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Eramurra Solar Salt Project

Sediment Analysis Report

ENVIRONMENT
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Version Register

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Transmission Register

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Abbreviations and Acronyms

Abbreviation / Acronym	Expanded text
AASS	Actual Acid Sulfate Soils
ADAS	Australian Diver Accreditation Scheme
ANZECC	Australian and New Zealand Environment and Conservation Council
ANZG	Australia and New Zealand Guidelines for Fresh and Marine Water Quality
ASS	Acid Sulfate Soil
BTEXN	Benzene, toluene, ethylbenzene, xylenes and naphthalene
CoC	Chain of Custody
COPC	Contaminants of Potential Concern
DEC	Department of Environment and Conservation
Dups	Laboratory Duplicates
DWER	Department of Water and Environmental Regulation
FRP	Filterable reactive phosphorus
ISQG	Interim Sediment Quality Guideline
Km	Kilometres
LCS	Laboratory Control Samples
LEP	Levels of Ecological Protection
LoR	Limit of Reporting
MB	Method Blanks
MS	Matrix Spikes
NAGD	National Assessment Guidelines for Dredging
NEPM	National Environment Protection Measures
NWS	North-West Shelf
OC	Organochlorine
PAH	Polycyclic aromatic hydrocarbon
PASS	Potential Acid Sulfate Soils
PCB	Polychlorinated biphenyls
PQL	Practical Quantitation Limit
PSD	Particle size distribution
Pty Ltd	Proprietary Limited
QA/QC	Quality Assurance/Quality Control
RPD	Relative Percent Difference
RSD	Relative Standard Difference
SAP	Sampling and Analysis Plan
SPLIT	Split sample
SPOCAS	Suspension Peroxide Oxidation Combined Acidity and Sulphur

SQG	Sediment Quality Guidelines
TBT	Tributyl tin
TKN	Total kjeldahl nitrogen
TN	Total Nitrogen
TOC	Total Organic Carbon
TP	Total Phosphorus
TPH	Total Petroleum Hydrocarbons
TRIP	Triplicate sample
UCL	Upper Confidence Limit
µm	Micrometers
WA	Western Australia

Executive Summary

Leichhardt Pty Ltd has engaged O2 Marine (O2M) to undertake the marine environmental impact assessment (EIA) of the proposed Eramurra Solar Salt Project. One aspect of these studies includes the assessment of sediment characteristics within the proposed dredge channel between Cape Preston and South-West Regnard Island, Western Australia, and the proposed offshore spoil disposal ground, located approximately 16 km north east of the dredge channel.. The specific objectives of this Sediment Analysis Report are to:

- Summarise the sediment sampling program undertaken in November 2020 (dredge footprint) and March 2023 (offshore spoil disposal ground) in relation to the proposed methodology outlined in the SAP (O2 Marine 2021a)
- Present and analyse sediment results and compare levels against appropriate guidelines, screening levels and action criteria (including NADG (2009), ANZG (2018), NEPM (2013) and DWER (2015)).
- Identify the risk to marine environmental quality resulting from disturbance and mobilisation of the sediments, and
- Determine the suitability of the dredged sediment for either onshore or offshore disposal.

Sediment sampling and analysis of the proposed dredge material was undertaken in accordance with the Sediment Sampling and Analysis Plan (SAP) (O2 Marine 2021a), approved by Leichhardt. Dredge footprint samples were collected using push corers at seventeen (17) locations randomly distributed over the dredge footprint, whilst a vibracorer was used at six (6) additional randomly distributed sites. Samples were analysed for particle size distribution, total organic carbon, metals, total petroleum hydrocarbon, polyaromatic hydrocarbon, organotins and potential acid sulfate soils by a NATA accredited laboratory (Eurofins). The contaminant results were compared against recommended screening levels in the National Assessment Guidelines for Dredging (NAGD 2009), Australian and New Zealand Environment and Conservation Council Guidelines (ANZG 2018) and Assessment levels for Soil, Sediment and Water (DEC 2010). Tests for potential acid sulfate soils were compared against the action criteria in Department of Water and Environmental Regulation (DER 2015).

Whilst using the vibratory, there was refusal at 0.5m, therefore only the top layer of sediment was collected.

The proposed dredge area was dominated by sand fractions (62 – 2000 µm). All samples reported analyte concentrations below the available ANZG (2018) guideline values and NAGD 2009 screening levels. All hydrocarbons and organic compounds were below the laboratory Limit or Reporting (LoR).

The screening acid sulfate test did not detect the presence of Potential Acid Sulfate Soils (PASS).

Sediment results were found to be comparable to that identified in “Background quality of the marine sediments of the Pilbara coast” (DEC 2006).

Benthic infauna results recorded a total of 267 individuals from 14 morphological species across six samples. The three most common taxa across all sites were Polychaeta Cirratulidae, Ostracoda and Tanaidacea Pseudozeuxoidae. The distribution and abundance of benthic infauna taxa were found to be heterogeneous, and there was no observable difference in species richness, diversity or composition identified across sites.

Both field and laboratory Quality Assurance/ Quality Control (QA/QC) procedures produced results that indicate reliable and accurate results.

Results from the offshore spoil disposal ground, showed sediments ranging from fine to coarse grained sands. Concentrations of TRH, BTEXN, Polycyclic Aromatic Hydrocarbons (PAH), Monobutyltin, Dibutyltin and Tributyltin were below the laboratories LoR and HIL guideline values. Metal concentrations were below DGVs and largely comparable to background Pilbara concentrations (DEC (2006).

Based on the results, all sediment samples collected during the November 2020 survey are likely acceptable for offshore disposal and do not pose a safety or environmental risk. Due to restrictions on sampling depth, a definitive conclusion of the presence of PASS to full dredge depth cannot be determined from this study.

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1. Introduction

1.1. Proposal Description

Leichhardt Salt Pty Ltd (the proponent) propose to develop the Eramurra Solar Salt Project (the proposal) in the Cape Preston East area, Western Australia (Figure 1). The proposal will produce high purity industrial grade sodium chloride salt from seawater via a solar evaporation, crystallisation and raw salt purification operation. Salt will be shipped from the marine loading terminal to overseas markets. Key development areas associated with the proposal are identified in Figure 2. A short summary of the proposal is presented in Table 1.

O2 Marine have been engaged by the proponent to undertake marine environmental investigations to help identify environmental risks of the proposal, establish baseline conditions, guide appropriate monitoring and management to minimise potential environmental impacts and to inform proposal design.

Table 1 Short summary of the proposal

Project Title	**Eramurra Solar Salt Project**
Proponent Name	**Leichhardt Salt Pty Ltd**
Short Description	Leichhardt Salt Pty Ltd (Leichhardt) is seeking to develop a solar salt project in the Cape Preston East Area, approximately 55 kilometres(km) west-south-west of Karratha in Western Australia (WA) (the Proposal). The proposal will utilise seawater and evaporation to produce a concentrated salt product for export. The Proposal includes the development of a series of concentrator and crystalliser ponds and processing plant. Supporting infrastructure includes bittern's outfall, drainage channels, product dewatering facilities, desalination plant and/or groundwater bores, pumps, pipelines, power supply, access roads, administration buildings, workshops, laydown areas, landfill facility, communication facilities and other associated infrastructure. The Proposal also includes dredging in the Cape Preston East Port and either offshore disposal of dredge material or onshore disposal.

1.2. Objectives

This document has been prepared by O2M on behalf of Leichhardt Salt Pty Ltd to summarise the sediment sampling program which was implemented to assess sediment quality, inform dredging and spoil disposal management and understand potential impacts associated with bitterns discharge. The sediment sampling program was undertaken in accordance with NAGD (2009).

Specific objectives of this Sediment Analysis Report are to:

- Summarise the sediment sampling program undertaken in November 2020 and March 2023 in relation to the proposed methodology outlined in the SAP (O2 Marine 2021a)
- Present and analyse sediment results and compare levels against appropriate guidelines
- Identify the risk to marine environmental quality resulting from disturbance and mobilisation of the sediments, and
- Determine the suitability of the dredged sediment for either onshore or offshore disposal.

1.3. Relevant Guidelines and Procedures

Sampling methods and result analysis for this study incorporates guidance from the following documents:

- National Assessment Guidelines for Dredging. Department of the Environment, Water, Heritage and the Arts, Commonwealth of Australia (NAGD 2009).
- Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZG 2018)
- Contaminated Sites Management Series. Assessment levels for Soil, Sediment and Water (DEC 2010).
- Background quality of the marine sediments of the Pilbara coast. Marine Technical Report Series (DEC 2006).
- Identification and investigation of acid sulfate soils and acidic landscapes. Department of Environmental Regulation, Government of Western Australia (DER 2015)
- National Environment Protection (Assessment of Site Contamination) Measure. National Environment Protection Council (NEPM 2013).

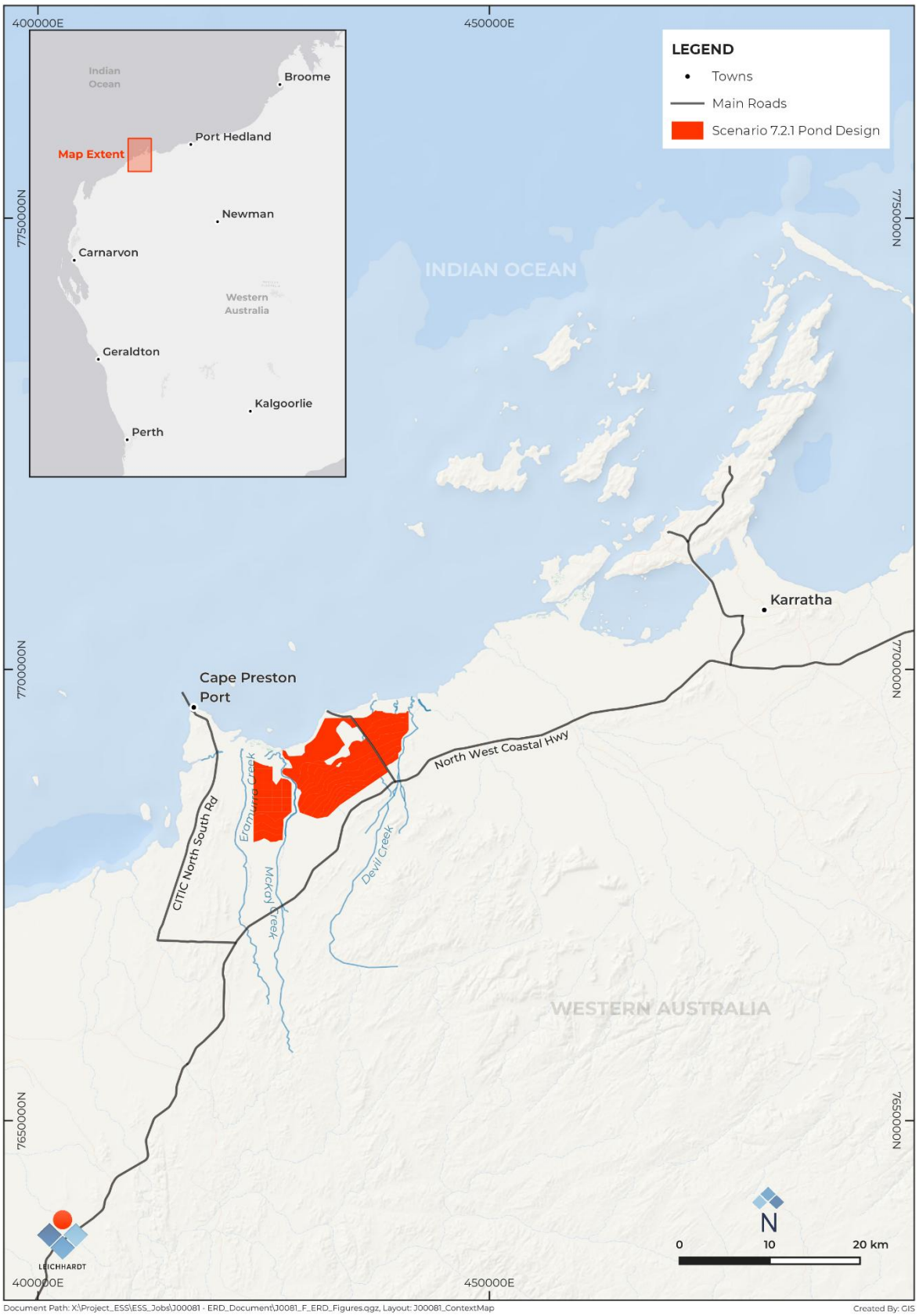


Figure 1 Regional location of the Proposal

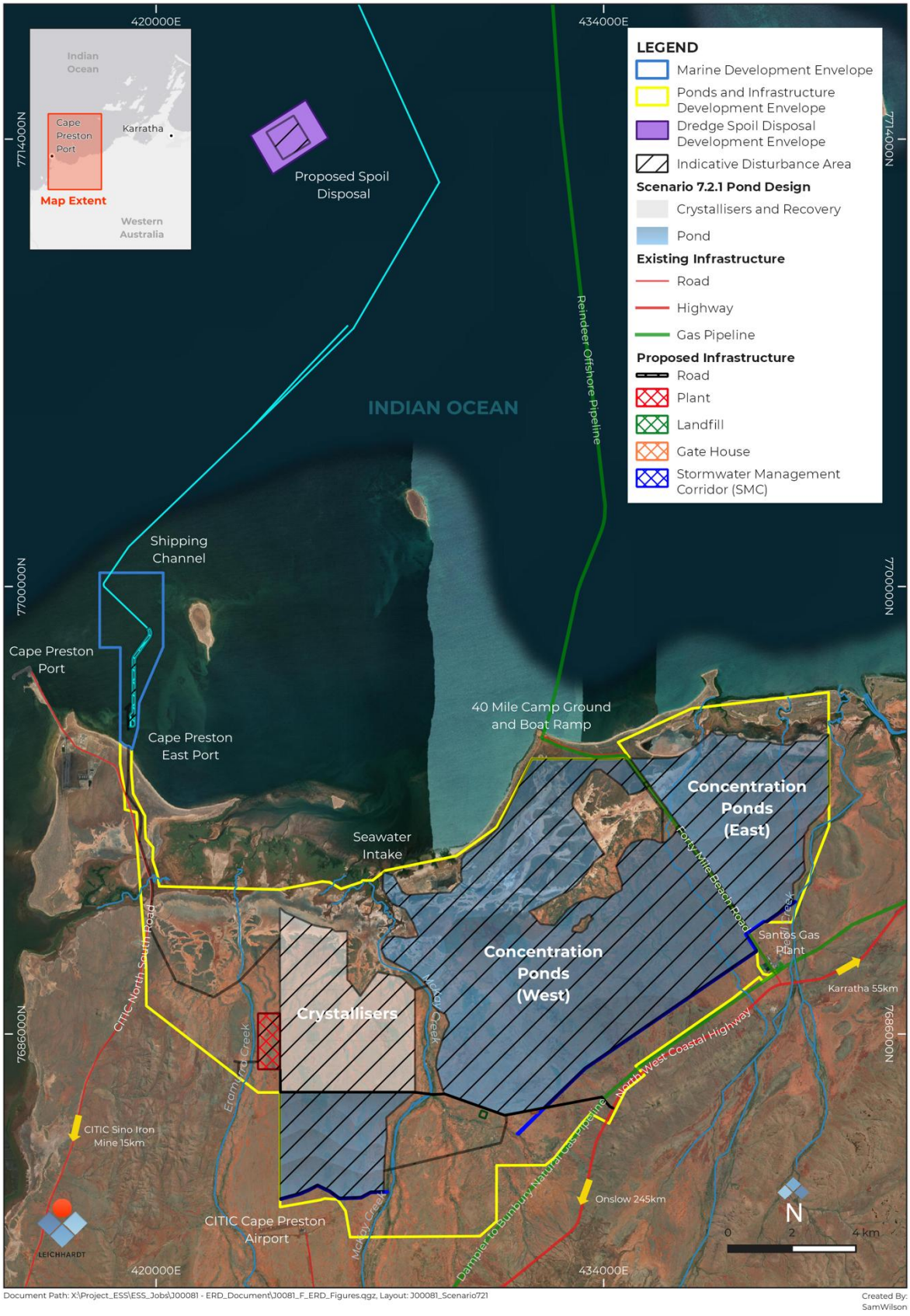


Figure 2 Development Envelopes for the Proposal

2. Existing Environment

2.1. Environmental Setting

The offshore dredging component of the project occur within shallow (<8 m) nearshore areas, east of the Cape Preston facility and slightly west of South Regnard Island. The geomorphology of the area consists of a layer of Quaternary Coastal Deposits between 0.5m and 6m thick, in which surficial sediments have largely been identified as loose gravelly sand with coral fines (SKM 2013a). Benthic habitat surveys have determined the presence of patches of coral and macroalgae, seagrass, sponges, and ascidians which may occur within, or immediately adjacent to the dredge footprint (O2 Marine 2021b).

2.1.1. Previous Sediment Investigations

SKM (2013a) undertook sediment and geotechnical investigations in the Cape Preston area for the Proposed Buckland Project in April and May 2013. The investigation involved drilling bore holes at multiple locations to a maximum depth of -22.2 m AHD, as well as surficial sediment sampling and analysis. These studies found that sediment in the area consist of sand deposits described as fine to coarse grained, well-graded, sub-rounded, dark brown and grey with sub-angular gravels, shells, corals and rootlets (SKM, 2013a). The sediment chemistry results of the investigation found:

- TBT was below detection in surficial sediment collected at all sample locations
- The metals/metalloids cadmium (Cd), mercury (Hg) and silver (Ag) were below detection at all sampling locations
- Manganese (Mn), selenium (Se) and vanadium (V) were detectable but there were no guideline screening levels for comparison
- Of the other metals/metalloids with measurable concentrations, only arsenic (As) had a 95% UCL concentration that exceeded the NAGD (2009) screening level. The arsenic (As) exceedances were observed for samples collected in the Jetty Alignment area and the Berth area but not the Channel area.

It should be noted that arsenic is a commonly occurring metalloid found in coastal waters of Western Australia at levels that exceed the recommended sediment quality guidelines (DEC 2006).

2.1.2. Background Quality of the Pilbara Coast Sediments (DEC 2006)

The Department of Environment and Conservation (DEC) undertook an investigation of marine sediments off the Pilbara coast in 2005 to estimate the background concentrations for selected contaminants (DEC 2006). Sediment samples collected from coastal waters at Port Hedland, Dampier Archipelago, Onslow, Ashburton River Mouth and Exmouth Gulf were analysed for TBT, PAHs, TPH, BTEXN, organochlorine pesticides and polychlorinated biphenyls (PCBs), and total metals and metalloids (Al, As, Cd, Cr, Co, Cu, Fe, Pb, Hg, Ni, Se, Ag, V and Zn) (DEC 2006). Background sediment quality was found to be high and concentrations of most metals and metalloids were found to be at similar levels or lower than found in other studies undertaken in northern Australia. However, total arsenic concentrations were found to be relatively high (median of 36 mg/kg for one site off Onslow) and exceeded the recommended sediment quality guideline at some of the essentially unimpacted locations sampled across the region. The elevations are considered to be natural and likely to be

related to the geology of the region (DEC 2006). The results of this study and the ANZECC & ARMCANZ (2000) guidelines were used to develop a set of sediment quality guidelines appropriate for the four levels of ecological protection in the Pilbara region (DEC 2006), they are outlined below in Table 2.

Table 2 Summary of recommended sediment quality guidelines for the Pilbara coast waters.

Level of Ecological Protection	ISQG available	Natural background exceeds ISQG	No ISQG available
Maximum	(All metals) Use estimated natural background; or Derive site specific SQG from 80th percentile of reference site*. (Organic chemicals) No detectable concentration using lowest LoR available. or use 80th percentile of reference site.		(All metals) Use estimated natural background; or Derive site specific SQG from 80th percentile of reference site*. (Organic chemicals) No detectable concentration using lowest LoR available or use 80th percentile of reference site.
High	(As, Cd, Cr, Cu, Pb, Hg, Ni, Ag, Zn) Use ISQG from ANZECC (2000) (Organic chemicals) Use ISQG from ANZECC (2000) unless below LoR then guideline should be no detectable concentration	(As) Use estimated natural background concentration; or compare dilute acid extractable concentration with ISQG.	(e.g. Al, Co, Fe, Se, V) Use median of natural background concentration multiplied by factor of 2*. (Organic chemicals) No detectable concentration using lowest LoR available or median of natural background concentration multiplied by a factor of 2.
Moderate	(As, Cd, Cr, Cu, Pb, Hg, Ni, Ag, Zn) Use ISQG from ANZECC (2000) (Organic chemicals) Use ISQG from ANZECC (2000) unless below LoR then guideline should be no detectable concentration.	(As) Use estimated natural background concentration; or compare dilute acid extractable concentration with ISQG	(eg. Al, Co, Fe, Se, V) Use median of natural background concentration multiplied by factor of 2 (Organic chemicals) No detectable concentration using lowest LoR available or median of natural background concentration multiplied by a factor of 2.
Low	(Bioaccumulators or biomagnifiers eg. Cd, Hg) Use ISQG from ANZECC (2000) unless below LoR then guideline should be no detectable concentration.		(Bioaccumulators or biomagnifiers eg. Se) Use natural background concentration multiplied by a factor of 3 unless below LoR then guideline should be no detectable concentration.

** Assessment could be done on total contaminant concentration or on potentially bioavailable concentration*

2.1.3. Identifying Contaminant of Potential Concern

NAGD (2009) identifies Cu, Pb, Zn, Cr, Cd, Ni, As and Hg, as the most widespread and common sediment pollutants in Australia, sometimes at high levels. Metal contaminant sources are linked to port activities, discharge processes and other coastal construction activities. Organotin compounds are also common contaminants in ports and harbours and are frequently present at high levels in berths and inner harbour

areas. The nearest Port is Cape Preston Port located approximately 3 km to the west of the Project area. Whilst it is possible that TBT may have entered the environment at Cape Preston, contamination in the Project area is considered to be a low risk.

Petroleum hydrocarbons and polycyclic aromatic hydrocarbons (PAHs) are also common but are normally found at elevated levels only in restricted locations and the potential for hydrocarbon spill is low if managed appropriately. However, it is noted that herbicide spraying to combat Mesquite has known to occur in the surrounding region. This spraying used a mixture of herbicide at a ratio of 1:50 with diesel. Therefore, diesel inputs to the catchment are possible, but are considered to represent a low risk.

A review of the potential contaminant sources of the North-West Shelf (NWS) was undertaken as a part of investigations associated with the Wheatstone Project in Chevron (2010). Potential contaminants identified from marine based activities included organic and inorganic contaminants from the oil and gas industry, shipping activities, commercial and recreational fishing activities, aquaculture and tourism. Coastal issues such as domestic waste, e.g. sewage disposal, have been perceived as less significant in this region than elsewhere because of low population density. However, potential pollutants from diffuse sources in the region include metals and antifoulants from shipping, harbour works, shore-based plants and cross-shelf trunklines. A review of contaminant sources, impacts, pathways and effects on the NWS by Fandry et al. (2006) identified the following Contaminants of Potential Concern (COPC) in the region, including:

- Metals: (Ba, Cd, Cr, Cu, Pb, Hg and Zn) associated with shipment of minerals and runoff from onshore mining activities;
- TBT: antifoulant on ships;
- Nitrogen: Nutrients;
- Wastewater from industrial processing; and
- Hydrocarbons associated with oil spills and chronic releases such as bilge and tank residues from ships.

Due to the undeveloped nature of the catchment and sparse farming practices it was considered that sources for PAHs and Organochlorine (OC) pesticides would be unlikely to make a substantial contribution to contaminant loads in offshore sediments (Fandry et al. 2006).

Based on literature review, there are very few known COPCs in the region. Sampling and analysis is considered to be warranted for the following CoPCs:

- Inorganic Compounds: Total metals and metalloids (Al, Ag, As, Cd, Co, Cr, Cu, Fe, Hg, Mn, Ni, Sb, V and Zn)
- Organic Compounds: TRH, BTEXN, PAH and TBT
- TOC.

Benthic infauna is also monitored (dredge footprint only) as the key ecological element of the habitat. Benthic infauna provides fundamental data that are relevant to general objectives to sustained Sediment Quality as they are sedentary and respond to pollutant stresses.

In addition, as the nearby coastline is mapped as an Acid Sulfate Soils (ASS) risk area, an investigation into the potential for acid sulfate soils were also investigated within dredge footprint sediments.

3. Methods

3.1. Sampling and Analysis Plan

The sediment sampling field investigation was implemented in accordance with the SAP (O2 Marine 2021a). The SAP details the method of sample collection, number and location of samples as well as the analysis suite for each sample. It is recommended that this report be read in conjunction with the SAP.

3.2. Dredge Footprint Field Sampling

Sediment samples were collected from twenty-three (23) randomly distributed sampling locations within the proposed dredge footprint (Figure 3) on the 25th November 2020.

3.2.1. Sediment Sampling Collection

Australian Diver Accreditation Scheme (ADAS) certified commercial divers were deployed with push corers at seventeen (17) locations (IG1 – IG6 and G1 – G11). Observations and photographs were recorded for each sample (Appendix A). Samples were then placed into pre-labelled laboratory jars and stored in a chilled esky. Sediment corers and caps were washed using appropriate decontamination solution (i.e. DECON) between samples. Equipment used for the diver core sampling method included:

- 5x Polycarbonate sediment corers with caps;
- Core sample collection tray;
- Laboratory supplied sample containers;
- DECON 90; and
- Camera.

3.2.2. Benthic Infauna Sampling

Sediment samples for benthic infauna analysis were collected at six (6) locations. Sediment recovery methods were the same as the recovery methods described above. Three (3) individual diver cores were taken to provide the volume and statistical replication required for adequate analysis of benthic infauna.

Once the sample had been recovered and secured on deck, O2 Marine personnel transferred the sample into the collection tray. O2 Marine personnel then undertook the following sample process/collection steps:

- Sieve the sediment through a 500 µm sieve using the saltwater deck wash to remove fine sediment; and
- Transfer all material retained on the sieve, such as coarse sediment and benthic infauna into two pre-labelled 2kg zip-lock bags and preserved with 95-100% ethanol solution.

This process was replicated for three (3) individual sediment samples at each of the six (6) benthic infauna sediment sampling sites.

Equipment used for the benthic infauna sediment sampling included the following:

- Diver ush cores
- Deck winch;
- Deck wash hose;

- Sample collection tray;
- Funnel (x2)
- 500 µm sieve box;
- 2kg zip lock sample bags;
- Washing bottles;
- DECON 90; and
- 95-100% Ethanol solution.

3.2.3. Vibracoring

The intention of the Vibracoring method is to sample different sediment horizons to inform dredge design. This method involves the use of a 76.2mm diameter stainless steel tube of 6 m length fastened to a custom-made bracket which used the flexible shaft of a small concrete vibrator to penetrate the tube into unconsolidated sediment. The tube was suspended from a davit arm over the side of the vessel and vibrated into unconsolidated sediment. A plastic liner was used inside the tube to collect the sample and a one-way core catcher was custom made for the tube to prevent losing the sample on recovery.

The tube was recovered using the deck winch, the actual core depth was recorded and the core sample removed from the tube. The core sample will initially hang vertically to settle sediments prior to being laid into the collection tube. Vibracore samples (V1 – V6) were sampled at different horizons to a maximum depth of 3m (or until refusal). The sample horizons which were meant to be sampled according to the SAP are: A (surface – 0.5m), B (0.5m – 1m), C (1m – 2m) and D (2m – 3m). However due to refusal only A was collected.

Replacement core liners were used for each core and core catchers was rinsed using appropriate decontamination solution (i.e. DECON) between samples. All equipment used to undertake the sampling is included in O2 Marine (2021a).

3.3. Offshore Spoil Disposal Field Sampling

Five (5) sediment samples were collected from the proposed offshore spoil disposal ground on 21st March 2023. The location of each site is outlined in Table 8 and Figure 3. All samples were collected using a petite ponar sediment grab. Once the grab was winched back onto the vessel deck, the sediment was transferred to a glass bowel, where observations and photographs were recorded (Appendix A). Samples were then placed into pre-labelled laboratory jars and stored in a chilled esky. Sediment sampling equipment was washed using appropriate decontamination solution (i.e. DECON) between samples.

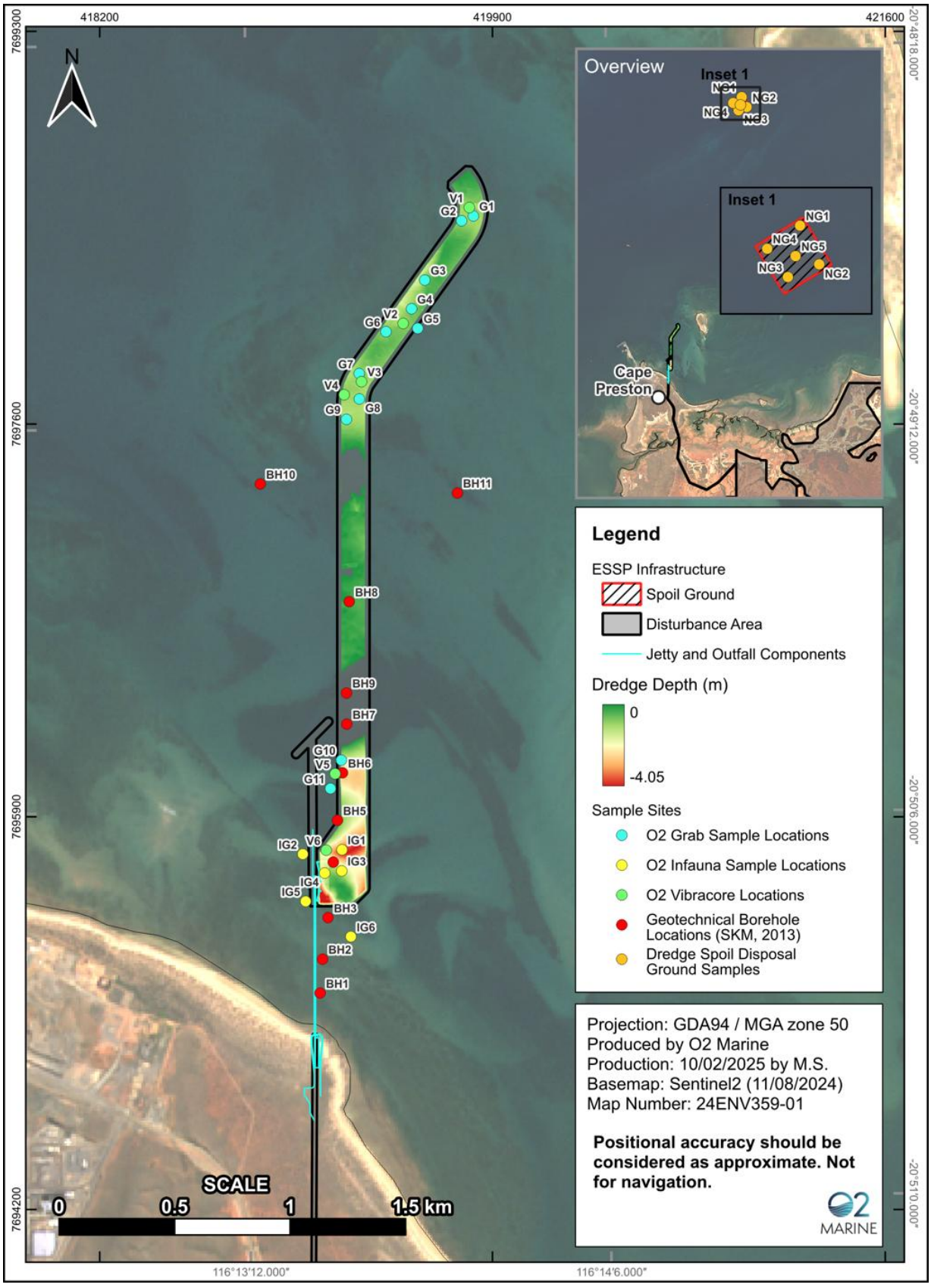


Figure 3 Location of geotechnical/sediment samples collected between 2013 and 2023.

3.4. Laboratory Testing

All sediment samples were packed into suitable (laboratory supplied) jars and stored on ice during the field program and transferred to a freezer at the completion of each day (note: Infauna samples were not required to be chilled). All samples were marked with a unique identifier with the date/time and sampler's name using a 'Wet Write' permanent marker. All samples were listed on an O2 Marine Chain of Custody (CoC) form included with the samples when transported to the NATA-accredited laboratory for analysis. Copies of the CoC are provided in Appendix B. The suite of analysis tested for at each location is outlined in Section 2.1.3 above.

Sediment analysis (chemical and PSD) was undertaken by Eurofins, and the benthic infauna analysis undertaken by Benthic Australia in Queensland.

The list of analytes is based upon the following assumptions:

1. The proposed suite of analytes is based on general requirements for sediment quality assessment in Western Australia;
2. PASS is included for compliance with the *Contaminated Sites Act* 2003 as this will be applicable to land-based reclamation impact assessments;
3. Elutriate and/or Bioavailability testing were only to be analysed if results exceed the relevant guidelines in accordance with NAGD (2009);
4. PSD has been included as it will assist in dredge impact assessment (plume dispersion and settling rates etc); and
5. Total Organic Carbon (TOC) is required to normalise organic contaminants (i.e. TBT) for comparison against guidelines values in accordance with NAGD (2009). The TOC is also useful to assist with PASS interpretation.

3.5. Quality Assurance/Quality Control (QA/QC)

3.5.1. Field QA/QC

The following QA/QC procedures were undertaken during field work in accordance with ANZECC/ARMCANZ (2000) and NAGD (2009) guidelines, including:

- Using suitably qualified environmental staff experienced in sediment sampling, field supervision and sediment logging;
- Samples were handled using gloved hands (powderless latex or nitrile gloves). New gloves were used for each sample to avoid potential cross-contamination;
- All sampling equipment, including mixing bowls etc. being decontaminated between sampling locations via a decontamination procedure involving a wash with ambient seawater and a laboratory grade detergent, and successive rinsing with fresh water; or by a similarly acceptable method;
- Logs were completed for each sample collected including time, location, initials of sampler, duplicate type, chemical analyses to be performed and site observations;
- Three (3) triplicate samples, two (2) field replicates and one (1) field blank.

- Field Triplicates are collected for all benthic infauna samples to account for typically high intra site variability in addition to comparison between sites.
- Chain-of-custody (CoC) forms identifying (for each sample) the sampler, nature of the sample, collection date and time, analyses to be performed, sample preservation method and departure time from the site;
- Ensuring the survey vessel was thoroughly inspected and washed down prior to each survey;
- Samples were contained in appropriately cleaned, pre-treated and labelled sample containers;
- Samples were kept cool (4°C) after sampling and during transport, stored in eskies with pre-frozen ice bricks;
- Transportation of samples under CoC documentation (Appendix B); and
- Additional QC field samples collected in accordance with the NAGD (2009).

3.5.2. Laboratory QA/QC

Both the primary and secondary laboratories are NATA accredited, and as such provide a comprehensive best practice QA/QC program, designed to provide highly defensible analytical data in accordance with NEPM (2013), ANZG (2018) and NAGD (2009) guidelines. Both laboratories undertake Laboratory Control Samples (LCS), Method Blanks (MB), Matrix Spikes (MS), Laboratory Duplicates (Dups) and Surrogates (where applicable), at frequencies at or above the NEPM (2013) guidelines.

3.6. Data Analysis

The results shall be compared to the Default Guideline Values (DGV) as defined in ANZG (2018). The recommended sediment quality guidelines (SQGs) for the Pilbara coastal waters shall also be applied for parameters in which no DGV are available. Estimated natural background data for manganese is not available in DEC (2006) and therefore a low reliability guideline value from The Ontario Ministry of the Environment (Persaud et al. 1990) presented in ANZG (2018) shall be applied.

Based on NAGD (2009), a screening level is exceeded if the upper 95% upper confidence limit (95% UCL) exceeds the DGV. The USEPA's ProUCL software is used to calculate and recommend the most appropriate 95% UCL test to apply based on the data size, data distribution and skewness. If the 95% UCL does not exceed the screening level, this means there is a 95% probability that the mean concentration of that contaminant will not exceed the screening level. If the 95 UCL of a contaminant exceeds the specified screening level, it is a Contaminant of Potential Concern (CoPC) and evaluation shall proceed through the decision-tree described in NAGD (2009). For any analytes which exceed the NAGD (2009) sediment screening level an elutriate is to be extracted from that sample for comparison against the relevant ANZG (2018) water quality guideline value.

The project has options for both offshore and onshore dredge material placement, therefore, in relation to the onshore disposal option, the characterisation of the material and assessment of its compatibility with the receiving environment and associated land uses on a site-specific basis is required in accordance with Schedule B1 of the NEPM (2013). DEC (2010) includes Health Investigation Level F for commercial/industrial areas (this is equivalent to category D in NEPM (2013)). This was applied as any dredge material would be disposed to an area dedicated to industry purposes, and not widely accessible to the public. Table 1 in DEC (2010) has been used to compare results as it includes a larger array of contaminates, sourced from both NEPM

(2013) and US EPA (2009) HILs. Whilst NEPM (2013) recommends these values should not be directly applied to assess the contamination of marine sediments, these values are recognised for the fact that they will inform the site contamination status once the material is placed on land.

3.7. RPD and RSD

Relative percentage difference and relative standard deviation of QA/QC samples were calculated as followed. The relative percentage difference (RPD) between the primary and duplicate sample is calculated as:

$$RPD = \frac{Primary\ Sample - Duplicate\ Sample}{Average\ of\ Primary\ and\ Duplicate\ Samples}$$

If the RPDs are less than 35% then field and laboratory procedures are considered of acceptable quality and meaningful conclusions can be drawn from the data.

Three interlaboratory triplicates were collected for the 2021 program. This involves collecting three sub-samples from one sample replicate. The relative standard deviation (RSD) was calculated as:

$$RSD = \frac{Standard\ Deviation\ of\ Triplicate\ Samples}{Mean\ of\ Triplicate\ Samples}$$

If the RSDs are less than 50% then field and inter-laboratory procedures are considered of acceptable quality and meaningful conclusions can be made with the data.

4. Results

4.1. Dredge Footprint

Samples were successfully collected at each of the twenty-three (23) proposed locations. Table 3 depicts the site name, location, method of collection, sample ID and sampling outcome for all locations. Note, triplicate splits were collected at G8 and G11 whilst triplicates were collected at G4, G7 and V1 as per guidance in the SAP (O2 Marine 2021a). All laboratory reports are included as Appendix C.

Table 3 Field sample summary

Site ID	Coordinates		Collection Method	Sample ID	Sampling outcome (✓ indicates 'collected')
IG 1	-20.83645375	116.2238731	Diver Push Core	IG 1	✓
IG 2	-20.83661772	116.2222409	Diver Push Core	IG 2	✓
IG 3	-20.83728111	116.2238569	Diver Push Core	IG 3	✓
IG 4	-20.83736131	116.2231466	Diver Push Core	IG 4	✓
IG 5	-20.83846447	116.2223518	Diver Push Core	IG 5	✓
IG 6	-20.83985292	116.2242246	Diver Push Core	IG 6	✓
G1	-20.81169274	116.229462	Diver Push Core	G1	✓
G2	-20.81187705	116.2289713	Diver Push Core	G2	✓
G3	-20.81419063	116.2274271	Diver Push Core	G3	✓
G4	-20.81531048	116.226873	Diver Push Core	G4	✓
				T1-A	✓
				T1-B	
G5	-20.81607755	116.2271272	Diver Push Core	G5	✓
G6	-20.81620049	116.2258038	Diver Push Core	G6	✓
G7	-20.81783344	116.2246824	Diver Push Core	G7	✓
				T2-A	✓
				T2-B	✓
G8	-20.81882531	116.2246846	Diver Push Core	G8	✓
				S1-A	✓
				S1-B	✓
G9	-20.81962067	116.2241409	Diver Push Core	G9	✓
G10	-20.83295102	116.2238629	Diver Push Core	G10	✓
G11	-20.83405613	116.2234056	Diver Push Core	G11	✓
				S2-A	✓
				S2-B	✓
V1	-20.81136284	116.2292966	Vibracore	V1	✓
				T3-A	✓
				T3-B	✓
V2	-20.81588193	116.2265209	Vibracore	V2	✓
V3	-20.81815237	116.2247776	Vibracore	V3	✓
V4	-20.81866023	116.2240513	Vibracore	V4	✓
V5	-20.83348068	116.2236021	Vibracore	V5	✓
V6	-20.83646678	116.2232157	Vibracore	V6	✓

4.2. Particle size distribution

PSD results indicate that all samples were comparable in grain size. The large majority of sediments sampled comprised of medium sand (250-500µm) or coarse sand (500-2000µm). A small fraction of some samples contained fine sand (62-250µm), clay (<4µm), silt (4-62µm), and gravel (>2000µm). These results are comparable to those reported in DEC (2006) for several areas along the Pilbara coast (Onslow, Dampier Archipelago and Dampier Port. PSD summary results are shown in Table 4 and Figure 4, with full results included in Appendix C.

Table 4 Tabulated Particle Size Distribution results.

Site ID	Clay % (<4µm)	Silt % (4-62µm)	Fine Sand % (62-250µm)	Medium Sand % (250-500µm)	Coarse Sand % (500-2000µm)	Gravel % (>2000µm)
G1	0.67	3.79	27.21	34.78	31.78	1.77
G2	0.95	4.16	17.73	32.65	41.83	2.68
G3	0.36	2.77	15.3	44.59	35.57	1.41
G4	0.82	3.92	11.44	25.99	50.83	6.99
G5	0.21	1.75	29.36	37	26.16	5.51
G6	0.65	3.65	13.71	37.23	40.71	4.05
G7	0.06	2.57	10.98	41.66	32.47	12.26
G8	0	0	19.49	38.19	38.04	4.28
G9	0	0	21.66	41.29	31.21	5.84
G10	0	0	25.74	56.86	16.88	0.51
G11	0	0	22.25	55.81	14.83	7.1
V1	0.25	1.9	12.66	32.99	42.89	9.31
V2	0.74	4.56	28.21	32.19	28.29	6.01
V3	0	0	20.71	50.17	27.9	1.22
V4	0.26	2.18	16.3	35.75	40.7	4.81
V5	0	0	8.01	53.18	37.95	0.86
V6	0	0	19.41	66.69	13.78	0.13
IG1	0	0	4.62	59.55	35.36	0.47
IG2	0	0	3.29	59.12	37.31	0.28
IG3	1.63	13.5	9.89	18.55	52.47	3.96
IG4	4.08	22.89	14.51	16.2	35.83	6.5
IG5	0.42	4.36	5.75	41.5	40.5	7.47
IG6	0.44	3.73	2.43	36.57	54.93	1.89
S1-A	0	0	17.77	34.59	41.8	5.84
S2-A	0	0	22.47	58.95	17.98	0.6
T1-A	0.57	5.59	9.99	22.24	49.78	11.82
T2-A	0	0	14.67	37.81	44.32	3.2
T3-A	0.94	4.57	16.04	39.8	33.63	5.01
S1-B	0	0	22.91	38.7	35.02	3.38
S2-B	0	0	25.17	56.92	16.81	1.1

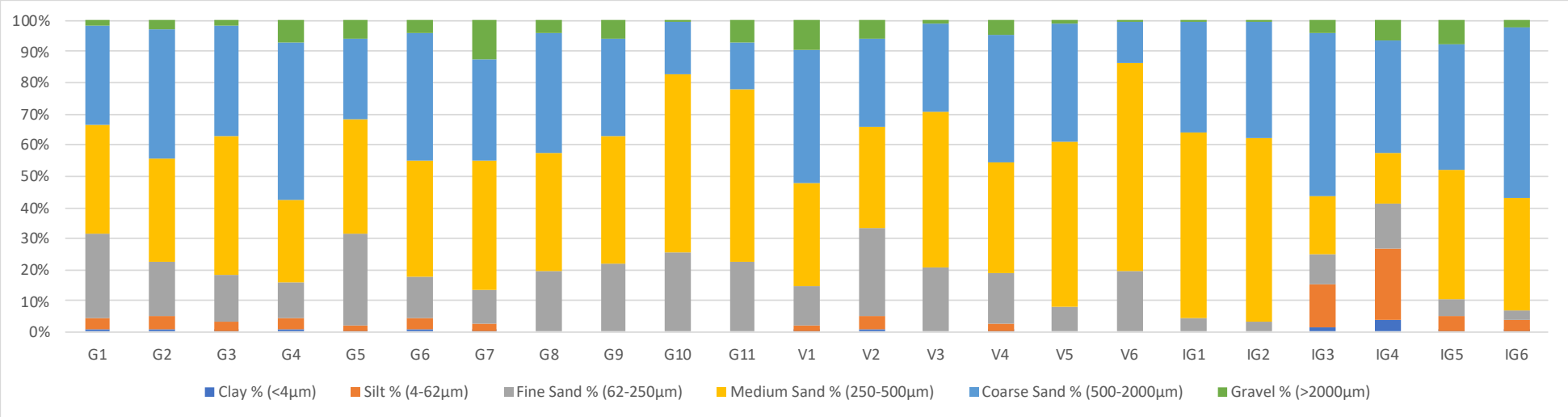


Figure 4 Particle Size Distribution analysis results.

4.3. Total Organic Carbon

The TOC ranged from 0.02 % at 17 of the 23 sites up to 0.04 % (IG3, IG4 and T1-A). These results are comparable to background quality of the marine sediments of the Pilbara coast including Onslow and Dampier (DEC 2006). TOC results are included in Appendix C.

4.4. Metals

Table 5 shows all metal concentrations in sediment were below their respective DGVs as per ANZG (2018). The 95% Upper Confidence Limit (UCL) for all metals were calculated for all sites and were also recorded below the ISQG-High. Results were uniform across all sites and no areas of contamination were identified. Site G7 has an arsenic value of 20 mg/kg matching the DGV and marginally above the background DEC (2006) value of 18mg/kg. Mean background levels recorded in Pilbara sediments (DEC 2006) are included for comparison purposes. It should be noted that the laboratory LoR for silver, cadmium and mercury were above the DEC (2006) mean background levels, and as such accurate comparison cannot be achieved for these parameters. All metal results were well below the DEC (2010) HIL (level F) for commercial/industrial purposes.

Table 5 Total metal concentrations in sediment samples

Analyte	Metals											
	Silver	Aluminium	Arsenic	Cadmium	Chromium	Copper	Lead	Manganese	Mercury	Nickel	Antimony	Zinc
Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Laboratory LoR	*1#*	*1*	*5*	*0.1*	*1*	*1*	*1*	*1*	*0.02*	*1*	*2#*	*1*
DGV (ANZG 2018))	*1*	*6300**	*20*	*1.5*	*80*	*65*	*50*	*N/A*	*0.15*	*21*	*2*	*200*
ISQG – High (ANZG 2018)	*4*	*N/A*	*70*	*10*	*370*	*270*	*220*	*N/A*	*1*	*52*	*25*	*410*
DEC (2006)	*<0.2*	*3150*	*18*	*<0.06*	*17*	*2.2*	*2*	*N/A*	*<0.01*	*5.5*	*N/A*	*5.4*
HIL (DEC 2010)	*NA*	*NA*	*3000*	*900*	*3600*	*240000*	*1500*	*60000*	*730*	*6000*	*NA*	*400000*
G1	<1	1,200	15	<0.1	11	1	1	78	<0.02	2	<2	2
G2	<1	1,100	14	<0.1	9	<1	1	78	<0.02	2	<2	2
G3	<1	1,200	14	<0.1	9	<1	1	87	<0.02	3	<2	3
G4	<1	1,200	15	<0.1	8	<1	1	93	<0.02	2	<2	2
G5	<1	1,000	15	<0.1	9	<1	<1	86	<0.02	2	<2	2
G6	<1	1,100	14	<0.1	8	1	1	90	<0.02	2	<2	2
G7	<1	1,100	20	<0.1	9	<1	<1	100	<0.02	2	<2	2
G8	<1	1,000	18	<0.1	9	<1	1	95	<0.02	2	<2	2
G9	<1	990	18	<0.1	9	<1	1	93	<0.02	2	<2	2
G10	<1	1,100	15	<0.1	11	<1	1	79	<0.02	2	<2	2
G11	<1	1,100	16	<0.1	12	<1	1	87	<0.02	2	<2	2

Metals												
Analyte	Silver	Aluminium	Arsenic	Cadmium	Chromium	Copper	Lead	Manganese	Mercury	Nickel	Antimony	Zinc
V1	<1	1,100	15	<0.1	9	<1	1	86	<0.02	2	<2	2
V2	<1	1,600	16	<0.1	11	<1	1	98	<0.02	3	<2	3
V3	<1	980	18	<0.1	9	<1	1	100	<0.02	2	<2	2
V4	<1	970	15	<0.1	8	<1	<1	82	<0.02	2	<2	2
V5	<1	960	15	<0.1	9	<1	1	110	<0.02	2	<2	2
V6	<1	1,100	16	<0.1	12	<1	1	80	<0.02	2	<2	2
IG1	<1	1,000	16	<0.1	11	<1	<1	98	<0.02	2	<2	2
IG2	<1	900	14	<0.1	9	<1	<1	96	<0.02	1	<2	1
IG3	<1	1,400	11	<0.1	8	1	1	96	<0.02	3	<2	3
IG4	<1	2,000	13	<0.1	11	1	2	110	<0.02	4	<2	4
IG5	<1	1,500	12	<0.1	10	<1	1	96	<0.02	3	<2	3
IG6	<1	1,000	15	<0.1	9	<1	1	110	<0.02	2	<2	2
Mean	0.5	1143	15.6	0.05	9.6	1.1	0.9	88.9	0.01	2.13	1	2.16
95% UCL	0.5	1247	15.93	0.05	10.02	0.65	1.04	96.07	0.01	2.43	1	2.43

[#] Laboratory LoRs for these analytes are above the prescribed NADG (2009) PQL values and should be considered when assessing these results.

* Derived from natural background conditions “Pilbara Coastal Sediments” (DEC 2006) and multiplied by a scale factor of 2 as per recommendations in ANZECC

N/A=No guideline available in NAGD, 2009.

4.5. Hydrocarbons and TBT

All results for TRH, BTEXN, Polycyclic Aromatic Hydrocarbons (PAH), Monobutyltin, Dibutyltin and Tributyltin were below the laboratories LoR and HIL guideline values (see Appendix D). This indicates very little to no hydrocarbon contamination was recorded. BTENX results displayed similar results to that of DEC Background quality of the marine sediments of the Pilbara coast (DEC, 2006). As all results were below the LoR, normalisation to TOC was not required.

4.6. Acid Sulfate Soil

4.6.1. Assessment Guideline

Potential Acid Sulfate Soils (PASS) in sediment was assessed assuming a disturbance greater than 1000 tonnes of sediment. The representative action criteria adopted for the assessment is shown in Table 6.

Table 6 Texture base action criteria for PASS (Ahern *et al.* 1998)

		Net Acidity Action Criteria			
		1-1000 t		>1000 t	
Texture range	*Clay Content (%)*	*%S*	*Mole H+/t*	*%S*	*Mole H+/t*
Coarse Texture (Sand to loamy sands)	<5%	0.03	18.7	0.03	18.7
Medium Texture (sandy loams to light clays)	5-40%	0.06	37.4	0.03	18.7
Fine Texture (medium to heavy clays and silty clays)	>40%	0.1	64.8	0.03	18.7

4.6.2. Field Screening Test (Laboratory)

The screening acidity (pHF) of the samples ranged from 7.7 to 8.4, which are typical of marine sediments and did not indicate the presence of any Actual Acid Sulfate Soils (AASS). The oxidised screening test (pHFOX) ranged from 6.5 to 6.8. The maximum change between pHF and pHFOX was 1.8 at the site IG6. No sites showed an 'Extreme' reaction to oxidation with 30% peroxide. As there was no ASS detected in the field screening test, there was no need to undertake further investigation for ASS (Chromium suites or Suspension Peroxide OPxidation Combined Acidity and Sulfur (SPOCAS)). A data summary is provided in (Table 7).

Table 7 Potential Acid sulfate soils field screening results (U= no identified PASS)

Site	pH (F)	pH (Fox)	ΔpH	Reaction Rate	PASS
G1	8.1	6.6	1.5	2	U
G2	7.8	6.7	1.1	2	U
G3	7.8	6.7	1.1	2	U
G4	7.7	6.7	1	2	U
G5	8	6.7	1.3	2	U
G6	8	6.7	1.3	2	U
G7	7.8	6.7	1.1	2	U
G8	8	6.8	1.2	2	U
G9	8.2	6.6	1.6	2	U
G10	8	6.7	1.3	2	U
G11	8.1	6.7	1.4	2	U
V1	7.7	6.7	1	2	U
V2	8	6.6	1.4	2	U
V3	7.7	6.7	1	2	U
V4	7.8	6.8	1	2	U
V5	8.1	6.7	1.4	2	U
V6	7.8	6.7	1.1	2	U
IG1	8	6.8	1.2	2	U
IG2	7.9	6.7	1.2	2	U
IG3	7.9	6.6	1.3	2	U
IG4	7.9	6.5	1.4	2	U
IG5	8	6.6	1.4	2	U
IG6	8.4	6.6	1.8	2	U
Mean	7.94	6.68	1.27	-	-
95% UCL	8.19	6.8	1.59	-	-

4.6.3. Benthic Infauna

Benthic infauna sampling and analysis was carried out on samples collected at six (6) locations within zone F (nearest to the mainland). A total of 267 individuals from 14 morphological species were identified by Benthic Australia. The three most common taxa across all sites were Polychaeta Cirratulidae (n = 34), Ostracoda (n = 32) and Tanaidacea Pseudozeuxoidae (n = 26). Polychaeta was the most diverse class in terms of the number of morphological species identified (16). Sample location IG5 recorded the highest number of taxa per sample (n= 70), with a total number of 27, with IG2 recording the lowest number of taxa (n=16). QA/QC on laboratory infauna count methods found 0% picking error. A summary of benthic infauna counts are included in Appendix E.

The distribution and abundance of benthic infauna taxa across the six sample locations is heterogeneous, and there was no observable difference in species richness, diversity or composition identified across sites

4.7. Offshore Spoil Disposal Ground

Five sediment samples were successfully collected at the offshore spoil disposal ground on the 21st March 2023, at the locations listed below in Table 8. All laboratory reports are included in Appendix C.

Table 8 Field sample summary at offshore spoil disposal ground

Site ID	Coordinates		Collection Method	Sampling outcome (✓ indicates 'collected')
NG1	-20.666521°	116.272782°	Petite Ponar Grab	✓
NG2	-20.672833°	116.276074°	Petite Ponar Grab	✓
NG3	-20.674879°	116.270640°	Petite Ponar Grab	✓
NG4	-20.670256°	116.267081°	Petite Ponar Grab	✓
NG5	-20.671478°	116.271981°	Petite Ponar Grab	✓

4.7.1. Particle Size Distribution

The offshore spoil disposal ground sediments were found to comprised of a range of fine to coarse grained sands. NG1, NG3 and NG5 showed comparable results, dominated by fine and medium grained sand, while Ng2 and NG4 recorded a larger proportion of coarse grained sand. PSD results for each site are displayed in Figure 5.

4.7.2. Metals

All metal concentrations were below their respective DGVs as per ANZG (2018), and were comparable to the mean background levels recorded in Pilbara sediments (DEC 2006). Copper concentrations at all sites were higher than the DEC (2006) levels (but below DGV). All metal results were well below the DEC (2010) HIL (level F) for commercial/industrial purposes.

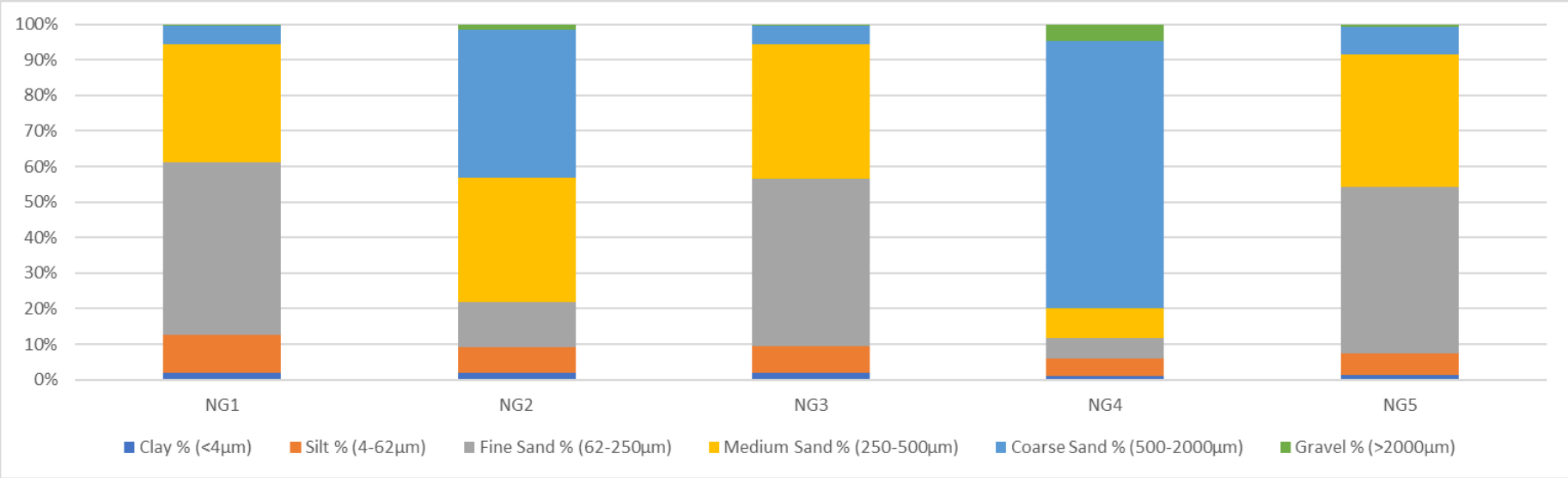


Figure 5 Particle Size Distribution analysis results for the offshore spoil disposal ground

Table 9 Total metal concentrations in sediment samples at the offshore spoil disposal ground

	Metals											
Analyte	**Silver**	**Aluminium**	**Arsenic**	**Cadmium**	**Chromium**	**Copper**	**Lead**	**Manganese**	**Mercury**	**Nickel**	**Antimony**	**Zinc**
Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Laboratory LoR	*1#*	*1*	*5*	*0.1*	*1*	*1*	*1*	*1*	*0.02*	*1*	*2#*	*1*
DGV (ANZG 2018))	*1*	*6300**	*20*	*1.5*	*80*	*65*	*50*	*N/A*	*0.15*	*21*	*2*	*200*
ISQG – High (ANZG	*4*	*N/A*	*70*	*10*	*370*	*270*	*220*	*N/A*	*1*	*52*	*25*	*410*
DEC (2006)	*<0.2*	*3150*	*18*	*<0.06*	*17*	*2.2*	*2*	*N/A*	*<0.01*	*5.5*	*N/A*	*5.4*
HIL (DEC 2010)	*NA*	*NA*	*3000*	*900*	*3600*	*240000*	*1500*	*60000*	*730*	*6000*	*NA*	*400000*
NG1	<1	810	7	<0.1	12	7	<1	65	0.03	2.1	<2	2.4
NG2	<1	930	15	<0.1	16	8.9	<1	99	0.03	2.4	<2	2.6
NG3	<1	880	8.7	<0.1	14	8.6	<1	83	0.02	2.3	<2	2.5
NG4	<1	950	16	<0.1	14	8.4	<1	110	0.02	2.3	<2	2.6
NG5	<1	860	7	<0.1	12	8	<1	77	0.02	2.4	<2	2.5

4.8. Hydrocarbons and TBT

All results for TRH, BTEXN, Polycyclic Aromatic Hydrocarbons (PAH), Monobutyltin, Dibutyltin and Tributyltin were below the laboratories LoR and HIL guideline values (see Appendix C). This indicates very little to no hydrocarbon contamination was recorded. BTENX results displayed similar results to that of DEC Background quality of the marine sediments of the Pilbara coast (DEC, 2006).

5. Quality Assurance/Quality Control

The field sampling methods and sediment variability results produced acceptable RPD (+/-35%) and RSD (+/-50%) results in accordance with the requirements of NAGD (2009). One exception was the RPD value for lead (67%) when comparing G7 to T2-A and V1 to T3-A. In this instance, one of the samples was below the LoR, resulting in the RSD being calculated by using half LoR value. This method can often result in misleading RPD results. No TRH & BTEXN, PAH, or organotin values exceeded the RPD of 35%

To test intra site variability, two of the three triplicate samples were analysed and compared (with the lab holding the third). The third sample was to be tested in the event samples showed an elevated degree of variability (i.e. RPD > 35%). RPD results indicate that all but one analyte (as discussed above) recorded an RPD > 35%. Overall, the vast majority of results indicate low variability, and as such it was determined that the third triplicate sample was not required to be tested.

The Internal laboratory QA/QC report (Appendix C) indicates that all duplicate analysis, blank analysis and matrix spikes, recorded results within acceptable limit percentages. The secondary lab samples were inadvertently tested by the primary lab, which mean interlaboratory QA/QC split samples was not sufficiently tested. However, based on the primary results (with widespread values below LoR) and the comparison to previous investigations, O2 Marine have confidence in the results of the primary laboratory.

Field QA/QC results are tabulated in Appendix F.

6. Discussion

A detailed site investigation of sediments from within the proposed Eramurra dredge area, and the proposed offshore spoil disposal ground were undertaken in November 2020 and March 2023 respectively. All sites returned adequate sample volumes and were observed as brown fine to coarse grained sand with shell grit. Within the dredge footprint, vibracore refusal was encountered within the first horizon for each of the six vibracore sites. As a result, analysis to full dredge depth was not undertaken.

For both the dredge footprint offshore spoil disposal ground, all metal results (including the calculated 95% UCLs) recorded concentrations below the DGV (ANZG 2018) and HILs (DEC 2010). The majority of metal concentrations were below the background levels as stated in DEC (2006). Arsenic concentrations within the dredge footprint recorded comparable concentrations (and one instance above the background level of 18mg/kg (G7 – 20mg/kg)). Copper results within the offshore spoil disposal ground were above the background (Dec (2006) levels at all sites, but below relevant DGVs. In general metal results indicate the frequency of adverse effects resulting from disturbing these sediments is expected to be very low (DEC 2010).

All results for TRH, PAH and organotins were below the laboratory LoRs as well as the available screening levels (ANZG 2018) and HILs (DEC 2010). This indicates no contamination was present and is consistent with previous investigations (SKM 2013b and DEC 2006).

All dredge footprint samples collected were assessed for PASS using the laboratory field screening test, however, as no reactions were recorded, further chromium sulfur suite tests in the laboratory were not necessary. The pH values recorded during screening tests from all samples were within the expected values for marine sediments (pH 8.2) except site IG6 with a value of 8.4. There was no presence of ASS. It should be noted that the sample collection method did not test to the final dredge depth. As such, in regard to PASS, a definitive conclusion on the presence of PASS to full dredge depth cannot be concluded form these results. Further studies would likely be required to confirm and inform potential management strategies for PASS where required.

Benthic infauna analysis within the dredge footprint found heterogeneous distribution of taxa across the six sampled locations (IG1 – IG6). The results did not identify any significant ecological importance and were generally comparable to similar infauna studies undertaken for the Mardie Project (O2 Marine 2019).

A review of the laboratory and field QA/QC outputs identified lead was the only analyte that exceeded an RPD value of 35%. All remaining laboratory RPD values were below 35%.

Overall, results indicate that the twenty-three (23) sample locations sampled in November 2020 along the proposed dredge footprint comprises surface sediments that were uncontaminated. Deeper sediments could not be analysed due to coring refusal, however when considering the lack of anthropogenic impacts, and the results of previous coring studies in the study area (SKM 2013b), it is likely that deeper sediments are also uncontaminated and are environmentally acceptable for offshore disposal. Sediments within the proposed offshore spoil disposal ground were also found to be uncontaminated and have largely comparable characteristics as sediments within the dredge footprint.

7. References

Ahern, C. R., Ahern M. R., and Powell, B., 1998, Guidelines for sampling and analysis of Lowland Acid Sulfate Soils (ASS) in Queensland 1998: QASSIT, Department of Natural Resources, Resource Sciences Centre, Indooroopilly, Qld

ANZECC & ARMCANZ (2000). Australian and New Zealand Guidelines for Fresh and Marine Water Quality. Volume 1- the Guidelines (Chapters 1 – 7). Australian and New Zealand Environment and Conservation Council, Agriculture and Resource Management Council of Australia and New Zealand.

ANZG (2018). Australian and New Zealand Guidelines for Fresh and Marine Water Quality, Australian and New Zealand Governments and Australian state and territory Governments, Canberra ACT, Australia. Available at www.waterquality.gov.au/anz-guidelines Chevron (2010). Draft Environmental Impact Statement/Environmental Review and Management Programme for the Proposed Wheatstone Project. Volume 1 (Chapters 1 to 6).

Chevron (2010). Draft Environmental Impact Statement/Environmental Review and Management Programme for the Proposed Wheatstone Project. Technical Appendices N1 and N2.

DEC (2006). Background quality of the marine sediments of the Pilbara coast. Marine Technical Report Series.

DEC (2010). Contaminated Sites Management Series. Assessment levels for Soil, Sediment and Water. Version 4, revision 1.

DER (2015). Identification and investigation of acid sulfate soils and acidic landscapes. Department of Environmental Regulation, Government of Western Australia

Fandry, C., Revill. A, Wenziker. K, McAlpine. K, Apte. S, Masini and Hillman. K (2006). Contaminants on Australia's North West Shelf: sources, impacts, pathways and effects. Technical Report No. 13

NAGD (2009). National Assessment Guidelines for Dredging. Department of the Environment, Water, Heritage and the Arts, Commonwealth of Australia

NEPM (2013). National Environment Protection (Assessment of Site Contamination) Measure. National Environment Protection Council.

O2 Marine (2019). Mardie Project. Sediment Quality Assessment Report. Report number R190033. Fremantle Western Australia.

O2 Marine (2021a). Sediment Sampling and Analysis Plan for Eramurra; Report Number R210014

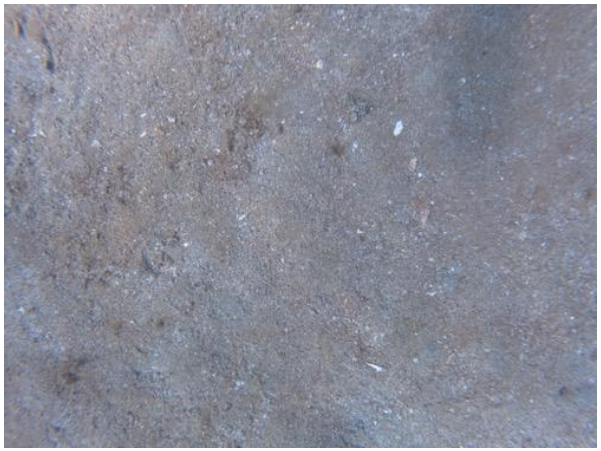
O2 Marine (2021b). Subtidal Benthic Communities and Habitat Assessment Report. Eramurra Solar Salt Project. Draft A. Fremantle, Western Australia.

SKM (2013a). Buckland Project. Preliminary Surficial Sediment Sampling and Analysis. Rev 0. Perth Western Australia.

SKM (2013b). Iron Ore Holdings – Buckland Project. Marine Geotechnical Investigation – Factual Report. WV04717. Perth, Western Australia.

US EPA (2009). United States Environmental Protection Agency Regions 3, 6 and 9. Regional Screening Levels for Chemical Contaminants at Superfund Sites (RSLs). http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/index.htm.

Appendix A. Field Notes and site photos

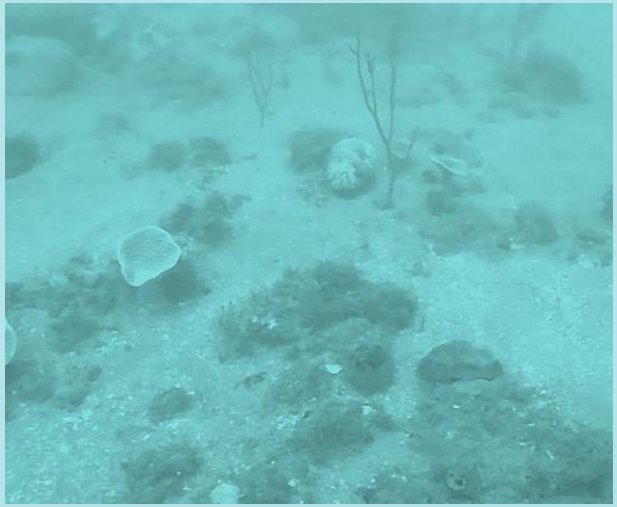
Site	QA/QC	Sediment type	odour	colour	Shell (Y/N)	Comments	Photo ID
G3	-	coarse sand	no	brown	Y	shallow sand veneer over hard substrate	

Site	QA/QC	Sediment type	odour	colour	Shell (Y/N)	Comments	Photo ID
G2	-	coarse sand	no	brown	Y	Sand with sparse seagrass halophila	

Site	QA/QC	Sediment type	odour	colour	Shell (Y/N)	Comments	Photo ID
G1	-	coarse sand	no	brown	Y	sand with sparse seagrass halophila/cymodocea	

Site	QA/QC	Sediment type	odour	colour	Shell (Y/N)	Comments	Photo ID
G4	Triplicate - T1A, T1B	coarse sand	no	brown	Y	Sand with coral patches	

Site	QA/QC	Sediment type	odour	colour	Shell (Y/N)	Comments	Photo ID
G5	-	coarse sand	no	brown	Y	sand with sparse seagrass halophila	

Site	QA/QC	Sediment type	odour	colour	Shell (Y/N)	Comments	Photo ID
G6	-	coarse sand	no	brown	Y	Low profile reef with dense macroalgae	

Site	QA/QC	Sediment type	odour	colour	Shell (Y/N)	Comments	Photo ID
G7	Triplicate - T2A, T2B	coarse sand	no	brown	Y	Sand with very sparse coral	

Site	QA/QC	Sediment type	odour	colour	Shell (Y/N)	Comments	Photo ID
G8	Trip Split - S1A, S1B	coarse sand	no	brown	Y	Sand	

Site	QA/QC	Sediment type	odour	colour	Shell (Y/N)	Comments	Photo ID
G9	-	coarse sand	no	brown	Y	Sand with sparse H. spinulosa. Probe - 20-40cm	
G10	-	coarse sand	no	brown	Y	Sand. Probe - 50-100cm	

Site	QA/QC	Sediment type	odour	colour	Shell (Y/N)	Comments	Photo ID
G11	Trip Split - S2A, S2B	coarse sand	no	brown	Y	Sand	

Site	QA/QC	Sediment type	odour	colour	Shell (Y/N)	Comments	Photo ID
IG1	-	coarse sand	no	brown	Y	Sand	

Site	QA/QC	Sediment type	odour	colour	Shell (Y/N)	Comments	Photo ID
IG2	-	coarse sand	no	brown	Y	Sand, macroalgae with H. spinulosa	

Site	QA/QC	Sediment type	odour	colour	Shell (Y/N)	Comments	Photo ID
IG3	-	coarse sand	no	brown	Y	Sand, macroalgae with H. spinulosa	

Site	QA/QC	Sediment type	odour	colour	Shell (Y/N)	Comments	Photo ID
IG4	-	coarse sand	no	brown	Y	Sand, macroalgae with H. spinulosa	

Site	QA/QC	Sediment type	odour	colour	Shell (Y/N)	Comments	Photo ID
IG6	-	coarse sand	no	brown	Y	Sand, macroalgae with H. spinulosa	
V1	Triplicate - T3A, T3B	coarse sand	no	brown	Y	20-40cm - coarse shell grit with sand and sparse seagrass.	

Site	QA/QC	Sediment type	odour	colour	Shell (Y/N)	Comments	Photo ID
V2	-	coarse sand	no	brown	Y	10cm penetration - sand overlaying limestone cement, patchy seagrass	
V3	-	coarse sand	no	brown	Y	10cm penetration - shells on surface with underline cemented shell limestone layer, patchy seagrass	

Site	QA/QC	Sediment type	odour	colour	Shell (Y/N)	Comments	Photo ID
V4	-	coarse sand	no	brown	Y	10cm penetration - shells on surface with underline cemented shell limestone layer, patchy seagrass	
V5		coarse sand	no	brown	Y	10-25cm penetration	

Site	QA/QC	Sediment type	odour	colour	Shell (Y/N)	Comments	Photo ID
V6		coarse sand	no	brown	Y	10cm penetration. Sand surface with underline shell/coral rubble layer or rock	

Site	QA/QC	Sediment type	odour	colour	Shell (Y/N)	Comments	Photo ID
Offshore Spoil Disposal Ground							
NG1		Fine/medium sand	no	brown			
NG2		Medium/coarse sand	no	brown			

Site	QA/QC	Sediment type	odour	colour	Shell (Y/N)	Comments	Photo ID
NG3	Duplicates and triplicates	Fine/medium sand	no	brown			
NG4		Coarse sand	no	brown			

Site	QA/QC	Sediment type	odour	colour	Shell (Y/N)	Comments	Photo ID
Ng5		Fine/medium sand	no	brown			

Appendix B. Chain of Custody

O2 MARINE Chain of Custody (CoC) Record

Project:	Eramurra Salt Project - Monthly WQ Sampling	**Laboratory:**	ARL
		Address:	46-48 Banksia Road, Welshpool, 6106
Client:	Leichhardt	**Job No.:**	19WAU-0027_11
		Lab. Contact:	
Lab Quote No.:		**Turnaround Time:**	
O2M Project Manager (Ph. Number):	Josh Abbott 0477039 996	**Email Address:**	josh.abbott@o2marine.com.au

Please Note:
Please sign copy on receipt of samples and email signed copy of CoC record to O2M Project Manager.

Email laboratory analysis results to O2M Project Manager.

Sediment

O2M Sample ID	Laboratory Sample ID	Date	Time	Sample Matrix (S-Soil / SL-Sludge / W-Water / A-Air)	Container Type (B-Bottle / J-Jar / V-Vial / G-Glass / P-Plastic)	Container Preservative (Unpreserved / HCL / H_2SO_4 / HNO_3 / Other)	No. of Samples	Total Volume (mL)	Analyses: Metals (Ag, Al, As, Cd, Cr, Cu, Pb, Mn, Hg, Ni, Sb, Zn)	Analyses: PAH, TRH & BTEXEN	Analyses: Organics	Analyses: PSD	Analyses: TOC	Analyses: Moisture	Analyses: ASS Field Test	Comments
G1	20-21316.1	25/11/20		S	GJ	U	2		x	x	x	x	x	x	x	All samples are marine sediments
G2	-2	25/11/20		S	GJ	U	2		x	x		x	x	x	x	
G3	-3	25/11/20		S	GJ	U	2		x	x	x	x	x	x	x	
G4	-4	25/11/20		S	GJ	U	2		x	x		x	x	x	x	
G5	-5	25/11/20		S	GJ	U	2		x	x		x	x	x	x	
G6	-6	25/11/20		S	GJ	U	2		x	x	x	x	x	x	x	
G7	-7	25/11/20		S	GJ	U	2		x	x	x	x	x	x	x	
G8	-8	25/11/20		S	GJ	U	2		x	x		x	x	x	x	
G9	-9	25/11/20		S	GJ	U	2		x	x	x	x	x	x	x	
G10	-10	25/11/20		S	GJ	U	2		x	x	x	x	x	x	x	
G11	-11	25/11/20		S	GJ	U	2		x	x	x	x	x	x	x	
V1	-12	25/11/20		S	GJ	U	2		x	x	x	x	x	x	x	
V2	-13	25/11/20		S	GJ	U	2		x	x	x	x	x	x	x	
V3	-14	25/11/20		S	GJ	U	2		x	x	x	x	x	x	x	
V4	-15	25/11/20		S	GJ	U	2		x	x	x	x	x	x	x	
V5	-16	25/11/20		S	GJ	U	2		x	x	x	x	x	x	x	
V6	-17	25/11/20		S	GJ	U	2		x	x	x	x	x	x	x	
IG 1	-18	25/11/20		S	GJ	U	2		x	x	x	x	x	x	x	
IG 2	-19	25/11/20		S	GJ	U	2		x	x	x	x	x	x	x	
IG 3	-20	25/11/20		S	GJ	U	2		x	x	x	x	x	x	x	
IG 4	-21	25/11/20		S	GJ	U	2		x	x	x	x	x	x	x	
IG 5	-22	25/11/20		S	GJ	U	2		x	x	x	x	x	x	x	
IG 6	-23	25/11/20		S	GJ	U	2		x	x	x	x	x	x	x	
S1-A	-24	25/11/20		S	GJ	U	2		x	x		x	x			
S2-A	-25	25/11/20		S	GJ	U	2		x	x		x	x			
T1-A	-26	23/11/20		S	GJ	U	2		x	x		x	x			
T1-B	-27	24/11/20		S	GJ	U	2									HOLD For 3 Months
T2-A	-28	25/11/20		S	GJ	U	2		x	x		x	x			
T2-B	-29	26/11/20		S	GJ	U	2									HOLD For 3 Months
T3-A	-30	26/11/20		S	GJ	U	2		x	x	x	x	x			
T3-B	-31	26/11/20		S	GJ	U	2									HOLD For 3 Months
Field Blank	-32	N/A		S	GJ	U	2			x	x					Laboratory Blank Sand

Sampled By:	G. Lane	**Date/Time:**	25/11/2020	**Relinquished By:**	Ryan Seale
Received By Lab:		**Date/Time:**		**Courier:**	**Date/Time:** 01/12/20
Sample Cold (Yes/No):		**Sample Container Sealed (Yes/No):**			

O2 MARINE Chain of Custody (CoC) Record

Project:	Eramurra Salt Project - Sediment Sampling		
Client:	Leichhardt	**Job No.:**	19WAU-0027
Lab Quote No.:		**Turnaround Time:**	
O2M Project Manager (Ph. Number):	Josh Abbott 0477039 996	**Email Address:**	josh.abbott@o2marine.com.au

Laboratory:	ARL
Address:	46-48 Banksia Road, Welshpool, 6106
Lab. Contact:	

Please Note:
Please sign copy on receipt of samples and email signed copy of CoC record to O2M Project Manager.

Email laboratory analysis results to O2M Project Manager.

Sediment

O2M Sample ID	Laboratory Sample ID	Date	Time	Container: Sample Matrix (S-Soil / SL-Sludge / W-Water / A-Air)	Container: Type (B-Bottle / J-Jar / V-Vial / G-Glass / P-Plastic)	Container: Preservative (Unpreserved / HCL / H_2SO^4 / HNO_3 / Other)	Container: No. of Samples	Container: Total Volume (mL)	Analyses: Metals (Ag, Al, As, Cd, Cr, Cu, Pb, Mn, Hg, Ni, Sb, Zn)	Analyses: PAH, TRH & BTEXEN	Analyses: Organics - Organochlorine Pesticides	Analyses: PSD	Analyses: TOC	Analyses: Moisture	Analyses: Acidic Herbicides	Comments
NG1		21/03/23		S	BP	NA	3		x	x	x	x	x	x	x	
NG2		"		S	"	"	3					x				
NG3		"		S	"	"	3					x				
NG4		"		S	"	"	3					x				
NG5		"		S	"	"	3					x				
NG1-T1		"		S	G	NA	2									
NG1-T2		"		S	G	NA	2									
NG5_DUPE		"		S	G	NA	2									

Sampled By:		**Date/Time:**	21/03/21
Received By Lab:		**Date/Time:**	28/03/21 13:45
Sample Cold (Yes/No):		**Sample Container Sealed (Yes/No):**	

Hayley @ 7.4°C

Relinquished By:		**Date/Time:**	28/03/23
Courier:	-12°C		

976075

Appendix C. Laboratory Results and QAQC Reports

ARL Group
Proudly Western Australian

LABORATORY REPORT

Job Number: 20-21316
Revision: 00
Date: 13 January 2021

ADDRESS: **O2 Marine**
Suite 2, 4B Mews Rd
Fremantle WA 6160

ATTENTION: Josh Abbott

DATE RECEIVED: 1/12/2020

YOUR REFERENCE: 19WAU-0027_11 - Eramurra Salt Project - Monthly WQ Sampling

PURCHASE ORDER:

APPROVALS:

Paul Nottle
Organics Manager

Leigh Bermingham
Applications Chemist

Sean Sangster
Inorganics Supervisor

DouglasTodd
Laboratory Manager

REPORT COMMENTS:

This report is issued by Analytical Reference Laboratory (WA) Pty Ltd. The report shall not be reproduced except in full without written approval from the laboratory.

Samples are analysed on an as received basis unless otherwise noted.

Organotins analysis subcontracted to MPL, NATA Accred No. 2901, Report Number 254212
Metals and TOC in soils analysis was conducted on a dry weight basis.
Rates of Reaction are determined by visual observation and are based on
Acid Sulphate Soils Laboratory Methods Guidelines: Section H - Table H1.1

RATES OF REACTION
Slight Reaction = X
Moderate Reaction = XX
Vigorous Reaction = XXX
Very Vigorous Reaction = XXXX

METHOD REFERENCES:

Methods prefixed with "ARL" are covered under NATA Accreditation Number: 2377
Methods prefixed with "PM" are covered under NATA Accreditation Number: 2561
Methods prefixed with "EDP" are covered under NATA Accreditation Number: 19290

Method ID	Method Description
ARL No. 192	Total Recoverable Hydrocarbons (C_6-C_{10}) in Soil
ARL No. 193	Total Recoverable Hydrocarbons (>C_{10}-C_{40}) in Soil
ARL No. 006	Polycyclic Aromatic Hydrocarbons in Soil
ARL No. 030	Metals in Soil and Sediment by AAS
ARL No. 401/403	Metals in Soil and Sediment by ICPOES/MS
ARL No. 406	Mercury by Cold Vapour Atomic Absorption Spectrophotometry
ARL No. 064	Total Organic Carbon in Sediment
ARL No. 208	"Field" pH measurements
23A and 23B	QASSIT et al Method Code

NATA
WORLD RECOGNISED ACCREDITATION
Accredited for compliance with ISO/IEC 17025 - Testing

O2 Marine
Job No: 20-21316

LABORATORY REPORT
Revision: 00

Date: 13/01/21

TRH (C_6-C_{40}) in Soil		Sample No	20-21316-1	20-21316-2	20-21316-3	20-21316-4	20-21316-5
		Sample Description	G1	G2	G3	G4	G5
		Sample Date	25/11/2020	25/11/2020	25/11/2020	25/11/2020	25/11/2020
ANALYTE	LOR	Units	Result	Result	Result	Result	Result
Benzene	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Toluene	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethylbenzene	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Xylenes (Total)	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Naphthalene	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
TRH C_{6-10}	2	mg/kg	<2	<2	<2	<2	<2
TRH C_{6-10} minus BTEX (F1)	2	mg/kg	<2	<2	<2	<2	<2
TRH $C_{>10-16}$	20	mg/kg	<20	<20	<20	<20	<20
TRH $C_{>10-16}$ minus Naphthalene (F2)	20	mg/kg	<20	<20	<20	<20	<20
TRH $C_{>16-34}$	50	mg/kg	<50	<50	<50	<50	<50
TRH $C_{>34-40}$	50	mg/kg	<50	<50	<50	<50	<50

TRH (C_6-C_{40}) in Soil		Sample No	20-21316-6	20-21316-7	20-21316-8	20-21316-9	20-21316-10
		Sample Description	G6	G7	G8	G9	G10
		Sample Date	25/11/2020	25/11/2020	25/11/2020	25/11/2020	25/11/2020
ANALYTE	LOR	Units	Result	Result	Result	Result	Result
Benzene	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Toluene	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethylbenzene	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Xylenes (Total)	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Naphthalene	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
TRH C_{6-10}	2	mg/kg	<2	<2	<2	<2	<2
TRH C_{6-10} minus BTEX (F1)	2	mg/kg	<2	<2	<2	<2	<2
TRH $C_{>10-16}$	20	mg/kg	<20	<20	<20	<20	<20
TRH $C_{>10-16}$ minus Naphthalene (F2)	20	mg/kg	<20	<20	<20	<20	<20
TRH $C_{>16-34}$	50	mg/kg	<50	<50	<50	<50	<50
TRH $C_{>34-40}$	50	mg/kg	<50	<50	<50	<50	<50

TRH (C_6-C_{40}) in Soil		Sample No	20-21316-11	20-21316-12	20-21316-13	20-21316-14	20-21316-15
		Sample Description	G11	V1	V2	V3	V4
		Sample Date	25/11/2020	25/11/2020	25/11/2020	25/11/2020	25/11/2020
ANALYTE	LOR	Units	Result	Result	Result	Result	Result
Benzene	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Toluene	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethylbenzene	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Xylenes (Total)	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Naphthalene	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
TRH C_{6-10}	2	mg/kg	<2	<2	<2	<2	<2
TRH C_{6-10} minus BTEX (F1)	2	mg/kg	<2	<2	<2	<2	<2
TRH $C_{>10-16}$	20	mg/kg	<20	<20	<20	<20	<20
TRH $C_{>10-16}$ minus Naphthalene (F2)	20	mg/kg	<20	<20	<20	<20	<20
TRH $C_{>16-34}$	50	mg/kg	<50	<50	<50	<50	<50
TRH $C_{>34-40}$	50	mg/kg	<50	<50	<50	<50	<50

O2 Marine
Job No: 20-21316

LABORATORY REPORT
Revision: 00

Date: 13/01/21

TRH (C_6-C_{40}) in Soil	Sample No	20-21316-16	20-21316-17	20-21316-18	20-21316-19	20-21316-20
	Sample Description	V5	V6	IG 1	IG 2	IG 3
	Sample Date	25/11/2020	25/11/2020	25/11/2020	25/11/2020	25/11/2020
ANALYTE	LOR / Units	Result	Result	Result	Result	Result
Benzene	0.1 mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Toluene	0.1 mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethylbenzene	0.1 mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Xylenes (Total)	0.2 mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Naphthalene	0.5 mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
TRH C_{6-10}	2 mg/kg	<2	<2	<2	<2	<2
TRH C_{6-10} minus BTEX (F1)	2 mg/kg	<2	<2	<2	<2	<2
TRH $C_{>10-16}$	20 mg/kg	<20	<20	<20	<20	<20
TRH $C_{>10-16}$ minus Naphthalene (F2)	20 mg/kg	<20	<20	<20	<20	<20
TRH $C_{>16-34}$	50 mg/kg	<50	<50	<50	<50	<50
TRH $C_{>34-40}$	50 mg/kg	<50	<50	<50	<50	<50

TRH (C_6-C_{40}) in Soil	Sample No	20-21316-21	20-21316-22	20-21316-23	20-21316-24	20-21316-25
	Sample Description	IG 4	IG 5	IG 6	S1-A	S2-A
	Sample Date	25/11/2020	25/11/2020	25/11/2020	25/11/2020	25/11/2020
ANALYTE	LOR / Units	Result	Result	Result	Result	Result
Benzene	0.1 mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Toluene	0.1 mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethylbenzene	0.1 mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Xylenes (Total)	0.2 mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Naphthalene	0.5 mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
TRH C_{6-10}	2 mg/kg	<2	<2	<2	<2	<2
TRH C_{6-10} minus BTEX (F1)	2 mg/kg	<2	<2	<2	<2	<2
TRH $C_{>10-16}$	20 mg/kg	<20	<20	<20	<20	<20
TRH $C_{>10-16}$ minus Naphthalene (F2)	20 mg/kg	<20	<20	<20	<20	<20
TRH $C_{>16-34}$	50 mg/kg	<50	<50	<50	<50	<50
TRH $C_{>34-40}$	50 mg/kg	<50	<50	<50	<50	<50

TRH (C_6-C_{40}) in Soil	Sample No	20-21316-26	20-21316-28	20-21316-30	20-21316-32
	Sample Description	T1-A	T2-A	T3-A	Field Blank
	Sample Date	23/11/2020	25/11/2020	26/11/2020	25/11/2020
ANALYTE	LOR / Units	Result	Result	Result	Result
Benzene	0.1 mg/kg	<0.1	<0.1	<0.1	<0.1
Toluene	0.1 mg/kg	<0.1	<0.1	<0.1	<0.1
Ethylbenzene	0.1 mg/kg	<0.1	<0.1	<0.1	<0.1
Xylenes (Total)	0.2 mg/kg	<0.2	<0.2	<0.2	<0.2
Naphthalene	0.5 mg/kg	<0.5	<0.5	<0.5	<0.5
TRH C_{6-10}	2 mg/kg	<2	<2	<2	<2
TRH C_{6-10} minus BTEX (F1)	2 mg/kg	<2	<2	<2	<2
TRH $C_{>10-16}$	20 mg/kg	<20	<20	<20	<20
TRH $C_{>10-16}$ minus Naphthalene (F2)	20 mg/kg	<20	<20	<20	<20
TRH $C_{>16-34}$	50 mg/kg	<50	<50	<50	<50
TRH $C_{>34-40}$	50 mg/kg	<50	<50	<50	<50

O2 Marine
Job No: 20-21316

LABORATORY REPORT
Revision: 00

Date: 13/01/21

PAH in Soil		Sample No	20-21316-1	20-21316-2	20-21316-3	20-21316-4	20-21316-5
		Sample Description	G1	G2	G3	G4	G5
		Sample Date	25/11/2020	25/11/2020	25/11/2020	25/11/2020	25/11/2020
ANALYTE	LOR	Units	Result	Result	Result	Result	Result
Naphthalene	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
2-Methylnaphthalene	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benz(a)anthracene	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Chrysene	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(b)fluoranthene	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(k)fluoranthene	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Indeno(1,2,3-c,d)pyrene	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Dibenz(a,h)anthracene	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(ghi)perylene	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2

PAH in Soil		Sample No	20-21316-6	20-21316-7	20-21316-8	20-21316-9	20-21316-10
		Sample Description	G6	G7	G8	G9	G10
		Sample Date	25/11/2020	25/11/2020	25/11/2020	25/11/2020	25/11/2020
ANALYTE	LOR	Units	Result	Result	Result	Result	Result
Naphthalene	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
2-Methylnaphthalene	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benz(a)anthracene	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Chrysene	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(b)fluoranthene	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(k)fluoranthene	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Indeno(1,2,3-c,d)pyrene	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Dibenz(a,h)anthracene	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(ghi)perylene	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2

PAH in Soil		Sample No	20-21316-11	20-21316-12	20-21316-13	20-21316-14	20-21316-15
		Sample Description	G11	V1	V2	V3	V4
		Sample Date	25/11/2020	25/11/2020	25/11/2020	25/11/2020	25/11/2020
ANALYTE	LOR	Units	Result	Result	Result	Result	Result
Naphthalene	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
2-Methylnaphthalene	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1

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PAH in Soil		Sample No	20-21316-11	20-21316-12	20-21316-13	20-21316-14	20-21316-15
		Sample Description	G11	V1	V2	V3	V4
		Sample Date	25/11/2020	25/11/2020	25/11/2020	25/11/2020	25/11/2020
Fluorene	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benz(a)anthracene	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Chrysene	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(b)fluoranthene	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(k)fluoranthene	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Indeno(1,2,3-c,d)pyrene	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Dibenz(a,h)anthracene	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(ghi)perylene	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2

PAH in Soil		Sample No	20-21316-16	20-21316-17	20-21316-18	20-21316-19	20-21316-20
		Sample Description	V5	V6	IG 1	IG 2	IG 3
		Sample Date	25/11/2020	25/11/2020	25/11/2020	25/11/2020	25/11/2020
ANALYTE	**LOR**	**Units**	**Result**	**Result**	**Result**	**Result**	**Result**
Naphthalene	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
2-Methylnaphthalene	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benz(a)anthracene	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Chrysene	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(b)fluoranthene	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(k)fluoranthene	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Indeno(1,2,3-c,d)pyrene	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Dibenz(a,h)anthracene	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(ghi)perylene	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2

PAH in Soil		Sample No	20-21316-21	20-21316-22	20-21316-23	20-21316-24	20-21316-25
		Sample Description	IG 4	IG 5	IG 6	S1-A	S2-A
		Sample Date	25/11/2020	25/11/2020	25/11/2020	25/11/2020	25/11/2020
ANALYTE	**LOR**	**Units**	**Result**	**Result**	**Result**	**Result**	**Result**
Naphthalene	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
2-Methylnaphthalene	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1

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PAH in Soil		Sample No	20-21316-21	20-21316-22	20-21316-23	20-21316-24	20-21316-25
		Sample Description	IG 4	IG 5	IG 6	S1-A	S2-A
		Sample Date	25/11/2020	25/11/2020	25/11/2020	25/11/2020	25/11/2020
Benz(a)anthracene	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Chrysene	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(b)fluoranthene	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(k)fluoranthene	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Indeno(1,2,3-c,d)pyrene	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Dibenz(a,h)anthracene	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(ghi)perylene	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2

PAH in Soil		Sample No	20-21316-26	20-21316-28	20-21316-30	20-21316-32
		Sample Description	T1-A	T2-A	T3-A	Field Blank
		Sample Date	23/11/2020	25/11/2020	26/11/2020	25/11/2020
ANALYTE	**LOR**	**Units**	**Result**	**Result**	**Result**	**Result**
Naphthalene	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1
2-Methylnaphthalene	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1
Acenaphthene	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1
Fluorene	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1
Phenanthrene	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1
Anthracene	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1
Fluoranthene	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1
Pyrene	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1
Benz(a)anthracene	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2
Chrysene	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2
Benzo(b)fluoranthene	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2
Benzo(k)fluoranthene	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2
Indeno(1,2,3-c,d)pyrene	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2
Dibenz(a,h)anthracene	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2
Benzo(ghi)perylene	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2

Metals in Soil and Sediment		Sample No	20-21316-1	20-21316-2	20-21316-3	20-21316-4	20-21316-5
		Sample Description	G1	G2	G3	G4	G5
		Sample Date	25/11/2020	25/11/2020	25/11/2020	25/11/2020	25/11/2020
ANALYTE	**LOR**	**Units**	**Result**	**Result**	**Result**	**Result**	**Result**
Silver	1	mg/kg	<1	<1	<1	<1	<1
Aluminium	1	mg/kg	1,200	1,100	1,200	1,200	1,000
Arsenic	5	mg/kg	15	14	14	15	15
Cadmium	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chromium	1	mg/kg	11	9	9	8	9
Copper	1	mg/kg	1	<1	<1	<1	<1
Lead	1	mg/kg	1	1	1	1	<1
Manganese	1	mg/kg	78	78	87	93	86
Mercury	0.02	mg/kg	<0.02	<0.02	<0.02	<0.02	<0.02
Nickel	1	mg/kg	2	2	3	2	2
Antimony	2	mg/kg	<2	<2	<2	<2	<2
Zinc	1	mg/kg	2	2	3	2	2

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Metals in Soil and Sediment		Sample No	20-21316-6	20-21316-7	20-21316-8	20-21316-9	20-21316-10
		Sample Description	G6	G7	G8	G9	G10
		Sample Date	25/11/2020	25/11/2020	25/11/2020	25/11/2020	25/11/2020
ANALYTE	LOR	Units	Result	Result	Result	Result	Result
Silver	1	mg/kg	<1	<1	<1	<1	<1
Aluminium	1	mg/kg	1,100	1,100	1,000	990	1,100
Arsenic	5	mg/kg	14	20	18	18	15
Cadmium	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chromium	1	mg/kg	8	9	9	9	11
Copper	1	mg/kg	1	<1	<1	<1	<1
Lead	1	mg/kg	1	<1	1	1	1
Manganese	1	mg/kg	90	100	95	93	79
Mercury	0.02	mg/kg	<0.02	<0.02	<0.02	<0.02	<0.02
Nickel	1	mg/kg	2	2	2	2	2
Antimony	2	mg/kg	<2	<2	<2	<2	<2
Zinc	1	mg/kg	2	2	2	2	2

Metals in Soil and Sediment		Sample No	20-21316-11	20-21316-12	20-21316-13	20-21316-14	20-21316-15
		Sample Description	G11	V1	V2	V3	V4
		Sample Date	25/11/2020	25/11/2020	25/11/2020	25/11/2020	25/11/2020
ANALYTE	LOR	Units	Result	Result	Result	Result	Result
Silver	1	mg/kg	<1	<1	<1	<1	<1
Aluminium	1	mg/kg	1,100	1,100	1,600	980	970
Arsenic	5	mg/kg	16	15	16	18	15
Cadmium	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chromium	1	mg/kg	12	9	11	9	8
Copper	1	mg/kg	<1	<1	<1	<1	<1
Lead	1	mg/kg	1	1	1	1	<1
Manganese	1	mg/kg	87	86	98	100	82
Mercury	0.02	mg/kg	<0.02	<0.02	<0.02	<0.02	<0.02
Nickel	1	mg/kg	2	2	3	2	2
Antimony	2	mg/kg	<2	<2	<2	<2	<2
Zinc	1	mg/kg	2	2	3	2	2

Metals in Soil and Sediment		Sample No	20-21316-16	20-21316-17	20-21316-18	20-21316-19	20-21316-20
		Sample Description	V5	V6	IG 1	IG 2	IG 3
		Sample Date	25/11/2020	25/11/2020	25/11/2020	25/11/2020	25/11/2020
ANALYTE	LOR	Units	Result	Result	Result	Result	Result
Silver	1	mg/kg	<1	<1	<1	<1	<1
Aluminium	1	mg/kg	960	1,100	1,000	900	1,400
Arsenic	5	mg/kg	15	16	16	14	11
Cadmium	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chromium	1	mg/kg	9	12	11	9	8
Copper	1	mg/kg	<1	<1	<1	<1	1
Lead	1	mg/kg	1	1	<1	<1	1
Manganese	1	mg/kg	110	80	98	96	96
Mercury	0.02	mg/kg	<0.02	<0.02	<0.02	<0.02	<0.02
Nickel	1	mg/kg	2	2	2	1	3
Antimony	2	mg/kg	<2	<2	<2	<2	<2
Zinc	1	mg/kg	2	2	2	1	3

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Metals in Soil and Sediment		Sample No	20-21316-21	20-21316-22	20-21316-23	20-21316-24	20-21316-25
		Sample Description	IG 4	IG 5	IG 6	S1-A	S2-A
		Sample Date	25/11/2020	25/11/2020	25/11/2020	25/11/2020	25/11/2020
ANALYTE	LOR	Units	Result	Result	Result	Result	Result
Silver	1	mg/kg	<1	<1	<1	<1	<1
Aluminium	1	mg/kg	2,000	1,500	1,000	1,100	1,100
Arsenic	5	mg/kg	13	12	15	18	16
Cadmium	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chromium	1	mg/kg	11	10	9	10	11
Copper	1	mg/kg	1	<1	<1	<1	<1
Lead	1	mg/kg	2	1	1	1	<1
Manganese	1	mg/kg	110	96	110	110	78
Mercury	0.02	mg/kg	<0.02	<0.02	<0.02	<0.02	<0.02
Nickel	1	mg/kg	4	3	2	2	2
Antimony	2	mg/kg	<2	<2	<2	<2	<2
Zinc	1	mg/kg	4	3	2	2	2

Metals in Soil and Sediment		Sample No	20-21316-26	20-21316-28	20-21316-30
		Sample Description	T1-A	T2-A	T3-A
		Sample Date	23/11/2020	25/11/2020	26/11/2020
ANALYTE	LOR	Units	Result	Result	Result
Silver	1	mg/kg	<1	<1	<1
Aluminium	1	mg/kg	1,100	1,100	1,200
Arsenic	5	mg/kg	15	18	16
Cadmium	0.1	mg/kg	<0.1	<0.1	<0.1
Chromium	1	mg/kg	8	9	10
Copper	1	mg/kg	<1	<1	<1
Lead	1	mg/kg	1	1	<1
Manganese	1	mg/kg	90	97	83
Mercury	0.02	mg/kg	<0.02	<0.02	<0.02
Nickel	1	mg/kg	2	2	2
Antimony	2	mg/kg	<2	<2	<2
Zinc	1	mg/kg	2	2	2

Misc. Inorganics in Soil		Sample No	20-21316-1	20-21316-2	20-21316-3	20-21316-4	20-21316-5
		Sample Description	G1	G2	G3	G4	G5
		Sample Date	25/11/2020	25/11/2020	25/11/2020	25/11/2020	25/11/2020
ANALYTE	LOR	Units	Result	Result	Result	Result	Result
TOC	0.1	%	0.2	0.2	0.3	0.3	0.2

Misc. Inorganics in Soil		Sample No	20-21316-6	20-21316-7	20-21316-8	20-21316-9	20-21316-10
		Sample Description	G6	G7	G8	G9	G10
		Sample Date	25/11/2020	25/11/2020	25/11/2020	25/11/2020	25/11/2020
ANALYTE	LOR	Units	Result	Result	Result	Result	Result
TOC	0.1	%	0.3	0.2	0.2	0.2	0.2

Misc. Inorganics in Soil		Sample No	20-21316-11	20-21316-12	20-21316-13	20-21316-14	20-21316-15
		Sample Description	G11	V1	V2	V3	V4
		Sample Date	25/11/2020	25/11/2020	25/11/2020	25/11/2020	25/11/2020
ANALYTE	LOR	Units	Result	Result	Result	Result	Result
TOC	0.1	%	0.2	0.3	0.3	0.2	0.2

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Misc. Inorganics in Soil		Sample No	20-21316-16	20-21316-17	20-21316-18	20-21316-19	20-21316-20
		Sample Description	V5	V6	IG 1	IG 2	IG 3
		Sample Date	25/11/2020	25/11/2020	25/11/2020	25/11/2020	25/11/2020
ANALYTE	LOR	Units	Result	Result	Result	Result	Result
TOC	0.1	%	0.3	0.2	0.2	0.2	0.4

Misc. Inorganics in Soil		Sample No	20-21316-21	20-21316-22	20-21316-23	20-21316-24	20-21316-25
		Sample Description	IG 4	IG 5	IG 6	S1-A	S2-A
		Sample Date	25/11/2020	25/11/2020	25/11/2020	25/11/2020	25/11/2020
ANALYTE	LOR	Units	Result	Result	Result	Result	Result
TOC	0.1	%	0.4	0.3	0.3	0.2	0.3

Misc. Inorganics in Soil		Sample No	20-21316-26	20-21316-28	20-21316-30
		Sample Description	T1-A	T2-A	T3-A
		Sample Date	23/11/2020	25/11/2020	26/11/2020
ANALYTE	LOR	Units	Result	Result	Result
TOC	0.1	%	0.4	0.2	0.3

Acid Sulfate Soils		Sample No	20-21316-1	20-21316-2	20-21316-3	20-21316-4	20-21316-5
		Sample Description	G1	G2	G3	G4	G5
		Sample Date	25/11/2020	25/11/2020	25/11/2020	25/11/2020	25/11/2020
ANALYTE	LOR	Units	Result	Result	Result	Result	Result
pH_f (23Af)	0.1	pH units	8.1	7.8	7.8	7.7	8.0
pH_{fox} (23Bf)	0.1	pH units	6.6	6.7	6.7	6.7	6.7
Rate of Reaction			XX	XX	XX	XX	XX

Acid Sulfate Soils		Sample No	20-21316-6	20-21316-7	20-21316-8	20-21316-9	20-21316-10
		Sample Description	G6	G7	G8	G9	G10
		Sample Date	25/11/2020	25/11/2020	25/11/2020	25/11/2020	25/11/2020
ANALYTE	LOR	Units	Result	Result	Result	Result	Result
pH_f (23Af)	0.1	pH units	8.0	7.8	8.0	8.2	8.0
pH_{fox} (23Bf)	0.1	pH units	6.7	6.7	6.8	6.6	6.7
Rate of Reaction			XX	XX	XX	XX	XX

Acid Sulfate Soils		Sample No	20-21316-11	20-21316-12	20-21316-13	20-21316-14	20-21316-15
		Sample Description	G11	V1	V2	V3	V4
		Sample Date	25/11/2020	25/11/2020	25/11/2020	25/11/2020	25/11/2020
ANALYTE	LOR	Units	Result	Result	Result	Result	Result
pH_f (23Af)	0.1	pH units	8.1	7.7	8.0	7.7	7.8
pH_{fox} (23Bf)	0.1	pH units	6.7	6.7	6.6	6.7	6.8
Rate of Reaction			XX	XX	XX	XX	XX

Acid Sulfate Soils		Sample No	20-21316-16	20-21316-17	20-21316-18	20-21316-19	20-21316-20
		Sample Description	V5	V6	IG 1	IG 2	IG 3
		Sample Date	25/11/2020	25/11/2020	25/11/2020	25/11/2020	25/11/2020
ANALYTE	LOR	Units	Result	Result	Result	Result	Result
pH_f (23Af)	0.1	pH units	8.1	7.8	8.0	7.9	7.9
pH_{fox} (23Bf)	0.1	pH units	6.7	6.7	6.8	6.7	6.6
Rate of Reaction			XX	XX	XX	XX	XX

O2 Marine *LABORATORY REPORT*
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Acid Sulfate Soils		Sample No	20-21316-21	20-21316-22	20-21316-23
		Sample Description	IG 4	IG 5	IG 6
		Sample Date	25/11/2020	25/11/2020	25/11/2020
ANALYTE	LOR	Units	Result	Result	Result
pH_f (23Af)	0.1	pH units	7.9	8.0	8.4
pH_{fox} (23Bf)	0.1	pH units	6.5	6.6	6.6
Rate of Reaction			XX	XX	XX

Subcontracting		Sample No	20-21316-1	20-21316-3	20-21316-6	20-21316-7	20-21316-9
		Sample Description	G1	G3	G6	G7	G9
		Sample Date	25/11/2020	25/11/2020	25/11/2020	25/11/2020	25/11/2020
ANALYTE	LOR	Units	Result	Result	Result	Result	Result
Monobutyltin as Sn	0.5	µg Sn/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dibutyltin as Sn	0.5	µg Sn/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Tributyltin as Sn	0.5	µg Sn/kg	<0.5	<0.5	<0.5	<0.5	<0.5

Subcontracting		Sample No	20-21316-10	20-21316-11	20-21316-12	20-21316-13	20-21316-14
		Sample Description	G10	G11	V1	V2	V3
		Sample Date	25/11/2020	25/11/2020	25/11/2020	25/11/2020	25/11/2020
ANALYTE	LOR	Units	Result	Result	Result	Result	Result
Monobutyltin as Sn	0.5	µg Sn/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dibutyltin as Sn	0.5	µg Sn/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Tributyltin as Sn	0.5	µg Sn/kg	<0.5	<0.5	<0.5	<0.5	<0.5

Subcontracting		Sample No	20-21316-15	20-21316-16	20-21316-17	20-21316-18	20-21316-19
		Sample Description	V4	V5	V6	IG 1	IG 2
		Sample Date	25/11/2020	25/11/2020	25/11/2020	25/11/2020	25/11/2020
ANALYTE	LOR	Units	Result	Result	Result	Result	Result
Monobutyltin as Sn	0.5	µg Sn/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dibutyltin as Sn	0.5	µg Sn/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Tributyltin as Sn	0.5	µg Sn/kg	<0.5	<0.5	<0.5	<0.5	<0.5

Subcontracting		Sample No	20-21316-20	20-21316-21	20-21316-22	20-21316-23	20-21316-30
		Sample Description	IG 3	IG 4	IG 5	IG 6	T3-A
		Sample Date	25/11/2020	25/11/2020	25/11/2020	25/11/2020	26/11/2020
ANALYTE	LOR	Units	Result	Result	Result	Result	Result
Monobutyltin as Sn	0.5	µg Sn/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dibutyltin as Sn	0.5	µg Sn/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Tributyltin as Sn	0.5	µg Sn/kg	<0.5	<0.5	<0.5	<0.5	<0.5

Subcontracting		Sample No	20-21316-32
		Sample Description	Field Blank
		Sample Date	25/11/2020
ANALYTE	LOR	Units	Result
Monobutyltin as Sn	0.5	µg Sn/kg	<0.5
Dibutyltin as Sn	0.5	µg Sn/kg	<0.5
Tributyltin as Sn	0.5	µg Sn/kg	<0.5

Result Definitions
LOR Limit of Reporting [NT] Not Tested [ND] Not Detected at indicated Limit of Reporting
* Denotes test not covered by NATA Accreditation

FOR MICROBIOLOGICAL TESTING - The data in this report may not be representative of a lot, batch or other samples and may not necessarily justify the acceptance or rejection of a lot or batch, a product recall or support legal proceedings. Tests are not routinely performed as duplicates unless specifically requested. Changes occur in the bacterial content of biological samples. Samples should

be examined as soon as possible after collection, preferably within 6 hrs and must be stored at 4 degrees Celsius or below. Samples tested after 24 hrs cannot be regarded as satisfactory because of temperature abuse and variations.

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Suite 2, 4B Mews Rd
Fremantle
WA 6160

Attention: **Josh Abbott**

Report **976075-S**
Project name ERAMURRA SALT PROJECT - SEDIMENT SAMPLING
Project ID 19WAU-0027
Received Date Mar 28, 2023

Client Sample ID			**NG1**	**NG2**	**NG3**	**NG4**
Sample Matrix			**Sediment**	**Sediment**	**Sediment**	**Sediment**
Eurofins Sample No.			**L23-Ma0066568**	**L23-Ma0066569**	**L23-Ma0066570**	**L23-Ma0066571**
Date Sampled			**Mar 21, 2023**	**Mar 21, 2023**	**Mar 21, 2023**	**Mar 21, 2023**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50	< 50	< 50	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
BTEX						
4-Bromofluorobenzene (surr.)	1	%	55	59	57	69
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			NG1	NG2	NG3	NG4
Sample Matrix			Sediment	Sediment	Sediment	Sediment
Eurofins Sample No.			L23-Ma0066568	L23-Ma0066569	L23-Ma0066570	L23-Ma0066571
Date Sampled			Mar 21, 2023	Mar 21, 2023	Mar 21, 2023	Mar 21, 2023
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	80	91	108	82
p-Terphenyl-d14 (surr.)	1	%	69	76	93	70
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100	< 100
Acidic Herbicides in Soil						
Dicamba	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
MCPA	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
2.4-D	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
2.4.5-T	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
2.4.6-T	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Triclopyr	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Fluazifop	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Total Organic Carbon	0.1	%	0.2	0.5	0.2	0.5
Aluminium	1	mg/kg	810	930	880	950
Antimony	2	mg/kg	< 2	< 2	< 2	< 2
Arsenic	5	mg/kg	7.0	15	8.7	16
Cadmium	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Chromium	1	mg/kg	12	16	14	14
Copper	1	mg/kg	7.0	8.9	8.6	8.4
Lead	1	mg/kg	< 1	< 1	< 1	< 1
Manganese	1	mg/kg	65	99	83	110
Mercury	0.02	mg/kg	0.03	0.03	0.02	0.02
Nickel	1	mg/kg	2.1	2.4	2.3	2.3
Silver	1	mg/kg	< 1	< 1	< 1	< 1
Zinc	1	mg/kg	2.4	2.6	2.5	2.6
Organotins			See attached	See attached	See attached	See attached
Particle Size Distribution			See attached	See attached	See attached	See attached
Sample Properties						
% Moisture	1	%	33	28	33	19

Client Sample ID			NG5	NG1-T2	NG5-DUPE
Sample Matrix			Sediment	Sediment	Sediment
Eurofins Sample No.			L23-Ma0066572	L23-Ma0066574	L23-Ma0066575
Date Sampled			Mar 21, 2023	Mar 21, 2023	Mar 21, 2023
Test/Reference	LOR	Unit			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions					
TRH C6-C9	20	mg/kg	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50	< 50	< 50
BTEX					
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3	< 0.3	< 0.3
BTEX					
4-Bromofluorobenzene (surr.)	1	%	53	84	68
Total Recoverable Hydrocarbons - 2013 NEPM Fractions					
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50
TRH C6-C10	20	mg/kg	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20
Polycyclic Aromatic Hydrocarbons					
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	86	92	85
p-Terphenyl-d14 (surr.)	1	%	86	79	77
Total Recoverable Hydrocarbons - 2013 NEPM Fractions					
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100

Client Sample ID			NG5	NG1-T2	NG5-DUPE
Sample Matrix			Sediment	Sediment	Sediment
Eurofins Sample No.			L23-Ma0066572	L23-Ma0066574	L23-Ma0066575
Date Sampled			Mar 21, 2023	Mar 21, 2023	Mar 21, 2023
Test/Reference	LOR	Unit			
Acidic Herbicides in Soil					
Dicamba	0.05	mg/kg	< 0.05	< 0.05	< 0.05
MCPA	0.05	mg/kg	< 0.05	< 0.05	< 0.05
2.4-D	0.05	mg/kg	< 0.05	< 0.05	< 0.05
2.4.5-T	0.05	mg/kg	< 0.05	< 0.05	< 0.05
2.4.6-T	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Triclopyr	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Fluazifop	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Total Organic Carbon	0.1	%	0.2	0.1	< 0.1
Aluminium	1	mg/kg	860	910	960
Antimony	2	mg/kg	< 2	< 2	< 2
Arsenic	5	mg/kg	7.0	7.6	7.3
Cadmium	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Chromium	1	mg/kg	12	13	14
Copper	1	mg/kg	8.0	7.8	8.9
Lead	1	mg/kg	< 1	< 1	< 1
Manganese	1	mg/kg	77	74	83
Mercury	0.02	mg/kg	0.02	0.02	< 0.02
Nickel	1	mg/kg	2.4	2.5	2.8
Silver	1	mg/kg	< 1	< 1	< 1
Zinc	1	mg/kg	2.5	2.9	2.9
Organotins			See attached	See attached	See attached
Particle Size Distribution			See attached	-	-
Sample Properties					
% Moisture	1	%	35	33	27

Sample History

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

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

Description	Testing Site	Extracted	Holding Time
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Welshpool	Mar 29, 2023	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
BTEX	Welshpool	Mar 29, 2023	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Welshpool	Mar 29, 2023	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Polycyclic Aromatic Hydrocarbons	Welshpool	Mar 29, 2023	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Welshpool	Mar 29, 2023	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Acidic Herbicides in Soil	Welshpool	Mar 29, 2023	14 Days
- Method: ARL055 - Chlorinated Acidic Herbicides in Soil			
Total Organic Carbon	Melbourne	Mar 30, 2023	28 Days
- Method: LTM-INO-4060 Total Organic Carbon in water and soil			
Aluminium	Welshpool	Mar 29, 2023	180 Days
- Method: ARL401/403 - Metals in Soil and Sediment by ICPOES/MS			
Antimony	Welshpool	Mar 29, 2023	180 Day
- Method: ARL401/403 - Metals in Soil and Sediment by ICPOES/MS			
Manganese	Welshpool	Mar 29, 2023	180 Days
- Method: ARL401/403 - Metals in Soil and Sediment by ICPOES/MS			
Silver	Welshpool	Mar 29, 2023	180 Days
- Method: ARL030 - Metals in Soil and Sediment by AAS			
Arsenic	Welshpool	Mar 29, 2023	180 Days
- Method: ARL401/403 - Metals in Soil and Sediment by ICPOES/MS			
Cadmium	Welshpool	Mar 29, 2023	180 Days
- Method: ARL401/403 - Metals in Soil and Sediment by ICPOES/MS			
Chromium	Welshpool	Mar 29, 2023	180 Days
- Method: ARL401/403 - Metals in Soil and Sediment by ICPOES/MS			
Copper	Welshpool	Mar 29, 2023	180 Days
- Method: ARL401/403 - Metals in Soil and Sediment by ICPOES/MS			
Lead	Welshpool	Mar 29, 2023	180 Days
- Method: ARL401/403 - Metals in Soil and Sediment by ICPOES/MS			
Mercury	Welshpool	Mar 29, 2023	28 Days
- Method: ARL No. 406 - Mercury by Cold Vapour Atomic Absorption Spectrophotometry			
Nickel	Welshpool	Mar 29, 2023	180 Days
- Method: ARL401/403 - Metals in Soil and Sediment by ICPOES/MS			
Zinc	Welshpool	Mar 29, 2023	180 Days
- Method: ARL401/403 - Metals in Soil and Sediment by ICPOES/MS			
% Moisture	Welshpool	Mar 28, 2023	14 Days
- Method: ARL135 Moisture in Solids			

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Order No.:
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Phone:
Fax:

Received: Mar 28, 2023 1:45 PM
Due: Apr 6, 2023
Priority: 7 Day
Contact Name: Josh Abbott

Project Name: ERAMURRA SALT PROJECT - SEDIMENT SAMPLING
Project ID: 19WAU-0027

Eurofins Analytical Services Manager : Andrew Harvey

Sample Detail						Antimony	Manganese	Organotins	Particle Size Distribution	Silver	Total Organic Carbon	Moisture Set	Eurofins Suite B4	Acidic Herbicides in Soil	Metals M8 Soil
Perth Laboratory - NATA # 2377 Site # 2370						X	X			X		X	X	X	X
Melbourne Laboratory - NATA # 1261 Site # 1254											X				
External Laboratory								X	X						
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**										
1	NG1	Mar 21, 2023		Sediment	L23-Ma0066568	X	X	X	X	X	X	X	X	X	X
2	NG2	Mar 21, 2023		Sediment	L23-Ma0066569	X	X	X	X	X	X	X	X	X	X
3	NG3	Mar 21, 2023		Sediment	L23-Ma0066570	X	X	X	X	X	X	X	X	X	X
4	NG4	Mar 21, 2023		Sediment	L23-Ma0066571	X	X	X	X	X	X	X	X	X	X
5	NG5	Mar 21, 2023		Sediment	L23-Ma0066572	X	X	X	X	X	X	X	X	X	X
6	NG1-T2	Mar 21, 2023		Sediment	L23-Ma0066574	X	X	X		X	X	X	X	X	X
7	NG5-DUPE	Mar 21, 2023		Sediment	L23-Ma0066575	X	X	X		X	X	X	X	X	X
Test Counts						7	7	7	5	7	7	7	7	7	7

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Internal Quality Control Review and Glossary

General

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

Holding Times

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

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

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

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

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

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
µg/L: micrograms per litre
ppm: parts per million
ppb: parts per billion
%: Percentage
org/100 mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100 mL: Most Probable Number of organisms per 100 millilitres
CFU: Colony forming unit

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

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

Results <10 times the LOR: No Limit

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

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

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/kg	< 20			20	Pass	
TRH C10-C14	mg/kg	< 20			20	Pass	
TRH C15-C28	mg/kg	< 50			50	Pass	
TRH C29-C36	mg/kg	< 50			50	Pass	
Method Blank							
BTEX							
Benzene	mg/kg	< 0.1			0.1	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Xylenes - Total*	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g.h.i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a.h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
Method Blank							
Acidic Herbicides in Soil							
Dicamba	mg/kg	< 0.05			0.05	Pass	
MCPA	mg/kg	< 0.05			0.05	Pass	
2.4-D	mg/kg	< 0.05			0.05	Pass	
2.4.5-T	mg/kg	< 0.05			0.05	Pass	
2.4.6-T	mg/kg	< 0.05			0.05	Pass	
Triclopyr	mg/kg	< 0.05			0.05	Pass	
Fluazifop	mg/kg	< 0.1			0.1	Pass	
Method Blank							
Total Organic Carbon	%	< 0.1			0.1	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Aluminium	mg/kg	< 1			1	Pass	
Arsenic	mg/kg	< 5			5	Pass	
Cadmium	mg/kg	< 0.1			0.1	Pass	
Chromium	mg/kg	< 1			1	Pass	
Copper	mg/kg	< 1			1	Pass	
Lead	mg/kg	< 1			1	Pass	
Manganese	mg/kg	< 1			1	Pass	
Mercury	mg/kg	< 0.02			0.02	Pass	
Nickel	mg/kg	< 1			1	Pass	
Silver	mg/kg	< 1			1	Pass	
Zinc	mg/kg	< 1			1	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	105			70-130	Pass	
TRH C10-C14	%	119			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	104			70-130	Pass	
Toluene	%	103			70-130	Pass	
Ethylbenzene	%	107			70-130	Pass	
m&p-Xylenes	%	102			70-130	Pass	
o-Xylene	%	101			70-130	Pass	
Xylenes - Total*	%	101			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	120			70-130	Pass	
TRH C6-C10	%	90			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	101			70-130	Pass	
Acenaphthylene	%	96			70-130	Pass	
Anthracene	%	95			70-130	Pass	
Benz(a)anthracene	%	89			70-130	Pass	
Benzo(a)pyrene	%	89			70-130	Pass	
Benzo(b&j)fluoranthene	%	90			70-130	Pass	
Benzo(g.h.i)perylene	%	96			70-130	Pass	
Benzo(k)fluoranthene	%	109			70-130	Pass	
Chrysene	%	102			70-130	Pass	
Dibenz(a.h)anthracene	%	97			70-130	Pass	
Fluoranthene	%	93			70-130	Pass	
Fluorene	%	97			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	98			70-130	Pass	
Naphthalene	%	108			70-130	Pass	
Phenanthrene	%	93			70-130	Pass	
Pyrene	%	90			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	%	118			70-130	Pass	
LCS - % Recovery							
Acidic Herbicides in Soil							
Dicamba	%	109			60-120	Pass	
MCPA	%	116			60-120	Pass	
2.4-D	%	113			60-120	Pass	
2.4.5-T	%	96			60-120	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
2.4.6-T	%	106			60-120	Pass	
LCS - % Recovery							
Total Organic Carbon	%	95			70-130	Pass	
Aluminium	%	88			80-120	Pass	
Antimony	%	119			80-120	Pass	
Arsenic	%	95			80-120	Pass	
Cadmium	%	92			80-120	Pass	
Chromium	%	100			80-120	Pass	
Copper	%	94			80-120	Pass	
Lead	%	91			80-120	Pass	
Manganese	%	93			80-120	Pass	
Nickel	%	95			80-120	Pass	
Silver	%	108			80-120	Pass	
Zinc	%	81			80-120	Pass	
CRM - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	111			80-120	Pass	
Acenaphthylene	%	93			80-120	Pass	
Anthracene	%	99			80-120	Pass	
Benz(a)anthracene	%	90			70-130	Pass	
Benzo(a)pyrene	%	85			80-120	Pass	
Benzo(b&j)fluoranthene	%	87			80-120	Pass	
Benzo(g.h.i)perylene	%	100			80-120	Pass	
Benzo(k)fluoranthene	%	105			80-120	Pass	
Chrysene	%	113			80-120	Pass	
Dibenz(a.h)anthracene	%	86			80-120	Pass	
Fluoranthene	%	94			80-120	Pass	
Fluorene	%	105			80-120	Pass	
Indeno(1.2.3-cd)pyrene	%	86			80-120	Pass	
Naphthalene	%	104			70-130	Pass	
Phenanthrene	%	110			80-120	Pass	
Pyrene	%	90			80-120	Pass	
CRM - % Recovery							
Aluminium	%	104			80-120	Pass	
Arsenic	%	118			80-120	Pass	
Cadmium	%	119			80-120	Pass	
Chromium	%	104			80-120	Pass	
Copper	%	101			80-120	Pass	
Lead	%	97			80-120	Pass	
Manganese	%	99			80-120	Pass	
Mercury	%	118			60-120	Pass	
Nickel	%	102			80-120	Pass	
Zinc	%	86			80-120	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	L23-Ma0066224	NCP	%	91			70-130	Pass	
Acenaphthylene	L23-Ma0066224	NCP	%	80			70-130	Pass	
Anthracene	L23-Ma0066224	NCP	%	93			70-130	Pass	
Benz(a)anthracene	L23-Ma0066224	NCP	%	81			70-130	Pass	
Benzo(a)pyrene	L23-Ma0066224	NCP	%	82			70-130	Pass	
Benzo(b&j)fluoranthene	L23-Ma0066224	NCP	%	84			70-130	Pass	
Benzo(g.h.i)perylene	L23-Ma0062621	NCP	%	89			70-130	Pass	
Benzo(k)fluoranthene	L23-Ma0066224	NCP	%	103			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Chrysene	L23-Ma0066224	NCP	%	104			70-130	Pass	
Dibenz(a.h)anthracene	L23-Ma0066224	NCP	%	86			70-130	Pass	
Fluoranthene	L23-Ma0066224	NCP	%	86			70-130	Pass	
Fluorene	L23-Ma0066224	NCP	%	91			70-130	Pass	
Indeno(1.2.3-cd)pyrene	L23-Ma0066224	NCP	%	75			70-130	Pass	
Naphthalene	L23-Ma0066224	NCP	%	85			70-130	Pass	
Phenanthrene	L23-Ma0066224	NCP	%	94			70-130	Pass	
Pyrene	L23-Ma0066224	NCP	%	84			70-130	Pass	
Spike - % Recovery									
				Result 1					
Arsenic	L23-Ma0073168	NCP	%	104			80-120	Pass	
Cadmium	L23-Ma0073168	NCP	%	93			80-120	Pass	
Chromium	L23-Ma0072358	NCP	%	100			80-120	Pass	
Copper	L23-Ma0072358	NCP	%	93			80-120	Pass	
Lead	L23-Ma0072358	NCP	%	119			80-120	Pass	
Nickel	L23-Ma0072358	NCP	%	88			80-120	Pass	
Zinc	L23-Ma0072358	NCP	%	138			80-120	Fail	Q08
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	L23-Ma0066569	CP	%	95			70-130	Pass	
TRH C10-C14	L23-Ma0066569	CP	%	109			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	L23-Ma0066569	CP	%	112			70-130	Pass	
Toluene	L23-Ma0066569	CP	%	94			70-130	Pass	
Ethylbenzene	L23-Ma0066569	CP	%	104			70-130	Pass	
m&p-Xylenes	L23-Ma0066569	CP	%	108			70-130	Pass	
o-Xylene	L23-Ma0066569	CP	%	98			70-130	Pass	
Xylenes - Total*	L23-Ma0066569	CP	%	104			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	L23-Ma0066569	CP	%	115			70-130	Pass	
TRH C6-C10	L23-Ma0066569	CP	%	75			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	L23-Ma0066569	CP	%	107			70-130	Pass	
Spike - % Recovery									
Acidic Herbicides in Soil				Result 1					
Dicamba	L23-Ma0066569	CP	%	102			60-120	Pass	
MCPA	L23-Ma0066569	CP	%	117			60-120	Pass	
2.4-D	L23-Ma0066569	CP	%	109			60-120	Pass	
2.4.5-T	L23-Ma0066569	CP	%	88			60-120	Pass	
2.4.6-T	L23-Ma0066569	CP	%	103			60-120	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	L23-Ma0066568	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	L23-Ma0066568	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	L23-Ma0066568	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	L23-Ma0066568	CP	mg/kg	< 50	< 50	<1	30%	Pass	

Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	L23-Ma0066568	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	L23-Ma0066568	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	L23-Ma0066568	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	L23-Ma0066568	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	L23-Ma0066568	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total*	L23-Ma0066568	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	L23-Ma0066568	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	L23-Ma0066568	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	L23-Ma0066568	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	L23-Ma0066568	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	L23-Ma0066568	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	L23-Ma0066568	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	L23-Ma0066568	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	L23-Ma0066568	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	L23-Ma0066568	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	L23-Ma0066568	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	L23-Ma0066568	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	L23-Ma0066568	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	L23-Ma0066568	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	L23-Ma0066568	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	L23-Ma0066568	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	L23-Ma0066568	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	L23-Ma0066568	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	L23-Ma0066568	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	L23-Ma0066568	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	L23-Ma0066568	CP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	L23-Ma0066568	CP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
Acidic Herbicides in Soil				Result 1	Result 2	RPD			
Dicamba	L23-Ma0066568	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
MCPA	L23-Ma0066568	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
2.4-D	L23-Ma0066568	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
2.4.5-T	L23-Ma0066568	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
2.4.6-T	L23-Ma0066568	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Triclopyr	L23-Ma0066568	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Fluazifop	L23-Ma0066568	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Total Organic Carbon	L23-Ma0066568	CP	%	0.2	< 0.1	93	30%	Fail	Q15
Aluminium	L23-Ma0072329	NCP	mg/kg	5800	6000	2.4	20%	Pass	
Antimony	L23-Ma0072329	NCP	mg/kg	2.0	2.1	2.3	20%	Pass	
Arsenic	L23-Ma0073167	NCP	mg/kg	< 5	< 5	<1	20%	Pass	
Cadmium	L23-Ma0073167	NCP	mg/kg	< 0.1	< 0.1	<1	20%	Pass	
Chromium	L23-Ma0072329	NCP	mg/kg	59	61	3.6	20%	Pass	
Copper	L23-Ma0072329	NCP	mg/kg	80	82	2.8	20%	Pass	
Lead	L23-Ma0072329	NCP	mg/kg	23	23	<1	20%	Pass	
Manganese	L23-Ma0072329	NCP	mg/kg	260	270	3.5	20%	Pass	
Mercury	L23-Ma0073167	NCP	mg/kg	0.36	0.37	3.2	30%	Pass	

Duplicate									
				Result 1	Result 2	RPD			
Nickel	L23-Ma0072329	NCP	mg/kg	18	18	2.9	20%	Pass	
Silver	L23-Ma0072329	NCP	mg/kg	< 1	< 1	<1	20%	Pass	
Zinc	L23-Ma0072329	NCP	mg/kg	920	960	4.1	20%	Pass	
Duplicate									
Sample Properties				Result 1	Result 2	RPD			
% Moisture	L23-Ma0066568	CP	%	33	35	5.1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Total Organic Carbon	L23-Ma0066572	CP	%	0.2	0.2	7.9	30%	Pass	

Comments

Analysis of organotins has been completed by MPL, NATA Accreditation Number 2901, report reference PEC2046 (see attached)
Analysis of PSD has been completed by Microanalysis, report reference 23_0504

Sample Integrity

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

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
Q08	The matrix spike recovery is outside of the recommended acceptance criteria. An acceptable recovery was obtained for the laboratory control sample indicating a sample matrix interference.
Q15	The RPD reported passes Eurofins Environment Testing's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.

Authorised by:

Andrew Harvey	Analytical Services Manager
Douglas Todd	Senior Analyst-Organic
Mary Makarios	Senior Analyst-Inorganic
Patrick Patfield	Senior Analyst-Organic
Patrick Patfield	Senior Analyst-Volatile
Sean Sangster	Senior Analyst-Metal
Sean Sangster	Senior Analyst-Sample Properties

Kim Rodgers
Business Unit Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

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

Measurement uncertainty of test data is available on request

Appendix D. Dredge Footprint Hydrocarbon and TBT Results

Analytes	TRH & BTEXN											TBT
	Benzene	Toluene	Ethylbenzene	Xylenes (Total)	Naphthalene	TRH C_{6-10}	TRH C_{6-10} minus BTEX (F1)	TRH $C_{>10-16}$	TRH $C_{>10-16}$ minus Naphthalene (F2)	TRH $C_{>16-34}$	TRH $C_{>34-40}$	TBT
Units	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*µg Sn/kg*
Laboratory LoR	*0.1*	*0.1*	*0.1*	*0.2*	*0.5*	*2*	*2*	*20*	*20*	*50*	*50*	*0.5*
DGV (ANZG 2018)	*0.2*	*0.2*	*0.2*	*0.2*	*0.005*	*550*	*550*	*550*	*550*	*550*	*550*	*N/A*
HIL (DEC 2010)	*5.6*	*5200*	*230*	*2600*	*190*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
G1	<0.1	<0.1	<0.1	<0.2	<0.5	<2	<2	<20	<20	<50	<50	<0.5
G2	<0.1	<0.1	<0.1	<0.2	<0.5	<2	<2	<20	<20	<50	<50	<0.5
G3	<0.1	<0.1	<0.1	<0.2	<0.5	<2	<2	<20	<20	<50	<50	<0.5
G4	<0.1	<0.1	<0.1	<0.2	<0.5	<2	<2	<20	<20	<50	<50	<0.5
G5	<0.1	<0.1	<0.1	<0.2	<0.5	<2	<2	<20	<20	<50	<50	<0.5
G6	<0.1	<0.1	<0.1	<0.2	<0.5	<2	<2	<20	<20	<50	<50	<0.5
G7	<0.1	<0.1	<0.1	<0.2	<0.5	<2	<2	<20	<20	<50	<50	<0.5
G8	<0.1	<0.1	<0.1	<0.2	<0.5	<2	<2	<20	<20	<50	<50	<0.5

Analytes	TRH & BTEXN											TBT
	Benzene	Toluene	Ethylbenzene	Xylenes (Total)	Naphthalene	TRH C_{6-10}	TRH C_{6-10} minus BTEX (F1)	TRH $C_{>10-16}$	TRH $C_{>10-16}$ minus Naphthalene (F2)	TRH $C_{>16-34}$	TRH $C_{>34-40}$	TBT
Units	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*µg Sn/kg*
Laboratory LoR	*0.1*	*0.1*	*0.1*	*0.2*	*0.5*	*2*	*2*	*20*	*20*	*50*	*50*	*0.5*
DGV (ANZG 2018)	*0.2*	*0.2*	*0.2*	*0.2*	*0.005*	*550*	*550*	*550*	*550*	*550*	*550*	*N/A*
HIL (DEC 2010)	*5.6*	*5200*	*230*	*2600*	*190*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
G9	<0.1	<0.1	<0.1	<0.2	<0.5	<2	<2	<20	<20	<50	<50	<0.5
G10	<0.1	<0.1	<0.1	<0.2	<0.5	<2	<2	<20	<20	<50	<50	<0.5
G11	<0.1	<0.1	<0.1	<0.2	<0.5	<2	<2	<20	<20	<50	<50	<0.5
V1	<0.1	<0.1	<0.1	<0.2	<0.5	<2	<2	<20	<20	<50	<50	<0.5
V2	<0.1	<0.1	<0.1	<0.2	<0.5	<2	<2	<20	<20	<50	<50	<0.5
V3	<0.1	<0.1	<0.1	<0.2	<0.5	<2	<2	<20	<20	<50	<50	<0.5
V4	<0.1	<0.1	<0.1	<0.2	<0.5	<2	<2	<20	<20	<50	<50	<0.5
V5	<0.1	<0.1	<0.1	<0.2	<0.5	<2	<2	<20	<20	<50	<50	<0.5
V6	<0.1	<0.1	<0.1	<0.2	<0.5	<2	<2	<20	<20	<50	<50	<0.5

Analytes	TRH & BTEXN											TBT
	Benzene	Toluene	Ethylbenzene	Xylenes (Total)	Naphthalene	TRH C_{6-10}	TRH C_{6-10} minus BTEX (F1)	TRH $C_{>10-16}$	TRH $C_{>10-16}$ minus Naphthalene (F2)	TRH $C_{>16-34}$	TRH $C_{>34-40}$	TBT
Units	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*µg Sn/kg*
Laboratory LoR	*0.1*	*0.1*	*0.1*	*0.2*	*0.5*	*2*	*2*	*20*	*20*	*50*	*50*	*0.5*
DGV (ANZG 2018)	*0.2*	*0.2*	*0.2*	*0.2*	*0.005*	*550*	*550*	*550*	*550*	*550*	*550*	*N/A*
HIL (DEC 2010)	*5.6*	*5200*	*230*	*2600*	*190*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
IG1	<0.1	<0.1	<0.1	<0.2	<0.5	<2	<2	<20	<20	<50	<50	<0.5
IG2	<0.1	<0.1	<0.1	<0.2	<0.5	<2	<2	<20	<20	<50	<50	<0.5
IG3	<0.1	<0.1	<0.1	<0.2	<0.5	<2	<2	<20	<20	<50	<50	<0.5
IG4	<0.1	<0.1	<0.1	<0.2	<0.5	<2	<2	<20	<20	<50	<50	<0.5
IG5	<0.1	<0.1	<0.1	<0.2	<0.5	<2	<2	<20	<20	<50	<50	<0.5
IG6	<0.1	<0.1	<0.1	<0.2	<0.5	<2	<2	<20	<20	<50	<50	<0.5
NG1												
NG2												
NG3												

Analytes	TRH & BTEXN											TBT
	Benzene	Toluene	Ethylbenzene	Xylenes (Total)	Naphthalene	TRH C_{6-10}	TRH C_{6-10} minus BTEX (F1)	TRH $C_{>10-16}$	TRH $C_{>10-16}$ minus Naphthalene (F2)	TRH $C_{>16-34}$	TRH $C_{>34-40}$	TBT
Units	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*µg Sn/kg*
Laboratory LoR	*0.1*	*0.1*	*0.1*	*0.2*	*0.5*	*2*	*2*	*20*	*20*	*50*	*50*	*0.5*
DGV (ANZG 2018)	*0.2*	*0.2*	*0.2*	*0.2*	*0.005*	*550*	*550*	*550*	*550*	*550*	*550*	*N/A*
HIL (DEC 2010)	*5.6*	*5200*	*230*	*2600*	*190*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
NG4												
NG5												
S1-A	<0.1	<0.1	<0.1	<0.2	<0.5	<2	<2	<20	<20	<50	<50	<0.5
S2-A	<0.1	<0.1	<0.1	<0.2	<0.5	<2	<2	<20	<20	<50	<50	<0.5
T1-A	<0.1	<0.1	<0.1	<0.2	<0.5	<2	<2	<20	<20	<50	<50	<0.5
T2-A	<0.1	<0.1	<0.1	<0.2	<0.5	<2	<2	<20	<20	<50	<50	<0.5
T3-A	<0.1	<0.1	<0.1	<0.2	<0.5	<2	<2	<20	<20	<50	<50	<0.5
S1-B	<0.1	<0.1	<0.1	<0.2	<0.5	<2	<2	<20	<20	<50	<50	<0.5
S2-B	<0.1	<0.1	<0.1	<0.2	<0.5	<2	<2	<20	<20	<50	<50	<0.5

Analytes	TRH & BTEXN											TBT
	Benzene	Toluene	Ethylbenzene	Xylenes (Total)	Naphthalene	TRH C_{6-10}	TRH C_{6-10} minus BTEX (F1)	TRH $C_{>10-16}$	TRH $C_{>10-16}$ minus Naphthalene (F2)	TRH $C_{>16-34}$	TRH $C_{>34-40}$	TBT
Units	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*µg Sn/kg*
Laboratory LoR	*0.1*	*0.1*	*0.1*	*0.2*	*0.5*	*2*	*2*	*20*	*20*	*50*	*50*	*0.5*
DGV (ANZG 2018)	*0.2*	*0.2*	*0.2*	*0.2*	*0.005*	*550*	*550*	*550*	*550*	*550*	*550*	*N/A*
HIL (DEC 2010)	*5.6*	*5200*	*230*	*2600*	*190*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
Field Blank	<0.1	<0.1	<0.1	<0.2	<0.5	<2	<2	<20	<20	<50	<50	<0.5
Mean	0.05	0.05	0.05	0.1	0.25	1	1	10	10	25	25	0.5
95% UCL	0.05	0.05	0.05	0.1	0.25	1	1	10	10	25	25	0.5

Table 10 PAH laboratory results

Analyte	Naphthalene	2-Methylnaphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benzo(a)anthracene	Chrysene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(a)pyrene	Indeno(1,2,3-c,d)pyrene	Dibenz(a,h)anthracene	Benzo(ghi)perylene
Units	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*
LoR	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*
DGV (ANZG 2018)	*160*	*N/A*	*44*	*16*	*19*	*240*	*85*	*600*	*665*	*261*	*384*	*N/A*	*N/A*	*430*	*N/A*	*63*	*N/A*
HIL (DEC 2010)	*190*	*N/A*	*N/A*	*N/A*	*N/A*	*17,00*	*170,000*	*22,000*	*17,000*	*N/A*	*N/A*	*N/A*	*N/A*	*5*	*N/A*	*N/A*	*N/A*
G1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
G2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
G3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
G4	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
G5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
G6	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
G7	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
G8	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
G9	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
G10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
G11	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2

Analyte	Naphthalene	2-Methylnaphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benzo(a)anthracene	Chrysene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(a)pyrene	Indeno(1,2,3-c,d)pyrene	Dibenz(a,h)anthracene	Benzo(ghi)perylene
Units	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*
LoR	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*
DGV (ANZG 2018)	*160*	*N/A*	*44*	*16*	*19*	*240*	*85*	*600*	*665*	*261*	*384*	*N/A*	*N/A*	*430*	*N/A*	*63*	*N/A*
HIL (DEC 2010)	*190*	*N/A*	*N/A*	*N/A*	*N/A*	*17,00*	*170,000*	*22,000*	*17,000*	*N/A*	*N/A*	*N/A*	*N/A*	*5*	*N/A*	*N/A*	*N/A*
V1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
V2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
V3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
V4	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
V5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
V6	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
IG1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
IG2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
IG3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
IG4	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
IG5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
IG6	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2

Analyte	Naphthalene	2-Methylnaphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benzo(a)anthracene	Chrysene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(a)pyrene	Indeno(1,2,3-c,d)pyrene	Dibenz(a,h)anthracene	Benzo(ghi)perylene
Units	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*
LoR	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*
DGV (ANZG 2018)	*160*	*N/A*	*44*	*16*	*19*	*240*	*85*	*600*	*665*	*261*	*384*	*N/A*	*N/A*	*430*	*N/A*	*63*	*N/A*
HIL (DEC 2010)	*190*	*N/A*	*N/A*	*N/A*	*N/A*	*17,00*	*170,000*	*22,000*	*17,000*	*N/A*	*N/A*	*N/A*	*N/A*	*5*	*N/A*	*N/A*	*N/A*
S1-A	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
S2-A	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
T1-A	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
T2-A	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
T3-A	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
S1-B	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
S2-B	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Field Blank	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Mean	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
95% UCL	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1

Table 11 Organotin compounds laboratory results

Analytes	Organotin Compounds Monobutyltin	Dibutyltin	Tributyltin
Units	*µg Sn/kg*	*µg Sn/kg*	*µg Sn/kg*
Laboratory LoR	*0.5*	*0.5*	*0.5*
DGV (ANZG 2018)			*5*
G1	<0.5	<0.5	<0.5
G2	-	-	-
G3	<0.5	<0.5	<0.5
G4	-	-	-
G5	-	-	-
G6	<0.5	<0.5	<0.5
G7	<0.5	<0.5	<0.5
G8	-	-	-
G9	<0.5	<0.5	<0.5
G10	<0.5	<0.5	<0.5
G11	<0.5	<0.5	<0.5
V1	<0.5	<0.5	<0.5
V2	<0.5	<0.5	<0.5
V3	<0.5	<0.5	<0.5
V4	<0.5	<0.5	<0.5
V5	<0.5	<0.5	<0.5
V6	<0.5	<0.5	<0.5
IG1	<0.5	<0.5	<0.5
IG2	<0.5	<0.5	<0.5
IG3	<0.5	<0.5	<0.5
IG4	<0.5	<0.5	<0.5
IG5	<0.5	<0.5	<0.5
IG6	<0.5	<0.5	<0.5
S1-A	-	-	-
S2-A	-	-	-
T1-A	-	-	-
T2-A	-	-	-
T3-A	<0.5	<0.5	<0.5
S1-B	-	-	-
S2-B	-	-	-
Field Blank	<0.5	<0.5	<0.5
Mean	0.25	0.25	0.25
95% UCL	0.25	0.25	0.25

Appendix E. Benthic Infauna counts

Phylum	Class/Order	Family	IG1-A	IG1-B	IG1-C	IG2-A	IG2-B	IG2-C	IG3-A	IG3-B	IG3-C	IG4-A	IG4-B	IG4-C	IG5-A	IG5-B	IG5-C	IG6-A	IG6-B	IG6-C	Total
Annelida	Polychaeta	Amphinomidae	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
Annelida	Polychaeta	Arenicolidae	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	2
Annelida	Polychaeta	Capitellidae	0	0	0	0	0	0	0	1	0	0	0	0	4	0	0	0	1	0	6
Annelida	Polychaeta	Cirratulidae	0	0	0	0	0	0	0	2	0	0	2	0	14	11	4	0	0	1	34
Annelida	Polychaeta	Eunicidae	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	1	0	3
Annelida	Polychaeta	Glyceridae	0	0	0	0	0	0	0	0	1	0	0	2	0	0	0	0	0	0	3
Annelida	Polychaeta	Goniadidae	1	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	3
Annelida	Polychaeta	Lumbrineridae	0	1	0	0	0	0	2	0	0	0	0	0	0	1	0	0	0	0	4
Annelida	Polychaeta	Onuphidae	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	2
Annelida	Polychaeta	Orbiniidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
Annelida	Polychaeta	Paralacydonidae	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	2
Annelida	Polychaeta	Pilargidae	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	2
Annelida	Polychaeta	Sigalionidae	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
Annelida	Polychaeta	Spionidae	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	2
Annelida	Polychaeta	Syllidae	2	0	1	0	1	0	1	1	0	1	3	1	2	1	2	1	1	0	18
Annelida	Polychaeta	Terebellidae	0	0	0	0	0	0	2	0	0	0	0	0	0	0	2	0	1	0	5
Chelicerata	Pycnogonida	Pycnogonida	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
Chordata	Amphioxiformes	Branchiostomidae	0	0	0	0	0	0	1	0	0	1	0	1	0	0	0	0	1	0	4
Cnidaria	Anthozoa	Pennatulacea	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
Crustacea	Amphipoda	Ampeliscidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
Crustacea	Amphipoda	Aoridae	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
Crustacea	Amphipoda	Corophiidae	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1	0	3	6
Crustacea	Amphipoda	Ischyroceridae	0	0	0	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0	3
Crustacea	Amphipoda	Leucothoidae	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Crustacea	Amphipoda	Lysianassidae	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Crustacea	Amphipoda	Metilidae	0	0	0	0	0	0	0	2	1	1	2	2	0	0	1	1	0	0	10
Crustacea	Amphipoda	Oxycephalidae	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	1	0	0	3
Crustacea	Amphipoda	Philiantidae	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
Crustacea	Amphipoda	Phoxocephalidae	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	4
Crustacea	Amphipoda	Zobrachoidae	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1

Phylum	Class/Order	Family	IG1-A	IG1-B	IG1-C	IG2-A	IG2-B	IG2-C	IG3-A	IG3-B	IG3-C	IG4-A	IG4-B	IG4-C	IG5-A	IG5-B	IG5-C	IG6-A	IG6-B	IG6-C	Total
Crustacea	Copepoda	Copepoda	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	2
Crustacea	Cumacea	Bodotriidae	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	2
Crustacea	Cumacea	Ceratocumatidae	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	2
Crustacea	Isopoda	Anthuridae	0	1	2	0	3	2	0	0	0	1	1	0	0	0	0	4	1	1	16
Crustacea	Isopoda	Sphaeromatidae	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	2
Crustacea	Isopoda	Valvifera	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
Crustacea	Ostracoda	Ostracoda	0	0	2	0	0	0	1	1	1	2	1	0	4	2	6	4	6	2	32
Crustacea	Malacostraca	Penaeidae	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
Crustacea	Tanaidacea	Apseudidae	0	0	0	0	0	0	2	2	0	1	1	1	0	0	0	2	1	0	10
Crustacea	Tanaidacea	Pseudozeuxoidae	0	0	0	0	0	0	0	1	0	0	0	3	0	1	5	6	6	4	26
Crustacea	Tanaidacea	Tanaidae	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	3	4	0	10
Echinodermata	Ophiuroidea	Ophiuroidea	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	2
Mollusca	Bivalvia	Corbulidae	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
Mollusca	Bivalvia	Damaged-no-Shell	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Mollusca	Bivalvia	Mytillidae	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Mollusca	Bivalvia	Tellinidae	1	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	3
Mollusca	Bivalvia	Veneridae	0	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	1	4
Nematoda	Nematoda	Nematoda	1	3	0	0	1	0	0	0	0	3	2	7	0	0	0	1	1	0	19
Nemertea	Nemertea	Nemertea	0	0	0	2	0	0	0	0	0	0	1	0	0	0	0	0	0	0	3
Sipuncula	Sipuncula	Sipuncula	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	2
		Total	7	6	7	5	9	2	11	15	9	15	21	24	25	23	22	27	27	12	

Appendix F. Field QA/QC Results

Table 12 Metals QA/QC Results

Analyte	Silver	Aluminium	Arsenic	Cadmium	Chromium	Copper	Lead	Manganese	Mercury	Nickel	Antimony	Zinc
G4	0.5	1200	15	0.05	8	0.5	1	93	0.01	2	1	2
T1-A	0.5	1100	15	0.05	8	0.5	1	90	0.01	2	1	2
RPD	**0%**	**9%**	**0%**	**0%**	**0%**	**0%**	**0%**	**3%**	**0%**	**0%**	**0%**	**0%**
G7	0.5	1100	20	0.05	9	0.5	0.5	100	0.01	2	1	2
T2-A	0.5	1100	18	0.05	9	0.5	1	97	0.01	2	1	2
RPD	**0%**	**0%**	**11%**	**0%**	**0%**	**0%**	**-67%**	**3%**	**0%**	**0%**	**0%**	**0%**
V1	0.5	1100	15	0.05	9	0.5	1	86	0.01	2	1	2
T3-A	0.5	1200	16	0.05	10	0.5	0.5	83	0.01	2	1	2
RPD	**0%**	**-9%**	**-6%**	**0%**	**-11%**	**0%**	**67%**	**4%**	**0%**	**0%**	**0%**	**0%**

Table 13 TRH and BETEX QA/QC Results

Analyte	Benzene	Toluene	Ethylbenzene	Xylenes (Total)	Naphthalene	TRH C_{6-10}	TRH C_{6-10} minus BTEX (F1)	TRH $C_{>10-16}$	TRH $C_{>10-16}$	TRH $C_{>16-34}$	TRH $C_{>34-40}$
G4	0.05	0.05	0.05	0.1	0.25	1	1	10	10	25	25
T1-A	0.05	0.05	0.05	0.1	0.25	1	1	10	10	25	25
RPD	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**
G7	0.05	0.05	0.05	0.1	0.25	1	1	10	10	25	25
T2-A	0.05	0.05	0.05	0.1	0.25	1	1	10	10	25	25
RPD	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**
V1	0.05	0.05	0.05	0.1	0.25	1	1	10	10	25	25
T3-A	0.05	0.05	0.05	0.1	0.25	1	1	10	10	25	25
RPD	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**

Table 14 PAH QA/QC results

Analyte	Naphthalene	2-Methylnaphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benz(a)anthracene	Chrysene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(a)pyrene	Indeno(1,2,3-c,d)pyrene	Dibenz(a,h)anthracene	Benzo(ghi)perylene
G4	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
T1-A	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
RPD	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**
G7	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
T2-A	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
RPD	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**
V1	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
T3-A	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
RPD	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**

Table 15 Organic compounds QA/QC results

Analyte	Monobutyltin	Dibutyltin	Tributyltin
G4	0.25	0.25	0.25
T1-A	0.25	0.25	0.25
RPD	**0%**	**0%**	**0%**
G7	0.25	0.25	0.25
T2-A	0.25	0.25	0.25
RPD	**0%**	**0%**	**0%**
V1	0.25	0.25	0.25
T3-A	0.25	0.25	0.25
RPD	**0%**	**0%**	**0%**

Table 16 Infauna Picking QA/QC results

Site	Original Sort Count	Extra Fauna Collected	New Site Total	% Picking Error
IG4-A	12	0	12	0
IG4-B	16	0	16	0
IG4-C	14	0	14	0