	7439-92-1	50 mg/kg	102	----	70	130	----	----
		EG020-SD: Manganese	7439-96-5	50 mg/kg	# Not Determined	----	70	130	----	----
		EG020-SD: Nickel	7440-02-0	50 mg/kg	101	----	70	130	----	----
		EG020-SD: Vanadium	7440-62-2	50 mg/kg	112	----	70	130	----	----
		EG020-SD: Zinc	7440-66-6	50 mg/kg	96.9	----	70	130	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 3130620)										
EB1326059-002	C119A 0-0.2	EK061G: Total Kjeldahl Nitrogen as N	----	500 mg/kg	111	----	70	130	----	----
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 3130621)										
EB1326059-002	C119A 0-0.2	EK067G: Total Phosphorus as P	----	100 mg/kg	122	----	70	130	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 3130622)										
EB1326059-047	K167 0-0.25	EK061G: Total Kjeldahl Nitrogen as N	----	500 mg/kg	89.7	----	70	130	----	----
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 3130623)										
EB1326059-047	K167 0-0.25	EK067G: Total Phosphorus as P	----	100 mg/kg	115	----	70	130	----	----
EP231: Perfluorinated Compounds (QCLot: 3132898)										
EB1326059-047	K167 0-0.25	EP231: PFOS	1763-23-1	0.0025 mg/kg	99.2	----	54	146	----	----
		EP231: PFOA	335-67-1	0.0025 mg/kg	88.0	----	54	134	----	----
		EP231: 6:2 Fluorotelomer sulfonate (6:2 FtS)	27619-97-2	0.0125 mg/kg	102	----	56	138	----	----
EP231: Perfluorinated Compounds (QCLot: 3132899)										
EB1326059-047	K167 0-0.25	EP231-PFC: 8:2 Fluorotelomer sulfonate	39108-34-4	0.0125 mg/kg	126	----	60	130	----	----
		EP231-PFC: PFOSA	754-91-6	0.0025 mg/kg	105	----	60	130	----	----
		EP231-PFC: N-Me-FOSA	31506-32-8	0.0125 mg/kg	119	----	60	130	----	----
		EP231-PFC: N-Et-FOSA	4151-50-2	0.0125 mg/kg	# 57.3	----	60	130	----	----
		EP231-PFC: N-Me-FOSE	2448-09-7	0.0125 mg/kg	126	----	60	130	----	----
		EP231-PFC: N-Et-FOSE	1691-99-2	0.0125 mg/kg	70.6	----	60	130	----	----
		EP231-PFC: PFBS	375-73-5	0.0025 mg/kg	96.8	----	60	130	----	----
		EP231-PFC: PFHxS	3871-99-6	0.0025 mg/kg	92.8	----	60	130	----	----
		EP231-PFC: PFDcS	67906-42-7	0.0025 mg/kg	94.4	----	60	130	----	----
		EP231-PFC: PFHxA	307-24-4	0.0025 mg/kg	95.2	----	60	130	----	----
		EP231-PFC: PFHpA	375-85-9	0.0025 mg/kg	96.8	----	60	130	----	----
		EP231-PFC: PFNA	375-95-1	0.0025 mg/kg	110	----	60	130	----	----
		EP231-PFC: PFDcA	335-76-2	0.0025 mg/kg	72.2	----	60	130	----	----
		EP231-PFC: PFUnA	2058-94-8	0.0025 mg/kg	119	----	60	130	----	----

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration	Spike Recovery (%): MS	Spike Recovery (%): MSD	Recovery Limits (%): Low	Recovery Limits (%): High	RPDs (%): Value	RPDs (%): Control Limit
EP231: Perfluorinated Compounds (QCLot: 3132899) - continued										
EB1326059-047	K167 0-0.25	EP231-PFC: PFDoA	307-55-1	0.0025 mg/kg	117	----	60	130	----	----
		EP231-PFC: PFTriA	72629-94-8	0.0025 mg/kg	79.8	----	60	130	----	----
		EP231-PFC: PFTeA	376-06-7	0.0125 mg/kg	71.0	----	60	130	----	----
EP231: Perfluorinated Compounds (QCLot: 3132902)										
EB1326059-099	I162 0.13-0.33	EP231: PFOS	1763-23-1	0.0025 mg/kg	96.4	----	54	146	----	----
		EP231: PFOA	335-67-1	0.0025 mg/kg	82.8	----	54	134	----	----
		EP231: 6:2 Fluorotelomer sulfonate (6:2 FtS)	27619-97-2	0.0125 mg/kg	80.0	----	56	138	----	----
EP231: Perfluorinated Compounds (QCLot: 3132903)										
EB1326059-099	I162 0.13-0.33	EP231-PFC: 8:2 Fluorotelomer sulfonate	39108-34-4	0.0125 mg/kg	110	----	60	130	----	----
		EP231-PFC: PFOSA	754-91-6	0.0025 mg/kg	85.2	----	60	130	----	----
		EP231-PFC: N-Me-FOSA	31506-32-8	0.0125 mg/kg	122	----	60	130	----	----
		EP231-PFC: N-Et-FOSA	4151-50-2	0.0125 mg/kg	72.5	----	60	130	----	----
		EP231-PFC: N-Me-FOSE	2448-09-7	0.0125 mg/kg	122	----	60	130	----	----
		EP231-PFC: N-Et-FOSE	1691-99-2	0.0125 mg/kg	81.6	----	60	130	----	----
		EP231-PFC: PFBS	375-73-5	0.0025 mg/kg	90.8	----	60	130	----	----
		EP231-PFC: PFHxS	3871-99-6	0.0025 mg/kg	91.6	----	60	130	----	----
		EP231-PFC: PFDcS	67906-42-7	0.0025 mg/kg	101	----	60	130	----	----
		EP231-PFC: PFHxA	307-24-4	0.0025 mg/kg	98.0	----	60	130	----	----
		EP231-PFC: PFHpA	375-85-9	0.0025 mg/kg	102	----	60	130	----	----
		EP231-PFC: PFNA	375-95-1	0.0025 mg/kg	111	----	60	130	----	----
		EP231-PFC: PFDcA	335-76-2	0.0025 mg/kg	72.4	----	60	130	----	----
		EP231-PFC: PFUnA	2058-94-8	0.0025 mg/kg	115	----	60	130	----	----
		EP231-PFC: PFDoA	307-55-1	0.0025 mg/kg	114	----	60	130	----	----
		EP231-PFC: PFTriA	72629-94-8	0.0025 mg/kg	71.6	----	60	130	----	----
		EP231-PFC: PFTeA	376-06-7	0.0125 mg/kg	83.2	----	60	130	----	----
EP130A: Organophosphorus Pesticides (Ultra-trace) (QCLot: 3133326)										
EB1326059-047	K167 0-0.25	EP130: Bromophos-ethyl	4824-78-6	50 µg/kg	67.5	----	36	144	----	----
		EP130: Carbophenothion	786-19-6	50 µg/kg	69.2	----	38	120	----	----
		EP130: Chlorfenvinphos (E)	18708-86-6	5 µg/kg	76.7	----	49	157	----	----
		EP130: Chlorfenvinphos (Z)	18708-87-7	50 µg/kg	63.6	----	53	145	----	----
		EP130: Chlorpyrifos	2921-88-2	50 µg/kg	63.1	----	60	140	----	----
		EP130: Chlorpyrifos-methyl	5598-13-0	50 µg/kg	66.6	----	56	126	----	----
		EP130: Demeton-S-methyl	919-86-8	50 µg/kg	55.2	----	9.7	148	----	----
		EP130: Diazinon	333-41-5	50 µg/kg	66.3	----	60	122	----	----
		EP130: Dichlorvos	62-73-7	50 µg/kg	62.6	----	33	123	----	----
		EP130: Dimethoate	60-51-5	50 µg/kg	67.7	----	36	142	----	----
		EP130: Ethion	563-12-2	50 µg/kg	66.8	----	48	136	----	----
		EP130: Fenamiphos	22224-92-6	50 µg/kg	64.5	----	42	136	----	----
		EP130: Fenthion	55-38-9	50 µg/kg	64.1	----	35	131	----	----

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration	Spike Recovery (%) MS	Spike Recovery (%) MSD	Recovery Limits (%) Low	Recovery Limits (%) High	RPDs (%) Value	RPDs (%) Control Limit
EP130A: Organophosphorus Pesticides (Ultra-trace) (QCLot: 3133326) - continued										
EB1326059-047	K167 0-0.25	EP130: Malathion	121-75-5	50 µg/kg	65.4	----	55	141	----	----
		EP130: Azinphos Methyl	86-50-0	50 µg/kg	67.0	----	23.5	132	----	----
		EP130: Monocrotophos	6923-22-4	50 µg/kg	69.5	----	35	153	----	----
		EP130: Parathion	56-38-2	50 µg/kg	67.1	----	57	147	----	----
		EP130: Parathion-methyl	298-00-0	50 µg/kg	66.4	----	48	140	----	----
		EP130: Pirimphos-ethyl	23505-41-1	50 µg/kg	59.0	----	45	137	----	----
		EP130: Prothiofos	34643-46-4	50 µg/kg	64.6	----	51	137	----	----
EP131A: Organochlorine Pesticides (QCLot: 3133327)										
EB1326059-047	K167 0-0.25	EP131A: Aldrin	309-00-2	5 µg/kg	65.4	----	23.4	153	----	----
		EP131A: alpha-BHC	319-84-6	5 µg/kg	52.5	----	17.6	156	----	----
		EP131A: beta-BHC	319-85-7	5 µg/kg	48.8	----	24.9	153	----	----
		EP131A: delta-BHC	319-86-8	5 µg/kg	64.5	----	25.2	147	----	----
		EP131A: 4.4`-DDD	72-54-8	5 µg/kg	62.7	----	25.9	150	----	----
		EP131A: 4.4`-DDE	72-55-9	5 µg/kg	54.3	----	31.2	125	----	----
		EP131A: 4.4`-DDT	50-29-3	5 µg/kg	71.1	----	23.4	163	----	----
		EP131A: Dieldrin	60-57-1	5 µg/kg	47.2	----	30.2	140	----	----
		EP131A: alpha-Endosulfan	959-98-8	5 µg/kg	56.5	----	28.8	135	----	----
		EP131A: beta-Endosulfan	33213-65-9	5 µg/kg	62.1	----	22.6	141	----	----
		EP131A: Endosulfan sulfate	1031-07-8	5 µg/kg	77.7	----	16.1	156	----	----
		EP131A: Endrin	72-20-8	5 µg/kg	93.2	----	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	67.3	----	13.4	151	----	----
		EP131A: Heptachlor	76-44-8	5 µg/kg	102	----	23.8	170	----	----
		EP131A: Heptachlor epoxide	1024-57-3	5 µg/kg	61.0	----	28.3	140	----	----
		EP131A: Hexachlorobenzene (HCB)	118-74-1	5 µg/kg	50.4	----	17.7	144	----	----
		EP131A: gamma-BHC	58-89-9	5 µg/kg	61.0	----	21.8	158	----	----
		EP131A: Methoxychlor	72-43-5	5 µg/kg	77.0	----	24.4	158	----	----
		EP131A: cis-Chlordane	5103-71-9	5 µg/kg	60.7	----	27.3	139	----	----
		EP131A: trans-Chlordane	5103-74-2	5 µg/kg	64.1	----	29.5	138	----	----
EP132B: Polynuclear Aromatic Hydrocarbons (QCLot: 3133344)										
EB1326059-047	K167 0-0.25	EP132B-SD: Naphthalene	91-20-3	25 µg/kg	102	----	70	130	----	----
		EP132B-SD: 2-Methylnaphthalene	91-57-6	25 µg/kg	106	----	70	130	----	----
		EP132B-SD: Acenaphthylene	208-96-8	25 µg/kg	92.7	----	70	130	----	----
		EP132B-SD: Acenaphthene	83-32-9	25 µg/kg	106	----	70	130	----	----
		EP132B-SD: Fluorene	86-73-7	25 µg/kg	102	----	70	130	----	----
		EP132B-SD: Phenanthrene	85-01-8	25 µg/kg	110	----	70	130	----	----
		EP132B-SD: Anthracene	120-12-7	25 µg/kg	104	----	70	130	----	----
		EP132B-SD: Fluoranthene	206-44-0	25 µg/kg	82.5	----	70	130	----	----
		EP132B-SD: Pyrene	129-00-0	25 µg/kg	98.2	----	70	130	----	----

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration	Spike Recovery (%): MS	Spike Recovery (%): MSD	Recovery Limits (%): Low	Recovery Limits (%): High	RPDs (%): Value	RPDs (%): Control Limit
EP132B: Polynuclear Aromatic Hydrocarbons (QCLot: 3133344) - continued										
EB1326059-047	K167 0-0.25	EP132B-SD: Benz(a)anthracene	56-55-3	25 µg/kg	101	----	70	130	----	----
		EP132B-SD: Chrysene	218-01-9	25 µg/kg	84.1	----	70	130	----	----
		EP132B-SD: Benzo(b)fluoranthene	205-99-2	25 µg/kg	85.3	----	70	130	----	----
		EP132B-SD: Benzo(k)fluoranthene	207-08-9	25 µg/kg	76.7	----	70	130	----	----
		EP132B-SD: Benzo(e)pyrene	192-97-2	25 µg/kg	84.5	----	70	130	----	----
		EP132B-SD: Benzo(a)pyrene	50-32-8	25 µg/kg	83.1	----	70	130	----	----
		EP132B-SD: Perylene	198-55-0	25 µg/kg	106	----	70	130	----	----
		EP132B-SD: Benzo(g.h.i)perylene	191-24-2	25 µg/kg	93.5	----	70	130	----	----
		EP132B-SD: Dibenz(a.h)anthracene	53-70-3	25 µg/kg	102	----	70	130	----	----
		EP132B-SD: Indeno(1.2.3.cd)pyrene	193-39-5	25 µg/kg	96.7	----	70	130	----	----
		EP132B-SD: Coronene	191-07-1	25 µg/kg	88.2	----	70	130	----	----
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons (QCLot: 3133345)										
EB1326059-047	K167 0-0.25	EP071-SD: C10 - C14 Fraction	----	19.75 mg/kg	73.7	----	70	130	----	----
		EP071-SD: C15 - C28 Fraction	----	87.25 mg/kg	81.9	----	70	130	----	----
		EP071-SD: C29 - C36 Fraction	----	60 mg/kg	80.9	----	70	130	----	----
EP132B: Polynuclear Aromatic Hydrocarbons (QCLot: 3133346)										
EB1326059-099	I162 0.13-0.33	EP132B-SD: Naphthalene	91-20-3	25 µg/kg	82.2	----	70	130	----	----
		EP132B-SD: 2-Methylnaphthalene	91-57-6	25 µg/kg	82.6	----	70	130	----	----
		EP132B-SD: Acenaphthylene	208-96-8	25 µg/kg	90.7	----	70	130	----	----
		EP132B-SD: Acenaphthene	83-32-9	25 µg/kg	86.8	----	70	130	----	----
		EP132B-SD: Fluorene	86-73-7	25 µg/kg	81.7	----	70	130	----	----
		EP132B-SD: Phenanthrene	85-01-8	25 µg/kg	89.5	----	70	130	----	----
		EP132B-SD: Anthracene	120-12-7	25 µg/kg	84.8	----	70	130	----	----
		EP132B-SD: Fluoranthene	206-44-0	25 µg/kg	80.7	----	70	130	----	----
		EP132B-SD: Pyrene	129-00-0	25 µg/kg	88.3	----	70	130	----	----
		EP132B-SD: Benz(a)anthracene	56-55-3	25 µg/kg	100	----	70	130	----	----
		EP132B-SD: Chrysene	218-01-9	25 µg/kg	113	----	70	130	----	----
		EP132B-SD: Benzo(b)fluoranthene	205-99-2	25 µg/kg	85.6	----	70	130	----	----
		EP132B-SD: Benzo(k)fluoranthene	207-08-9	25 µg/kg	99.2	----	70	130	----	----
		EP132B-SD: Benzo(e)pyrene	192-97-2	25 µg/kg	95.1	----	70	130	----	----
		EP132B-SD: Benzo(a)pyrene	50-32-8	25 µg/kg	98.9	----	70	130	----	----
		EP132B-SD: Perylene	198-55-0	25 µg/kg	103	----	70	130	----	----
		EP132B-SD: Benzo(g.h.i)perylene	191-24-2	25 µg/kg	110	----	70	130	----	----
		EP132B-SD: Dibenz(a.h)anthracene	53-70-3	25 µg/kg	107	----	70	130	----	----
		EP132B-SD: Indeno(1.2.3.cd)pyrene	193-39-5	25 µg/kg	102	----	70	130	----	----
		EP132B-SD: Coronene	191-07-1	25 µg/kg	94.1	----	70	130	----	----
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons (QCLot: 3133347)										
EB1326059-099	I162 0.13-0.33	EP071-SD: C10 - C14 Fraction	----	19.75 mg/kg	73.7	----	70	130	----	----
		EP071-SD: C15 - C28 Fraction	----	87.25 mg/kg	77.9	----	70	130	----	----

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration	Spike Recovery (%): MS	Spike Recovery (%): MSD	Recovery Limits (%): Low	Recovery Limits (%): High	RPDs (%): Value	RPDs (%): Control Limit
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons (QCLot: 3133347) - continued										
EB1326059-099	I162 0.13-0.33	EP071-SD: C29 - C36 Fraction	----	60 mg/kg	106	----	70	130	----	----
EP130A: Organophosphorus Pesticides (Ultra-trace) (QCLot: 3133354)										
EB1326059-099	I162 0.13-0.33	EP130: Bromophos-ethyl	4824-78-6	50 µg/kg	81.9	----	36	144	----	----
		EP130: Carbophenothion	786-19-6	50 µg/kg	69.9	----	38	120	----	----
		EP130: Chlorfenvinphos (E)	18708-86-6	5 µg/kg	120	----	49	157	----	----
		EP130: Chlorfenvinphos (Z)	18708-87-7	50 µg/kg	65.4	----	53	145	----	----
		EP130: Chlorpyrifos	2921-88-2	50 µg/kg	77.5	----	60	140	----	----
		EP130: Chlorpyrifos-methyl	5598-13-0	50 µg/kg	63.7	----	56	126	----	----
		EP130: Demeton-S-methyl	919-86-8	50 µg/kg	63.2	----	9.7	148	----	----
		EP130: Diazinon	333-41-5	50 µg/kg	73.8	----	60	122	----	----
		EP130: Dichlorvos	62-73-7	50 µg/kg	68.7	----	33	123	----	----
		EP130: Dimethoate	60-51-5	50 µg/kg	84.7	----	36	142	----	----
		EP130: Ethion	563-12-2	50 µg/kg	69.1	----	48	136	----	----
		EP130: Fenamiphos	22224-92-6	50 µg/kg	71.8	----	42	136	----	----
		EP130: Fenthion	55-38-9	50 µg/kg	74.0	----	35	131	----	----
		EP130: Malathion	121-75-5	50 µg/kg	82.0	----	55	141	----	----
		EP130: Azinphos Methyl	86-50-0	50 µg/kg	79.4	----	23.5	132	----	----
		EP130: Monocrotophos	6923-22-4	50 µg/kg	73.0	----	35	153	----	----
		EP130: Parathion	56-38-2	50 µg/kg	89.2	----	57	147	----	----
		EP130: Parathion-methyl	298-00-0	50 µg/kg	84.9	----	48	140	----	----
		EP130: Pirimphos-ethyl	23505-41-1	50 µg/kg	81.6	----	45	137	----	----
		EP130: Prothiofos	34643-46-4	50 µg/kg	85.0	----	51	137	----	----
EP131A: Organochlorine Pesticides (QCLot: 3133355)										
EB1326059-099	I162 0.13-0.33	EP131A: Aldrin	309-00-2	5 µg/kg	88.5	----	23.4	153	----	----
		EP131A: alpha-BHC	319-84-6	5 µg/kg	64.6	----	17.6	156	----	----
		EP131A: beta-BHC	319-85-7	5 µg/kg	38.6	----	24.9	153	----	----
		EP131A: delta-BHC	319-86-8	5 µg/kg	79.4	----	25.2	147	----	----
		EP131A: 4.4`-DDD	72-54-8	5 µg/kg	78.5	----	25.9	150	----	----
		EP131A: 4.4`-DDE	72-55-9	5 µg/kg	68.2	----	31.2	125	----	----
		EP131A: 4.4`-DDT	50-29-3	5 µg/kg	74.5	----	23.4	163	----	----
		EP131A: Dieldrin	60-57-1	5 µg/kg	73.2	----	30.2	140	----	----
		EP131A: alpha-Endosulfan	959-98-8	5 µg/kg	70.7	----	28.8	135	----	----
		EP131A: beta-Endosulfan	33213-65-9	5 µg/kg	76.2	----	22.6	141	----	----
		EP131A: Endosulfan sulfate	1031-07-8	5 µg/kg	91.5	----	16.1	156	----	----
		EP131A: Endrin	72-20-8	5 µg/kg	112	----	17.7	162	----	----
		EP131A: Endrin aldehyde	7421-93-4	5 µg/kg	72.2	----	20.1	116	----	----
		EP131A: Endrin ketone	53494-70-5	5 µg/kg	80.6	----	13.4	151	----	----
		EP131A: Heptachlor	76-44-8	5 µg/kg	117	----	23.8	170	----	----
		EP131A: Heptachlor epoxide	1024-57-3	5 µg/kg	76.1	----	28.3	140	----	----

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration	Spike Recovery (%): MS	Spike Recovery (%): MSD	Recovery Limits (%): Low	Recovery Limits (%): High	RPDs (%): Value	RPDs (%): Control Limit
EP131A: Organochlorine Pesticides (QCLot: 3133355) - continued										
EB1326059-099	I162 0.13-0.33	EP131A: Hexachlorobenzene (HCB)	118-74-1	5 µg/kg	55.8	----	17.7	144	----	----
		EP131A: gamma-BHC	58-89-9	5 µg/kg	76.0	----	21.8	158	----	----
		EP131A: Methoxychlor	72-43-5	5 µg/kg	90.9	----	24.4	158	----	----
		EP131A: cis-Chlordane	5103-71-9	5 µg/kg	76.0	----	27.3	139	----	----
		EP131A: trans-Chlordane	5103-74-2	5 µg/kg	73.9	----	29.5	138	----	----
EK055: Ammonia as N (QCLot: 3134401)										
EB1326059-002	C119A 0-0.2	EK055-SD: Ammonia as N	7664-41-7	20 mg/kg	102	----	70	130	----	----
EK055: Ammonia as N (QCLot: 3134403)										
EB1326059-047	K167 0-0.25	EK055-SD: Ammonia as N	7664-41-7	20 mg/kg	75.7	----	70	130	----	----
EK055: Ammonia as N (QCLot: 3134405)										
EB1326059-075	C72 0-0.5	EK055-SD: Ammonia as N	7664-41-7	20 mg/kg	83.1	----	70	130	----	----
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons (QCLot: 3134489)										
EB1326059-047	K167 0-0.25	EP080-SD: C6 - C9 Fraction	----	6.5 mg/kg	98.9	----	70	130	----	----
EP080-SD: BTEXN (QCLot: 3134489)										
EB1326059-047	K167 0-0.25	EP080-SD: Benzene	71-43-2	0.5 mg/kg	85.3	----	70	130	----	----
		EP080-SD: Toluene	108-88-3	0.5 mg/kg	88.4	----	70	130	----	----
		EP080-SD: Ethylbenzene	100-41-4	0.5 mg/kg	98.0	----	70	130	----	----
		EP080-SD: meta- & para-Xylene	108-38-3 106-42-3	0.5 mg/kg	101	----	70	130	----	----
		EP080-SD: ortho-Xylene	95-47-6	0.5 mg/kg	102	----	70	130	----	----
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons (QCLot: 3134495)										
EB1326059-099	I162 0.13-0.33	EP080-SD: C6 - C9 Fraction	----	6.5 mg/kg	82.3	----	70	130	----	----
EP080-SD: BTEXN (QCLot: 3134495)										
EB1326059-099	I162 0.13-0.33	EP080-SD: Benzene	71-43-2	0.5 mg/kg	72.5	----	70	130	----	----
		EP080-SD: Toluene	108-88-3	0.5 mg/kg	74.1	----	70	130	----	----
		EP080-SD: Ethylbenzene	100-41-4	0.5 mg/kg	77.9	----	70	130	----	----
		EP080-SD: meta- & para-Xylene	108-38-3 106-42-3	0.5 mg/kg	80.0	----	70	130	----	----
		EP080-SD: ortho-Xylene	95-47-6	0.5 mg/kg	84.3	----	70	130	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 3149190)										
EB1326059-051	P180 0-0.05	EK061G: Total Kjeldahl Nitrogen as N	----	500 mg/kg	78.6	----	70	130	----	----
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 3149191)										
EB1326059-051	P180 0-0.05	EK067G: Total Phosphorus as P	----	100 mg/kg	72.6	----	70	130	----	----
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3150705)										
EB1326059-051	P180 0-0.05	EG035T-LL: Mercury	7439-97-6	0.5 mg/kg	118	----	70	130	----	----
EG020-SD: Total Metals in Sediments by ICPMS (QCLot: 3150706)										
EB1326059-061	QAQC3	EG020-SD: Arsenic	7440-38-2	50 mg/kg	116	----	70	130	----	----

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration	Spike Recovery (%): MS	Spike Recovery (%): MSD	Recovery Limits (%): Low	Recovery Limits (%): High	RPDs (%): Value	RPDs (%): Control Limit
EG020-SD: Total Metals in Sediments by ICPMS (QCLot: 3150706) - continued										
EB1326059-061	QAQC3	EG020-SD: Cadmium	7440-43-9	50 mg/kg	107	----	70	130	----	----
		EG020-SD: Copper	7440-50-8	250 mg/kg	90.0	----	70	130	----	----
		EG020-SD: Lead	7439-92-1	250 mg/kg	74.2	----	70	130	----	----
		EG020-SD: Nickel	7440-02-0	50 mg/kg	115	----	70	130	----	----
		EG020-SD: Zinc	7440-66-6	125 mg/kg	124	----	70	130	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 3150736)										
EB1326059-051	P180 0-0.05	EK059G: Nitrite + Nitrate as N (Sol.)	----	2.5 mg/kg	99.4	----	70	130	----	----

Sub-Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration	Spike Recovery (%): MS	Spike Recovery (%): MSD	Recovery Limits (%): Low	Recovery Limits (%): High	RPDs (%): Value	RPDs (%): Control Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 3133518)										
EB1326059-110	PWC Pore Water	EK059G: Nitrite + Nitrate as N	----	0.4 mg/L	91.8	----	70	130	----	----
EK055G: Ammonia as N by Discrete Analyser (QCLot: 3133519)										
EB1326059-110	PWC Pore Water	EK055G: Ammonia as N	7664-41-7	0.4 mg/L	90.4	----	70	130	----	----
EK057G: Nitrite as N by Discrete Analyser (QCLot: 3134396)										
EB1326059-110	PWC Pore Water	EK057G: Nitrite as N	----	0.4 mg/L	120	----	70	130	----	----
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 3134397)										
EB1326059-110	PWC Pore Water	EK071G: Reactive Phosphorus as P	14265-44-2	0.4 mg/L	112	----	70	130	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 3134802)										
EB1326059-115	PWC Seawater Elutriate	EK059G: Nitrite + Nitrate as N	----	0.4 mg/L	116	----	70	130	----	----
EK055G: Ammonia as N by Discrete Analyser (QCLot: 3134803)										
EB1326059-115	PWC Seawater Elutriate	EK055G: Ammonia as N	7664-41-7	0.4 mg/L	106	----	70	130	----	----
EK057G: Nitrite as N by Discrete Analyser (QCLot: 3135172)										
EB1326059-115	PWC Seawater Elutriate	EK057G: Nitrite as N	----	0.4 mg/L	114	----	70	130	----	----
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 3135173)										
EB1326059-115	PWC Seawater Elutriate	EK071G: Reactive Phosphorus as P	14265-44-2	0.4 mg/L	104	----	70	130	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 3140407)										
EB1326238-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.4 mg/L	98.2	----	70	130	----	----
EK055G: Ammonia as N by Discrete Analyser (QCLot: 3140408)										
EB1326238-001	Anonymous	EK055G: Ammonia as N	7664-41-7	0.4 mg/L	102	----	70	130	----	----
EP208: Phenylurea Herbicides (QCLot: 3141729)										
EB1326059-108	PWA Pore Water	EP208: Diuron	330-54-1	5 µg/L	97.0	----	70.8	129	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 3146952)										
EB1326059-109	PWB Pore Water	EK061G: Total Kjeldahl Nitrogen as N	----	5 mg/L	101	----	70	130	----	----
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 3146953)										
EB1326059-109	PWB Pore Water	EK067G: Total Phosphorus as P	----	1.0 mg/L	110	----	70	130	----	----

Sub-Matrix: **WATER**

				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	MSD	Low	High	Value	Control Limit
EG035F: Dissolved Mercury by FIMS (QCLot: 3156655)										
EB1326059-109	PWB Pore Water	EG035F: Mercury	7439-97-6	0.010 mg/L	95.1	----	70	130	----	----
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS (QCLot: 3157841)										
EB1326059-113	PWA Seawater Elutriate	EG093A-F: Arsenic	7440-38-2	25 µg/L	126	----	70	130	----	----
		EG093A-F: Cadmium	7440-43-9	25 µg/L	113	----	70	130	----	----
		EG093A-F: Chromium	7440-47-3	25 µg/L	96.5	----	70	130	----	----
		EG093A-F: Copper	7440-50-8	50 µg/L	112	----	70	130	----	----
		EG093A-F: Lead	7439-92-1	25 µg/L	113	----	70	130	----	----
		EG093A-F: Nickel	7440-02-0	25 µg/L	121	----	70	130	----	----
		EG093A-F: Zinc	7440-66-6	50 µg/L	103	----	70	130	----	----
EG093T: Total Metals in Saline Water by ORC-ICPMS (QCLot: 3157847)										
EB1326059-113	PWA Seawater Elutriate	EG093A-T: Arsenic	7440-38-2	50 µg/L	95.8	----	70	130	----	----
		EG093A-T: Cadmium	7440-43-9	50 µg/L	91.4	----	70	130	----	----
		EG093A-T: Chromium	7440-47-3	50 µg/L	93.1	----	70	130	----	----
		EG093A-T: Copper	7440-50-8	100 µg/L	97.5	----	70	130	----	----
		EG093A-T: Lead	7439-92-1	50 µg/L	95.4	----	70	130	----	----
		EG093A-T: Nickel	7440-02-0	50 µg/L	98.9	----	70	130	----	----
		EG093A-T: Zinc	7440-66-6	100 µg/L	88.8	----	70	130	----	----
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3157861)										
EB1326059-114	PWB Seawater Elutriate	EG035T: Mercury	7439-97-6	0.010 mg/L	107	----	70	130	----	----
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS (QCLot: 3160736)										
EB1326059-109	PWB Pore Water	EG093A-F: Arsenic	7440-38-2	50 µg/L	94.1	----	70	130	----	----
		EG093A-F: Cadmium	7440-43-9	50 µg/L	98.0	----	70	130	----	----
		EG093A-F: Chromium	7440-47-3	50 µg/L	105	----	70	130	----	----
		EG093A-F: Copper	7440-50-8	100 µg/L	101	----	70	130	----	----
		EG093A-F: Lead	7439-92-1	50 µg/L	98.6	----	70	130	----	----
		EG093A-F: Nickel	7440-02-0	50 µg/L	99.8	----	70	130	----	----
		EG093A-F: Zinc	7440-66-6	100 µg/L	107	----	70	130	----	----
EG093T: Total Metals in Saline Water by ORC-ICPMS (QCLot: 3160738)										
EB1326059-109	PWB Pore Water	EG093A-T: Arsenic	7440-38-2	50 µg/L	104	----	70	130	----	----
		EG093A-T: Cadmium	7440-43-9	50 µg/L	102	----	70	130	----	----
		EG093A-T: Chromium	7440-47-3	50 µg/L	104	----	70	130	----	----
		EG093A-T: Copper	7440-50-8	100 µg/L	101	----	70	130	----	----
		EG093A-T: Lead	7439-92-1	50 µg/L	99.9	----	70	130	----	----
		EG093A-T: Nickel	7440-02-0	50 µg/L	104	----	70	130	----	----
		EG093A-T: Zinc	7440-66-6	100 µg/L	100	----	70	130	----	----

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **EB1326059**	Page	: 1 of 51
Client	: BMT WBM GROUP LTD	Laboratory	: Environmental Division Brisbane
Contact	: DR MARKUS BILLERBECK	Contact	: Customer Services
Address	: PO BOX 203 SPRING HILL BRISBANE QLD 4004	Address	: 2 Byth Street Stafford QLD Australia 4053
E-mail	: markus.billerbeck@bmtwbm.com.au	E-mail	: Brisbane.Enviro.Services@alsglobal.com
Telephone	: +61 07 3831 6744	Telephone	: +61 7 3243 7222
Facsimile	: +61 07 3832 3627	Facsimile	: +61 7 3243 7218
Project	: B20180 Cairns EIS	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 25-OCT-2013
Sampler	: Stuart Taylor	Issue Date	: 16-NOV-2013
Order number	: ----		
		No. of samples received	: 118
Quote number	: BN/915/13 V2	No. of samples analysed	: 111

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Interpretive Quality Control Report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Parameter Frequency Compliance
- Brief Method Summaries
- Summary of Outliers

Analysis Holding Time Compliance

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

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

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

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA033-E: Acid Base Accounting								
Snap Lock Bag - frozen (EA033)								
C119 0-0.2,	C119A 0-0.2,	**18-OCT-2013**	---	18-OCT-2014	----	**12-NOV-2013**	18-OCT-2014	✓
C119B 0-0.2,	B130 0-0.5,							
A138 0-0.27,	A140 0-0.26,							
D149 0-0.15,	C146 0-0.25,							
D147 0-0.05								
Snap Lock Bag - frozen (EA033)								
B2 0-0.55,	B7 0-0.50,	**19-OCT-2013**	---	19-OCT-2014	----	**12-NOV-2013**	19-OCT-2014	✓
B7 0.5-0.95,	B9 0-0.5,							
B9 0.5-0.7,	C22 0-0.5,							
C22 0.5-0.9,	C29 0-0.5,							
C29 0.5-0.8,	B25 0-0.2,							
B25 0.2-0.3,	C30 0-0.5,							
C30 0.5-1.0,	C94 0-0.5,							
C94 0.5-1.0,	C99 0-0.5,							
C99 0.5-0.8,	C121 0-0.5,							
C121 0.5-0.8,	F156 0-0.05							
Snap Lock Bag - frozen (EA033)								
B108 0-0.5,	B108 0.5-1.0,	**20-OCT-2013**	---	20-OCT-2014	----	**12-NOV-2013**	20-OCT-2014	✓
B108 1.0-1.2,	B104 0-0.5,							
B104 0.5-0.95,	C50 0-0.5,							
C50 0.5-1.0,	C50 1.0-1.2,							
C53 0-0.5,	C53 0.5-0.9,							
B54 0-0.5,	B54 0.5-1.0,							
B54 1.0-1.1,	K167 0-0.25,							
M180 0-0.2,	M180A 0-0.2,							
M180B 0-0.2								
Snap Lock Bag - frozen (EA033)								

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA033-E: Acid Base Accounting - Continued								
H167 0-0.2,	H165 0-0.2,	**21-OCT-2013**	---	21-OCT-2014	----	**12-NOV-2013**	21-OCT-2014	✓
H165A 0-0.2,	H165B 0-0.2,							
V187 0-0.1,	V187A 0-0.2,							
V187B 0-0.2,	QAQC3,							
V185 0-0.5,	V185 0.5-1.0,							
V185 1.0-1.5,	V185 1.5-2.0,							
V185 2.0-2.5,	V185 2.5-2.9,							
QAQC5,	QAQC4							
Snap Lock Bag - frozen (EA033)								
B63 0-0.5,	B63 0.5-1.0,	**22-OCT-2013**	---	22-OCT-2014	----	**12-NOV-2013**	22-OCT-2014	✓
B63 1.0-1.45,	B41 0-0.5,							
B41 0.5-0.9,	C72 0-0.5,							
C72 0.5-1.0,	C72 1.0-2.1,							
B74 0-0.5,	B74 0.5-1.0,							
B74 1.0-1.9,	B79 0.5-1.0,							
B79 1.0-1.8,	C82 0-0.5,							
C82 0.5-1.0,	C82 1.0-1.53,							
QAQC7,	QAQC6,							
B41B 0-0.5,	B41B 0.5-0.9,							
B41A 0-0.5,	B41A 0.5-0.9							
Snap Lock Bag - frozen (EA033)								
A127 0-0.5,	A127 0.5-1.0,	**23-OCT-2013**	---	23-OCT-2014	----	**12-NOV-2013**	23-OCT-2014	✓
A127 1.0-1.7,	F150 0-0.43,							
I162 0.13-0.33,	J164 0-0.5,							
J164 0.5-1.02,	I172 0-0.5,							
I172 0.5-1.0								

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA033-C: Acid Neutralising Capacity								
Snap Lock Bag - frozen (EA033)								
C119 0-0.2,	C119A 0-0.2,	**18-OCT-2013**	---	18-OCT-2014	----	**12-NOV-2013**	18-OCT-2014	✓
C119B 0-0.2,	B130 0-0.5,							
A138 0-0.27,	A140 0-0.26,							
D149 0-0.15,	C146 0-0.25,							
D147 0-0.05								
Snap Lock Bag - frozen (EA033)								
B2 0-0.55,	B7 0-0.50,	**19-OCT-2013**	---	19-OCT-2014	----	**12-NOV-2013**	19-OCT-2014	✓
B7 0.5-0.95,	B9 0-0.5,							
B9 0.5-0.7,	C22 0-0.5,							
C22 0.5-0.9,	C29 0-0.5,							
C29 0.5-0.8,	B25 0-0.2,							
B25 0.2-0.3,	C30 0-0.5,							
C30 0.5-1.0,	C94 0-0.5,							
C94 0.5-1.0,	C99 0-0.5,							
C99 0.5-0.8,	C121 0-0.5,							
C121 0.5-0.8,	F156 0-0.05							
Snap Lock Bag - frozen (EA033)								
B108 0-0.5,	B108 0.5-1.0,	**20-OCT-2013**	---	20-OCT-2014	----	**12-NOV-2013**	20-OCT-2014	✓
B108 1.0-1.2,	B104 0-0.5,							
B104 0.5-0.95,	C50 0-0.5,							
C50 0.5-1.0,	C50 1.0-1.2,							
C53 0-0.5,	C53 0.5-0.9,							
B54 0-0.5,	B54 0.5-1.0,							
B54 1.0-1.1,	K167 0-0.25,							
M180 0-0.2,	M180A 0-0.2,							
M180B 0-0.2								
Snap Lock Bag - frozen (EA033)								
H167 0-0.2,	H165 0-0.2,	**21-OCT-2013**	---	21-OCT-2014	----	**12-NOV-2013**	21-OCT-2014	✓
H165A 0-0.2,	H165B 0-0.2,							
V187 0-0.1,	V187A 0-0.2,							
V187B 0-0.2,	QAQC3,							
V185 0-0.5,	V185 0.5-1.0,							
V185 1.0-1.5,	V185 1.5-2.0,							
V185 2.0-2.5,	V185 2.5-2.9,							
QAQC5,	QAQC4							
Snap Lock Bag - frozen (EA033)								

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA033-C: Acid Neutralising Capacity - Continued								
B63 0-0.5,	B63 0.5-1.0,	**22-OCT-2013**	---	22-OCT-2014	----	**12-NOV-2013**	22-OCT-2014	✓
B63 1.0-1.45,	B41 0-0.5,							
B41 0.5-0.9,	C72 0-0.5,							
C72 0.5-1.0,	C72 1.0-2.1,							
B74 0-0.5,	B74 0.5-1.0,							
B74 1.0-1.9,	B79 0.5-1.0,							
B79 1.0-1.8,	C82 0-0.5,							
C82 0.5-1.0,	C82 1.0-1.53,							
QAQC7,	QAQC6,							
B41B 0-0.5,	B41B 0.5-0.9,							
B41A 0-0.5,	B41A 0.5-0.9							
Snap Lock Bag - frozen (EA033)								
A127 0-0.5,	A127 0.5-1.0,	**23-OCT-2013**	---	23-OCT-2014	----	**12-NOV-2013**	23-OCT-2014	✓
A127 1.0-1.7,	F150 0-0.43,							
I162 0.13-0.33,	J164 0-0.5,							
J164 0.5-1.02,	I172 0-0.5,							
I172 0.5-1.0								

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA033-A: Actual Acidity								
Snap Lock Bag - frozen (EA033)								
C119 0-0.2,	C119A 0-0.2,	**18-OCT-2013**	---	18-OCT-2014	----	**12-NOV-2013**	18-OCT-2014	✓
C119B 0-0.2,	B130 0-0.5,							
A138 0-0.27,	A140 0-0.26,							
D149 0-0.15,	C146 0-0.25,							
D147 0-0.05								
Snap Lock Bag - frozen (EA033)								
B2 0-0.55,	B7 0-0.50,	**19-OCT-2013**	---	19-OCT-2014	----	**12-NOV-2013**	19-OCT-2014	✓
B7 0.5-0.95,	B9 0-0.5,							
B9 0.5-0.7,	C22 0-0.5,							
C22 0.5-0.9,	C29 0-0.5,							
C29 0.5-0.8,	B25 0-0.2,							
B25 0.2-0.3,	C30 0-0.5,							
C30 0.5-1.0,	C94 0-0.5,							
C94 0.5-1.0,	C99 0-0.5,							
C99 0.5-0.8,	C121 0-0.5,							
C121 0.5-0.8,	F156 0-0.05							
Snap Lock Bag - frozen (EA033)								
B108 0-0.5,	B108 0.5-1.0,	**20-OCT-2013**	---	20-OCT-2014	----	**12-NOV-2013**	20-OCT-2014	✓
B108 1.0-1.2,	B104 0-0.5,							
B104 0.5-0.95,	C50 0-0.5,							
C50 0.5-1.0,	C50 1.0-1.2,							
C53 0-0.5,	C53 0.5-0.9,							
B54 0-0.5,	B54 0.5-1.0,							
B54 1.0-1.1,	K167 0-0.25,							
M180 0-0.2,	M180A 0-0.2,							
M180B 0-0.2								
Snap Lock Bag - frozen (EA033)								
H167 0-0.2,	H165 0-0.2,	**21-OCT-2013**	---	21-OCT-2014	----	**12-NOV-2013**	21-OCT-2014	✓
H165A 0-0.2,	H165B 0-0.2,							
V187 0-0.1,	V187A 0-0.2,							
V187B 0-0.2,	QAQC3,							
V185 0-0.5,	V185 0.5-1.0,							
V185 1.0-1.5,	V185 1.5-2.0,							
V185 2.0-2.5,	V185 2.5-2.9,							
QAQC5,	QAQC4							
Snap Lock Bag - frozen (EA033)								

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA033-A: Actual Acidity - Continued								
B63 0-0.5,	B63 0.5-1.0,	**22-OCT-2013**	---	22-OCT-2014	----	**12-NOV-2013**	22-OCT-2014	✓
B63 1.0-1.45,	B41 0-0.5,							
B41 0.5-0.9,	C72 0-0.5,							
C72 0.5-1.0,	C72 1.0-2.1,							
B74 0-0.5,	B74 0.5-1.0,							
B74 1.0-1.9,	B79 0.5-1.0,							
B79 1.0-1.8,	C82 0-0.5,							
C82 0.5-1.0,	C82 1.0-1.53,							
QAQC7,	QAQC6,							
B41B 0-0.5,	B41B 0.5-0.9,							
B41A 0-0.5,	B41A 0.5-0.9							
Snap Lock Bag - frozen (EA033)								
A127 0-0.5,	A127 0.5-1.0,	**23-OCT-2013**	---	23-OCT-2014	----	**12-NOV-2013**	23-OCT-2014	✓
A127 1.0-1.7,	F150 0-0.43,							
I162 0.13-0.33,	J164 0-0.5,							
J164 0.5-1.02,	I172 0-0.5,							
I172 0.5-1.0								

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA033-B: Potential Acidity								
Snap Lock Bag - frozen (EA033)								
C119 0-0.2,	C119A 0-0.2,	**18-OCT-2013**	---	18-OCT-2014	----	**12-NOV-2013**	18-OCT-2014	✓
C119B 0-0.2,	B130 0-0.5,							
A138 0-0.27,	A140 0-0.26,							
D149 0-0.15,	C146 0-0.25,							
D147 0-0.05								
Snap Lock Bag - frozen (EA033)								
B2 0-0.55,	B7 0-0.50,	**19-OCT-2013**	---	19-OCT-2014	----	**12-NOV-2013**	19-OCT-2014	✓
B7 0.5-0.95,	B9 0-0.5,							
B9 0.5-0.7,	C22 0-0.5,							
C22 0.5-0.9,	C29 0-0.5,							
C29 0.5-0.8,	B25 0-0.2,							
B25 0.2-0.3,	C30 0-0.5,							
C30 0.5-1.0,	C94 0-0.5,							
C94 0.5-1.0,	C99 0-0.5,							
C99 0.5-0.8,	C121 0-0.5,							
C121 0.5-0.8,	F156 0-0.05							
Snap Lock Bag - frozen (EA033)								
B108 0-0.5,	B108 0.5-1.0,	**20-OCT-2013**	---	20-OCT-2014	----	**12-NOV-2013**	20-OCT-2014	✓
B108 1.0-1.2,	B104 0-0.5,							
B104 0.5-0.95,	C50 0-0.5,							
C50 0.5-1.0,	C50 1.0-1.2,							
C53 0-0.5,	C53 0.5-0.9,							
B54 0-0.5,	B54 0.5-1.0,							
B54 1.0-1.1,	K167 0-0.25,							
M180 0-0.2,	M180A 0-0.2,							
M180B 0-0.2								
Snap Lock Bag - frozen (EA033)								
H167 0-0.2,	H165 0-0.2,	**21-OCT-2013**	---	21-OCT-2014	----	**12-NOV-2013**	21-OCT-2014	✓
H165A 0-0.2,	H165B 0-0.2,							
V187 0-0.1,	V187A 0-0.2,							
V187B 0-0.2,	QAQC3,							
V185 0-0.5,	V185 0.5-1.0,							
V185 1.0-1.5,	V185 1.5-2.0,							
V185 2.0-2.5,	V185 2.5-2.9,							
QAQC5,	QAQC4							
Snap Lock Bag - frozen (EA033)								

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA033-B: Potential Acidity - Continued								
B63 0-0.5,	B63 0.5-1.0,	**22-OCT-2013**	---	22-OCT-2014	----	**12-NOV-2013**	22-OCT-2014	✓
B63 1.0-1.45,	B41 0-0.5,							
B41 0.5-0.9,	C72 0-0.5,							
C72 0.5-1.0,	C72 1.0-2.1,							
B74 0-0.5,	B74 0.5-1.0,							
B74 1.0-1.9,	B79 0.5-1.0,							
B79 1.0-1.8,	C82 0-0.5,							
C82 0.5-1.0,	C82 1.0-1.53,							
QAQC7,	QAQC6,							
B41B 0-0.5,	B41B 0.5-0.9,							
B41A 0-0.5,	B41A 0.5-0.9							
Snap Lock Bag - frozen (EA033)								
A127 0-0.5,	A127 0.5-1.0,	**23-OCT-2013**	---	23-OCT-2014	----	**12-NOV-2013**	23-OCT-2014	✓
A127 1.0-1.7,	F150 0-0.43,							
I162 0.13-0.33,	J164 0-0.5,							
J164 0.5-1.02,	I172 0-0.5,							
I172 0.5-1.0								

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA033-D: Retained Acidity								
Snap Lock Bag - frozen (EA033)								
C119 0-0.2,	C119A 0-0.2,	**18-OCT-2013**	---	18-OCT-2014	----	**12-NOV-2013**	18-OCT-2014	✓
C119B 0-0.2,	B130 0-0.5,							
A138 0-0.27,	A140 0-0.26,							
D149 0-0.15,	C146 0-0.25,							
D147 0-0.05								
Snap Lock Bag - frozen (EA033)								
B2 0-0.55,	B7 0-0.50,	**19-OCT-2013**	---	19-OCT-2014	----	**12-NOV-2013**	19-OCT-2014	✓
B7 0.5-0.95,	B9 0-0.5,							
B9 0.5-0.7,	C22 0-0.5,							
C22 0.5-0.9,	C29 0-0.5,							
C29 0.5-0.8,	B25 0-0.2,							
B25 0.2-0.3,	C30 0-0.5,							
C30 0.5-1.0,	C94 0-0.5,							
C94 0.5-1.0,	C99 0-0.5,							
C99 0.5-0.8,	C121 0-0.5,							
C121 0.5-0.8,	F156 0-0.05							
Snap Lock Bag - frozen (EA033)								
B108 0-0.5,	B108 0.5-1.0,	**20-OCT-2013**	---	20-OCT-2014	----	**12-NOV-2013**	20-OCT-2014	✓
B108 1.0-1.2,	B104 0-0.5,							
B104 0.5-0.95,	C50 0-0.5,							
C50 0.5-1.0,	C50 1.0-1.2,							
C53 0-0.5,	C53 0.5-0.9,							
B54 0-0.5,	B54 0.5-1.0,							
B54 1.0-1.1,	K167 0-0.25,							
M180 0-0.2,	M180A 0-0.2,							
M180B 0-0.2								
Snap Lock Bag - frozen (EA033)								
H167 0-0.2,	H165 0-0.2,	**21-OCT-2013**	---	21-OCT-2014	----	**12-NOV-2013**	21-OCT-2014	✓
H165A 0-0.2,	H165B 0-0.2,							
V187 0-0.1,	V187A 0-0.2,							
V187B 0-0.2,	QAQC3,							
V185 0-0.5,	V185 0.5-1.0,							
V185 1.0-1.5,	V185 1.5-2.0,							
V185 2.0-2.5,	V185 2.5-2.9,							
QAQC5,	QAQC4							
Snap Lock Bag - frozen (EA033)								

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA033-D: Retained Acidity - Continued								
B63 0-0.5,	B63 0.5-1.0,	**22-OCT-2013**	---	22-OCT-2014	----	**12-NOV-2013**	22-OCT-2014	✓
B63 1.0-1.45,	B41 0-0.5,							
B41 0.5-0.9,	C72 0-0.5,							
C72 0.5-1.0,	C72 1.0-2.1,							
B74 0-0.5,	B74 0.5-1.0,							
B74 1.0-1.9,	B79 0.5-1.0,							
B79 1.0-1.8,	C82 0-0.5,							
C82 0.5-1.0,	C82 1.0-1.53,							
QAQC7,	QAQC6,							
B41B 0-0.5,	B41B 0.5-0.9,							
B41A 0-0.5,	B41A 0.5-0.9							
Snap Lock Bag - frozen (EA033)								
A127 0-0.5,	A127 0.5-1.0,	**23-OCT-2013**	---	23-OCT-2014	----	**12-NOV-2013**	23-OCT-2014	✓
A127 1.0-1.7,	F150 0-0.43,							
I162 0.13-0.33,	J164 0-0.5,							
J164 0.5-1.02,	I172 0-0.5,							
I172 0.5-1.0								

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content								
Soil Glass Jar - Unpreserved (EA055-103)								
C119 0-0.2,	C119A 0-0.2,	**18-OCT-2013**	**----**	----	----	**29-OCT-2013**	01-NOV-2013	✓
C119B 0-0.2,	B130 0-0.5,							
A138 0-0.27,	A140 0-0.26,							
D149 0-0.15,	C146 0-0.25,							
D147 0-0.05								
Soil Glass Jar - Unpreserved (EA055-103)								
B2 0-0.55,	B7 0-0.50,	**19-OCT-2013**	**----**	----	----	**29-OCT-2013**	02-NOV-2013	✓
B7 0.5-0.95,	B9 0-0.5,							
B9 0.5-0.7,	C22 0-0.5,							
C22 0.5-0.9,	C29 0-0.5,							
C29 0.5-0.8,	B25 0-0.2,							
B25 0.2-0.3,	C30 0-0.5,							
C30 0.5-1.0,	C94 0-0.5,							
C94 0.5-1.0,	C99 0-0.5,							
C99 0.5-0.8,	C121 0-0.5,							
C121 0.5-0.8,	F156 0-0.05							
Soil Glass Jar - Unpreserved (EA055-103)								
B108 0-0.5,	B108 0.5-1.0,	**20-OCT-2013**	**----**	----	----	**29-OCT-2013**	03-NOV-2013	✓
B108 1.0-1.2,	B104 0-0.5,							
B104 0.5-0.95,	C50 0-0.5,							
C50 0.5-1.0,	C50 1.0-1.2,							
C53 0-0.5,	C53 0.5-0.9,							
B54 0-0.5,	B54 0.5-1.0,							
B54 1.0-1.1,	H160 0-0.02,							
H160 0.02-0.04,	K167 0-0.25,							
M180 0-0.2,	M180A 0-0.2,							
M180B 0-0.2								
Soil Glass Jar - Unpreserved (EA055-103)								
QAQC5		**21-OCT-2013**	**----**	----	----	**29-OCT-2013**	04-NOV-2013	✓
Soil Glass Jar - Unpreserved (EA055-103)								
P180 0-0.05		**21-OCT-2013**	**----**	----	----	**11-NOV-2013**	04-NOV-2013	✗
Soil Glass Jar - Unpreserved (EA055-103)								
H165 0-0.2,	H165B 0-0.2,	**21-OCT-2013**	**----**	----	----	**29-OCT-2013**	04-NOV-2013	✓
V187A 0-0.2,	V187B 0-0.2,							
V185 0-0.5,	V185 0.5-1.0,							
V185 1.5-2.0,	V185 2.0-2.5,							
QAQC4								
Soil Glass Jar - Unpreserved (EA055-103)								
QAQC3		**21-OCT-2013**	**----**	----	----	**11-NOV-2013**	04-NOV-2013	✗
Soil Glass Jar - Unpreserved (EA055-103)								

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content - Continued								
H167 0-0.2,	H165A 0-0.2,	**21-OCT-2013**	**----**	----	----	**29-OCT-2013**	04-NOV-2013	✓
V187 0-0.1,	H162,							
V185 1.0-1.5,	V185 2.5-2.9							
Soil Glass Jar - Unpreserved (EA055-103)								
B63 0-0.5,	B63 0.5-1.0,	**22-OCT-2013**	**----**	----	----	**29-OCT-2013**	05-NOV-2013	✓
B63 1.0-1.45,	B41 0-0.5,							
B41 0.5-0.9,	C72 0-0.5,							
C72 0.5-1.0,	C72 1.0-2.1,							
B74 0-0.5,	B74 0.5-1.0,							
B74 1.0-1.9,	B74 1.9-2.0,							
B79 0-0.5,	B79 0.5-1.0,							
B79 1.0-1.8,	C82 0-0.5,							
C82 0.5-1.0,	C82 1.0-1.53,							
C82 1.53-1.67,	QAQC7,							
QAQC6,	B41B 0-0.5,							
B41B 0.5-0.9,	B41A 0-0.5,							
B41A 0.5-0.9								
Soil Glass Jar - Unpreserved (EA055-103)								
A127 0-0.5,	A127 0.5-1.0,	**23-OCT-2013**	**----**	----	----	**29-OCT-2013**	06-NOV-2013	✓
A127 1.0-1.7,	F150 0-0.43,							
F150 0.43-0.62,	F150 0.62-0.80,							
G155 0-0.15,	J164 0-0.5,							
I172 0-0.5,	I172 0.5-1.0							
Soil Glass Jar - Unpreserved (EA055-103)								
I162 0-0.13		**23-OCT-2013**	**----**	----	----	**11-NOV-2013**	06-NOV-2013	✗
Soil Glass Jar - Unpreserved (EA055-103)								
I162 0.13-0.33,	J164 0.5-1.02	**23-OCT-2013**	**----**	----	----	**29-OCT-2013**	06-NOV-2013	✓

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA150: Particle Sizing								
Snap Lock Bag (EA150H)								
C119 0-0.2,	C119A 0-0.2,	**18-OCT-2013**	---	16-APR-2014	----	**12-NOV-2013**	16-APR-2014	✓
C119B 0-0.2,	B130 0-0.5,							
A138 0-0.27,	A140 0-0.26,							
C146 0-0.25,	D147 0-0.05							
Snap Lock Bag (EA150H)								
B2 0-0.55,	B7 0-0.50,	**19-OCT-2013**	---	17-APR-2014	----	**12-NOV-2013**	17-APR-2014	✓
B7 0.5-0.95,	B9 0-0.5,							
B9 0.5-0.7,	C22 0-0.5,							
C22 0.5-0.9,	C29 0-0.5,							
C29 0.5-0.8,	B25 0-0.2,							
C30 0-0.5,	C30 0.5-1.0,							
C94 0-0.5,	C94 0.5-1.0,							
C99 0-0.5,	C121 0-0.5							
Snap Lock Bag (EA150H)								
B108 0-0.5,	B108 0.5-1.0,	**20-OCT-2013**	---	18-APR-2014	----	**12-NOV-2013**	18-APR-2014	✓
B104 0-0.5,	B104 0.5-0.95,							
C50 0-0.5,	C50 1.0-1.2,							
C53 0-0.5,	B54 0-0.5,							
K167 0-0.25,	M180 0-0.2,							
M180A 0-0.2,	M180B 0-0.2							
Snap Lock Bag (EA150H)								
H167 0-0.2,	H165 0-0.2,	**21-OCT-2013**	---	19-APR-2014	----	**12-NOV-2013**	19-APR-2014	✓
H165A 0-0.2,	H165B 0-0.2,							
V187 0-0.1,	V187A 0-0.2,							
V187B 0-0.2,	QAQC3,							
V185 0-0.5,	V185 0.5-1.0,							
V185 1.0-1.5,	V185 2.5-2.9,							
QAQC5,	QAQC4							
Snap Lock Bag (EA150H)								
B63 0-0.5,	B41 0-0.5,	**22-OCT-2013**	---	20-APR-2014	----	**12-NOV-2013**	20-APR-2014	✓
B41 0.5-0.9,	C72 0-0.5,							
B74 0-0.5,	B74 1.0-1.9,							
B79 1.0-1.8,	C82 1.0-1.53,							
QAQC7,	QAQC6,							
B41B 0-0.5,	B41B 0.5-0.9,							
B41A 0-0.5,	B41A 0.5-0.9							
Snap Lock Bag (EA150H)								
A127 0-0.5,	A127 1.0-1.7,	**23-OCT-2013**	---	21-APR-2014	----	**12-NOV-2013**	21-APR-2014	✓
F150 0-0.43,	I162 0.13-0.33,							
J164 0-0.5,	J164 0.5-1.02,							
I172 0-0.5,	I172 0.5-1.0							

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Evaluation	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Evaluation
EA150: Soil Classification based on Particle Size								
Snap Lock Bag (EA150H)								
C119 0-0.2,	C119A 0-0.2,	**18-OCT-2013**	---	16-APR-2014	----	**12-NOV-2013**	16-APR-2014	✓
C119B 0-0.2,	B130 0-0.5,							
A138 0-0.27,	A140 0-0.26,							
C146 0-0.25,	D147 0-0.05							
Snap Lock Bag (EA150H)								
B2 0-0.55,	B7 0-0.50,	**19-OCT-2013**	---	17-APR-2014	----	**12-NOV-2013**	17-APR-2014	✓
B7 0.5-0.95,	B9 0-0.5,							
B9 0.5-0.7,	C22 0-0.5,							
C22 0.5-0.9,	C29 0-0.5,							
C29 0.5-0.8,	B25 0-0.2,							
C30 0-0.5,	C30 0.5-1.0,							
C94 0-0.5,	C94 0.5-1.0,							
C99 0-0.5,	C121 0-0.5							
Snap Lock Bag (EA150H)								
B108 0-0.5,	B108 0.5-1.0,	**20-OCT-2013**	---	18-APR-2014	----	**12-NOV-2013**	18-APR-2014	✓
B104 0-0.5,	B104 0.5-0.95,							
C50 0-0.5,	C50 1.0-1.2,							
C53 0-0.5,	B54 0-0.5,							
K167 0-0.25,	M180 0-0.2,							
M180A 0-0.2,	M180B 0-0.2							
Snap Lock Bag (EA150H)								
H167 0-0.2,	H165 0-0.2,	**21-OCT-2013**	---	19-APR-2014	----	**12-NOV-2013**	19-APR-2014	✓
H165A 0-0.2,	H165B 0-0.2,							
V187 0-0.1,	V187A 0-0.2,							
V187B 0-0.2,	QAQC3,							
V185 0-0.5,	V185 0.5-1.0,							
V185 1.0-1.5,	V185 2.5-2.9,							
QAQC5,	QAQC4							
Snap Lock Bag (EA150H)								
B63 0-0.5,	B41 0-0.5,	**22-OCT-2013**	---	20-APR-2014	----	**12-NOV-2013**	20-APR-2014	✓
B41 0.5-0.9,	C72 0-0.5,							
B74 0-0.5,	B74 1.0-1.9,							
B79 1.0-1.8,	C82 1.0-1.53,							
QAQC7,	QAQC6,							
B41B 0-0.5,	B41B 0.5-0.9,							
B41A 0-0.5,	B41A 0.5-0.9							
Snap Lock Bag (EA150H)								
A127 0-0.5,	A127 1.0-1.7,	**23-OCT-2013**	---	21-APR-2014	----	**12-NOV-2013**	21-APR-2014	✓
F150 0-0.43,	I162 0.13-0.33,							
J164 0-0.5,	J164 0.5-1.02,							
I172 0-0.5,	I172 0.5-1.0							

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG005-SD: Total Metals in Sediments by ICP-AES								
Soil Glass Jar - Unpreserved (EG005-SD)								
C119 0-0.2,	C119A 0-0.2,	**18-OCT-2013**	**07-NOV-2013**	16-APR-2014	✓	**08-NOV-2013**	16-APR-2014	✓
C119B 0-0.2,	B130 0-0.5,							
A138 0-0.27,	A140 0-0.26,							
D149 0-0.15,	C146 0-0.25,							
D147 0-0.05								
Soil Glass Jar - Unpreserved (EG005-SD)								
B2 0-0.55,	B7 0-0.50,	**19-OCT-2013**	**07-NOV-2013**	17-APR-2014	✓	**08-NOV-2013**	17-APR-2014	✓
B7 0.5-0.95,	B9 0-0.5,							
B9 0.5-0.7,	C22 0-0.5,							
C22 0.5-0.9,	C29 0-0.5,							
C29 0.5-0.8,	B25 0-0.2,							
B25 0.2-0.3,	C30 0-0.5,							
C30 0.5-1.0,	C94 0-0.5,							
C94 0.5-1.0,	C99 0-0.5,							
C99 0.5-0.8,	C121 0-0.5,							
C121 0.5-0.8,	F156 0-0.05							
Soil Glass Jar - Unpreserved (EG005-SD)								
B108 0-0.5,	B108 0.5-1.0,	**20-OCT-2013**	**07-NOV-2013**	18-APR-2014	✓	**08-NOV-2013**	18-APR-2014	✓
B108 1.0-1.2,	B104 0-0.5,							
B104 0.5-0.95,	C50 0-0.5,							
C50 0.5-1.0,	C50 1.0-1.2,							
C53 0-0.5,	C53 0.5-0.9,							
B54 0-0.5,	B54 0.5-1.0,							
B54 1.0-1.1,	H160 0-0.02,							
H160 0.02-0.04,	K167 0-0.25,							
M180 0-0.2,	M180A 0-0.2,							
M180B 0-0.2								
Soil Glass Jar - Unpreserved (EG005-SD)								
H167 0-0.2,	H165 0-0.2,	**21-OCT-2013**	**07-NOV-2013**	19-APR-2014	✓	**08-NOV-2013**	19-APR-2014	✓
H165A 0-0.2,	H165B 0-0.2,							
V187 0-0.1,	V187A 0-0.2,							
V187B 0-0.2,	H162,							
V185 0-0.5,	V185 0.5-1.0,							
V185 1.0-1.5,	V185 1.5-2.0,							
V185 2.0-2.5,	V185 2.5-2.9,							
QAQC5,	QAQC4							
Soil Glass Jar - Unpreserved (EG005-SD)								
P180 0-0.05,	QAQC3	**21-OCT-2013**	**09-NOV-2013**	19-APR-2014	✓	**11-NOV-2013**	19-APR-2014	✓
Soil Glass Jar - Unpreserved (EG005-SD)								

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG005-SD: Total Metals in Sediments by ICP-AES - Continued							
B63 0-0.5, B63 0.5-1.0, B63 1.0-1.45, B41 0-0.5, B41 0.5-0.9, C72 0-0.5, C72 0.5-1.0, C72 1.0-2.1, B74 0-0.5, B74 0.5-1.0, B74 1.0-1.9, B74 1.9-2.0, B79 0-0.5, B79 0.5-1.0, B79 1.0-1.8, C82 0-0.5, C82 0.5-1.0, C82 1.0-1.53, C82 1.53-1.67, QAQC7, QAQC6, B41B 0-0.5, B41B 0.5-0.9, B41A 0-0.5, B41A 0.5-0.9	**22-OCT-2013**	**07-NOV-2013**	20-APR-2014	✓	**08-NOV-2013**	20-APR-2014	✓
Soil Glass Jar - Unpreserved (EG005-SD)							
A127 0-0.5, A127 0.5-1.0, A127 1.0-1.7, F150 0-0.43, F150 0.43-0.62, F150 0.62-0.80, G155 0-0.15, I162 0-0.13, J164 0-0.5, J164 0.5-1.02, I172 0-0.5, I172 0.5-1.0	**23-OCT-2013**	**07-NOV-2013**	21-APR-2014	✓	**08-NOV-2013**	21-APR-2014	✓
Soil Glass Jar - Unpreserved (EG005-SD)							
I162 0.13-0.33	**23-OCT-2013**	**09-NOV-2013**	21-APR-2014	✓	**11-NOV-2013**	21-APR-2014	✓

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG020-SD: Total Metals in Sediments by ICPMS								
Soil Glass Jar - Unpreserved (EG020-SD)								
C119 0-0.2,	C119A 0-0.2,	**18-OCT-2013**	**07-NOV-2013**	16-APR-2014	✓	**08-NOV-2013**	16-APR-2014	✓
C119B 0-0.2,	B130 0-0.5,							
A138 0-0.27,	A140 0-0.26,							
D149 0-0.15,	C146 0-0.25,							
D147 0-0.05								
Soil Glass Jar - Unpreserved (EG020-SD)								
B2 0-0.55,	B7 0-0.50,	**19-OCT-2013**	**07-NOV-2013**	17-APR-2014	✓	**08-NOV-2013**	17-APR-2014	✓
B7 0.5-0.95,	B9 0-0.5,							
B9 0.5-0.7,	C22 0-0.5,							
C22 0.5-0.9,	C29 0-0.5,							
C29 0.5-0.8,	B25 0-0.2,							
B25 0.2-0.3,	C30 0-0.5,							
C30 0.5-1.0,	C94 0-0.5,							
C94 0.5-1.0,	C99 0-0.5,							
C99 0.5-0.8,	C121 0-0.5,							
C121 0.5-0.8,	F156 0-0.05							
Soil Glass Jar - Unpreserved (EG020-SD)								
B108 0-0.5,	B108 0.5-1.0,	**20-OCT-2013**	**07-NOV-2013**	18-APR-2014	✓	**08-NOV-2013**	18-APR-2014	✓
B108 1.0-1.2,	B104 0-0.5,							
B104 0.5-0.95,	C50 0-0.5,							
C50 0.5-1.0,	C50 1.0-1.2,							
C53 0-0.5,	C53 0.5-0.9,							
B54 0-0.5,	B54 0.5-1.0,							
B54 1.0-1.1,	H160 0-0.02,							
H160 0.02-0.04,	K167 0-0.25,							
M180 0-0.2,	M180A 0-0.2,							
M180B 0-0.2								
Soil Glass Jar - Unpreserved (EG020-SD)								
H167 0-0.2,	H165 0-0.2,	**21-OCT-2013**	**07-NOV-2013**	19-APR-2014	✓	**08-NOV-2013**	19-APR-2014	✓
H165A 0-0.2,	H165B 0-0.2,							
V187 0-0.1,	V187A 0-0.2,							
V187B 0-0.2,	H162,							
V185 0-0.5,	V185 0.5-1.0,							
V185 1.0-1.5,	V185 1.5-2.0,							
V185 2.0-2.5,	V185 2.5-2.9,							
QAQC5,	QAQC4							
Soil Glass Jar - Unpreserved (EG020-SD)								
P180 0-0.05,	QAQC3	**21-OCT-2013**	**09-NOV-2013**	19-APR-2014	✓	**11-NOV-2013**	19-APR-2014	✓
Soil Glass Jar - Unpreserved (EG020-SD)								

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG020-SD: Total Metals in Sediments by ICPMS - Continued								
B63 0-0.5, B63 1.0-1.45, B41 0.5-0.9, C72 0.5-1.0, B74 0-0.5, B74 1.0-1.9, B79 0-0.5, B79 1.0-1.8, C82 0.5-1.0, C82 1.53-1.67, QAQC6, B41B 0.5-0.9, B41A 0.5-0.9	B63 0.5-1.0, B41 0-0.5, C72 0-0.5, C72 1.0-2.1, B74 0.5-1.0, B74 1.9-2.0, B79 0.5-1.0, C82 0-0.5, C82 1.0-1.53, QAQC7, B41B 0-0.5, B41A 0-0.5,	**22-OCT-2013**	**07-NOV-2013**	20-APR-2014	✓	**08-NOV-2013**	20-APR-2014	✓
Soil Glass Jar - Unpreserved (EG020-SD) A127 0-0.5, A127 1.0-1.7, F150 0.43-0.62, G155 0-0.15, J164 0-0.5, I172 0-0.5,	A127 0.5-1.0, F150 0-0.43, F150 0.62-0.80, I162 0-0.13, J164 0.5-1.02, I172 0.5-1.0	**23-OCT-2013**	**07-NOV-2013**	21-APR-2014	✓	**08-NOV-2013**	21-APR-2014	✓
Soil Glass Jar - Unpreserved (EG020-SD) I162 0.13-0.33		**23-OCT-2013**	**09-NOV-2013**	21-APR-2014	✓	**11-NOV-2013**	21-APR-2014	✓
EG035F: Dissolved Mercury by FIMS								
Clear Plastic Bottle - Nitric Acid; Filtered (EG035F) PWA - Pore Water,	PWA - Seawater Elutriate	**15-NOV-2013**	---	13-DEC-2013	----	**04-NOV-2013**	13-DEC-2013	✓
Clear Plastic Bottle - Nitric Acid; Filtered (EG035F) PWA - Pore Water,	PWA - Seawater Elutriate	**15-NOV-2013**	---	13-DEC-2013	----	**14-NOV-2013**	13-DEC-2013	✓
Clear Plastic Bottle - Nitric Acid; Filtered (EG035F) PWB - Pore Water,	PWC - Seawater Elutriate	**21-OCT-2013**	---	18-NOV-2013	----	**04-NOV-2013**	18-NOV-2013	✓
Clear Plastic Bottle - Nitric Acid; Filtered (EG035F) PWB - Pore Water,	PWC - Seawater Elutriate	**21-OCT-2013**	---	18-NOV-2013	----	**14-NOV-2013**	18-NOV-2013	✓
Clear Plastic Bottle - Nitric Acid; Filtered (EG035F) PWC - Pore Water,	PWB - Seawater Elutriate	**31-OCT-2013**	---	28-NOV-2013	----	**04-NOV-2013**	28-NOV-2013	✓
Clear Plastic Bottle - Nitric Acid; Filtered (EG035F) PWC - Pore Water,	PWB - Seawater Elutriate	**31-OCT-2013**	---	28-NOV-2013	----	**14-NOV-2013**	28-NOV-2013	✓

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG035T: Total Recoverable Mercury by FIMS								
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG035T)								
PWA - Pore Water,	PWA - Seawater Elutriate	**15-NOV-2013**	**----**	----	----	**01-NOV-2013**	13-DEC-2013	✓
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG035T)								
PWA - Pore Water,	PWA - Seawater Elutriate	**15-NOV-2013**	**----**	----	----	**14-NOV-2013**	13-DEC-2013	✓
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG035T)								
PWB - Pore Water,	PWC - Seawater Elutriate	**21-OCT-2013**	**----**	----	----	**01-NOV-2013**	18-NOV-2013	✓
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG035T)								
PWB - Pore Water,	PWC - Seawater Elutriate	**21-OCT-2013**	**----**	----	----	**14-NOV-2013**	18-NOV-2013	✓
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG035T)								
PWC - Pore Water,	PWB - Seawater Elutriate	**31-OCT-2013**	**----**	----	----	**01-NOV-2013**	28-NOV-2013	✓
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG035T)								
PWC - Pore Water,	PWB - Seawater Elutriate	**31-OCT-2013**	**----**	----	----	**14-NOV-2013**	28-NOV-2013	✓

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG035T: Total Recoverable Mercury by FIMS								
Soil Glass Jar - Unpreserved (EG035T-LL)								
C119 0-0.2,	C119A 0-0.2,	**18-OCT-2013**	**07-NOV-2013**	15-NOV-2013	✓	**11-NOV-2013**	15-NOV-2013	✓
C119B 0-0.2,	B130 0-0.5,							
A138 0-0.27,	A140 0-0.26,							
D149 0-0.15,	C146 0-0.25,							
D147 0-0.05								
Soil Glass Jar - Unpreserved (EG035T-LL)								
B2 0-0.55,	B7 0-0.50,	**19-OCT-2013**	**07-NOV-2013**	16-NOV-2013	✓	**11-NOV-2013**	16-NOV-2013	✓
B7 0.5-0.95,	B9 0-0.5,							
B9 0.5-0.7,	C22 0-0.5,							
C22 0.5-0.9,	C29 0-0.5,							
C29 0.5-0.8,	B25 0-0.2,							
B25 0.2-0.3,	C30 0-0.5,							
C30 0.5-1.0,	C94 0-0.5,							
C94 0.5-1.0,	C99 0-0.5,							
C99 0.5-0.8,	C121 0-0.5,							
C121 0.5-0.8,	F156 0-0.05							
Soil Glass Jar - Unpreserved (EG035T-LL)								
B108 0-0.5,	B108 0.5-1.0,	**20-OCT-2013**	**07-NOV-2013**	17-NOV-2013	✓	**11-NOV-2013**	17-NOV-2013	✓
B108 1.0-1.2,	B104 0-0.5,							
B104 0.5-0.95,	C50 0-0.5,							
C50 0.5-1.0,	C50 1.0-1.2,							
C53 0-0.5,	C53 0.5-0.9,							
B54 0-0.5,	B54 0.5-1.0,							
B54 1.0-1.1,	H160 0-0.02,							
H160 0.02-0.04,	K167 0-0.25,							
M180 0-0.2,	M180A 0-0.2,							
M180B 0-0.2								
Soil Glass Jar - Unpreserved (EG035T-LL)								
H167 0-0.2,	H165 0-0.2,	**21-OCT-2013**	**07-NOV-2013**	18-NOV-2013	✓	**11-NOV-2013**	18-NOV-2013	✓
H165A 0-0.2,	H165B 0-0.2,							
V187 0-0.1,	V187A 0-0.2,							
V187B 0-0.2,	H162,							
V185 0-0.5,	V185 0.5-1.0,							
V185 1.0-1.5,	V185 1.5-2.0,							
V185 2.0-2.5,	V185 2.5-2.9,							
QAQC5,	QAQC4							
Soil Glass Jar - Unpreserved (EG035T-LL)								
P180 0-0.05,	QAQC3	**21-OCT-2013**	**09-NOV-2013**	18-NOV-2013	✓	**11-NOV-2013**	18-NOV-2013	✓
Soil Glass Jar - Unpreserved (EG035T-LL)								

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG035T: Total Recoverable Mercury by FIMS - Continued							
B79 1.0-1.8, C82 0-0.5, C82 0.5-1.0, C82 1.0-1.53, C82 1.53-1.67, QAQC7, QAQC6, B41B 0-0.5, B41B 0.5-0.9, B41A 0-0.5, B41A 0.5-0.9	**22-OCT-2013**	**07-NOV-2013**	19-NOV-2013	✓	**08-NOV-2013**	19-NOV-2013	✓
Soil Glass Jar - Unpreserved (EG035T-LL) B63 0-0.5, B63 0.5-1.0, B63 1.0-1.45, B41 0-0.5, B41 0.5-0.9, C72 0-0.5, C72 0.5-1.0, C72 1.0-2.1, B74 0-0.5, B74 0.5-1.0, B74 1.0-1.9, B74 1.9-2.0, B79 0-0.5, B79 0.5-1.0	**22-OCT-2013**	**07-NOV-2013**	19-NOV-2013	✓	**11-NOV-2013**	19-NOV-2013	✓
Soil Glass Jar - Unpreserved (EG035T-LL) A127 0-0.5, A127 0.5-1.0, A127 1.0-1.7, F150 0-0.43, F150 0.43-0.62, F150 0.62-0.80, G155 0-0.15, I162 0-0.13, J164 0-0.5, J164 0.5-1.02, I172 0-0.5, I172 0.5-1.0	**23-OCT-2013**	**07-NOV-2013**	20-NOV-2013	✓	**08-NOV-2013**	20-NOV-2013	✓
Soil Glass Jar - Unpreserved (EG035T-LL) I162 0.13-0.33	**23-OCT-2013**	**09-NOV-2013**	20-NOV-2013	✓	**11-NOV-2013**	20-NOV-2013	✓
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS							
Clear HDPE (U-T ORC) - UHP Nitric Acid; Filtered (EG093A-F) PWA - Seawater Elutriate	**15-NOV-2013**	---	14-MAY-2014	----	**14-NOV-2013**	14-MAY-2014	✓
Clear HDPE (U-T ORC) - UHP Nitric Acid; Filtered (EG093A-F) PWA - Pore Water	**15-NOV-2013**	---	14-MAY-2014	----	**15-NOV-2013**	14-MAY-2014	✓
Clear HDPE (U-T ORC) - UHP Nitric Acid; Filtered (EG093A-F) PWB - Seawater Elutriate, PWC - Seawater Elutriate	**21-OCT-2013**	---	19-APR-2014	----	**14-NOV-2013**	19-APR-2014	✓
Clear HDPE (U-T ORC) - UHP Nitric Acid; Filtered (EG093A-F) PWB - Pore Water, PWC - Pore Water	**21-OCT-2013**	---	19-APR-2014	----	**15-NOV-2013**	19-APR-2014	✓
EG093T: Total Metals in Saline Water by ORC-ICPMS							
Clear HDPE (U-T ORC) - UHP Nitric Acid; Unfiltered (EG093A-T) PWA - Pore Water	**15-NOV-2013**	---	14-MAY-2014	----	**15-NOV-2013**	14-MAY-2014	✓
Clear HDPE (U-T ORC) - UHP Nitric Acid; Unfiltered (EG093A-T) PWA - Seawater Elutriate	**15-NOV-2013**	**14-NOV-2013**	14-MAY-2014	✓	**14-NOV-2013**	14-MAY-2014	✓
Clear HDPE (U-T ORC) - UHP Nitric Acid; Unfiltered (EG093A-T) PWB - Seawater Elutriate, PWC - Seawater Elutriate	**21-OCT-2013**	**14-NOV-2013**	19-APR-2014	✓	**14-NOV-2013**	19-APR-2014	✓
Clear HDPE (U-T ORC) - UHP Nitric Acid; Unfiltered (EG093A-T) PWB - Pore Water, PWC - Pore Water	**21-OCT-2013**	**15-NOV-2013**	19-APR-2014	✓	**15-NOV-2013**	19-APR-2014	✓

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EK055G: Ammonia as N by Discrete Analyser								
Clear Plastic Bottle - Sulfuric Acid (EK055G)								
PWA - Pore Water,	PWA - Seawater Elutriate	**15-NOV-2013**	---	13-DEC-2013	----	**05-NOV-2013**	13-DEC-2013	✓
Clear Plastic Bottle - Sulfuric Acid (EK055G)								
PWB - Pore Water,	PWC - Seawater Elutriate	**21-OCT-2013**	---	18-NOV-2013	----	**05-NOV-2013**	18-NOV-2013	✓
Clear Plastic Bottle - Sulfuric Acid (EK055G)								
PWC - Pore Water,	PWB - Seawater Elutriate	**31-OCT-2013**	---	28-NOV-2013	----	**05-NOV-2013**	28-NOV-2013	✓
EK055: Ammonia as N								
Soil Glass Jar - Unpreserved (EK055-SD)								
C119 0-0.2,	C119A 0-0.2,	**18-OCT-2013**	----	----	----	**31-OCT-2013**	16-APR-2014	✓
C119B 0-0.2,	B130 0-0.5,							
A140 0-0.26,	D149 0-0.15							
Soil Glass Jar - Unpreserved (EK055-SD)								
B2 0-0.55,	B7 0-0.50,	**19-OCT-2013**	----	----	----	**31-OCT-2013**	17-APR-2014	✓
B9 0-0.5,	C22 0.5-0.9,							
C29 0-0.5,	B25 0-0.2,							
C30 0.5-1.0,	C94 0.5-1.0,							
C121 0-0.5								
Soil Glass Jar - Unpreserved (EK055-SD)								
B108 0-0.5,	B108 0.5-1.0,	**20-OCT-2013**	----	----	----	**31-OCT-2013**	18-APR-2014	✓
B104 0.5-0.95,	C50 0-0.5,							
C53 0.5-0.9,	B54 0-0.5,							
K167 0-0.25,	M180 0-0.2,							
M180A 0-0.2,	M180B 0-0.2							
Soil Glass Jar - Unpreserved (EK055-SD)								
P180 0-0.05,	H167 0-0.2,	**21-OCT-2013**	----	----	----	**31-OCT-2013**	19-APR-2014	✓
H165 0-0.2,	H165A 0-0.2,							
H165B 0-0.2,	V187 0-0.1,							
V187A 0-0.2,	V187B 0-0.2,							
QAQC3,	V185 0-0.5,							
V185 0.5-1.0,	V185 1.0-1.5,							
V185 2.5-2.9,	QAQC5,							
QAQC4								
Soil Glass Jar - Unpreserved (EK055-SD)								
B63 0.5-1.0,	C72 0-0.5,	**22-OCT-2013**	----	----	----	**31-OCT-2013**	20-APR-2014	✓
B74 0-0.5,	B74 1.0-1.9,							
B79 1.0-1.8,	C82 1.0-1.53							
Soil Glass Jar - Unpreserved (EK055-SD)								
F150 0-0.43,	I162 0.13-0.33,	**23-OCT-2013**	----	----	----	**31-OCT-2013**	21-APR-2014	✓
J164 0-0.5,	J164 0.5-1.02,							
I172 0-0.5,	I172 0.5-1.0							

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EK057G: Nitrite as N by Discrete Analyser								
Clear Plastic Bottle - Natural (EK057G)								
PWA - Pore Water,	PWA - Seawater Elutriate	**15-NOV-2013**	---	17-NOV-2013	----	**04-NOV-2013**	17-NOV-2013	✓
Clear Plastic Bottle - Natural (EK057G)								
PWB - Pore Water,	PWC - Seawater Elutriate	**21-OCT-2013**	---	23-OCT-2013	----	**04-NOV-2013**	23-OCT-2013	×
Clear Plastic Bottle - Natural (EK057G)								
PWC - Pore Water,	PWB - Seawater Elutriate	**31-OCT-2013**	---	02-NOV-2013	----	**04-NOV-2013**	02-NOV-2013	×

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Clear Plastic Bottle - Sulfuric Acid (EK059G)								
PWA - Pore Water,	PWA - Seawater Elutriate	**15-NOV-2013**	---	13-DEC-2013	----	**05-NOV-2013**	13-DEC-2013	✓
Clear Plastic Bottle - Sulfuric Acid (EK059G)								
PWB - Pore Water,	PWC - Seawater Elutriate	**21-OCT-2013**	---	18-NOV-2013	----	**05-NOV-2013**	18-NOV-2013	✓
Clear Plastic Bottle - Sulfuric Acid (EK059G)								
PWC - Pore Water,	PWB - Seawater Elutriate	**31-OCT-2013**	---	28-NOV-2013	----	**05-NOV-2013**	28-NOV-2013	✓
Soil Glass Jar - Unpreserved (EK059G)								
C119 0-0.2,	C119A 0-0.2,	**18-OCT-2013**	**07-NOV-2013**	16-APR-2014	✓	**09-NOV-2013**	16-APR-2014	✓
C119B 0-0.2,	B130 0-0.5,							
A140 0-0.26,	D149 0-0.15							
Soil Glass Jar - Unpreserved (EK059G)								
B2 0-0.55,	B7 0-0.50,	**19-OCT-2013**	**07-NOV-2013**	17-APR-2014	✓	**09-NOV-2013**	17-APR-2014	✓
B9 0-0.5,	C22 0.5-0.9,							
C29 0-0.5,	B25 0-0.2,							
C30 0.5-1.0,	C94 0.5-1.0,							
C121 0-0.5								
Soil Glass Jar - Unpreserved (EK059G)								
B108 0-0.5,	B108 0.5-1.0,	**20-OCT-2013**	**07-NOV-2013**	18-APR-2014	✓	**09-NOV-2013**	18-APR-2014	✓
B104 0.5-0.95,	C50 0-0.5,							
C53 0.5-0.9,	B54 0-0.5,							
K167 0-0.25,	M180 0-0.2,							
M180A 0-0.2,	M180B 0-0.2							
Soil Glass Jar - Unpreserved (EK059G)								
H167 0-0.2,	H165 0-0.2,	**21-OCT-2013**	**07-NOV-2013**	19-APR-2014	✓	**09-NOV-2013**	19-APR-2014	✓
H165A 0-0.2,	H165B 0-0.2,							
V187 0-0.1,	V187A 0-0.2,							
V187B 0-0.2,	V185 0-0.5,							
V185 0.5-1.0,	V185 1.0-1.5,							
V185 2.5-2.9,	QAQC5,							
QAQC4								
Soil Glass Jar - Unpreserved (EK059G)								
P180 0-0.05,	QAQC3	**21-OCT-2013**	**11-NOV-2013**	19-APR-2014	✓	**11-NOV-2013**	19-APR-2014	✓
Soil Glass Jar - Unpreserved (EK059G)								
B63 0.5-1.0,	C72 0-0.5,	**22-OCT-2013**	**07-NOV-2013**	20-APR-2014	✓	**09-NOV-2013**	20-APR-2014	✓
B74 0-0.5,	B74 1.0-1.9,							
B79 1.0-1.8,	C82 1.0-1.53							
Soil Glass Jar - Unpreserved (EK059G)								
F150 0-0.43,	J164 0-0.5,	**23-OCT-2013**	**07-NOV-2013**	21-APR-2014	✓	**09-NOV-2013**	21-APR-2014	✓
J164 0.5-1.02,	I172 0-0.5,							
I172 0.5-1.0								
Soil Glass Jar - Unpreserved (EK059G)								
I162 0.13-0.33		**23-OCT-2013**	**11-NOV-2013**	21-APR-2014	✓	**11-NOV-2013**	21-APR-2014	✓

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Clear Plastic Bottle - Sulfuric Acid (EK061G)								
PWA - Pore Water,	PWA - Seawater Elutriate	**15-NOV-2013**	**08-NOV-2013**	13-DEC-2013	✓	**08-NOV-2013**	13-DEC-2013	✓
Clear Plastic Bottle - Sulfuric Acid (EK061G)								
PWB - Pore Water,	PWC - Seawater Elutriate	**21-OCT-2013**	**08-NOV-2013**	18-NOV-2013	✓	**08-NOV-2013**	18-NOV-2013	✓
Clear Plastic Bottle - Sulfuric Acid (EK061G)								
PWC - Pore Water,	PWB - Seawater Elutriate	**31-OCT-2013**	**08-NOV-2013**	28-NOV-2013	✓	**08-NOV-2013**	28-NOV-2013	✓
Soil Glass Jar - Unpreserved (EK061G)								
C119 0-0.2,	C119A 0-0.2,	**18-OCT-2013**	**07-NOV-2013**	16-APR-2014	✓	**11-NOV-2013**	16-APR-2014	✓
C119B 0-0.2,	B130 0-0.5,							
A140 0-0.26,	D149 0-0.15							
Soil Glass Jar - Unpreserved (EK061G)								
B2 0-0.55,	B7 0-0.50,	**19-OCT-2013**	**07-NOV-2013**	17-APR-2014	✓	**11-NOV-2013**	17-APR-2014	✓
B9 0-0.5,	C22 0.5-0.9,							
C29 0-0.5,	B25 0-0.2,							
C30 0.5-1.0,	C94 0.5-1.0,							
C121 0-0.5								
Soil Glass Jar - Unpreserved (EK061G)								
B108 0-0.5,	B108 0.5-1.0,	**20-OCT-2013**	**07-NOV-2013**	18-APR-2014	✓	**11-NOV-2013**	18-APR-2014	✓
B104 0.5-0.95,	C50 0-0.5,							
C53 0.5-0.9,	B54 0-0.5,							
K167 0-0.25,	M180 0-0.2,							
M180A 0-0.2,	M180B 0-0.2							
Soil Glass Jar - Unpreserved (EK061G)								
H167 0-0.2,	H165 0-0.2,	**21-OCT-2013**	**07-NOV-2013**	19-APR-2014	✓	**11-NOV-2013**	19-APR-2014	✓
H165A 0-0.2,	H165B 0-0.2,							
V187 0-0.1,	V187A 0-0.2,							
V187B 0-0.2,	V185 0-0.5,							
V185 0.5-1.0,	V185 1.0-1.5,							
V185 2.5-2.9,	QAQC5							
Soil Glass Jar - Unpreserved (EK061G)								
QAQC4		**21-OCT-2013**	**08-NOV-2013**	19-APR-2014	✓	**11-NOV-2013**	19-APR-2014	✓
Soil Glass Jar - Unpreserved (EK061G)								
P180 0-0.05,	QAQC3	**21-OCT-2013**	**09-NOV-2013**	19-APR-2014	✓	**09-NOV-2013**	19-APR-2014	✓
Soil Glass Jar - Unpreserved (EK061G)								
B63 0.5-1.0		**22-OCT-2013**	**07-NOV-2013**	20-APR-2014	✓	**11-NOV-2013**	20-APR-2014	✓
Soil Glass Jar - Unpreserved (EK061G)								
C72 0-0.5,	B74 0-0.5,	**22-OCT-2013**	**08-NOV-2013**	20-APR-2014	✓	**11-NOV-2013**	20-APR-2014	✓
B74 1.0-1.9,	B79 1.0-1.8,							
C82 1.0-1.53								
Soil Glass Jar - Unpreserved (EK061G)								
F150 0-0.43,	J164 0-0.5,	**23-OCT-2013**	**08-NOV-2013**	21-APR-2014	✓	**11-NOV-2013**	21-APR-2014	✓
J164 0.5-1.02,	I172 0-0.5,							
I172 0.5-1.0								
Soil Glass Jar - Unpreserved (EK061G)								

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser - Continued							
I162 0.13-0.33	23-OCT-2013	09-NOV-2013	21-APR-2014	✓	09-NOV-2013	21-APR-2014	✓

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EK067G: Total Phosphorus as P by Discrete Analyser								
Clear Plastic Bottle - Sulfuric Acid (EK067G)								
PWA - Pore Water,	PWA - Seawater Elutriate	**15-NOV-2013**	**08-NOV-2013**	13-DEC-2013	✓	**08-NOV-2013**	13-DEC-2013	✓
Clear Plastic Bottle - Sulfuric Acid (EK067G)								
PWB - Pore Water,	PWC - Seawater Elutriate	**21-OCT-2013**	**08-NOV-2013**	18-NOV-2013	✓	**08-NOV-2013**	18-NOV-2013	✓
Clear Plastic Bottle - Sulfuric Acid (EK067G)								
PWC - Pore Water,	PWB - Seawater Elutriate	**31-OCT-2013**	**08-NOV-2013**	28-NOV-2013	✓	**08-NOV-2013**	28-NOV-2013	✓
Soil Glass Jar - Unpreserved (EK067G)								
C119 0-0.2,	C119A 0-0.2,	**18-OCT-2013**	**07-NOV-2013**	16-APR-2014	✓	**11-NOV-2013**	16-APR-2014	✓
C119B 0-0.2,	B130 0-0.5,							
A140 0-0.26,	D149 0-0.15							
Soil Glass Jar - Unpreserved (EK067G)								
B2 0-0.55,	B7 0-0.50,	**19-OCT-2013**	**07-NOV-2013**	17-APR-2014	✓	**11-NOV-2013**	17-APR-2014	✓
B9 0-0.5,	C22 0.5-0.9,							
C29 0-0.5,	B25 0-0.2,							
C30 0.5-1.0,	C94 0.5-1.0,							
C121 0-0.5								
Soil Glass Jar - Unpreserved (EK067G)								
B108 0-0.5,	B108 0.5-1.0,	**20-OCT-2013**	**07-NOV-2013**	18-APR-2014	✓	**11-NOV-2013**	18-APR-2014	✓
B104 0.5-0.95,	C50 0-0.5,							
C53 0.5-0.9,	B54 0-0.5,							
K167 0-0.25,	M180 0-0.2,							
M180A 0-0.2,	M180B 0-0.2							
Soil Glass Jar - Unpreserved (EK067G)								
H167 0-0.2,	H165 0-0.2,	**21-OCT-2013**	**07-NOV-2013**	19-APR-2014	✓	**11-NOV-2013**	19-APR-2014	✓
H165A 0-0.2,	H165B 0-0.2,							
V187 0-0.1,	V187A 0-0.2,							
V187B 0-0.2,	V185 0-0.5,							
V185 0.5-1.0,	V185 1.0-1.5,							
V185 2.5-2.9,	QAQC5							
Soil Glass Jar - Unpreserved (EK067G)								
QAQC4		**21-OCT-2013**	**08-NOV-2013**	19-APR-2014	✓	**11-NOV-2013**	19-APR-2014	✓
Soil Glass Jar - Unpreserved (EK067G)								
P180 0-0.05,	QAQC3	**21-OCT-2013**	**09-NOV-2013**	19-APR-2014	✓	**09-NOV-2013**	19-APR-2014	✓
Soil Glass Jar - Unpreserved (EK067G)								
B63 0.5-1.0		**22-OCT-2013**	**07-NOV-2013**	20-APR-2014	✓	**11-NOV-2013**	20-APR-2014	✓
Soil Glass Jar - Unpreserved (EK067G)								
C72 0-0.5,	B74 0-0.5,	**22-OCT-2013**	**08-NOV-2013**	20-APR-2014	✓	**11-NOV-2013**	20-APR-2014	✓
B74 1.0-1.9,	B79 1.0-1.8,							
C82 1.0-1.53								
Soil Glass Jar - Unpreserved (EK067G)								
F150 0-0.43,	J164 0-0.5,	**23-OCT-2013**	**08-NOV-2013**	21-APR-2014	✓	**11-NOV-2013**	21-APR-2014	✓
J164 0.5-1.02,	I172 0-0.5,							
I172 0.5-1.0								
Soil Glass Jar - Unpreserved (EK067G)								

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EK067G: Total Phosphorus as P by Discrete Analyser - Continued								
I162 0.13-0.33		**23-OCT-2013**	**09-NOV-2013**	21-APR-2014	✓	**09-NOV-2013**	21-APR-2014	✓
EK071G: Reactive Phosphorus as P by discrete analyser								
Clear Plastic Bottle - Natural (EK071G) PWA - Pore Water,	PWA - Seawater Elutriate	**15-NOV-2013**	---	17-NOV-2013	----	**04-NOV-2013**	17-NOV-2013	✓
Clear Plastic Bottle - Natural (EK071G) PWB - Pore Water,	PWC - Seawater Elutriate	**21-OCT-2013**	---	23-OCT-2013	----	**04-NOV-2013**	23-OCT-2013	×
Clear Plastic Bottle - Natural (EK071G) PWC - Pore Water,	PWB - Seawater Elutriate	**31-OCT-2013**	---	02-NOV-2013	----	**04-NOV-2013**	02-NOV-2013	×
EN68: Seawater Elutriate Testing Procedure								
LabSplit: Leach for organics and other tests (EN68a) PWA - Seawater Elutriate		**20-OCT-2013**	---	03-NOV-2013	----	**30-OCT-2013**	03-NOV-2013	✓
LabSplit: Leach for organics and other tests (EN68a) PWB - Seawater Elutriate,	PWC - Seawater Elutriate	**21-OCT-2013**	---	04-NOV-2013	----	**30-OCT-2013**	04-NOV-2013	✓
EN82: Porewater Extraction								
LabSplit: Leach for organics and other tests (EN82) PWA - Pore Water		**20-OCT-2013**	---	03-NOV-2013	----	**30-OCT-2013**	03-NOV-2013	✓
LabSplit: Leach for organics and other tests (EN82) PWB - Pore Water,	PWC - Pore Water	**21-OCT-2013**	---	04-NOV-2013	----	**30-OCT-2013**	04-NOV-2013	✓

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP003: Total Organic Carbon (TOC) in Soil								
Soil Glass Jar - Unpreserved (EP003)								
C119 0-0.2,	C119A 0-0.2,	**18-OCT-2013**	**30-OCT-2013**	15-NOV-2013	✓	**31-OCT-2013**	15-NOV-2013	✓
C119B 0-0.2,	B130 0-0.5,							
A138 0-0.27,	A140 0-0.26,							
D149 0-0.15,	C146 0-0.25,							
D147 0-0.05								
Soil Glass Jar - Unpreserved (EP003)								
B2 0-0.55,	B7 0-0.50,	**19-OCT-2013**	**30-OCT-2013**	16-NOV-2013	✓	**31-OCT-2013**	16-NOV-2013	✓
B7 0.5-0.95,	B9 0-0.5,							
B9 0.5-0.7,	C22 0-0.5,							
C22 0.5-0.9,	C29 0-0.5,							
C29 0.5-0.8,	B25 0-0.2,							
B25 0.2-0.3,	C30 0-0.5,							
C30 0.5-1.0,	C94 0-0.5,							
C94 0.5-1.0,	C99 0-0.5,							
C99 0.5-0.8,	C121 0-0.5,							
C121 0.5-0.8,	F156 0-0.05							
Soil Glass Jar - Unpreserved (EP003)								
B108 0-0.5,	B108 0.5-1.0,	**20-OCT-2013**	**30-OCT-2013**	17-NOV-2013	✓	**31-OCT-2013**	17-NOV-2013	✓
B108 1.0-1.2,	B104 0-0.5,							
B104 0.5-0.95,	C50 0-0.5,							
C50 0.5-1.0,	C50 1.0-1.2,							
C53 0-0.5,	C53 0.5-0.9,							
B54 0-0.5,	B54 0.5-1.0,							
B54 1.0-1.1,	H160 0-0.02,							
H160 0.02-0.04,	K167 0-0.25,							
M180 0-0.2,	M180A 0-0.2,							
M180B 0-0.2								
Soil Glass Jar - Unpreserved (EP003)								
P180 0-0.05,	H167 0-0.2,	**21-OCT-2013**	**30-OCT-2013**	18-NOV-2013	✓	**31-OCT-2013**	18-NOV-2013	✓
H165 0-0.2,	H165A 0-0.2,							
H165B 0-0.2,	V187 0-0.1,							
V187A 0-0.2,	V187B 0-0.2,							
H162,	QAQC3,							
V185 0-0.5,	V185 0.5-1.0,							
V185 1.0-1.5,	V185 1.5-2.0,							
V185 2.0-2.5,	V185 2.5-2.9,							
QAQC5,	QAQC4							
Soil Glass Jar - Unpreserved (EP003)								

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP003: Total Organic Carbon (TOC) in Soil - Continued								
B63 0-0.5, B63 1.0-1.45, B41 0.5-0.9, C72 0-0.5, C72 1.0-1.5, B74 0-0.5, B74 1.0-1.9, B79 0.5-1.0, C82 0-0.5, C82 1.0-1.53, QAQC7, B41B 0-0.5, B41A 0-0.5,	B63 0.5-1.0, B41 0-0.5, C72 0-0.5, C72 1.0-2.1, B74 0.5-1.0, B74 1.9-2.0, B79 1.0-1.8, C82 0.5-1.0, C82 1.53-1.67, QAQC6, B41B 0.5-0.9, B41A 0.5-0.9	**22-OCT-2013**	**30-OCT-2013**	19-NOV-2013	✓	**31-OCT-2013**	19-NOV-2013	✓
Soil Glass Jar - Unpreserved (EP003)								
A127 0-0.5, A127 1.0-1.7, F150 0.43-0.62, G155 0-0.15, I162 0.13-0.33, J164 0.5-1.02, I172 0.5-1.0	A127 0.5-1.0, F150 0-0.43, F150 0.62-0.80, I162 0-0.13, J164 0-0.5, I172 0-0.5,	**23-OCT-2013**	**30-OCT-2013**	20-NOV-2013	✓	**31-OCT-2013**	20-NOV-2013	✓
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons								
Soil Glass Jar - Unpreserved (EP071-SD)								
K167 0-0.25, M180A 0-0.2,	M180 0-0.2, M180B 0-0.2	**20-OCT-2013**	**31-OCT-2013**	03-NOV-2013	✓	**01-NOV-2013**	10-DEC-2013	✓
Soil Glass Jar - Unpreserved (EP071-SD)								
P180 0-0.05, H165 0-0.2, H165B 0-0.2, V187A 0-0.2, QAQC3, V185 0.5-1.0, V185 2.5-2.9, QAQC4	H167 0-0.2, H165A 0-0.2, V187 0-0.1, V187B 0-0.2, V185 0-0.5, V185 1.0-1.5, QAQC5,	**21-OCT-2013**	**31-OCT-2013**	04-NOV-2013	✓	**01-NOV-2013**	10-DEC-2013	✓
Soil Glass Jar - Unpreserved (EP071-SD)								
I162 0-0.13, J164 0-0.5, I172 0-0.5,	I162 0.13-0.33, J164 0.5-1.02, I172 0.5-1.0	**23-OCT-2013**	**31-OCT-2013**	06-NOV-2013	✓	**01-NOV-2013**	10-DEC-2013	✓

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080-SD: BTEXN								
Soil Glass Jar - Unpreserved (EP080-SD)								
K167 0-0.25,	M180 0-0.2,	**20-OCT-2013**	**31-OCT-2013**	03-NOV-2013	✓	**01-NOV-2013**	03-NOV-2013	✓
M180A 0-0.2,	M180B 0-0.2							
Soil Glass Jar - Unpreserved (EP080-SD)								
P180 0-0.05,	H167 0-0.2,	**21-OCT-2013**	**31-OCT-2013**	04-NOV-2013	✓	**01-NOV-2013**	04-NOV-2013	✓
H165 0-0.2,	H165A 0-0.2,							
H165B 0-0.2,	V187 0-0.1,							
V187A 0-0.2,	V187B 0-0.2,							
QAQC3,	V185 0-0.5,							
V185 0.5-1.0,	V185 1.0-1.5,							
V185 2.5-2.9,	QAQC5,							
QAQC4								
Soil Glass Jar - Unpreserved (EP080-SD)								
I162 0-0.13,	I162 0.13-0.33,	**23-OCT-2013**	**31-OCT-2013**	06-NOV-2013	✓	**01-NOV-2013**	06-NOV-2013	✓
J164 0-0.5,	J164 0.5-1.02,							
I172 0-0.5,	I172 0.5-1.0							
EP080-SD / EP071-SD: Total Recoverable Hydrocarbons								
Soil Glass Jar - Unpreserved (EP080-SD)								
K167 0-0.25,	M180 0-0.2,	**20-OCT-2013**	**31-OCT-2013**	03-NOV-2013	✓	**01-NOV-2013**	03-NOV-2013	✓
M180A 0-0.2,	M180B 0-0.2							
Soil Glass Jar - Unpreserved (EP080-SD)								
P180 0-0.05,	H167 0-0.2,	**21-OCT-2013**	**31-OCT-2013**	04-NOV-2013	✓	**01-NOV-2013**	04-NOV-2013	✓
H165 0-0.2,	H165A 0-0.2,							
H165B 0-0.2,	V187 0-0.1,							
V187A 0-0.2,	V187B 0-0.2,							
QAQC3,	V185 0-0.5,							
V185 0.5-1.0,	V185 1.0-1.5,							
V185 2.5-2.9,	QAQC5,							
QAQC4								
Soil Glass Jar - Unpreserved (EP080-SD)								
I162 0-0.13,	I162 0.13-0.33,	**23-OCT-2013**	**31-OCT-2013**	06-NOV-2013	✓	**01-NOV-2013**	06-NOV-2013	✓
J164 0-0.5,	J164 0.5-1.02,							
I172 0-0.5,	I172 0.5-1.0							

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP090: Organotin Compounds								
Soil Glass Jar - Unpreserved (EP090)								
C119 0-0.2,	C119A 0-0.2,	**18-OCT-2013**	**31-OCT-2013**	01-NOV-2013	✓	**03-NOV-2013**	10-DEC-2013	✓
C119B 0-0.2,	B130 0-0.5,							
A138 0-0.27,	A140 0-0.26,							
D149 0-0.15,	C146 0-0.25,							
D147 0-0.05								
Soil Glass Jar - Unpreserved (EP090)								
B25 0.2-0.3,	C30 0-0.5,	**19-OCT-2013**	**31-OCT-2013**	02-NOV-2013	✓	**01-NOV-2013**	10-DEC-2013	✓
C30 0.5-1.0,	C94 0-0.5,							
C94 0.5-1.0,	C99 0-0.5,							
C99 0.5-0.8,	C121 0-0.5,							
C121 0.5-0.8,	F156 0-0.05							
Soil Glass Jar - Unpreserved (EP090)								
B2 0-0.55,	B7 0-0.50,	**19-OCT-2013**	**31-OCT-2013**	02-NOV-2013	✓	**03-NOV-2013**	10-DEC-2013	✓
B7 0.5-0.95,	B9 0-0.5,							
B9 0.5-0.7,	C22 0-0.5,							
C22 0.5-0.9,	C29 0-0.5,							
C29 0.5-0.8,	B25 0-0.2							
Soil Glass Jar - Unpreserved (EP090)								
B108 0-0.5,	B108 0.5-1.0,	**20-OCT-2013**	**31-OCT-2013**	03-NOV-2013	✓	**01-NOV-2013**	10-DEC-2013	✓
B108 1.0-1.2,	B104 0-0.5,							
B104 0.5-0.95,	C50 0-0.5,							
C50 0.5-1.0,	C50 1.0-1.2,							
C53 0-0.5								
Soil Glass Jar - Unpreserved (EP090)								
C53 0.5-0.9,	B54 0-0.5,	**20-OCT-2013**	**31-OCT-2013**	03-NOV-2013	✓	**04-NOV-2013**	10-DEC-2013	✓
B54 0.5-1.0,	B54 1.0-1.1,							
H160 0-0.02,	H160 0.02-0.04,							
K167 0-0.25,	M180 0-0.2,							
M180A 0-0.2,	M180B 0-0.2							
Soil Glass Jar - Unpreserved (EP090)								
QAQC3,	V185 0-0.5,	**21-OCT-2013**	**01-NOV-2013**	04-NOV-2013	✓	**05-NOV-2013**	11-DEC-2013	✓
V185 0.5-1.0,	V185 1.0-1.5,							
V185 1.5-2.0,	V185 2.0-2.5,							
V185 2.5-2.9,	QAQC5,							
QAQC4								
Soil Glass Jar - Unpreserved (EP090)								
P180 0-0.05,	H167 0-0.2,	**21-OCT-2013**	**31-OCT-2013**	04-NOV-2013	✓	**04-NOV-2013**	10-DEC-2013	✓
H165 0-0.2,	H165A 0-0.2,							
H165B 0-0.2,	V187 0-0.1,							
V187A 0-0.2,	V187B 0-0.2,							
H162								
Soil Glass Jar - Unpreserved (EP090)								

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP090: Organotin Compounds - Continued								
B63 0-0.5, B63 1.0-1.45, B41 0.5-0.9, C72 0-0.5, B74 0-0.5,	B63 0.5-1.0, B41 0-0.5, C72 0-0.5, C72 1.0-2.1, B74 0.5-1.0	**22-OCT-2013**	**01-NOV-2013**	05-NOV-2013	✓	**05-NOV-2013**	11-DEC-2013	✓
Soil Glass Jar - Unpreserved (EP090) B74 1.0-1.9, B79 0-0.5, B79 1.0-1.8, C82 0-0.5, C82 1.53-1.67, QAQC6	B74 1.9-2.0, B79 0.5-1.0, C82 0-0.5, C82 1.0-1.53, QAQC7,	**22-OCT-2013**	**04-NOV-2013**	05-NOV-2013	✓	**07-NOV-2013**	14-DEC-2013	✓
Soil Glass Jar - Unpreserved (EP090) B41B 0-0.5, B41A 0-0.5,	B41B 0.5-0.9, B41A 0.5-0.9	**22-OCT-2013**	**05-NOV-2013**	05-NOV-2013	✓	**08-NOV-2013**	15-DEC-2013	✓
Soil Glass Jar - Unpreserved (EP090) A127 0-0.5, A127 1.0-1.7, F150 0.43-0.62, G155 0-0.15,	A127 0.5-1.0, F150 0-0.43, F150 0.62-0.80, I162 0-0.13	**23-OCT-2013**	**04-NOV-2013**	06-NOV-2013	✓	**07-NOV-2013**	14-DEC-2013	✓
Soil Glass Jar - Unpreserved (EP090) J164 0-0.5, I172 0-0.5,	J164 0.5-1.02, I172 0.5-1.0	**23-OCT-2013**	**05-NOV-2013**	06-NOV-2013	✓	**08-NOV-2013**	15-DEC-2013	✓
Soil Glass Jar - Unpreserved (EP090) I162 0.13-0.33		**23-OCT-2013**	**07-NOV-2013**	06-NOV-2013	×	**08-NOV-2013**	17-DEC-2013	✓
EP090: Organotin Compounds (Soluble)								
Amber Glass Bottle - Unpreserved (EP090S) PWA - Pore Water,	PWA - Seawater Elutriate	**15-NOV-2013**	**07-NOV-2013**	22-NOV-2013	✓	**07-NOV-2013**	22-NOV-2013	✓
Amber Glass Bottle - Unpreserved (EP090S) PWB - Seawater Elutriate		**31-OCT-2013**	**07-NOV-2013**	07-NOV-2013	✓	**07-NOV-2013**	17-DEC-2013	✓
LabSplit: Leach for organics and other tests (EP090S) PWC - Seawater Elutriate		**21-OCT-2013**	**07-NOV-2013**	28-OCT-2013	×	**07-NOV-2013**	17-DEC-2013	✓
Soil Glass Jar - Unpreserved (EP090S) PWB - Pore Water,	PWC - Pore Water	**21-OCT-2013**	**07-NOV-2013**	07-NOV-2013	✓	**07-NOV-2013**	17-DEC-2013	✓

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP130A: Organophosphorus Pesticides (Ultra-trace)								
Soil Glass Jar - Unpreserved (EP130) K167 0-0.25, M180A 0-0.2,	M180 0-0.2, M180B 0-0.2	**20-OCT-2013**	**31-OCT-2013**	03-NOV-2013	✓	**06-NOV-2013**	10-DEC-2013	✓
Soil Glass Jar - Unpreserved (EP130) P180 0-0.05, H165 0-0.2, H165B 0-0.2, V187A 0-0.2, QAQC3, V185 0.5-1.0, V185 2.5-2.9, QAQC4	H167 0-0.2, H165A 0-0.2, V187 0-0.1, V187B 0-0.2, V185 0-0.5, V185 1.0-1.5, QAQC5,	**21-OCT-2013**	**31-OCT-2013**	04-NOV-2013	✓	**06-NOV-2013**	10-DEC-2013	✓
Soil Glass Jar - Unpreserved (EP130) I162 0-0.13, J164 0-0.5, I172 0-0.5,	I162 0.13-0.33, J164 0.5-1.02, I172 0.5-1.0	**23-OCT-2013**	**31-OCT-2013**	06-NOV-2013	✓	**06-NOV-2013**	10-DEC-2013	✓
EP131A: Organochlorine Pesticides								
Soil Glass Jar - Unpreserved (EP131A) K167 0-0.25, M180A 0-0.2,	M180 0-0.2, M180B 0-0.2	**20-OCT-2013**	**31-OCT-2013**	03-NOV-2013	✓	**06-NOV-2013**	10-DEC-2013	✓
Soil Glass Jar - Unpreserved (EP131A) P180 0-0.05, H165 0-0.2, H165B 0-0.2, V187A 0-0.2, QAQC3, V185 0.5-1.0, V185 2.5-2.9, QAQC4	H167 0-0.2, H165A 0-0.2, V187 0-0.1, V187B 0-0.2, V185 0-0.5, V185 1.0-1.5, QAQC5,	**21-OCT-2013**	**31-OCT-2013**	04-NOV-2013	✓	**06-NOV-2013**	10-DEC-2013	✓
Soil Glass Jar - Unpreserved (EP131A) I162 0-0.13, J164 0-0.5, I172 0-0.5,	I162 0.13-0.33, J164 0.5-1.02, I172 0.5-1.0	**23-OCT-2013**	**31-OCT-2013**	06-NOV-2013	✓	**06-NOV-2013**	10-DEC-2013	✓

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP132B: Polynuclear Aromatic Hydrocarbons								
Soil Glass Jar - Unpreserved (EP132B-SD)								
K167 0-0.25,	M180 0-0.2,	**20-OCT-2013**	**31-OCT-2013**	03-NOV-2013	✓	**01-NOV-2013**	10-DEC-2013	✓
M180A 0-0.2,	M180B 0-0.2							
Soil Glass Jar - Unpreserved (EP132B-SD)								
P180 0-0.05,	H167 0-0.2,	**21-OCT-2013**	**31-OCT-2013**	04-NOV-2013	✓	**01-NOV-2013**	10-DEC-2013	✓
H165 0-0.2,	H165A 0-0.2,							
H165B 0-0.2,	V187 0-0.1,							
V187A 0-0.2,	V187B 0-0.2,							
QAQC3,	V185 0-0.5,							
V185 0.5-1.0,	V185 1.0-1.5,							
V185 2.5-2.9,	QAQC5,							
QAQC4								
Soil Glass Jar - Unpreserved (EP132B-SD)								
I162 0-0.13,	I162 0.13-0.33,	**23-OCT-2013**	**31-OCT-2013**	06-NOV-2013	✓	**01-NOV-2013**	10-DEC-2013	✓
J164 0-0.5,	J164 0.5-1.02,							
I172 0-0.5,	I172 0.5-1.0							
EP208: Phenylurea Herbicides								
Amber Glass Bottle - Unpreserved (EP208)								
PWA - Pore Water,	PWA - Seawater Elutriate	**15-NOV-2013**	**----**	----	----	**01-NOV-2013**	22-NOV-2013	✓
Amber Glass Bottle - Unpreserved (EP208)								
PWB - Pore Water,	PWC - Seawater Elutriate	**21-OCT-2013**	**----**	----	----	**01-NOV-2013**	28-OCT-2013	×
Amber Glass Bottle - Unpreserved (EP208)								
PWC - Pore Water,	PWB - Seawater Elutriate	**31-OCT-2013**	**----**	----	----	**01-NOV-2013**	07-NOV-2013	✓
EP231: Perfluorinated Compounds								
Soil Glass Jar - Unpreserved (EP231)								
K167 0-0.25,	M180 0-0.2,	**20-OCT-2013**	**01-NOV-2013**	18-APR-2014	✓	**01-NOV-2013**	11-DEC-2013	✓
M180A 0-0.2,	M180B 0-0.2							
Soil Glass Jar - Unpreserved (EP231)								
P180 0-0.05,	H167 0-0.2,	**21-OCT-2013**	**01-NOV-2013**	19-APR-2014	✓	**01-NOV-2013**	11-DEC-2013	✓
H165 0-0.2,	H165A 0-0.2,							
H165B 0-0.2,	V187 0-0.1,							
V187A 0-0.2,	V187B 0-0.2,							
QAQC3,	V185 0-0.5,							
V185 0.5-1.0,	V185 1.0-1.5,							
V185 2.5-2.9,	QAQC5,							
QAQC4								
Soil Glass Jar - Unpreserved (EP231)								
I162 0-0.13,	I162 0.13-0.33,	**23-OCT-2013**	**01-NOV-2013**	21-APR-2014	✓	**01-NOV-2013**	11-DEC-2013	✓
J164 0-0.5,	J164 0.5-1.02,							
I172 0-0.5,	I172 0.5-1.0							

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231: Perfluorinated Compounds							
Soil Glass Jar - Unpreserved (EP231-PFC) K167 0-0.25, M180 0-0.2, M180A 0-0.2, M180B 0-0.2	**20-OCT-2013**	**01-NOV-2013**	18-APR-2014	✓	**01-NOV-2013**	11-DEC-2013	✓
Soil Glass Jar - Unpreserved (EP231-PFC) P180 0-0.05, H167 0-0.2, H165 0-0.2, H165A 0-0.2, H165B 0-0.2, V187 0-0.1, V187A 0-0.2, V187B 0-0.2, QAQC3, V185 0-0.5, V185 0.5-1.0, V185 1.0-1.5, V185 2.5-2.9, QAQC5, QAQC4	**21-OCT-2013**	**01-NOV-2013**	19-APR-2014	✓	**01-NOV-2013**	11-DEC-2013	✓
Soil Glass Jar - Unpreserved (EP231-PFC) I162 0-0.13, I162 0.13-0.33, J164 0-0.5, J164 0.5-1.02, I172 0-0.5, I172 0.5-1.0	**23-OCT-2013**	**01-NOV-2013**	21-APR-2014	✓	**01-NOV-2013**	11-DEC-2013	✓

Matrix: **WATER**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG035F: Dissolved Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Filtered (EG035F) ELUTRIATE WATER - Seawater Blank	**22-OCT-2013**	---	19-NOV-2013	----	**04-NOV-2013**	19-NOV-2013	✓
Clear Plastic Bottle - Nitric Acid; Filtered (EG035F) ELUTRIATE WATER - Seawater Blank	**22-OCT-2013**	---	19-NOV-2013	----	**14-NOV-2013**	19-NOV-2013	✓
EG035T: Total Recoverable Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG035T) ELUTRIATE WATER - Seawater Blank	**22-OCT-2013**	----	----	----	**01-NOV-2013**	19-NOV-2013	✓
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG035T) ELUTRIATE WATER - Seawater Blank	**22-OCT-2013**	----	----	----	**14-NOV-2013**	19-NOV-2013	✓
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS							
Clear HDPE (U-T ORC) - UHP Nitric Acid; Filtered (EG093A-F) ELUTRIATE WATER - Seawater Blank	**22-OCT-2013**	---	20-APR-2014	----	**14-NOV-2013**	20-APR-2014	✓
EG093T: Total Metals in Saline Water by ORC-ICPMS							
Clear HDPE (U-T ORC) - UHP Nitric Acid; Unfiltered (EG093A-T) ELUTRIATE WATER - Seawater Blank	**22-OCT-2013**	**14-NOV-2013**	20-APR-2014	✓	**14-NOV-2013**	20-APR-2014	✓
EK055G: Ammonia as N by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK055G) ELUTRIATE WATER - Seawater Blank	**22-OCT-2013**	---	19-NOV-2013	----	**07-NOV-2013**	19-NOV-2013	✓
EK057G: Nitrite as N by Discrete Analyser							
Clear Plastic Bottle - Natural (EK057G) ELUTRIATE WATER - Seawater Blank	**22-OCT-2013**	---	24-OCT-2013	----	**30-OCT-2013**	24-OCT-2013	×

Matrix: **WATER**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK059G) ELUTRIATE WATER - Seawater Blank	**22-OCT-2013**	---	19-NOV-2013	----	**07-NOV-2013**	19-NOV-2013	✓
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK061G) ELUTRIATE WATER - Seawater Blank	**22-OCT-2013**	**08-NOV-2013**	19-NOV-2013	✓	**08-NOV-2013**	19-NOV-2013	✓
EK067G: Total Phosphorus as P by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK067G) ELUTRIATE WATER - Seawater Blank	**22-OCT-2013**	**08-NOV-2013**	19-NOV-2013	✓	**08-NOV-2013**	19-NOV-2013	✓
EK071G: Reactive Phosphorus as P by discrete analyser							
Clear Plastic Bottle - Natural (EK071G) ELUTRIATE WATER - Seawater Blank	**22-OCT-2013**	---	24-OCT-2013	----	**30-OCT-2013**	24-OCT-2013	✗
EN68: Seawater Elutriate Testing Procedure							
Soil Glass Jar - Unpreserved (EN68a) ELUTRIATE WATER - Seawater Blank	**22-OCT-2013**	---	05-NOV-2013	----	**30-OCT-2013**	05-NOV-2013	✓
EP090: Organotin Compounds (Soluble)							
Amber Glass Bottle - Unpreserved (EP090S) ELUTRIATE WATER - Seawater Blank	**22-OCT-2013**	**29-OCT-2013**	29-OCT-2013	✓	**30-OCT-2013**	08-DEC-2013	✓
EP208: Phenylurea Herbicides							
Amber Glass Bottle - Unpreserved (EP208) ELUTRIATE WATER - Seawater Blank	**22-OCT-2013**	**----**	----	----	**01-NOV-2013**	29-OCT-2013	✗

Quality Control Parameter Frequency Compliance

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

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
Buchi Ammonia - Low-Level in Sediment	EK055-SD	6	52	11.5	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Chromium Suite for Acid Sulphate Soils	EA033	10	93	10.8	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Moisture Content	EA055-103	13	121	10.7	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Nitrite and Nitrate as N (NOx)- Soluble by Discrete Analyser	EK059G	7	56	12.5	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Organochlorine Pesticides (Ultra-trace)	EP131A	3	25	12.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Organophosphorus Pesticides (Ultra-trace)	EP130	3	25	12.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Organotin Analysis	EP090	11	102	10.8	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAHs in Sediments by GCMS(SIM)	EP132B-SD	3	25	12.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Perfluorinated Compounds by LCMSMS	EP231-PFC	3	25	12.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Perfluorooctyl Acids and Sulfonates by LC/MS/MS	EP231	3	25	12.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TKN as N By Discrete Analyser	EK061G	7	52	13.5	9.9	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Fe and Al in Sediments by ICPAES	EG005-SD	13	121	10.7	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS (Low Level)	EG035T-LL	13	121	10.7	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals in Sediments by ICPMS	EG020-SD	13	120	10.8	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Organic Carbon	EP003	11	103	10.7	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Phosporus By Discrete Analyser	EK067G	7	53	13.2	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071-SD	3	25	12.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX in Sediments	EP080-SD	3	25	12.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
Buchi Ammonia - Low-Level in Sediment	EK055-SD	3	52	5.8	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Chromium Suite for Acid Sulphate Soils	EA033	5	93	5.4	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Nitrite and Nitrate as N (NOx)- Soluble by Discrete Analyser	EK059G	4	56	7.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Organochlorine Pesticides (Ultra-trace)	EP131A	2	25	8.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Organophosphorus Pesticides (Ultra-trace)	EP130	2	25	8.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Organotin Analysis	EP090	7	103	6.8	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAHs in Sediments by GCMS(SIM)	EP132B-SD	2	25	8.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Perfluorinated Compounds by LCMSMS	EP231-PFC	2	25	8.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Perfluorooctyl Acids and Sulfonates by LC/MS/MS	EP231	2	25	8.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TKN as N By Discrete Analyser	EK061G	6	52	11.5	7.4	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Fe and Al in Sediments by ICPAES	EG005-SD	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS (Low Level)	EG035T-LL	7	121	5.8	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals in Sediments by ICPMS	EG020-SD	7	120	5.8	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Organic Carbon	EP003	6	103	5.8	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Phosporus By Discrete Analyser	EK067G	6	53	11.3	7.5	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Control Samples (LCS) - Continued							
TPH - Semivolatile Fraction	EP071-SD	2	25	**8.0**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX in Sediments	EP080-SD	2	25	**8.0**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Buchi Ammonia - Low-Level in Sediment	EK055-SD	3	52	**5.8**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Chromium Suite for Acid Sulphate Soils	EA033	5	93	**5.4**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Nitrite and Nitrate as N (NOx)- Soluble by Discrete Analyser	EK059G	4	56	**7.1**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Organochlorine Pesticides (Ultra-trace)	EP131A	2	25	**8.0**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Organophosphorus Pesticides (Ultra-trace)	EP130	2	25	**8.0**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Organotin Analysis	EP090	7	103	**6.8**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAHs in Sediments by GCMS(SIM)	EP132B-SD	2	25	**8.0**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Perfluorinated Compounds by LCMSMS	EP231-PFC	2	25	**8.0**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Perfluorooctyl Acids and Sulfonates by LC/MS/MS	EP231	2	25	**8.0**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TKN as N By Discrete Analyser	EK061G	4	52	**7.7**	**4.9**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Fe and Al in Sediments by ICPAES	EG005-SD	7	121	**5.8**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS (Low Level)	EG035T-LL	7	121	**5.8**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals in Sediments by ICPMS	EG020-SD	7	120	**5.8**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Organic Carbon	EP003	6	103	**5.8**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Phosporus By Discrete Analyser	EK067G	4	53	**7.5**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071-SD	2	25	**8.0**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX in Sediments	EP080-SD	2	25	**8.0**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
Buchi Ammonia - Low-Level in Sediment	EK055-SD	3	52	**5.8**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Nitrite and Nitrate as N (NOx)- Soluble by Discrete Analyser	EK059G	4	56	**7.1**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Organochlorine Pesticides (Ultra-trace)	EP131A	2	25	**8.0**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Organophosphorus Pesticides (Ultra-trace)	EP130	2	25	**8.0**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Organotin Analysis	EP090	6	102	**5.9**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAHs in Sediments by GCMS(SIM)	EP132B-SD	2	25	**8.0**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Perfluorinated Compounds by LCMSMS	EP231-PFC	2	25	**8.0**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Perfluorooctyl Acids and Sulfonates by LC/MS/MS	EP231	2	25	**8.0**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TKN as N By Discrete Analyser	EK061G	4	52	**7.7**	**4.9**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS (Low Level)	EG035T-LL	7	121	**5.8**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals in Sediments by ICPMS	EG020-SD	7	120	**5.8**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Phosporus By Discrete Analyser	EK067G	4	53	**7.5**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071-SD	2	25	**8.0**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX in Sediments	EP080-SD	2	25	**8.0**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Ammonia as N by Discrete analyser	EK055G	5	46	**10.9**	**10.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Mercury by FIMS	EG035F	2	7	**28.6**	**10.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Saline Water -Suite A by ORC-ICPMS	EG093A-F	3	7	**42.9**	**10.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	6	56	**10.7**	**10.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Nitrite as N by Discrete Analyser	EK057G	4	28	**14.3**	**10.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Phenylurea Herbicides	EP208	2	7	**28.6**	**10.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Reactive Phosphorus as P-By Discrete Analyser	EK071G	3	7	**42.9**	**10.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	4	20	**20.0**	**10.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	7	**28.6**	**10.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals in Saline Water Suite A by ORC-ICPMS	EG093A-T	4	7	**57.1**	**10.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Phosphorus as P By Discrete Analyser	EK067G	4	20	**20.0**	**10.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
Ammonia as N by Discrete analyser	EK055G	3	46	**6.5**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Mercury by FIMS	EG035F	2	7	**28.6**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Saline Water -Suite A by ORC-ICPMS	EG093A-F	3	7	**42.9**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	3	56	**5.4**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Nitrite as N by Discrete Analyser	EK057G	3	28	**10.7**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Organotin Compounds (Soluble)	EP090S	2	7	**28.6**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Phenylurea Herbicides	EP208	2	7	**28.6**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Reactive Phosphorus as P-By Discrete Analyser	EK071G	3	7	**42.9**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	2	20	**10.0**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	7	**28.6**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals in Saline Water Suite A by ORC-ICPMS	EG093A-T	4	7	**57.1**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Phosphorus as P By Discrete Analyser	EK067G	2	20	**10.0**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Ammonia as N by Discrete analyser	EK055G	3	46	**6.5**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Mercury by FIMS	EG035F	2	7	**28.6**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Saline Water -Suite A by ORC-ICPMS	EG093A-F	3	7	**42.9**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	3	56	**5.4**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Nitrite as N by Discrete Analyser	EK057G	3	28	**10.7**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Organotin Compounds (Soluble)	EP090S	2	7	**28.6**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Phenylurea Herbicides	EP208	2	7	**28.6**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Reactive Phosphorus as P-By Discrete Analyser	EK071G	3	7	**42.9**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	2	20	**10.0**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	7	**28.6**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals in Saline Water Suite A by ORC-ICPMS	EG093A-T	4	7	**57.1**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Phosphorus as P By Discrete Analyser	EK067G	2	20	**10.0**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
Ammonia as N by Discrete analyser	EK055G	3	46	**6.5**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Mercury by FIMS	EG035F	2	7	**28.6**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Matrix Spikes (MS) - Continued							
Dissolved Metals in Saline Water -Suite A by ORC-ICPMS	EG093A-F	3	7	**42.9**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	3	56	**5.4**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Nitrite as N by Discrete Analyser	EK057G	2	27	**7.4**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Phenylurea Herbicides	EP208	2	7	**28.6**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Reactive Phosphorus as P-By Discrete Analyser	EK071G	2	6	**33.3**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	2	20	**10.0**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	7	**28.6**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals in Saline Water Suite A by ORC-ICPMS	EG093A-T	3	6	**50.0**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Phosphorus as P By Discrete Analyser	EK067G	2	20	**10.0**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement

Brief Method Summaries

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

Analytical Methods	Method	Matrix	Method Descriptions
Chromium Suite for Acid Sulphate Soils	EA033	SOIL	Ahern et al 2004. This method covers the determination of Chromium Reducible Sulfur (SCR); pHKCl; titratable actual acidity (TAA); acid neutralising capacity by back titration (ANC); and net acid soluble sulfur (SNAS) which incorporates peroxide sulfur. It applies to soils and sediments (including sands) derived from coastal regions. Liming Rate is based on results for samples as submitted and incorporates a minimum safety factor of 1.5.
Moisture Content	EA055-103	SOIL	A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Particle Size Analysis by Hydrometer	EA150H	SOIL	Particle Size Analysis by Hydrometer according to AS1289.3.6.3 - 2003
Total Fe and Al in Sediments by ICPAES	EG005-SD	SOIL	(APHA 21st ed., 3120; USEPA SW 846 - 6010) (ICPAES) Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (2013) Schedule B(3). LORs per NODG
Total Metals in Sediments by ICPMS	EG020-SD	SOIL	(APHA 21st ed., 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020): The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector. Analyte list and LORs per NODG.
Dissolved Mercury by FIMS	EG035F	SOIL	AS 3550, APHA 21st ed. 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) Samples are 0.45 um filtered prior to analysis. FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the filtered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Total Mercury by FIMS	EG035T	SOIL	AS 3550, APHA 21st ed. 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the unfiltered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Total Mercury by FIMS (Low Level)	EG035T-LL	SOIL	AS 3550, APHA 21st ed., 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
Dissolved Metals in Saline Water -Suite A by ORC-ICPMS	EG093A-F	SOIL	APHA 21st ed., 3125; USEPA SW846 - 6020 Samples are 0.45 um filtered prior to analysis. The ORC-ICPMS technique removes interfering species through a series of chemical reactions prior to ion detection. Ions are passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to measurement by a discrete dynode ion detector. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)

Analytical Methods	Method	Matrix	Method Descriptions
Total Metals in Saline Water Suite A by ORC-ICPMS	EG093A-T	SOIL	APHA 21st ed., 3125; USEPA SW846 - 6020 Samples are 0.45 um filtered prior to analysis. The ORC-ICPMS technique removes interfering species through a series of chemical reactions prior to ion detection. Ions are passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to measurement by a discrete dynode ion detector. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Ammonia as N by Discrete analyser	EK055G	SOIL	APHA 21st ed., 4500-NH3 G Ammonia is determined by direct colorimetry by Discrete Analyser. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Buchi Ammonia - Low-Level in Sediment	EK055-SD	SOIL	APHA 21st ed., 4500 NH3+-B&G, H Samples are steam distillated (Buchi) prior to analysis and quantified using titrimetric determination.
Nitrite as N by Discrete Analyser	EK057G	SOIL	APHA 21st ed., 4500-NO2- B. Nitrite is determined by direct colourimetry by Discrete Analyser. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Nitrate as N by Discrete Analyser	EK058G	SOIL	APHA 21st ed., 4500-NO3- F. Nitrate is reduced to nitrite by way of a chemical reduction followed by quantification by Discrete Analyser. Nitrite is determined seperately by direct colourimetry and result for Nitrate calculated as the difference between the two results. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	SOIL	APHA 21st ed., 4500-NO3- F. Combined oxidised Nitrogen (NO2+NO3) is determined by Chemical Reduction and direct colourimetry by Discrete Analyser. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	SOIL	APHA 21st ed., 4500-Norg D (In house). An aliquot of sample is digested using a high temperature Kjeldahl digestion to convert nitrogenous compounds to ammonia. Ammonia is determined colorimetrically by discrete analyser. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Total Nitrogen as N (TKN + NOx) By Discrete Analyser	EK062G	SOIL	APHA 21st ed., 4500 Norg/NO3- Total Nitrogen is determined as the sum of TKN and Oxidised Nitrrogen, each determined seperately as N.
Total Phosphorus as P By Discrete Analyser	EK067G	SOIL	APHA 21st ed., 4500-P H, Jirka et al (1976), Zhang et al (2006). This procedure involves sulphuric acid digestion of a sample aliquot to break phosphorus down to orthophosphate. The orthophosphate reacts with ammonium molybdate and antimony potassium tartrate to form a complex which is then reduced and its concentration measured at 880nm using discrete analyser. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Reactive Phosphorus as P-By Discrete Analyser	EK071G	SOIL	APHA 21st ed., 4500-P F Ammonium molybdate and potassium antimonyl tartrate reacts in acid medium with othophosphate to form a heteropoly acid -phosphomolybdic acid - which is reduced to intensely coloured molybdenum blue by ascorbic acid. Quantification is by Discrete Analyser. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Total Organic Carbon	EP003	SOIL	In-house C-IR17. Dried and pulverised sample is reacted with acid to remove inorganic Carbonates, then combusted in a LECO furnace in the presence of strong oxidants / catalysts. The evolved (Organic) Carbon (as CO2) is automaticaly measured by infra-red detector.
TPH - Semivolatile Fraction	EP071-SD	SOIL	(USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 504)
TPH Volatiles/BTEX in Sediments	EP080-SD	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 501)

Analytical Methods	Method	Matrix	Method Descriptions
Organotin Analysis	EP090	SOIL	(USEPA SW 846 - 8270D) Prepared sample extracts are analysed by GC/MS coupled with high volume injection, and quanitified against an established calibration curve.
Organotin Compounds (Soluble)	EP090S	SOIL	USEPA SW 846 - 8270D Sample extracts are analysed by GC/MS coupled with high volume injection and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Organophosphorus Pesticides (Ultra-trace)	EP130	SOIL	USEPA Method 3640 (GPC cleanup), 8141 (GC/FPD - Capillary Column) This technique is compliant with NEPM (2013) Schedule B(3) (Method 505)
Organochlorine Pesticides (Ultra-trace)	EP131A	SOIL	USEPA Method 3640 (GPC cleanup),3620 (Florisil), 8081/8082 (GC/uECD/uECD) This technique is compliant with NEPM (2013) Schedule B(3) (Method 504)
PAHs in Sediments by GCMS(SIM)	EP132B-SD	SOIL	USEPA 8270 GCMS Capillary column, SIM mode using large volume programmed temperature vaporisation injection.
Phenylurea Herbicides	EP208	SOIL	In-house, direct injection, LCMS (Electrospray in positive mode). Water samples are diluted with methanol before instrumental analysis.
Perfluorooctyl Acids and Sulfonates by LC/MS/MS	EP231	SOIL	In-House. A portion of soil is soaked in sodium hydroxide followed by extraction with methanol. The extract is neutralised with HCl and an aliquot taken to dryness, made up in mobile phase. Analysis is by LC/MSMS, ESI Negative Mode using MRM.
Perfluorinated Compounds by LCMSMS	EP231-PFC	SOIL	In-House. A portion of soil is extracted with MTBE. The extract is taken to dryness, made up in mobile phase. Analysis is by LC/MSMS, ESI Negative Mode using MRM.
Dissolved Mercury by FIMS	EG035F	WATER	AS 3550, APHA 21st ed. 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) Samples are 0.45 um filtered prior to analysis. FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the filtered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Total Mercury by FIMS	EG035T	WATER	AS 3550, APHA 21st ed. 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the unfiltered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Dissolved Metals in Saline Water -Suite A by ORC-ICPMS	EG093A-F	WATER	APHA 21st ed., 3125; USEPA SW846 - 6020 Samples are 0.45 um filtered prior to analysis. The ORC-ICPMS technique removes interfering species through a series of chemical reactions prior to ion detection. Ions are passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to measurement by a discrete dynode ion detector. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Total Metals in Saline Water Suite A by ORC-ICPMS	EG093A-T	WATER	APHA 21st ed., 3125; USEPA SW846 - 6020 Samples are 0.45 um filtered prior to analysis. The ORC-ICPMS technique removes interfering species through a series of chemical reactions prior to ion detection. Ions are passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to measurement by a discrete dynode ion detector. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Ammonia as N by Discrete analyser	EK055G	WATER	APHA 21st ed., 4500-NH3 G Ammonia is determined by direct colorimetry by Discrete Analyser. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)

Analytical Methods	Method	Matrix	Method Descriptions
Nitrite as N by Discrete Analyser	EK057G	WATER	APHA 21st ed., 4500-NO2- B. Nitrite is determined by direct colourimetry by Discrete Analyser. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Nitrate as N by Discrete Analyser	EK058G	WATER	APHA 21st ed., 4500-NO3- F. Nitrate is reduced to nitrite by way of a chemical reduction followed by quantification by Discrete Analyser. Nitrite is determined seperately by direct colourimetry and result for Nitrate calculated as the difference between the two results. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	WATER	APHA 21st ed., 4500-NO3- F. Combined oxidised Nitrogen (NO2+NO3) is determined by Chemical Reduction and direct colourimetry by Discrete Analyser. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	WATER	APHA 21st ed., 4500-Norg D (In house). An aliquot of sample is digested using a high temperature Kjeldahl digestion to convert nitrogenous compounds to ammonia. Ammonia is determined colorimetrically by discrete analyser. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Total Nitrogen as N (TKN + Nox) By Discrete Analyser	EK062G	WATER	APHA 21st ed., 4500-Norg / 4500-NO3-. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Total Phosphorus as P By Discrete Analyser	EK067G	WATER	APHA 21st ed., 4500-P H, Jirka et al (1976), Zhang et al (2006). This procedure involves sulphuric acid digestion of a sample aliquot to break phosphorus down to orthophosphate. The orthophosphate reacts with ammonium molybdate and antimony potassium tartrate to form a complex which is then reduced and its concentration measured at 880nm using discrete analyser. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Reactive Phosphorus as P-By Discrete Analyser	EK071G	WATER	APHA 21st ed., 4500-P F Ammonium molybdate and potassium antimonyl tartrate reacts in acid medium with othophosphate to form a heteropoly acid -phosphomolybdic acid - which is reduced to intensely coloured molybdenum blue by ascorbic acid. Quantification is by Discrete Analyser. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Organotin Compounds (Soluble)	EP090S	WATER	USEPA SW 846 - 8270D Sample extracts are analysed by GC/MS coupled with high volume injection and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Phenylurea Herbicides	EP208	WATER	In-house, direct injection, LCMS (Electrospray in positive mode). Water samples are diluted with methanol before instrumental analysis.

Preparation Methods	Method	Matrix	Method Descriptions
Drying at 85 degrees, bagging and labelling (ASS)	EN020PR	SOIL	In house
Digestion for Total Recoverable Metals	EN25	SOIL	USEPA SW846-3005 Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Digestion for Total Recoverable Metals - ORC	EN25-ORC	SOIL	Modified USEPA SW846-3005. This is an Ultrapure Nitric acid digestion procedure used to prepare surface and ground water samples for analysis by ORC- ICPMS. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)

Preparation Methods	Method	Matrix	Method Descriptions
Seawater Elutriate Testing Procedure	EN68a	SOIL	USEPA Evaluation of Dredged Material Proposed for Ocean Disposal - Testing Guide, 1991, EPA-503/8-91/001, USEPA and US Army Corps of Engineers. ANZECC Interim Ocean Disposal Guidelines, December, 1998 This Procedure outlines the preparation of leachate designed to simulate release of contaminants from sediment during the disposal of dredged material. Release can occur by physical processes or a variety of chemical changes such as oxidation of metal sulphides and release of contaminants adsorbed to particles or organic matter.
Porewater Extraction	EN82	SOIL	Extraction of porewater from sediment samples using centrifuge.
Sample Extraction for Perfluoroalkyl Compounds	EP231-PR	SOIL	In-House
Methanolic Extraction of Soils for Purge and Trap	* ORG16	SOIL	(USEPA SW 846 - 5030A) 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids/ Sample Cleanup	ORG17A-UTP	SOIL	In-house, Mechanical agitation (tumbler). 20g of sample, Na2SO4 and surrogate are extracted with 150mL 1:1 DCM/Acetone by end over end tumble. Samples are extracted, concentrated (by KD) and exchanged into an appropriate solvent for GPC and florisil cleanup as required.
Tumbler Extraction of Solids for LVI (Non-concentrating)	ORG17D	SOIL	In house: 10g of sample, Na2SO4 and surrogate are extracted with 50mL 1:1 DCM/Acetone by end over end tumbling. An aliquot is concentrated by nitrogen blowdown to a reduced volume for analysis if required.
Organotin Sample Preparation	ORG34	SOIL	In-house. A specified volume of sample is spiked with surrogate, acidified and vacuum filtered. Reagents and solvent are added and the mixture tumbled. The butyltin compounds is derivitisated, extracted and the subtitution reaction completed. The extract is transferred to a separatory funnel and further extracted two times with petroleum ether. The resultant extracts are combined and concentrated for analysis.
Organotin Sample Preparation	ORG35	SOIL	In house. 20g sample is spiked with surrogate and leached in a methanol:acetic acid:UHP water mix and vacuum filtered. Reagents and solvents are added to the sample and the mixture tumbled. The butyltin compounds are simultaneously derivatised and extracted. The extract is further extracted with petroleum ether. The resultant extracts are combined and concentrated for analysis.
Digestion for Total Recoverable Metals	EN25	WATER	USEPA SW846-3005 Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Digestion for Total Recoverable Metals - ORC	EN25-ORC	WATER	Modified USEPA SW846-3005. This is an Ultrapure Nitric acid digestion procedure used to prepare surface and ground water samples for analysis by ORC- ICPMS. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Seawater Elutriate Testing Procedure	EN68a	WATER	USEPA Evaluation of Dredged Material Proposed for Ocean Disposal - Testing Guide, 1991, EPA-503/8-91/001, USEPA and US Army Corps of Engineers. ANZECC Interim Ocean Disposal Guidelines, December, 1998 This Procedure outlines the preparation of leachate designed to simulate release of contaminants from sediment during the disposal of dredged material. Release can occur by physical processes or a variety of chemical changes such as oxidation of metal sulphides and release of contaminants adsorbed to particles or organic matter.
Organotin Sample Preparation	ORG34	WATER	In-house. A specified volume of sample is spiked with surrogate, acidified and vacuum filtered. Reagents and solvent are added and the mixture tumbled. The butyltin compounds is derivitisated, extracted and the subtitution reaction completed. The extract is transferred to a separatory funnel and further extracted two times with petroleum ether. The resultant extracts are combined and concentrated for analysis.

Preparation Methods	Method	Matrix	Method Descriptions

Summary of Outliers

Outliers : Quality Control Samples

The following report highlights outliers flagged in the Quality Control (QC) Report. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). This report displays QC Outliers (breaches) only.

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
EG020-SD: Total Metals in Sediments by ICPMS	EB1326059-044	B54 1.0-1.1	**Manganese**	7439-96-5	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EG020-SD: Total Metals in Sediments by ICPMS	EB1326059-023	C30 0.5-1.0	**Manganese**	7439-96-5	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EG020-SD: Total Metals in Sediments by ICPMS	EB1326059-002	C119A 0-0.2	**Manganese**	7439-96-5	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EG020-SD: Total Metals in Sediments by ICPMS	EB1326059-065	V185 1.5-2.0	**Manganese**	7439-96-5	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EG020-SD: Total Metals in Sediments by ICPMS	EB1326059-085	C82 0-0.5	**Manganese**	7439-96-5	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EG020-SD: Total Metals in Sediments by ICPMS	EB1326059-105	B41B 0.5-0.9	**Manganese**	7439-96-5	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP090: Organotin Compounds	EB1326059-022	C30 0-0.5	**Monobutyltin**	78763-54-9	15.4 %	35-130%	**Recovery less than lower data quality objective**
EP090: Organotin Compounds	EB1326059-081	B74 1.9-2.0	**Monobutyltin**	78763-54-9	2.5 %	35-130%	**Recovery less than lower data quality objective**
EP090: Organotin Compounds	EB1326059-101	J164 0.5-1.02	**Monobutyltin**	78763-54-9	8.1 %	35-130%	**Recovery less than lower data quality objective**
EP090: Organotin Compounds	EB1326059-002	C119A 0-0.2	**Monobutyltin**	78763-54-9	13.1 %	35-130%	**Recovery less than lower data quality objective**
EP090: Organotin Compounds	EB1326059-042	B54 0-0.5	**Monobutyltin**	78763-54-9	15.7 %	35-130%	**Recovery less than lower data quality objective**
EP090: Organotin Compounds	EB1326059-062	V185 0-0.5	**Monobutyltin**	78763-54-9	4.0 %	35-130%	**Recovery less than lower data quality objective**
EP090: Organotin Compounds	EB1326059-081	B74 1.9-2.0	**Dibutyltin**	1002-53-5	13.0 %	20-130%	**Recovery less than lower data quality objective**
EP231: Perfluorinated Compounds	EB1326059-047	K167 0-0.25	**N-Et-FOSA**	4151-50-2	57.3 %	60-130%	**Recovery less than lower data quality objective**

- **For all matrices, no Method Blank value outliers occur.**
- **For all matrices, no Duplicate outliers occur.**
- **For all matrices, no Laboratory Control outliers occur.**

Regular Sample Surrogates

Sub-Matrix: **SEDIMENT**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Samples Submitted							
EP080-SD: TPH(V)/BTEX Surrogates	EB1326059-055	H165B 0-0.2	**Toluene-D8**	2037-26-5	72.6 %	74-134 %	**Recovery less than lower data quality objective**
EP080-SD: TPH(V)/BTEX Surrogates	EB1326059-067	V185 2.5-2.9	**4-Bromofluorobenzene**	460-00-4	137 %	73-137 %	**Recovery greater than upper data quality objective**

Outliers : Analysis Holding Time Compliance

This report displays Holding Time breaches only. Only the respective Extraction / Preparation and/or Analysis component is/are displayed.

Matrix: **SOIL**

Method		*Extraction / Preparation*			*Analysis*		
Container / Client Sample ID(s)		*Date extracted*	*Due for extraction*	***Days overdue***	*Date analysed*	*Due for analysis*	***Days overdue***
EA055: Moisture Content							
Soil Glass Jar - Unpreserved P180 0-0.05,	QAQC3	----	----	----	11-NOV-2013	04-NOV-2013	**7**
Soil Glass Jar - Unpreserved I162 0-0.13		----	----	----	11-NOV-2013	06-NOV-2013	**5**
EK057G: Nitrite as N by Discrete Analyser							
Clear Plastic Bottle - Natural PWB - Pore Water,	PWC - Seawater Elutriate	----	----	----	04-NOV-2013	23-OCT-2013	**12**
Clear Plastic Bottle - Natural PWC - Pore Water,	PWB - Seawater Elutriate	----	----	----	04-NOV-2013	02-NOV-2013	**2**
EK071G: Reactive Phosphorus as P by discrete analyser							
Clear Plastic Bottle - Natural PWB - Pore Water,	PWC - Seawater Elutriate	----	----	----	04-NOV-2013	23-OCT-2013	**12**
Clear Plastic Bottle - Natural PWC - Pore Water,	PWB - Seawater Elutriate	----	----	----	04-NOV-2013	02-NOV-2013	**2**
EP090: Organotin Compounds							
Soil Glass Jar - Unpreserved I162 0.13-0.33		07-NOV-2013	06-NOV-2013	**1**	----	----	----
EP090: Organotin Compounds (Soluble)							
LabSplit: Leach for organics and other tests PWC - Seawater Elutriate		07-NOV-2013	28-OCT-2013	**10**	----	----	----
Soil Glass Jar - Unpreserved PWB - Pore Water		07-NOV-2013	28-OCT-2013	**10**	----	----	----
EP208: Phenylurea Herbicides							

Matrix: **SOIL**

Method / Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EP208: Phenylurea Herbicides - Analysis Holding Time Compliance						
Amber Glass Bottle - Unpreserved						
PWB - Pore Water, PWC - Seawater Elutriate	----	----	----	01-NOV-2013	28-OCT-2013	**4**

Matrix: **WATER**

Method / Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EK057G: Nitrite as N by Discrete Analyser						
Clear Plastic Bottle - Natural						
ELUTRIATE WATER - Seawater Blank	----	----	----	30-OCT-2013	24-OCT-2013	**6**
EK071G: Reactive Phosphorus as P by discrete analyser						
Clear Plastic Bottle - Natural						
ELUTRIATE WATER - Seawater Blank	----	----	----	30-OCT-2013	24-OCT-2013	**6**
EP208: Phenylurea Herbicides						
Amber Glass Bottle - Unpreserved						
ELUTRIATE WATER - Seawater Blank	----	----	----	01-NOV-2013	29-OCT-2013	**3**

Outliers : Frequency of Quality Control Samples

The following report highlights breaches in the Frequency of Quality Control Samples.

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

2012 inductee into the Queensland Business Leaders Hall of Fame

Please consider the environment before printing this email.

From: Markus Billerbeck [mailto:Markus.Billerbeck@bmtwbm.com.au]
Sent: Thursday, 14 November 2013 4:50 PM
To: Rebecca Kleinschmidt
Subject: Urgent analyses required: Workorder : EB1326059 Additional mercury analyses

Hi Rebecca,

Can you please re-analyse in triplicate three of the Cairns samples for total mercury. The samples are:

- EB1326059060 (H162) 1, 2, 3,
- EB1326059064 (V185 1.0-1.5) 4, 5, 6,
- EB1326059039 (C53 0-0.5) 7, 8, 9

Can you please organise also undertake elutriate testing (ORC) and dilute acid extraction (as per NAGD) for mercury on these samples

- EB1326059060 (H162) –please undertake analyses in ~~duplicate~~ for this sample 1
- EB1326059064 (V185 1.0-1.5) please undertake analyses in duplicate for this sample 4, 5
- EB1326059056 (V187 0-0.1) 10
- EB1326059062 (V185 0-0.5) 11
- EB1326059097 (G155 0-0.15) 12
- EB1326059048 (M180 0-0.2) 13
- EB1326059053 (H165 0-0.2) 14

Environmental Division
Brisbane
Work Order
EB1328096

Telephone : +61-7-3243 7222

Please note that I would like to avoid an exceedance of the holding time, which essentially ends this Sunday. So the analyses will have to start as soon as possible.

I will give you a call tomorrow morning to confirm.

Can you please also confirm whether you keep the frozen hold samples for this work order. There is likely going to be further diuron analyses required.

Thanks a lot,
Markus

Dr Markus Billerbeck

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EB1328096**	Page	: 1 of 8
Client	: **BMT WBM GROUP LTD**	Laboratory	: Environmental Division Brisbane
Contact	: DR MARKUS BILLERBECK	Contact	: Customer Services
Address	: PO BOX 203 SPRING HILL BRISBANE QLD 4004	Address	: 2 Byth Street Stafford QLD Australia 4053
E-mail	: markus.billerbeck@bmtwbm.com.au	E-mail	: Brisbane.Enviro.Services@alsglobal.com
Telephone	: +61 07 3831 6744	Telephone	: +61 7 3243 7222
Facsimile	: +61 07 3832 3627	Facsimile	: +61 7 3243 7218
Project	: B20180 Cairns EIS	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: ----		
C-O-C number	: ----	Date Samples Received	: 14-NOV-2013
Sampler	: Stuart Taylor	Issue Date	: 19-NOV-2013
Site	: ----		
		No. of samples received	: 16
Quote number	: BN/915/13 V2	No. of samples analysed	: 16

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

WORLD RECOGNISED ACCREDITATION

Signatories

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

Signatories	*Position*	*Accreditation Category*
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics

General Comments

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

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

- **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.**

Analytical Results

Sub-Matrix: ELUTRIATE (Matrix: WATER)			Client sample ID	EB1326059064 (V185 1.0-1.5) 1	EB1326059064 (V185 1.0-1.5) 2	EB1326059056 (V187 0-0.1)	EB1326059062 (V185 0-0.5) 1	EB1326059097 (G155 0-0.15)
			Client sampling date / time	15-NOV-2013 19:16	15-NOV-2013 19:16	15-NOV-2013 19:16	15-NOV-2013 19:16	15-NOV-2013 19:16
Compound	CAS Number	LOR	Unit	EB1328096-004	EB1328096-005	EB1328096-010	EB1328096-011	EB1328096-012
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001

Analytical Results

Sub-Matrix: ELUTRIATE (Matrix: WATER)			Client sample ID	EB1326059048 (M180 0-0.2)	EB1326059053 (H162 0-0.2)	EB1326059062 (V185 0-0.5) 2	Elutriate Seawater Blank	----
			Client sampling date / time	15-NOV-2013 19:16	15-NOV-2013 19:16	15-NOV-2013 19:15	15-NOV-2013 19:15	----
Compound	CAS Number	LOR	Unit	EB1328096-013	EB1328096-014	EB1328096-015	EB1328096-016	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	EB1326059060 (H162) 1	EB1326059060 (H162) 2	EB1326059060 (H162) 3	EB1326059064 (V185 1.0-1.5) 1	EB1326059064 (V185 1.0-1.5) 2
			Client sampling date / time	21-OCT-2013 15:00	21-OCT-2013 15:00	21-OCT-2013 15:00	21-OCT-2013 15:00	21-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EB1328096-001	EB1328096-002	EB1328096-003	EB1328096-004	EB1328096-005
EA055: Moisture Content								
Moisture Content (dried @ 103°C)	----	1.0	%	23.3	25.2	22.0	46.5	47.0
EG035-SDH: 1M HCl extractable Mercury by FIMS								
Mercury	7439-97-6	0.10	mg/kg	<0.10	----	----	<0.10	<0.10
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.01	mg/kg	<0.01	<0.01	<0.01	0.01	0.01
EN68: Seawater Elutriate Testing Procedure								
Seawater Sampling Date	----	0.1	-	----	----	----	1	1

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	EB1326059064 (V185 1.0-1.5) 3	EB1326059039 (C53 0-0.5) 1	EB1326059039 (C53 0-0.5) 2	EB1326059039 (C53 0-0.5) 3	EB1326059056 (V187 0-0.1)
			Client sampling date / time	21-OCT-2013 15:00	20-OCT-2013 15:00	20-OCT-2013 15:00	20-OCT-2013 15:00	21-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EB1328096-006	EB1328096-007	EB1328096-008	EB1328096-009	EB1328096-010
EA055: Moisture Content								
Moisture Content (dried @ 103°C)	----	1.0	%	45.7	51.1	50.0	51.1	55.8
EG035-SDH: 1M HCl extractable Mercury by FIMS								
Mercury	7439-97-6	0.10	mg/kg	----	----	----	----	<0.10
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.01	mg/kg	0.01	0.02	0.02	0.02	----
EN68: Seawater Elutriate Testing Procedure								
Seawater Sampling Date	----	0.1	-	----	----	----	----	1

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	EB1326059062 (V185 0-0.5) 1	EB1326059097 (G155 0-0.15)	EB1326059048 (M180 0-0.2)	EB1326059053 (H162 0-0.2)	EB1326059062 (V185 0-0.5) 2
			Client sampling date / time	21-OCT-2013 15:00	23-OCT-2013 15:00	20-OCT-2013 15:00	21-OCT-2013 15:00	21-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EB1328096-011	EB1328096-012	EB1328096-013	EB1328096-014	EB1328096-015
EA055: Moisture Content								
Moisture Content (dried @ 103°C)	----	1.0	%	41.0	22.1	56.0	55.6	40.0
EG035-SDH: 1M HCl extractable Mercury by FIMS								
Mercury	7439-97-6	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
EN68: Seawater Elutriate Testing Procedure								
Seawater Sampling Date	----	0.1	-	1	1	1	1	1

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)			Client sample ID	**Elutriate Seawater Blank**	----	----	----	----
			Client sampling date / time	21-OCT-2013 15:00	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**EB1328096-016**	**----**	**----**	**----**	**----**
EN68: Seawater Elutriate Testing Procedure								
Seawater Sampling Date	----	0.1	-	**1**	----	----	----	----

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EB1328096**	Page	: 1 of 5
Client	: **BMT WBM GROUP LTD**	Laboratory	: Environmental Division Brisbane
Contact	: DR MARKUS BILLERBECK	Contact	: Customer Services
Address	: PO BOX 203 SPRING HILL BRISBANE QLD 4004	Address	: 2 Byth Street Stafford QLD Australia 4053
E-mail	: markus.billerbeck@bmtwbm.com.au	E-mail	: Brisbane.Enviro.Services@alsglobal.com
Telephone	: +61 07 3831 6744	Telephone	: +61 7 3243 7222
Facsimile	: +61 07 3832 3627	Facsimile	: +61 7 3243 7218
Project	: B20180 Cairns EIS	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 14-NOV-2013
Sampler	: Stuart Taylor	Issue Date	: 19-NOV-2013
Order number	: ----		
		No. of samples received	: 16
Quote number	: BN/915/13 V2	No. of samples analysed	: 16

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

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

NATA WORLD RECOGNISED ACCREDITATION

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by 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	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EA055: Moisture Content (QC Lot: 3161451)									
EB1328096-004	EB1326059064 (V185 1.0-1.5) 1	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	46.5	45.7	1.6	0% - 20%
EB1328096-011	EB1326059062 (V185 0-0.5) 1	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	41.0	41.3	0.6	0% - 20%
EG035-SDH: 1M HCl extractable Mercury by FIMS (QC Lot: 3161289)									
EB1328096-001	EB1326059060 (H162) 1	EG035-SDH: Mercury	7439-97-6	0.10	mg/kg	<0.10	<0.10	0.0	No Limit
EG035-SDH: 1M HCl extractable Mercury by FIMS (QC Lot: 3161659)									
EB1328096-015	EB1326059062 (V185 0-0.5) 2	EG035-SDH: Mercury	7439-97-6	0.10	mg/kg	<0.10	<0.10	0.0	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3161290)									
EB1328096-001	EB1326059060 (H162) 1	EG035T-LL: Mercury	7439-97-6	0.01	mg/kg	<0.01	<0.01	0.0	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3164422)									
EB1328096-004	EB1326059064 (V185 1.0-1.5) 1	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit

Method Blank (MB) and Laboratory Control Spike (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 (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EG035-SDH: 1M HCl extractable Mercury by FIMS (QCLot: 3161289)								
EG035-SDH: Mercury	7439-97-6	0.1	mg/kg	<0.10	1.863 mg/kg	88.8	70	130
EG035-SDH: 1M HCl extractable Mercury by FIMS (QCLot: 3161659)								
EG035-SDH: Mercury	7439-97-6	0.1	mg/kg	<0.10	1.863 mg/kg	88.6	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3161290)								
EG035T-LL: Mercury	7439-97-6	0.01	mg/kg	<0.01	0.111 mg/kg	98.0	70	114

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3164422)								
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.0100 mg/L	108	83	119

Matrix Spike (MS) Report

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

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG035-SDH: 1M HCl extractable Mercury by FIMS (QCLot: 3161289)							
EB1328096-004	EB1326059064 (V185 1.0-1.5) 1	EG035-SDH: Mercury	7439-97-6	0.25 mg/kg	72.4	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3161290)							
EB1328096-002	EB1326059060 (H162) 2	EG035T-LL: Mercury	7439-97-6	0.5 mg/kg	120	70	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3164422)							
EB1328096-005	EB1326059064 (V185 1.0-1.5) 2	EG035T: Mercury	7439-97-6	0.010 mg/L	104	70	130

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

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

Sub-Matrix: **SOIL**

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

Sub-Matrix: **SOIL**

				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	MSD	Low	High	Value	Control Limit
EG035-SDH: 1M HCl extractable Mercury by FIMS (QCLot: 3161289)										
EB1328096-004	EB1326059064 (V185 1.0-1.5) 1	EG035-SDH: Mercury	7439-97-6	0.25 mg/kg	72.4	----	70	130	----	----
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3161290)										
EB1328096-002	EB1326059060 (H162) 2	EG035T-LL: Mercury	7439-97-6	0.5 mg/kg	120	----	70	130	----	----

Sub-Matrix: **WATER**

				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	MSD	Low	High	Value	Control Limit
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3164422)										
EB1328096-005	EB1326059064 (V185 1.0-1.5) 2	EG035T: Mercury	7439-97-6	0.010 mg/L	104	----	70	130	----	----

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **EB1328096**	Page	: 1 of 6
Client	: BMT WBM GROUP LTD	Laboratory	: Environmental Division Brisbane
Contact	: DR MARKUS BILLERBECK	Contact	: Customer Services
Address	: PO BOX 203 SPRING HILL BRISBANE QLD 4004	Address	: 2 Byth Street Stafford QLD Australia 4053
E-mail	: markus.billerbeck@bmtwbm.com.au	E-mail	: Brisbane.Enviro.Services@alsglobal.com
Telephone	: +61 07 3831 6744	Telephone	: +61 7 3243 7222
Facsimile	: +61 07 3832 3627	Facsimile	: +61 7 3243 7218
Project	: B20180 Cairns EIS	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 14-NOV-2013
Sampler	: Stuart Taylor	Issue Date	: 19-NOV-2013
Order number	: ----		
		No. of samples received	: 16
Quote number	: BN/915/13 V2	No. of samples analysed	: 16

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Interpretive Quality Control Report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Parameter Frequency Compliance
- Brief Method Summaries
- Summary of Outliers

Analysis Holding Time Compliance

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

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

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

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content								
Snap Lock Bag - frozen (EA055-103) EB1326059039 (C53 0-0.5) - 1, EB1326059039 (C53 0-0.5) - 3,	EB1326059039 (C53 0-0.5) - 2, EB1326059048 (M180 0-0.2)	**20-OCT-2013**	**----**	----	----	**15-NOV-2013**	03-NOV-2013	×
Snap Lock Bag - frozen (EA055-103) EB1326059064 (V185 1.0-1.5) - 1, EB1326059064 (V185 1.0-1.5) - 3, EB1326059062 (V185 0-0.5) - 1, EB1326059062 (V185 0-0.5) - 2	EB1326059064 (V185 1.0-1.5) - 2, EB1326059056 (V187 0-0.1), EB1326059053 (H162 0-0.2),	**21-OCT-2013**	**----**	----	----	**15-NOV-2013**	04-NOV-2013	×
Soil Glass Jar - Unpreserved (EA055-103) EB1326059060 (H162) - 1, EB1326059060 (H162) - 3	EB1326059060 (H162) - 2,	**21-OCT-2013**	**----**	----	----	**15-NOV-2013**	04-NOV-2013	×
Soil Glass Jar - Unpreserved (EA055-103) EB1326059097 (G155 0-0.15)		**23-OCT-2013**	**----**	----	----	**15-NOV-2013**	06-NOV-2013	×
EG035-SDH: 1M HCl extractable Mercury by FIMS								
Snap Lock Bag - frozen (EG035-SDH) EB1326059048 (M180 0-0.2)		**20-OCT-2013**	**15-NOV-2013**	17-NOV-2013	✓	**15-NOV-2013**	17-NOV-2013	✓
Snap Lock Bag - frozen (EG035-SDH) EB1326059064 (V185 1.0-1.5) - 1, EB1326059056 (V187 0-0.1), EB1326059053 (H162 0-0.2)	EB1326059064 (V185 1.0-1.5) - 2, EB1326059062 (V185 0-0.5) - 1,	**21-OCT-2013**	**15-NOV-2013**	18-NOV-2013	✓	**15-NOV-2013**	18-NOV-2013	✓
Snap Lock Bag - frozen (EG035-SDH) EB1326059062 (V185 0-0.5) - 2		**21-OCT-2013**	**15-NOV-2013**	18-NOV-2013	✓	**18-NOV-2013**	18-NOV-2013	✓
Soil Glass Jar - Unpreserved (EG035-SDH) EB1326059060 (H162) - 1		**21-OCT-2013**	**15-NOV-2013**	18-NOV-2013	✓	**15-NOV-2013**	18-NOV-2013	✓
Soil Glass Jar - Unpreserved (EG035-SDH) EB1326059097 (G155 0-0.15)		**23-OCT-2013**	**15-NOV-2013**	20-NOV-2013	✓	**15-NOV-2013**	20-NOV-2013	✓
EG035T: Total Recoverable Mercury by FIMS								
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG035T) EB1326059064 (V185 1.0-1.5) - 1, EB1326059056 (V187 0-0.1), EB1326059097 (G155 0-0.15), EB1326059053 (H162 0-0.2), Elutriate Seawater Blank	EB1326059064 (V185 1.0-1.5) - 2, EB1326059062 (V185 0-0.5) - 1, EB1326059048 (M180 0-0.2), EB1326059062 (V185 0-0.5) - 2,	**15-NOV-2013**	**----**	----	----	**19-NOV-2013**	13-DEC-2013	✓

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG035T: Total Recoverable Mercury by FIMS								
Snap Lock Bag - frozen (EG035T-LL) EB1326059039 (C53 0-0.5) - 1, EB1326059039 (C53 0-0.5) - 3	EB1326059039 (C53 0-0.5) - 2,	**20-OCT-2013**	**15-NOV-2013**	17-NOV-2013	✓	**15-NOV-2013**	17-NOV-2013	✓
Snap Lock Bag - frozen (EG035T-LL) EB1326059064 (V185 1.0-1.5) - 1, EB1326059064 (V185 1.0-1.5) - 3	EB1326059064 (V185 1.0-1.5) - 2,	**21-OCT-2013**	**15-NOV-2013**	18-NOV-2013	✓	**15-NOV-2013**	18-NOV-2013	✓
Soil Glass Jar - Unpreserved (EG035T-LL) EB1326059060 (H162) - 1, EB1326059060 (H162) - 3	EB1326059060 (H162) - 2,	**21-OCT-2013**	**15-NOV-2013**	18-NOV-2013	✓	**15-NOV-2013**	18-NOV-2013	✓
EN68: Seawater Elutriate Testing Procedure								
Lab Split : Leach for Hg, Cr(VI) and other metal (EN68a) EB1326059048 (M180 0-0.2)		**20-OCT-2013**	---	17-NOV-2013	----	**15-NOV-2013**	17-NOV-2013	✓
Lab Split : Leach for Hg, Cr(VI) and other metal (EN68a) EB1326059064 (V185 1.0-1.5) - 1, EB1326059056 (V187 0-0.1), EB1326059053 (H162 0-0.2), Elutriate Seawater Blank	EB1326059064 (V185 1.0-1.5) - 2, EB1326059062 (V185 0-0.5) - 1, EB1326059062 (V185 0-0.5) - 2,	**21-OCT-2013**	---	18-NOV-2013	----	**15-NOV-2013**	18-NOV-2013	✓
Lab Split : Leach for Hg, Cr(VI) and other metal (EN68a) EB1326059097 (G155 0-0.15)		**23-OCT-2013**	---	20-NOV-2013	----	**15-NOV-2013**	20-NOV-2013	✓

Quality Control Parameter Frequency Compliance

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

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
1M HCl Extractable Mercury by FIMS	EG035-SDH	2	9	22.2	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Moisture Content	EA055-103	2	14	14.3	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS (Low Level)	EG035T-LL	1	9	11.1	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
1M HCl Extractable Mercury by FIMS	EG035-SDH	2	9	22.2	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS (Low Level)	EG035T-LL	1	9	11.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
1M HCl Extractable Mercury by FIMS	EG035-SDH	2	9	22.2	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS (Low Level)	EG035T-LL	1	9	11.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
1M HCl Extractable Mercury by FIMS	EG035-SDH	1	8	12.5	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS (Low Level)	EG035T-LL	1	9	11.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
Total Mercury by FIMS	EG035T	1	9	11.1	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
Total Mercury by FIMS	EG035T	1	9	11.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Total Mercury by FIMS	EG035T	1	9	11.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
Total Mercury by FIMS	EG035T	1	9	11.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement

Brief Method Summaries

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

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055-103	SOIL	A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
1M HCl Extractable Mercury by FIMS	EG035-SDH	SOIL	AS 3550, APHA 21st ed., 3112 Hg - B. Mercury is determined via FIMS following weak acid extraction. FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	AS 3550, APHA 21st ed. 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the unfiltered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Total Mercury by FIMS (Low Level)	EG035T-LL	SOIL	AS 3550, APHA 21st ed., 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)

Preparation Methods	Method	Matrix	Method Descriptions
Seawater Elutriate Testing Procedure	EN68a	SOIL	USEPA Evaluation of Dredged Material Proposed for Ocean Disposal - Testing Guide, 1991, EPA-503/8-91/001, USEPA and US Army Corps of Engineers. ANZECC Interim Ocean Disposal Guidelines, December, 1998 This Procedure outlines the preparation of leachate designed to simulate release of contaminants from sediment during the disposal of dredged material. Release can occur by physical processes or a variety of chemical changes such as oxidation of metal sulphides and release of contaminants adsorbed to particles or organic matter.
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	USEPA 200.2 Mod. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (2013) Schedule B(3) (Method 202)
1M HCl Extraction for Metals in Sediments (1 hour)	EN71	SOIL	In house, Allen (1993) Mod. 1g of sample is leached at room temperature for 1 hour in 10% hydrochloric acid. The resultant extract is filtered and bulked for analysis of extracted metals.

Summary of Outliers

Outliers : Quality Control Samples

The following report highlights outliers flagged in the Quality Control (QC) Report. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). This report displays QC Outliers (breaches) only.

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

- **For all matrices, no Method Blank value outliers occur.**
- **For all matrices, no Duplicate outliers occur.**
- **For all matrices, no Laboratory Control outliers occur.**
- **For all matrices, no Matrix Spike outliers occur.**

Regular Sample Surrogates

- **For all regular sample matrices, no surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

This report displays Holding Time breaches only. Only the respective Extraction / Preparation and/or Analysis component is/are displayed.

Matrix: **SOIL**

Method		Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EA055: Moisture Content							
Snap Lock Bag - frozen							
EB1326059039 (C53 0-0.5) - 1,	EB1326059039 (C53 0-0.5) - 2,	----	----	----	15-NOV-2013	03-NOV-2013	**12**
EB1326059039 (C53 0-0.5) - 3,	EB1326059048 (M180 0-0.2)						
Snap Lock Bag - frozen							
EB1326059064 (V185 1.0-1.5) - 1,	EB1326059064 (V185 1.0-1.5) - 2,	----	----	----	15-NOV-2013	04-NOV-2013	**11**
EB1326059064 (V185 1.0-1.5) - 3,	EB1326059056 (V187 0-0.1),						
EB1326059062 (V185 0-0.5) - 1,	EB1326059053 (H162 0-0.2),						
EB1326059062 (V185 0-0.5) - 2							
Soil Glass Jar - Unpreserved							
EB1326059060 (H162) - 1,	EB1326059060 (H162) - 2,	----	----	----	15-NOV-2013	04-NOV-2013	**11**
EB1326059060 (H162) - 3							
Soil Glass Jar - Unpreserved							
EB1326059097 (G155 0-0.15)		----	----	----	15-NOV-2013	06-NOV-2013	**9**

Outliers : Frequency of Quality Control Samples

The following report highlights breaches in the Frequency of Quality Control Samples.

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

Appendix F Results – Secondary Laboratory

ENVIROLABS

9 of 9.

CHAIN OF CUSTODY

CLIENT:
OFFICE:
PROJECT:
ORDER NUMBER:
PROJECT MANAGER:
SAMPLER:
CONTACT PH:
SAMPLER MOBILE:
EDD FORMAT (or default):
S / NO)
Email Reports to (will default to PM if no other addresses are listed):
Email Invoice to (will default to PM if no other addresses are listed):

TURNAROUND REQUIREMENTS: ☐ Standard TAT (List due date): ☐ Non Standard or urgent TAT (List due date):
(Standard TAT may be longer for some tests e.g. Ultra Trace Organics)

COC SEQUENCE NUMBER (Circle)
COC: 1 2 3 4 5 6 7
SF: 1 2 3 4 5 6 7

FOR LABORATORY USE ONLY (Circle)

Custody Seal Intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt:	°C		
Other comment:			

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
S. Taylor	T. Cooper		
DATE/TIME 24/10/13 10:30	DATE/TIME 25/10/13 0930	DATE/TIME	DATE/TIME

ALS USE ONLY — SAMPLE DETAILS — MATRIX: Solid(S) Water(W) — CONTAINER INFORMATION — ANALYSIS REQUIRED including SUITES (NB: Suite Codes must be listed to attract suite price) — Additional Information

(Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required))

LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	Particle Size to 75um - Sieve only (EA150)	Particle Size plus Hydrometer 1-5um (EA150H)	Metals - Ag, As, Cd, Cr, Cu, Hg, Ni, Pb, Sb, Zn, Fe, Al (SD-3)	Organotins (EP090)	BTEX, TPH, PAH, OCP/OPP, Diuron	PFCs (EP231-PFC)	Nutrients - TN, TKN, TP, NH4, NOx (NT-11S plus EK055-SD)	Chromium Suite (EA033)	TOC (EP003)
1	U167 0-0.2		Sed		4	✓	✓	✓	✓	✓	✓	✓	✓	✓
2	U185 0-0.5		Sed		4	✓	✓	✓	✓	✓	✓	✓	✓	✓
3	U185 0.5-1.0		Sed		4	✓	✓	✓	✓	✓	✓	✓	✓	✓
4	B41 0-0.5		Sed		4	✓	✓	✓	✓	✓	✓	✓	✓	✓
5	B41 0.5-0.9		Sed		4	✓	✓	✓	✓	✓	✓	✓	✓	✓
			Sed					✓	✓					
			Sed					✓	✓					
			Sed					✓	✓					
			Sed					✓	✓					
			Sed					✓	✓					
			Sed					✓	✓					
			Sed					✓	✓					
			Sed					✓	✓					
			Sed					✓	✓					
			Sed					✓	✓					
			Sed					✓	✓					
			Sed					✓	✓					
			Sed					✓	✓					
			Sed					✓	✓					
			Sed					✓	✓					
			Sed					✓	✓					

Additional Information: Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis only.

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 99730
Date Received: 29/10/13
Time Received: 10:00
Received by: PT
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

SEND TO ENVIROLABS
Sent 28/10/13
ORD

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

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
enquiries@envirolabservices.com.au
www.envirolabservices.com.au

CERTIFICATE OF ANALYSIS 99730

Client:
BMT WBM Pty. Ltd
Level 1, 256-258 Norton St
Leichhardt
NSW

Attention: Markus Billerbeck, Stuart Taylor

Sample log in details:

Your Reference:	**Cairns EIS**		
No. of samples:	5 soils		
Date samples received / completed instructions received	29/10/13	/	29/10/13

Analysis Details:
Please refer to the following pages for results, methodology summary and quality control data.
Samples were analysed as received from the client. Results relate specifically to the samples as received.
Results are reported on a dry weight basis for solids and on an as received basis for other matrices.
Please refer to the last page of this report for any comments relating to the results.

Report Details:

Date results requested by: / Issue Date:	8/11/13	/	20/11/13
Date of Preliminary Report:	Not issued		

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Accredited for compliance with ISO/IEC 17025. **Tests not covered by NATA are denoted with *.**

Results Approved By:

Jacinta Hurst
Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil Our Reference: Your Reference Depth Type of sample	UNITS ---------- ----------	99730-1 H167 0-0.2 soil	99730-2 U185 0-0.5 soil	99730-3 U185 0.5-1.0 soil
Date extracted	-	30/10/2013	30/10/2013	30/10/2013
Date analysed	-	04/11/2013	04/11/2013	04/11/2013
TRH C_6 - C_9	mg/kg	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	91	93	77

svTRH (C10-C40) in Soil				
Our Reference:	UNITS	99730-1	99730-2	99730-3
Your Reference	----------	H167	U185	U185
Depth	----------	0-0.2	0-0.5	0.5-1.0
Type of sample		soil	soil	soil
Date extracted	-	30/10/2013	30/10/2013	30/10/2013
Date analysed	-	31/10/2013	31/10/2013	31/10/2013
$TRHC_{10}$ - C_{14}	mg/kg	<50	<50	<50
$TRHC_{15}$ - C_{28}	mg/kg	<100	<100	<100
$TRHC_{29}$ - C_{36}	mg/kg	<100	<100	<100
$TRH>C_{10}$-C_{16}	mg/kg	<50	<50	<50
$TRH>C_{10}$ - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50
$TRH>C_{16}$-C_{34}	mg/kg	<100	<100	<100
$TRH>C_{34}$-C_{40}	mg/kg	<100	<100	<100
Surrogate o-Terphenyl	%	90	90	88

PAHs in Soil Our Reference: Your Reference Depth Type of sample	UNITS ---------- ----------	99730-1 H167 0-0.2 soil	99730-2 U185 0-0.5 soil	99730-3 U185 0.5-1.0 soil
Date extracted	-	30/10/2013	30/10/2013	30/10/2013
Date analysed	-	31/10/2013	31/10/2013	31/10/2013
Naphthalene	mg/kg	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1
Benzo(b+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1
Benzo(a)pyrene TEQ NEPM B1	mg/kg	<0.5	<0.5	<0.5
Total +ve PAH's	mg/kg	NIL (+)VE	NIL (+)VE	NIL (+)VE
Surrogate p-Terphenyl-d14	%	101	95	97

Organochlorine Pesticides in soil Our Reference: Your Reference Depth Type of sample	UNITS ---------- ----------	99730-1 H167 0-0.2 soil	99730-2 U185 0-0.5 soil	99730-3 U185 0.5-1.0 soil
Date extracted	-	31/10/2013	31/10/2013	31/10/2013
Date analysed	-	01/11/2013	01/11/2013	01/11/2013
HCB	mg/kg	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1
Surrogate TCMX	%	97	95	98

Organophosphorus Pesticides				
Our Reference:	UNITS	99730-1	99730-2	99730-3
Your Reference	----------	H167	U185	U185
Depth	----------	0-0.2	0-0.5	0.5-1.0
Type of sample		soil	soil	soil
Date extracted	-	31/10/2013	31/10/2013	31/10/2013
Date analysed	-	01/11/2013	01/11/2013	01/11/2013
Diazinon	mg/kg	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1
Surrogate TCMX	%	97	95	98

Acid Extractable metals in soil						
Our Reference:	UNITS	99730-1	99730-2	99730-3	99730-4	99730-5
Your Reference	----------	H167	U185	U185	B41	B41
Depth	----------	0-0.2	0-0.5	0.5-1.0	0-0.5	0.5-0.9
Type of sample		soil	soil	soil	soil	soil
Date digested	-	30/10/2013	30/10/2013	30/10/2013	30/10/2013	30/10/2013
Date analysed	-	30/10/2013	30/10/2013	30/10/2013	30/10/2013	30/10/2013
Arsenic	mg/kg	16	12	13	16	17
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	34	17	25	34	33
Copper	mg/kg	17	8	8	12	12
Lead	mg/kg	16	9	15	15	15
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	16	8	12	17	16
Zinc	mg/kg	53	29	29	43	44
Silver	mg/kg	<1	<1	<1	<1	<1
Aluminium	mg/kg	21,000	10,000	15,000	21,000	19,000
Iron	mg/kg	29,000	18,000	24,000	28,000	28,000
Antimony	mg/kg	<7	<7	<7	<7	<7
Phosphorus	mg/kg	370	190	200	[NA]	[NA]

Miscellaneous Inorg - soil						
Our Reference:	UNITS	99730-1	99730-2	99730-3	99730-4	99730-5
Your Reference	----------	H167	U185	U185	B41	B41
Depth	----------	0-0.2	0-0.5	0.5-1.0	0-0.5	0.5-0.9
Type of sample		soil	soil	soil	soil	soil
Date prepared	-	31/10/2013	31/10/2013	31/10/2013	[NA]	[NA]
Date analysed	-	31/10/2013	31/10/2013	31/10/2013	[NA]	[NA]
TKN as N in soil	mg/kg	1,500	730	910	[NA]	[NA]
Total Nitrogen in soil	mg/kg	1,500	730	910	[NA]	[NA]
Ammonia as N in soil	mg/kg	24	1.6	3.1	[NA]	[NA]
NOx as N in soil	mg/kg	<0.5	<0.5	<0.5	[NA]	[NA]
Total Organic Carbon (Combustion)	mg/kg	21,000	15,000	13,000	14,000	14,000

Moisture						
Our Reference:	UNITS	99730-1	99730-2	99730-3	99730-4	99730-5
Your Reference	----------	H167	U185	U185	B41	B41
Depth	----------	0-0.2	0-0.5	0.5-1.0	0-0.5	0.5-0.9
Type of sample		soil	soil	soil	soil	soil
Date prepared	-	30/10/2013	30/10/2013	30/10/2013	30/10/2013	30/10/2013
Date analysed	-	31/10/2013	31/10/2013	31/10/2013	31/10/2013	31/10/2013
Moisture	%	56	39	47	57	51

Chromium Suite Our Reference: Your Reference Depth Type of sample	UNITS ---------- ----------	99730-1 H167 0-0.2 soil	99730-2 U185 0-0.5 soil	99730-3 U185 0.5-1.0 soil	99730-4 B41 0-0.5 soil	99730-5 B41 0.5-0.9 soil
pH $_{kcl}$	pH units	8.1	8.4	8.4	8.7	8.7
s-TAA pH 6.5	%w/w S	<0.01	<0.01	<0.01	<0.01	<0.01
TAA pH 6.5	moles H^+/t	<5	<5	<5	<5	<5
Chromium Reducible Sulfur	%w/w	0.20	0.29	0.44	0.03	0.15
a-Chromium Reducible Sulfur	moles H^+/t	130	180	280	21	97
S_{KCl}	%w/w S	0.23	0.14	0.17	0.19	0.11
ANC_{BT}	% $CaCO_3$	6.5	4.2	5.6	11	10
s-ANC_{BT}	%w/w S	2.1	1.3	1.8	3.4	3.2
s-Net Acidity	%w/w S	<0.01	<0.01	<0.01	<0.01	<0.01
a-Net Acidity	moles H^+/t	<10	<10	<10	<10	<10
Liming rate	kg $CaCO_3$/t	<0.75	<0.75	<0.75	<0.75	<0.75
a-Net Acidity without ANCE	moles H^+/t	<10	<10	<10	<10	<10
Liming rate without ANCE	kg $CaCO_3$/t	<0.75	<0.75	<0.75	<0.75	<0.75

Particle Size Distribution in Soils						
Our Reference:	UNITS	99730-1	99730-2	99730-3	99730-4	99730-5
Your Reference	----------	H167	U185	U185	B41	B41
Depth	----------	0-0.2	0-0.5	0.5-1.0	0-0.5	0.5-0.9
Type of sample		soil	soil	soil	soil	soil
Particle Size Analysis	%	#	#	#	#	#

Herbicides in Soil				
Our Reference:	UNITS	99730-1	99730-2	99730-3
Your Reference	----------	H167	U185	U185
Depth	----------	0-0.2	0-0.5	0.5-1.0
Type of sample		soil	soil	soil
Diuron	mg/kg	<0.1	<0.1	<0.1

Organotin Compunds in Soil						
Our Reference:	UNITS	99730-1	99730-2	99730-3	99730-4	99730-5
Your Reference	----------	H167	U185	U185	B41	B41
Depth	----------	0-0.2	0-0.5	0.5-1.0	0-0.5	0.5-0.9
Type of sample		soil	soil	soil	soil	soil
Monobutyltin as Sn	ng/g	<0.50	0.58	<0.50	<0.50	0.62
Dibutyltin as Sn	ng/g	1.3	1.0	<0.50	<0.50	0.61
Tributyltin as Sn	ng/g	0.93	<0.50	<0.50	<0.50	<0.50
Surrogate (Tripropyltin)	%	130	130	120	140	120

Perfluorochemicals in Soil				
Our Reference:	UNITS	99730-1	99730-2	99730-3
Your Reference	----------	H167	U185	U185
Depth	----------	0-0.2	0-0.5	0.5-1.0
Type of sample		soil	soil	soil
PFOS (Branched and Linear)	µg/kg	<1.0	<1.0	<1.0
Perfluorooctanoate PFOA	µg/kg	<0.50	<0.50	<0.50
Total Solids	%	39.7	58.0	53.4
Surrogate 1 Recovery	%	86.0	106	102
Date Analysed	-	13/11/2013	13/11/2013	13/11/2013
Date Extracted	-	15/11/2013	15/11/2013	15/11/2013

Method ID	Methodology Summary
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-014	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note Naphthalene is determined from the VOC analysis.
Org-012 subset	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013.
Org-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Org-008	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Metals-020 ICP-AES	Determination of various metals by ICP-AES.
Metals-021 CV-AAS	Determination of Mercury by Cold Vapour AAS.
Inorg-062	TKN - determined colourimetrically based on APHA 22nd ED 4500 Norg.
Inorg-055/062	Total Nitrogen - Calculation sum of TKN and oxidised Nitrogen.
Inorg-057	Ammonia - determined colourimetrically based on EPA350.1 and APHA 22nd ED 4500-NH3 F, Soils are analysed following a KCl extraction.
Inorg-055	Nitrate - determined colourimetrically based on EPA353.2 and APHA 22nd ED NO3- F. Soils are analysed following a water extraction.
Ext-020	Analysis subcontracted to Australian Government - National Measurement Institute. NATA Accreditation No: 198
Inorg-008	Moisture content determined by heating at 105+/-5 deg C for a minimum of 12 hours.
Inorg-068	Chromium Reducible Sulfur - Hydrogen Sulfide is quantified by iodometric titration after distillation to determine potential acidity. Based on Acid Sulfate Soils Laboratory Methods Guidelines, Version 2.1 - June 2004.
Ext-062	Analysed by East West Enviroag
Ext-038	Analysed by Advanced Analytical Australia Pty Ltd. NATA accreditation 15109.

QUALITY CONTROL vTRH(C6-C10)/BTEXN in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			30/10/2013	[NT]	[NT]	LCS-3	30/10/2013
Date analysed	-			30/10/2013	[NT]	[NT]	LCS-3	30/10/2013
TRHC_6 - C_9	mg/kg	25	Org-016	<25	[NT]	[NT]	LCS-3	89%
TRHC_6 - C_{10}	mg/kg	25	Org-016	<25	[NT]	[NT]	LCS-3	89%
Benzene	mg/kg	0.2	Org-016	<0.2	[NT]	[NT]	LCS-3	71%
Toluene	mg/kg	0.5	Org-016	<0.5	[NT]	[NT]	LCS-3	93%
Ethylbenzene	mg/kg	1	Org-016	<1	[NT]	[NT]	LCS-3	90%
m+p-xylene	mg/kg	2	Org-016	<2	[NT]	[NT]	LCS-3	95%
o-Xylene	mg/kg	1	Org-016	<1	[NT]	[NT]	LCS-3	94%
naphthalene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
Surrogate aaa-Trifluorotoluene	%		Org-016	91	[NT]	[NT]	LCS-3	84%

QUALITY CONTROL svTRH (C10-C40) in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			30/10/2013	[NT]	[NT]	LCS-4	30/10/2013
Date analysed	-			31/10/2013	[NT]	[NT]	LCS-4	31/10/2013
TRHC_{10} - C_{14}	mg/kg	50	Org-003	<50	[NT]	[NT]	LCS-4	121%
TRHC_{15} - C_{28}	mg/kg	100	Org-003	<100	[NT]	[NT]	LCS-4	99%
TRHC_{29} - C_{36}	mg/kg	100	Org-003	<100	[NT]	[NT]	LCS-4	89%
TRH>C_{10}-C_{16}	mg/kg	50	Org-003	<50	[NT]	[NT]	LCS-4	121%
TRH>C_{16}-C_{34}	mg/kg	100	Org-003	<100	[NT]	[NT]	LCS-4	99%
TRH>C_{34}-C_{40}	mg/kg	100	Org-003	<100	[NT]	[NT]	LCS-4	89%
Surrogate o-Terphenyl	%		Org-003	96	[NT]	[NT]	LCS-4	127%

QUALITY CONTROL PAHs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			30/10/2013	[NT]	[NT]	LCS-4	30/10/2013
Date analysed	-			31/10/2013	[NT]	[NT]	LCS-4	31/10/2013
Naphthalene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-4	109%
Acenaphthylene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Acenaphthene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Fluorene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-4	110%
Phenanthrene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-4	107%
Anthracene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Fluoranthene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-4	108%

QUALITY CONTROL PAHs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Pyrene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-4	111%
Benzo(a)anthracene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Chrysene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-4	97%
Benzo(b+k)fluoranthene	mg/kg	0.2	Org-012 subset	<0.2	[NT]	[NT]	[NR]	[NR]
Benzo(a)pyrene	mg/kg	0.05	Org-012 subset	<0.05	[NT]	[NT]	LCS-4	99%
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Surrogate p-Terphenyl-d14	%		Org-012 subset	105	[NT]	[NT]	LCS-4	96%

QUALITY CONTROL Organochlorine Pesticides in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			31/10/2013	[NT]	[NT]	LCS-11	31/10/2013
Date analysed	-			01/11/2013	[NT]	[NT]	LCS-11	01/11/2013
HCB	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
alpha-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-11	105%
gamma-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
beta-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-11	106%
Heptachlor	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-11	125%
delta-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
Aldrin	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-11	110%
Heptachlor Epoxide	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-11	105%
gamma-Chlordane	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
alpha-chlordane	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
Endosulfan I	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
pp-DDE	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-11	114%
Dieldrin	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-11	110%
Endrin	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-11	107%
pp-DDD	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-11	105%
Endosulfan II	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
pp-DDT	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
Endrin Aldehyde	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
Endosulfan Sulphate	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-11	133%
Methoxychlor	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
Surrogate TCMX	%		Org-005	89	[NT]	[NT]	LCS-11	87%

QUALITY CONTROL Organophosphorus Pesticides	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			31/10/2013	[NT]	[NT]	LCS-11	31/10/2013
Date analysed	-			01/11/2013	[NT]	[NT]	LCS-11	01/11/2013
Diazinon	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NR]	[NR]
Dimethoate	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NR]	[NR]
Chlorpyriphos-methyl	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NR]	[NR]
Ronnel	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NR]	[NR]
Chlorpyriphos	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	LCS-11	89%
Fenitrothion	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	LCS-11	126%
Bromophos-ethyl	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NR]	[NR]
Ethion	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	LCS-11	124%
Surrogate TCMX	%		Org-008	89	[NT]	[NT]	LCS-11	87%

QUALITY CONTROL Acid Extractable metals in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date digested	-			30/10/2013	[NT]	[NT]	LCS-4	30/10/2013
Date analysed	-			30/10/2013	[NT]	[NT]	LCS-4	30/10/2013
Arsenic	mg/kg	4	Metals-020 ICP-AES	<4	[NT]	[NT]	LCS-4	100%
Cadmium	mg/kg	0.4	Metals-020 ICP-AES	<0.4	[NT]	[NT]	LCS-4	106%
Chromium	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-4	104%
Copper	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-4	102%
Lead	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-4	102%
Mercury	mg/kg	0.1	Metals-021 CV-AAS	<0.1	[NT]	[NT]	LCS-4	93%
Nickel	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-4	103%
Zinc	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-4	104%
Silver	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-4	83%
Aluminium	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-4	106%
Iron	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-4	114%
Antimony	mg/kg	7	Metals-020 ICP-AES	<7	[NT]	[NT]	LCS-4	110%
Phosphorus	mg/kg	10	Metals-020 ICP-AES	<10	[NT]	[NT]	LCS-4	102%

QUALITY CONTROL Miscellaneous Inorg - soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date prepared	-			12/11/2013	[NT]	[NT]	LCS-1	31/10/2013
Date analysed	-			12/11/2013	[NT]	[NT]	LCS-1	31/10/2013
TKN as N in soil	mg/kg	10	Inorg-062	<10	[NT]	[NT]	LCS-1	96%
Total Nitrogen in soil	mg/kg	10	Inorg-055/062	<10	[NT]	[NT]	LCS-1	96%
Ammonia as N in soil	mg/kg	0.5	Inorg-057	<0.5	[NT]	[NT]	LCS-1	104%
NOx as N in soil	mg/kg	0.5	Inorg-055	<0.5	[NT]	[NT]	LCS-1	102%
Total Organic Carbon (Combustion)	mg/kg	100	Ext-020	<100	[NT]	[NT]	LCS-1	94%

QUALITY CONTROL Moisture	UNITS	PQL	METHOD	Blank
Date prepared	-			[NT]
Date analysed	-			[NT]
Moisture	%	0.1	Inorg-008	[NT]

QUALITY CONTROL Chromium Suite	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
pH kcl	pH units		Inorg-068	[NT]	99730-1	8.1 || 8.3 || RPD: 2	LCS-1	96%
s-TAA pH 6.5	%w/w S	0.01	Inorg-068	<0.01	99730-1	<0.01 || <0.01	[NR]	[NR]
TAA pH 6.5	moles H^+/t	5	Inorg-068	<5	99730-1	<5 || <5	LCS-1	128%
Chromium Reducible Sulfur	%w/w	0.005	Inorg-068	<0.005	99730-1	0.20 || 0.19 || RPD: 5	LCS-1	93%
a-Chromium Reducible Sulfur	moles H^+/t	3	Inorg-068	<3	99730-1	130 || 120 || RPD: 8	[NR]	[NR]
S_{HCl}	%w/w S	0.005	Inorg-068	<0.005	[NT]	[NT]	[NR]	[NR]
S_{KCl}	%w/w S	0.005	Inorg-068	<0.005	99730-1	0.23 || 0.22 || RPD: 4	LCS-1	100%
S_{NAS}	%w/w S	0.005	Inorg-068	<0.005	[NT]	[NT]	[NR]	[NR]
ANC_{BT}	% $CaCO_3$	0.05	Inorg-068	<0.05	99730-1	6.5 || 6.7 || RPD: 3	[NR]	[NR]
s-ANC_{BT}	%w/w S	0.05	Inorg-068	<0.05	99730-1	2.1 || 2.1 || RPD: 0	[NR]	[NR]
s-Net Acidity	%w/w S	0.01	Inorg-068	<0.01	99730-1	<0.01 || <0.01	[NR]	[NR]
a-Net Acidity	moles H^+/t	10	Inorg-068	<10	99730-1	<10 || <10	[NR]	[NR]
Liming rate	kg $CaCO_3$/t	0.75	Inorg-068	<0.75	99730-1	<0.75 || <0.75	[NR]	[NR]
a-Net Acidity without ANCE	moles H^+/t	10	Inorg-068	<10	99730-1	<10 || <10	[NR]	[NR]
Liming rate without ANCE	kg $CaCO_3$/t	0.75	Inorg-068	<0.75	99730-1	<0.75 || <0.75	[NR]	[NR]

QUALITY CONTROL Particle Size Distribution in Soils	UNITS	PQL	METHOD	Blank
Particle Size Analysis	%	0.01	Ext-062	<0.01

QUALITY CONTROL Herbicides in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Diuron	mg/kg	0.1	Ext-020	<0.1	[NT]	[NT]	[NR]	[NR]

QUALITY CONTROL Organotin Compunds in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Monobutyltin as Sn	ng/g	0.5	Ext-020	<0.50	[NT]	[NT]	LCS-1	74%
Dibutyltin as Sn	ng/g	0.5	Ext-020	<0.50	[NT]	[NT]	LCS-1	143%
Tributyltin as Sn	ng/g	0.5	Ext-020	<0.50	[NT]	[NT]	LCS-1	132%
Surrogate (Tripropyltin)	%		Ext-020	[NT]	[NT]	[NT]	LCS-1	141%

QUALITY CONTROL Perfluorochemicals in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
PFOS (Branched and Linear)	µg/kg	1	Ext-038	<1.0	99730-2	<1.0 || <1.0	99730-2	93%
Perfluorooctanoate PFOA	µg/kg	0.5	Ext-038	<1	99730-2	<0.50 || <0.50	99730-2	96%
Total Solids	%	1	Ext-038	<1.00	99730-2	58.0 || 59.6 || RPD: 3	[NR]	[NR]
Surrogate 1 Recovery	%		Ext-038	87.0	99730-2	106 || [N/T]	99730-2	120%
Date Analysed	-		Ext-038	12/11/2013	99730-2	13/11/2013 || 13/11/2013	99730-2	13/11/2013
Date Extracted	-		Ext-038	15/11/2013	99730-2	15/11/2013 || 15/11/2013	99730-2	15/11/2013

Report Comments:

Organotins, Herbicides & TOC analysed by NMI. Report No.RN0996418.

PSD analysed by East West report number EW130723.

PFCS analysed by Advanced analytical report number A13/5272

Asbestos ID was analysed by Approved Identifier:	Not applicable for this job
Asbestos ID was authorised by Approved Signatory:	Not applicable for this job

INS: Insufficient sample for this test	PQL: Practical Quantitation Limit	NT: Not tested
NA: Test not required	RPD: Relative Percent Difference	NA: Test not required
<: Less than	>: Greater than	LCS: Laboratory Control Sample

Quality Control Definitions

Blank: This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.

Duplicate: This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.

Matrix Spike : A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

LCS (Laboratory Control Sample) : This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

Surrogate Spike: Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.
Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.
Spikes for Physical and Aggregate Tests are not applicable.
For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.
Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics and 10-140% for SVOC and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

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ABN 82 125 442 382

ANALYSIS REPORT SOIL

Project No:	**EW130723**	**Date of Issue:**	**11/11/2013**
Customer:	Envirolab Services	Report No:	1
Address:	12 Ashley Street	Date Received:	30/10/2013
	Chatswood NSW 2067	Matrix:	Soil
Phone:	02 9910 6200	Location:	-
Fax:	-	Sampler ID:	Client Supplied
email:	ahie@envirolab.com.au	Date of Sampling:	-
		Sample Condition:	Acceptable

Results apply to the samples as submitted. All pages of this report have been checked and approved for release.

Signed:

Dan Poflotski

Laboratory Manager

PROFICIENT LAB
Visit www.aspac-australasia.com to view our certification details.

East West is certified by the Australian-Asian Soil & Plant Analysis Council to perform various soil and plant tissue analysis. The tests reported herein have been performed in accordance with our terms of accreditation.
This report must not be reproduced except in full and EWEA takes no responsibility of the end use of the results within this report.
This analysis relates to the sample submitted and it is the client's responsibility to make certain the sample is representative of the matrix to be tested.
Samples will be discarded one month after the date of this report. Please advise if you wish to have your sample/s returned.

Results you can rely on.

ANALYSIS REPORT

Project No: EW130723

Particle Size Analysis	Method Description	Method Reference	Units	130723-1	130723-2
			Sample ID	99730-1	99730-2
			Depth		
Gravel >2.36mm	Hydrometer	ATSM D422	%	0.1	7.6
Very Coarse Sand 1.18-2.36mm	Hydrometer	ATSM D422	%	0.1	13.0
Coarse Sand 0.6-1.18mm	Hydrometer	ATSM D422	%	0.1	16.7
Medium Sand 0.3-0.6mm	Hydrometer	ATSM D422	%	0.5	11.1
Fine Sand 0.15-0.3mm	Hydrometer	ATSM D422	%	0.8	3.0
Very Fine Sand 0.075-0.15mm	Hydrometer	ATSM D422	%	0.7	4.7
Coarse Silt 0.075-0.02mm	Hydrometer	ATSM D422	%	26.6	9.3
Fine Silt 0.002-0.02mm	Hydrometer	ATSM D422	%	25.6	11.9
Clay <0.002mm	Hydrometer	ATSM D422	%	45.5	22.7
Moisture	Oven dry	AS 1289	% v/v	46.1	60.9

ANALYSIS REPORT

Project No: EW130723

Particle Size Analysis	Method Description	Method Reference	Units	99730-3 130723-3	99730-4 130723-4
			Sample ID Depth	99730-3	99730-4
Gravel >2.36mm	Hydrometer	ATSM D422	%	9.1	0.0
Very Coarse Sand 1.18-2.36mm	Hydrometer	ATSM D422	%	13.7	0.0
Coarse Sand 0.6-1.18mm	Hydrometer	ATSM D422	%	16.4	0.1
Medium Sand 0.3-0.6mm	Hydrometer	ATSM D422	%	15.0	0.1
Fine Sand 0.15-0.3mm	Hydrometer	ATSM D422	%	5.3	0.6
Very Fine Sand 0.075-0.15mm	Hydrometer	ATSM D422	%	4.4	4.1
Coarse Silt 0.075-0.02mm	Hydrometer	ATSM D422	%	9.0	39.9
Fine Silt 0.002-0.02mm	Hydrometer	ATSM D422	%	10.0	17.6
Clay <0.002mm	Hydrometer	ATSM D422	%	12.2	37.6
Moisture	Oven dry	AS 1289	% v/v	67.7	50.3

ANALYSIS REPORT

Project No: EW130723

			Sample ID	99730-5
			Depth	
Particle Size Analysis	**Method Description**	**Method Reference**	**Units**	**130723-5**
Gravel >2.36mm	Hydrometer	ATSM D422	%	0.0
Very Coarse Sand 1.18-2.36mm	Hydrometer	ATSM D422	%	0.0
Coarse Sand 0.6-1.18mm	Hydrometer	ATSM D422	%	0.3
Medium Sand 0.3-0.6mm	Hydrometer	ATSM D422	%	0.3
Fine Sand 0.15-0.3mm	Hydrometer	ATSM D422	%	0.7
Very Fine Sand 0.075-0.15mm	Hydrometer	ATSM D422	%	3.3
Coarse Silt 0.075-0.02mm	Hydrometer	ATSM D422	%	30.4
Fine Silt 0.002-0.02mm	Hydrometer	ATSM D422	%	27.6
Clay <0.002mm	Hydrometer	ATSM D422	%	37.4
Moisture	Oven dry	AS 1289	% v/v	55.4

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DOCUMENT END

Appendix G Results – Additional Grab Sampling

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Australia

PO Box 129
Fivedock NSW 2046

Telephone (02) 9713 4836
Facsimile (02) 9713 4890

4/12

A13/5926

BMT WBM

BMT WBM Sample Analysis Sheet

Laboratory: Advanced Analytical Australia

Attention: Andrew Bradbury Date Results Required: Fast turnaround

Project Title: B20180 - Cairns Sediment Sampling

Project No: B20180 Contact (incl. office): Martin Billeter

Nature of Samples: Sediment/Soil [X] Water [ ] Fresh [ ] Saline/Marine [X] Preserved in ice/fridge [X]

Other: Courier Used:

No. of Samples: 10 Date Collected: 26.11.2013

Please analyse the attached samples for the following:

Nutrients
- [ ] Ortho-P
- [ ] Total-P
- [ ] Ammonia-N
- [ ] Total Kjeldahl N (Org N + NH_3)
- [ ] NO_2 + NO_3
- [ ] Organic N
- [ ] Total N

Physical
- [ ] Suspended Solids
- [ ] Chlorophyll a
- [ ] pH
- [ ] Conductivity
- [ ] Salinity
- [ ] Turbidity
- [ ] True & Apparent Colour
- [ ] Total Hardness
- [ ] S.A.R.
- [ ] Alkalinity
- [ ] BOD

Bacteriological
- [ ] E. coli
- [ ] Enterococci
- [ ] Faecal coliforms

Organics
- [ ] Organochlorines
- [ ] Organophosphates
- [ ] PCB's
- [ ] PAH's
- [ ] Oil and Grease
- [ ] TPH (by GC)
- [ ] TPH (by IR)
- [ ] Organic Content

Other
- [X] Dioxin in sediment
- [ ] to 1 µg/kg LOR
- [ ]

Heavy Metals
- [ ] Aluminum
- [ ] Arsenic
- [ ] Cadmium
- [ ] Chromium
- [ ] Copper
- [ ] Iron
- [ ] Lead
- [ ] Manganese
- [ ] Mercury
- [ ] Nickel
- [ ] Silver
- [ ] Zinc

Particle Size Dist
- [ ] Sieve
- [ ] Hydrometer
- [ ] Other

27 NOV 2013

Remarks: Fast turnaround required!

Relinquished by: Martin Billeter Date: 26.11.2013

Received by: Date:

PLEASE RETURN TO WBM A COPY OF SIGNED SHEET UPON SATISFACTORY RECEIPT OF SAMPLES (INCLUDING LAB. REFERENCE FOR SAMPLES OVERLEAF)

DETAILS OF SAMPLING

	OUR REF NO (sample ID)	REMARKS (Sampling Location/Address, Date/Time of sample collection etc)	LAB REF NO
1	A 138	Cairns Harbour 26.11.2013	
2	A 140	" "	
3	C 146	" "	
4	D 147	" "	
5	D 149	" "	
6	F 150	" "	
7	G 155	" "	
8	F 156	" "	
9	H 160	" "	
10	H 162	" "	

REPORT OF ANALYSIS

Laboratory Reference: A13/5926 [R01]

Client: BMT WBM Pty Ltd
Level 8, 200 Creek Street
Brisbane QLD 4000

Contact: Markus Billerbeck

Order No: B20180
Project: Diuron Anaysis of Marine Sediment
Sample Type: Marine Sediment
No. of Samples: 10
Date Received: 27/11/2013
Date Completed: 9/12/2013

Laboratory Contact Details:

Client Services Manager: Daniel Um
Technical Enquiries: Ian Eckhard
Telephone: +61 2 9888 9077
Fax: +61 2 9888 9577
Email: daniel.um@advancedanalytical.com.au

Attached Results Approved By:

Ian Eckhard
Technical Director

Comments:
All samples tested as submitted by client. All attached results have been checked and approved for release.
This is the Final Report and supersedes any reports previously issued with this reference number.
Accredited for compliance with ISO/IEC 17025. This document shall not be reproduced, except in full.

Accreditation No.15109

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Laboratory Reference: A13/5926 [R01]
Project: Diuron Anaysis of Marine Sediment

Laboratory Reference: **Client Reference:** **Date Sampled:** **Analysis Description**	- - - **Method**	- - - **Units**	**A13/5926/1** **A138** **26/11/2013**	**A13/5926/2** **A140** **26/11/2013**	**A13/5926/3** **C146** **26/11/2013**	**A13/5926/4** **D147** **26/11/2013**
Moisture Content						
Moisture Content	04-004	%	39.6	44.7	27.3	44.2
Herbicides by LCMSMS						
Diuron	LCMSMS	µg/kg	<1	<1	<1	<1
Subcontract Analysis - Soil						
Total Organic Carbon	SUB	%	1.3	1.7	0.28	0.96

Laboratory Reference: **Client Reference:** **Date Sampled:** **Analysis Description**	- - - **Method**	- - - **Units**	**A13/5926/5** **D149** **26/11/2013**	**A13/5926/6** **F150** **26/11/2013**	**A13/5926/7** **G155** **26/11/2013**	**A13/5926/8** **F156** **26/11/2013**
Moisture Content						
Moisture Content	04-004	%	61.2	46.0	25.8	29.5
Herbicides by LCMSMS						
Diuron	LCMSMS	µg/kg	1.2	2.0	1	<1
Subcontract Analysis - Soil						
Total Organic Carbon	SUB	%	2.1	2.1	0.19	0.57

Laboratory Reference: **Client Reference:** **Date Sampled:** **Analysis Description**	- - - **Method**	- - - **Units**	**A13/5926/9** **H160** **26/11/2013**	**A13/5926/10** **H162** **26/11/2013**
Moisture Content				
Moisture Content	04-004	%	24.0	28.8
Herbicides by LCMSMS				
Diuron	LCMSMS	µg/kg	<1	<1
Subcontract Analysis - Soil				
Total Organic Carbon	SUB	%	0.19	0.31

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Laboratory Reference: A13/5926 [R01]
Project: Diuron Anaysis of Marine Sediment

Method	Method Description
04-004	Moisture by gravimetric, %
LCMSMS	*Analysis by LCMSMS
SUB	Subcontracted Analyses

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www.advancedanalytical.com.au

Laboratory Reference: A13/5926 [R01]
Project: Diuron Anaysis of Marine Sediment

Result Comments

[<] Less than
[INS] Insufficient sample for this test
[NA] Test not required

*Analyte is not covered by NATA scope of accreditation.

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Laboratory Reference: A13/5926 [R01]
Project: Diuron Anaysis of Marine Sediment

QUALITY ASSURANCE REPORT

TEST	UNITS	Blank	Duplicate Sm#	Duplicate Results	Spike Sm#	Spike Results
Diuron	µg/kg	<1	A13/5926-1	<1 || <1	External	106%

TEST	UNITS	Blank	Duplicate Sm#	Duplicate Results	Spike Sm#	Spike Results
Total Organic Carbon	%	<0.01		1.3 || NT		NA

Comments:
RPD = Relative Percent Deviation
[NT] = Not Tested
[N/A] = Not Applicable
'#' = Spike recovery data could not be calculated due to high levels of contaminants

Acceptable replicate reproducibility limit or RPD: Results < 10 times LOR: no limits.
Results >10 times LOR: 0% - 50%.

Acceptable matrix spike & LCS recovery limits: Trace elements 70-130%
Organic analyses 50-150%
SVOC & speciated phenols 10-140%
Surrogates 10-140%

When levels outside these limits are obtained, an investigation into the cause of the deviation is performed before the batch is accepted or rejected, and results are released.

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Appendix H Results – Supplementary SAP Sampling

 2416

CHAIN OF CUSTODY **QUOTE NO:**

FROM *Client:* BMT WBM
Address: Level 8, 200 Creek St., Brisbane QLD, 4000
Tel: (07) 3831 6744 *Fax:*
Project Manager: Brad Grant
E-mail Address: Brad.Grant@bmtwbm.com.au
Project Ref:
Turn-Around-Time : Standard
Report results by e-mail: excel / pdf

TO *ADVANCED ANALYTICAL AUSTRALIA*
Unit 1, 482 Kingsford Smith Drive, Hamilton Q 4007
Tel: 07 3268 1228 *Fax: 07 3268 1238*
Contact: Andrew Bradbury A14/3001
Email: andrew.bradbury@advancedanalytical.com.au
www.advancedanalytical.com.au

ANALYSES

Laboratory ID	Client ID	Sample Date	Preservation	Matrix: Sediment	Diruon, ultratrace	TOC as per NAGD protocols
1	C94 0-0.5	2 06/14	Nil	Sediment	✓	✓
2	C94 0.5-0.95	2 06/14	Nil	Sediment	✓	✓
3	B2 0-0.5	2 06/14	Nil	Sediment	✓	✓
4	B2 0.5-1.0	2 06/14	Nil	Sediment	✓	✓
5	B7 0-0.5	2 06/14	Nil	Sediment	✓	✓
6	B7 0.5-0.9	2 06/14	Nil	Sediment	✓	✓
7	B9 0-0.5	2 06/14	Nil	Sediment	✓	✓
8	B9 0.5-1.0	2 06/14	Nil	Sediment	✓	✓
9	C22 0-0.5	2 06/14	Nil	Sediment	✓	✓
10	C22 0.5-0.9	2 06/14	Nil	Sediment	✓	✓
11	B25 0-0.5	2 06/14	Nil	Sediment	✓	✓
12	B25 0.5-1.0	2 06/14	Nil	Sediment	✓	✓
13	C29 0-0.5	2 06/14	Nil	Sediment	✓	✓
14	C29 0.5-0.8	2 06/14	Nil	Sediment	✓	✓
15	C30 0-0.5	2 06/14	Nil	Sediment	✓	✓
16	C30 0.5-1.0	2 06/14	Nil	Sediment	✓	✓
17	B41 0-0.5	2 06/14	Nil	Sediment	✓	✓
18	B41 0.5-0.9	2 06/14	Nil	Sediment	✓	✓
19	C50 0-0.5	2 06/14	Nil	Sediment	✓	✓
20	C50 0.5-1.0	2 06/14	Nil	Sediment	✓	✓
21	C50 1.0-1.2	2 06/14	Nil	Sediment	✓	✓
22	C53 0-0.5	2 06/14	Nil	Sediment	✓	✓
23	C53 0.5-0.9	2 06/14	Nil	Sediment	✓	✓
24	QAQC 2	2 06/14	Nil	Sediment	✓	✓
25	QAQC 1	2 06/14	Nil	Sediment	✓	✓

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06 JUN 2014 TB

RELINQUISHED BY: **Date:** 5/6/14 **RECEIVED BY:** **Date:**

CHAIN OF CUSTODY

QUOTE NO:

FROM Client: BMT WBM
Address: Level 8, 200 Creek St., Brisbane QLD, 4000
Tel: (07) 3831 6744 Fax:
Project Manager: Brad Grant
E-mail Address: Brad.Grant@bmtwbm.com.au
Project Ref:
Turn-Around-Time : Standard
Report results by e-mail: excel / pdf

TO ADVANCED ANALYTICAL AUSTRALIA
Unit 1, 482 Kingsford Smith Drive, Hamilton Q 4007
Tel: 07 3268 1228 Fax: 07 3268 1238
Contact: Andrew Bradbury
Email: andrew.bradbury@advancedanalytical.com.au
www.advancedanalytical.com.au

ANALYSES

Laboratory ID	Client ID	Sample Date	Preservation	Matrix: Sediment	Dirron, ultratrace	TOC as per NAGD protocols
26	B54 0 - 0.5	2 06/14	Nil	Sediment	✓	✓
27	B54 0.5 - 1.0	2 06/14	Nil	Sediment	✓	✓
28	B54 1.0 - 1.1	2 06/14	Nil	Sediment	✓	✓
29	C99 0 - 0.5	2 06/14	Nil	Sediment	✓	✓
30	C99 0.5 - 0.8	2 06/14	Nil	Sediment	✓	✓
31	B63 0 - 0.5	3 06/14	Nil	Sediment	✓	✓
32	B63 0.5 - 1.0	3 06/14	Nil	Sediment	✓	✓
33	B63 1.0 - 1.8	3 06/14	Nil	Sediment	✓	✓
34	C72 0 - 0.5	3 06/14	Nil	Sediment	✓	✓
35	C72 0.5 - 1.0	3 06/14	Nil	Sediment	✓	✓
36	C72 1.0 - 1.95	3 06/14	Nil	Sediment	✓	✓
37	B74 0 - 0.5	3 06/14	Nil	Sediment	✓	✓
38	B74 0.5 - 1.0	3 06/14	Nil	Sediment	✓	✓
39	B74 1.0 - 2.0	3 06/14	Nil	Sediment	✓	✓
40	B79 0 - 0.5	3 06/14	Nil	Sediment	✓	✓
41	B79 0.5 - 1.0	3 06/14	Nil	Sediment	✓	✓
42	B79 1.0 - 1.8	3 06/14	Nil	Sediment	✓	✓
43	C82 0 - 0.5	3 06/14	Nil	Sediment	✓	✓
44	C82 0.5 - 1.0	3 06/14	Nil	Sediment	✓	✓
45	C82 1.0 - 1.8	3 06/14	Nil	Sediment	✓	✓
46	B104 0 - 0.5	3 06/14	Nil	Sediment	✓	✓
47	B104 0.5 - 1.0	3 06/14	Nil	Sediment	✓	✓
48	B104 1.0 - 1.1	3 06/14	Nil	Sediment	✓	✓
49	QAQC 4	3 06/14	Nil	Sediment	✓	✓
50	QAQC 3	3 06/14	Nil	Sediment	✓	✓

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RELINQUISHED BY: Date: 5/6/14 RECEIVED BY: Date:

CHAIN OF CUSTODY

QUOTE NO:

FROM Client: BMT WBM
Address: Level 8, 200 Creek St., Brisbane QLD, 4000
Tel: (07) 3831 6744 Fax:
Project Manager: Brad Grant
E-mail Address: Brad.Grant@bmtwbm.com.au
Project Ref:
Turn-Around-Time : Standard
Report results by e-mail: excel / pdf

TO ADVANCED ANALYTICAL AUSTRALIA
Unit 1, 482 Kingsford Smith Drive, Hamilton Q 4007
Tel: 07 3268 1228 Fax: 07 3268 1238
Contact: Andrew Bradbury
Email: andrew.bradbury@advancedanalytical.com.au
www.advancedanalytical.com.au

ANALYSES

Laboratory ID	Client ID		Sample Date	Preservation	Matrix: Sediment	Diruon, ultratrace	TOC as per NAGD protocols									
51	B108	0-0.5	3 06/14	Nil	Sediment	✓	✓									
52	B108	0.5-1.0	3 06/14	Nil	Sediment	✓	✓									
53	B108	1.0-1.3	3 06/14	Nil	Sediment	✓	✓									
*	B108	1.3-2.05	3 06/14	Nil	Sediment	✓	✓	TBA	BY	BMT	WBM					
54	C119	0-0.2	3 06/14	Nil	Sediment	✓	✓									
*	C119	0.2-0.97	3 06/14	Nil	Sediment	✓	✓	TBA	BY	BMT	WBM					
55	C121	0-0.5	3 06/14	Nil	Sediment	✓	✓									
56	C121	0.5-0.8	3 06/14	Nil	Sediment	✓	✓									
57	B130	0-0.5	3 06/14	Nil	Sediment	✓	✓									
*	B130	0.5-1.0	3 06/14	Nil	Sediment			TBA	BY	BMT	WBM					
*	B130	1.0-1.57	3 06/14	Nil	Sediment			"	"	"	"					
58	A127	0.1-0.55	3 06/14	Nil	Sediment	✓	✓									
59	F150	0.01-0.45	3 06/14	Nil	Sediment	✓	✓									
60	H165	0.02-0.1	4 06/14	Nil	Sediment	✓	✓									
61	G155	0-0.05	4 06/14	Nil	Sediment	✓	✓									
62	H167	0.05-0.11	4 06/14	Nil	Sediment	✓	✓									
63	H167	0-0.08	4 06/14	Nil	Sediment	✓	✓									
64	K167	0-0.03	4 06/14	Nil	Sediment	✓	✓									
65	P180	0-0.04	4 06/14	Nil	Sediment	✓	✓									
66	I172	1.05-1.10	4 06/14	Nil	Sediment	✓	✓									
67	M180	GRAB	4 06/14	Nil	Sediment	✓	✓									
68	M180	0.06-0.12	4 06/14	Nil	Sediment	✓	✓									
			06/14	Nil	Sediment											
69 ~~68~~	QAQC6		4 06/14	Nil	Sediment	✓	✓									
70 ~~69~~	QAQC5		3 06/14	Nil	Sediment	✓	✓									
71	A127	0-0.1	3/6/14													

Date: 5/6/14 ✓ RECEIVED BY: receipt subsampling Date: 13/6/14

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REPORT OF ANALYSIS

Laboratory Reference: A14/3001 [R00]

Client: BMT WBM Pty Ltd
Level 8, 200 Creek Street
Brisbane QLD 4000

Contact: Brad Grant

Order No:
Project: Sediment Analysis
Sample Type: Sediment
No. of Samples: 71
Date Received: 06/06/2014
Date Completed: 26/06/2014

Laboratory Contact Details:

Client Services Manager: Trent Biggin
Technical Enquiries: Andrew Bradbury
Telephone: +61 7 3268 1228
Fax: +61 7 3268 1238
Email: brisbane@advancedanalytical.com.au
andrew.bradbury@advancedanalytical.com.au

Attached Results Approved By:

Ian Eckhard
Technical Director

Comments:
All samples tested as submitted by client. All attached results have been checked and approved for release.
This is the Final Report and supersedes any reports previously issued with this reference number.
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Accreditation No.15109

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Batch Number: A14/3001 [R00]
Project Reference: Sediment Analysis

Laboratory Reference: **Client Reference:** **Date Sampled:** **Analysis Description**	**-** **-** **-** **Method**	**-** **-** **-** **Units**	**/1** **C94 0-0.5** **02/06/2014**	**/2** **C94 0.5-0.95** **02/06/2014**	**/3** **B2 0-0.5** **02/06/2014**	**/4** **B2 0.5-1.0** **02/06/2014**
Moisture Content						
Moisture Content	04-004	%	56.9	53.5	37.0	42.1
Herbicides by LCMSMS						
Diuron	LCMSMS	µg/kg	<1	<1	<1	<1
Subcontract Analysis						
Total Organic Carbon	SUB	%	1.6	1.6	0.51	0.45

Laboratory Reference: **Client Reference:** **Date Sampled:** **Analysis Description**	**-** **-** **-** **Method**	**-** **-** **-** **Units**	**/5** **B7 0-0.5** **02/06/2014**	**/6** **B7 0.5-0.9** **02/06/2014**	**/7** **B9 0-0.5** **02/06/2014**	**/8** **B9 0.5-1.0** **02/06/2014**
Moisture Content						
Moisture Content	04-004	%	40.1	38.3	38.8	39.9
Herbicides by LCMSMS						
Diuron	LCMSMS	µg/kg	<1	<1	<1	<1
Subcontract Analysis						
Total Organic Carbon	SUB	%	0.50	0.46	0.48	0.51

Laboratory Reference: **Client Reference:** **Date Sampled:** **Analysis Description**	**-** **-** **-** **Method**	**-** **-** **-** **Units**	**/9** **C22 0-0.5** **02/06/2014**	**/10** **C22 0.5-0.9** **02/06/2014**	**/11** **B25 0-0.5** **02/06/2014**	**/12** **B25 0.5-1.0** **02/06/2014**
Moisture Content						
Moisture Content	04-004	%	57.6	51.7	48.9	49.7
Herbicides by LCMSMS						
Diuron	LCMSMS	µg/kg	<1	<1	<1	<1
Subcontract Analysis						
Total Organic Carbon	SUB	%	0.97	0.92	0.87	0.97

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Batch Number: A14/3001 [R00]
Project Reference: Sediment Analysis

Laboratory Reference:	-	-	**/13**	**/14**	**/15**	**/16**
Client Reference:	-	-	**C29 0-0.5**	**C29 0.5-0.8**	**C30 0-0.5**	**C30 0.5-1.0**
Date Sampled:	-	-	**02/06/2014**	**02/06/2014**	**02/06/2014**	**02/06/2014**
Analysis Description	**Method**	**Units**				
Moisture Content						
Moisture Content	04-004	%	52.0	55.6	57.3	55.8
Herbicides by LCMSMS						
Diuron	LCMSMS	µg/kg	<1	<1	<1	<1
Subcontract Analysis						
Total Organic Carbon	SUB	%	1.1	1.1	1.5	1.1

Laboratory Reference:	-	-	**/17**	**/18**	**/19**	**/20**
Client Reference:	-	-	**B41 0-0.5**	**B41 0.5-0.9**	**C50 0-0.5**	**C50 0.5-1.0**
Date Sampled:	-	-	**02/06/2014**	**02/06/2014**	**02/06/2014**	**02/06/2014**
Analysis Description	**Method**	**Units**				
Moisture Content						
Moisture Content	04-004	%	52.1	52.4	58.5	58.0
Herbicides by LCMSMS						
Diuron	LCMSMS	µg/kg	<1	<1	<1	<1
Subcontract Analysis						
Total Organic Carbon	SUB	%	1.0	1.3	1.2	1.2

Laboratory Reference:	-	-	**/21**	**/22**	**/23**	**/24**
Client Reference:	-	-	**C50 1.0-1.2**	**C53 0-0.5**	**C53 0.5-0.9**	**QAQC 2**
Date Sampled:	-	-	**02/06/2014**	**02/06/2014**	**02/06/2014**	**02/06/2014**
Analysis Description	**Method**	**Units**				
Moisture Content						
Moisture Content	04-004	%	52.8	55.1	56.8	58.9
Herbicides by LCMSMS						
Diuron	LCMSMS	µg/kg	<1	<1	<1	<1
Subcontract Analysis						
Total Organic Carbon	SUB	%	1.3	1.1	1.3	1.2

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Batch Number: A14/3001 [R00]
Project Reference: Sediment Analysis

Laboratory Reference:	-	-	**/25**	**/26**	**/27**	**/28**
Client Reference:	-	-	**QAQC1**	**B54 0-0.5**	**B54 0.5-1.0**	**B54 1.0-1.1**
Date Sampled:	-	-	**02/06/2014**	**02/06/2014**	**02/06/2014**	**02/06/2014**
Analysis Description	**Method**	**Units**				
Moisture Content						
Moisture Content	04-004	%	42.5	[NA]	55.6	52.6
Herbicides by LCMSMS						
Diuron	LCMSMS	µg/kg	<1	<1	<1	<1
Subcontract Analysis						
Total Organic Carbon	SUB	%	0.46	0.91	1.3	0.93

Laboratory Reference:	-	-	**/29**	**/30**	**/31**	**/32**
Client Reference:	-	-	**C99 0-0.5**	**C99 0.5-0.8**	**B63 0-0.5**	**B63 0.5-1.0**
Date Sampled:	-	-	**02/06/2014**	**02/06/2014**	**03/06/2014**	**03/06/2014**
Analysis Description	**Method**	**Units**				
Moisture Content						
Moisture Content	04-004	%	59.5	58.4	44.0	57.2
Herbicides by LCMSMS						
Diuron	LCMSMS	µg/kg	<1	<1	<1	<1
Subcontract Analysis						
Total Organic Carbon	SUB	%	2.1	1.8	0.78	1.5

Laboratory Reference:	-	-	**/33**	**/34**	**/35**	**/36**
Client Reference:	-	-	**B63 1.0-1.8**	**C72 0-0.5**	**C72 0.5-1.0**	**C72 1.0-1.95**
Date Sampled:	-	-	**03/06/2014**	**03/06/2014**	**03/06/2014**	**03/06/2014**
Analysis Description	**Method**	**Units**				
Moisture Content						
Moisture Content	04-004	%	52.9	53.4	53.1	53.1
Herbicides by LCMSMS						
Diuron	LCMSMS	µg/kg	<1	<1	<1	<1
Subcontract Analysis						
Total Organic Carbon	SUB	%	1.6	1.4	1.3	1.5

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Batch Number: A14/3001 [R00]
Project Reference: Sediment Analysis

Laboratory Reference:	-	-	**/37**	**/38**	**/39**	**/40**
Client Reference:	-	-	**B74 0-0..5**	**B74 0.5-1.0**	**B74 1.0-2.0**	**B79 0-0.5**
Date Sampled:	-	-	**03/06/2014**	**03/06/2014**	**03/06/2014**	**03/06/2014**
Analysis Description	**Method**	**Units**				
Moisture Content						
Moisture Content	04-004	%	59.3	55.3	52.2	57.5
Herbicides by LCMSMS						
Diuron	LCMSMS	µg/kg	<1	<1	<1	<1
Subcontract Analysis						
Total Organic Carbon	SUB	%	1.4	1.5	1.6	1.4

Laboratory Reference:	-	-	**/41**	**/42**	**/43**	**/44**
Client Reference:	-	-	**B79 0.5-1.0**	**B79 1.0-1.8**	**C82 0-0.5**	**C82 0.5-1.0**
Date Sampled:	-	-	**03/06/2014**	**03/06/2014**	**03/06/2014**	**03/06/2014**
Analysis Description	**Method**	**Units**				
Moisture Content						
Moisture Content	04-004	%	53.5	52.0	56.7	55.0
Herbicides by LCMSMS						
Diuron	LCMSMS	µg/kg	<1	<1	<1	<1
Subcontract Analysis						
Total Organic Carbon	SUB	%	1.6	1.7	1.6	1.5

Laboratory Reference:	-	-	**/45**	**/46**	**/47**	**/48**
Client Reference:	-	-	**C82 1.0-1.8**	**B104 0-0.5**	**B104 0.5-1.0**	**B104 1.0-1.1**
Date Sampled:	-	-	**03/06/2014**	**03/06/2014**	**03/06/2014**	**03/06/2014**
Analysis Description	**Method**	**Units**				
Moisture Content						
Moisture Content	04-004	%	54.2	31.1	32.4	30.9
Herbicides by LCMSMS						
Diuron	LCMSMS	µg/kg	<1	<1	<1	<1
Subcontract Analysis						
Total Organic Carbon	SUB	%	1.7	0.51	0.63	0.80

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www.advancedanalytical.com.au

Batch Number: A14/3001 [R00]
Project Reference: Sediment Analysis

Laboratory Reference:	-	-	**/49**	**/50**	**/51**	**/52**
Client Reference:	-	-	**QAQC 4**	**QAQC 3**	**B108 0-0.5**	**B108 0.5-1.0**
Date Sampled:	-	-	**03/06/2014**	**03/06/2014**	**03/06/2014**	**03/06/2014**
Analysis Description	**Method**	**Units**				
Moisture Content						
Moisture Content	04-004	%	55.2	53.6	31.6	35.4
Herbicides by LCMSMS						
Diuron	LCMSMS	µg/kg	<1	<1	<1	<1
Subcontract Analysis						
Total Organic Carbon	SUB	%	1.4	1.3	0.72	0.96

Laboratory Reference:	-	-	**/53**	**/54**	**/55**	**/56**
Client Reference:	-	-	**B108 1.0-1.3**	**C119 0-0.2**	**C121 0-0.5**	**C121 0.5-0.8**
Date Sampled:	-	-	**03/06/2014**	**03/06/2014**	**03/06/2014**	**03/06/2014**
Analysis Description	**Method**	**Units**				
Moisture Content						
Moisture Content	04-004	%	30.6	54.2	55.6	52.7
Herbicides by LCMSMS						
Diuron	LCMSMS	µg/kg	<1	<1	<1	<1
Subcontract Analysis						
Total Organic Carbon	SUB	%	0.63	2.0	1.5	1.3

Laboratory Reference:	-	-	**/57**	**/58**	**/59**	**/60**
Client Reference:	-	-	**B130 0-0.5**	**A127 0.1-0.55**	**F150 0.01-0.45**	**H165 0.02-0.1**
Date Sampled:	-	-	**03/06/2014**	**03/06/2014**	**03/06/2014**	**04/06/2014**
Analysis Description	**Method**	**Units**				
Moisture Content						
Moisture Content	04-004	%	54.3	36.1	32.0	23.1
Herbicides by LCMSMS						
Diuron	LCMSMS	µg/kg	<1	<1	<1	<1
Subcontract Analysis						
Total Organic Carbon	SUB	%	1.3	1.1	4.0	0.05

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Batch Number: A14/3001 [R00]
Project Reference: Sediment Analysis

Laboratory Reference: **Client Reference:** **Date Sampled:** **Analysis Description**	**-** **-** **-** **Method**	**-** **-** **-** **Units**	**/61** **G155 0-0.05** **04/06/2014**	**/62** **H167 0.05-0.11** **04/06/2014**	**/63** **H167 0-0.08** **04/06/2014**	**/64** **k167 0-0.03** **04/06/2014**
Moisture Content						
Moisture Content	04-004	%	23.0	28.1	62.0	31.5
Herbicides by LCMSMS						
Diuron	LCMSMS	µg/kg	<1	<1	1.8	<1
Subcontract Analysis						
Total Organic Carbon	SUB	%	0.05	0.13	2.3	1.0

Laboratory Reference: **Client Reference:** **Date Sampled:** **Analysis Description**	**-** **-** **-** **Method**	**-** **-** **-** **Units**	**/65** **P180 0-0.04** **04/06/2014**	**/66** **I172 1.05-1.10** **04/06/2014**	**/67** **M180 Grab** **04/06/2014**	**/68** **M180 0.06-0.12** **04/06/2014**
Moisture Content						
Moisture Content	04-004	%	65.8	22.7	53.4	21.0
Herbicides by LCMSMS						
Diuron	LCMSMS	µg/kg	<1	<1	1.5	<1
Subcontract Analysis						
Total Organic Carbon	SUB	%	0.98	0.20	2.0	0.07

Laboratory Reference: **Client Reference:** **Date Sampled:** **Analysis Description**	**-** **-** **-** **Method**	**-** **-** **-** **Units**	**/69** **QAQC 6** **04/06/2014**	**/70** **QAQC 5** **03/06/2014**	**/71** **A127 0-0.1** **03/06/2014**
Moisture Content					
Moisture Content	04-004	%	60.1	53.0	42.0
Herbicides by LCMSMS					
Diuron	LCMSMS	µg/kg	1.8	<1	<1
Subcontract Analysis					
Total Organic Carbon	SUB	%	2.3	1.3	0.81

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Batch Number: A14/3001 [R00]
Project Reference: Sediment Analysis

Method	Method Description
04-004	Moisture by gravimetric, %
LCMSMS	*Analysis by LCMSMS
SUB	Subcontracted Analyses

Result Comments
[<] Less than
[INS] Insufficient sample for this test
[NA] Test not required

*Analyte is not covered by NATA scope of accreditation.
Solid sample results are reported on a dry weight basis.
Analysis was subcontracted to Sydney Analytical Laboratories (NATA Number 1884); reference SAL report number SAL25126B.

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Batch Number: A14/3001 [R00]
Project Reference: Sediment Analysis

QUALITY ASSURANCE REPORT

TEST	UNITS	Blank	Duplicate Sm#	Duplicate Results	Spike Sm#	Spike Results
Diuron	µg/kg	<1	A14/3001-1	<1 || <1	A14/3001-1	102%

TEST	UNITS	Blank
Total Organic Carbon	%	<0.01

TEST	Units	Blank	Duplicate Sm#	Duplicate Results	Spike Sm#	Spike Results
Diuron	µg/kg	<1	A14/3001-11	<1 || <1	A14/3001-21	97%

TEST	Units	Blank	Duplicate Sm#	Duplicate Results	Spike Sm#	Spike Results
Diuron	µg/kg	<1	A14/3001-21	<1 || <1	A14/3001-41	105%

TEST	Units	Blank	Duplicate Sm#	Duplicate Results	Spike Sm#	Spike Results
Diuron	µg/kg	[NT]	A14/3001-31	<1 || <1	A14/3001-61	95%

TEST	Units	Blank	Duplicate Sm#	Duplicate Results
Diuron	µg/kg	[NT]	A14/3001-41	<1 || <1

TEST	Units	Blank	Duplicate Sm#	Duplicate Results
Diuron	µg/kg	[NT]	A14/3001-51	<1 || <1

TEST	Units	Blank	Duplicate Sm#	Duplicate Results
Diuron	µg/kg	[NT]	A14/3001-61	<1 || <1

TEST	Units	Blank	Duplicate Sm#	Duplicate Results
Diuron	µg/kg	[NT]	A14/3001-71	<1 || <1

TEST	Units	Blank	Duplicate Sm#	Duplicate Results
Total Organic Carbon	%	[NT]	A14/3001-10	0.92 || 0.90 || RPD: 2

TEST	Units	Blank	Duplicate Sm#	Duplicate Results
Total Organic Carbon	%	[NT]	A14/3001-20	1.2 || 1.2 || RPD: 0

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Batch Number: A14/3001 [R00]
Project Reference: Sediment Analysis

TEST	Units	Blank	Duplicate Sm#	Duplicate Results
Total Organic Carbon	%	[NT]	A14/3001-30	1.8 || 1.8 || RPD: 0

TEST	Units	Blank	Duplicate Sm#	Duplicate Results
Total Organic Carbon	%	[NT]	A14/3001-40	1.4 || 1.5 || RPD: 7

TEST	Units	Blank	Duplicate Sm#	Duplicate Results
Total Organic Carbon	%	[NT]	A14/3001-50	1.3 || 1.3 || RPD: 0

TEST	Units	Blank	Duplicate Sm#	Duplicate Results
Total Organic Carbon	%	[NT]	A14/3001-60	0.05 || 0.06 || RPD: 18

TEST	Units	Blank	Duplicate Sm#	Duplicate Results
Total Organic Carbon	%	[NT]	A14/3001-70	1.3 || 1.3 || RPD: 0

Comments:

RPD = Relative Percent Deviation
[NT] = Not Tested
[N/A] = Not Applicable
'#' = Spike recovery data could not be calculated due to high levels of contaminants

Acceptable replicate reproducibility limit or RPD: Results < 10 times LOR: no limits
Results >10 times LOR: 0% - 50%

Acceptable matrix spike & LCS recovery limits: Trace elements 70-130%
Organic analyses 50-150%
SVOC & speciated phenols 10-140%
Surrogates 10-140%

When levels outside these limits are obtained, an investigation into the cause of the deviation is performed before the batch is accepted or rejected, and results are released.

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