

**LIMITED PHASE II ENVIRONMENTAL SITE ASSESSMENT
PREPARED FOR
GOW STREET RECYCLING CENTRE
81-87 GOW STREET, PADSTOW NSW 2211**

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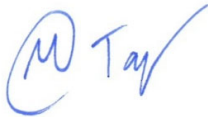
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EXECUTIVE SUMMARY

Benbow Environmental was engaged by Gow Street Recycling Centre to undertake a Limited Phase II Environmental Site Assessment (ESA) for the site located at 81-87 Gow Street, Padstow NSW 2211.

The limited Phase II ESA's purpose is to establish the contamination status of soils within the two locations (areas of interest) chosen for the proposed concrete batching and drilling mud dewatering plants. The areas of interest are located in the northern and centre sections of the facility.

The assessment was restricted to the following proposed operational areas:

- The drive over pit and structural footings for the mixing and concrete batching plant; and
- The in-ground water pit location for the drilling mud dewatering plant.

Soil samples were collected from seven locations using push tubes on the 13th of February 2020. Samples were taken from the surface (0.5 m), at 1.5 m and at 3.0 m below ground level (bgl) at each location. Soils were examined for quality, visible contamination and odour. As the site is located on Class 5 Acid Sulfate Soils (ASS), additional samples were collected for ASS presence at every 0.5 m intervals in all boreholes to a maximum depth of 4.0 m.

All samples were sent to ALS, a NATA accredited laboratory, for analysis of selected contaminants of concern. These included:

- Heavy metals: Arsenic (As), Cadmium (Cd), Chromium (Cr), Copper (Cu), Lead (Pb), Mercury (Hg), Nickel (Ni), Zinc (Zn);
- Organochlorine Pesticides (OCP) and Organophosphorus Pesticides (OPP);
- Phenol;
- Polycyclic Aromatic Hydrocarbons (PAH);
- Total Recoverable Hydrocarbons (TRH);
- Benzene, Toluene, Ethyl Benzene, Xylene, Naphthalene (BTEXN);
- Polychlorinated Biphenyls (PCB); and
- Acid Sulfate Soils (ASS).

The above selection of contaminants is based on the current site operations and past site activities, with particular consideration given to chemicals of potential concern typically associated with industrial activities.

Laboratory results for all samples are included in Attachment 5. Results have been compared to the adopted Site Assessment Criteria (SAC). All soil samples complied with the relevant criteria for all analytes tested with the majority of contaminants found to be below the laboratory's limit of reporting (LOR).

A calculation of the average 95% UCL (upper confidence limit) concentrations for each analyte was undertaken using the relevant procedure outlined in the NSW EPA 'Sample Design Guidelines' (1995). All calculated 95% UCL values were significantly less than the assessment criteria.



No asbestos containing material was encountered during the sampling, neither on the site nor within the samples themselves, although this was limited to visual inspection only (no laboratory analysis for asbestos). A previous Phase I ESA had concluded the likelihood of ACM contamination on the site was very low.

Preliminary field ASS testing determined that 28 samples required the additional SPOCAS (Suspension Peroxide Oxidation Combined Acidity and Sulfur) testing to establish the presence or not of ASS. SPOCAS testing confirmed ASS presence. Therefore, an Acid Sulfate Soil Management Plan (ASSMP) is required for the proposed excavation and construction works.

Contaminant levels were assessed against the National Environment Protection (Assessment of Site Contamination) Measure 1999 (ASC NEPM) (Amendment 2013) and Dept. of Environment and Conservation (DEC) Contaminated Site Guidelines (2006). All contaminants were below the criteria for industrial zoned premises and pose no risk to human or ecological health. The site is suitable for its ongoing use and the proposed development but requires an ASSMP to manage the proposed excavation of soils within the areas of interest.

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Attachment 5: Soil sampling results (COA)

Attachment 6: Proposed Site Plan



1. INTRODUCTION

Benbow Environmental was engaged by Gow Street Recycling Centre to undertake a limited Phase II Environmental Site Assessment (ESA) for the site located at 81-87 Gow Street, Padstow NSW 2211.

The limited Phase II ESA's purpose is to establish the contamination status of soils within the two locations (areas of interest) chosen for the proposed concrete batching and drilling mud dewatering plants. The areas of interest are located in the northern and centre sections of the facility.

The assessment was restricted to the following proposed operational areas:

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- The in-ground water pit location for the drilling mud dewatering plant.

Soil samples were collected from seven locations using push tubes on the 13th of February 2020. Samples were taken from the surface (0.5 m), at 1.5 m and at 3.0 m below ground level (bgl) at each location. Soils were examined for quality, visible contamination and odour. As the site is located on Class 5 Acid Sulfate Soils (ASS), additional samples were collected for ASS presence at 0.5 m intervals in all boreholes to a maximum depth of 4.0 m.

All samples were sent to NATA accredited laboratory, ALS Environmental, for analysis of contaminants of concern. Soil samples were field screened with a Photoionization Detector (PID) for Volatile Organic Compounds (VOCs).

The selection of analytes is based on the current site operations and past site activities, with particular consideration to contaminants of potential concern that are generally associated with industrial activities. Selected analytes for testing include the following:

- Heavy metals: Arsenic (As), Cadmium (Cd), Chromium (Cr), Copper (Cu), Lead (Pb), Mercury (Hg), Nickel (Ni), Zinc (Zn);
- Organochlorine Pesticides (OCP) and Organophosphorus Pesticides (OPP);
- Phenol;
- Polycyclic Aromatic Hydrocarbons (PAH);
- Total Recoverable Hydrocarbons (TRH);
- Benzene, Toluene, Ethyl Benzene, Xylene, Naphthalene (BTEXN);
- Polychlorinated Biphenyls (PCB); and
- Acid Sulfate Soils (ASS).

This report has been prepared in accordance with the Guidelines for Consultants Reporting on Contaminated Sites (OEH September 2011).

The NEPM Assessment of Site Contamination (NEPC, 1999) amended 2013 and AS 4482.1–2005 Guide to the investigation and sampling of sites with potentially contaminated soil, was also referenced for the undertaking of the assessment.

1.1 SCOPE OF WORKS

The limited Phase II ESA comprises the following tasks:

- Design an inspection and a soil sampling program based on key planned excavation areas on the site;
- Sample soil at specified boreholes/areas planned for excavation at 0.5 m, 1.5 m to a maximum depth of 3.0 m for contaminants of concern;
- Sample soil at specified boreholes/areas planned for excavation at 0.5 m intervals to a maximum depth of 4.0 m for acid sulfate soils.
- Field testing and laboratory analysis of samples for contaminants of concern;
- Comparison of analytical data against adopted criteria;
- Determine suitability of the site's land for its proposed development; and
- Prepare a report which outlines the above-listed aspects of the Phase II ESA.

1.2 RELEVANT LEGISLATION AND GUIDELINES

The limited Phase II ESA has been carried out in accordance with the following relevant legislation and guidelines:

- Contaminated Land Management Act, 1997;
- Guidelines for Consultants Reporting on Contaminated Sites (OEH, 2011);
- Sampling Design Guidelines (NSW EPA, 1995);
- National Environmental Protection (Assessment of Site Contamination) Measure (NEPM) (NEPC, 1999) amended 2013;
- NEPC (2013) National Environmental Protection (Assessment of Site Contamination) Schedule B (1) Guideline on the Investigation Levels for Soil and Groundwater;
- AS 4482.1-2005 Guide to the investigation and sampling of sites with potentially contaminated soil; and
- Acid Sulfate Soils Assessment Guidelines in 'Acid Sulfate Soils Manual 1998' (ASSMAC).

2. SITE IDENTIFICATION

The subject site is located at 81-87 Gow Street, Padstow NSW 2211, and consists of a single rectangular lot. Site identification and land use information is summarised in Table 2-1.

Table 2-1: Site identification

Lot / Plan No.	A/DP/103140
Local Government Area	Canterbury-Bankstown Council
Approximate site area	10,400 m ²
Current Land Zoning	IN1 – General Industrial

The site location in a local context is presented as Figure 2-1 with site and lot boundaries displayed in Figure 2-2. An aerial view of the site is presented in Figure 2-3 and the site and surrounding land use zoning is shown in Figure 2-4.

Figure 2-1: Site location in a local context



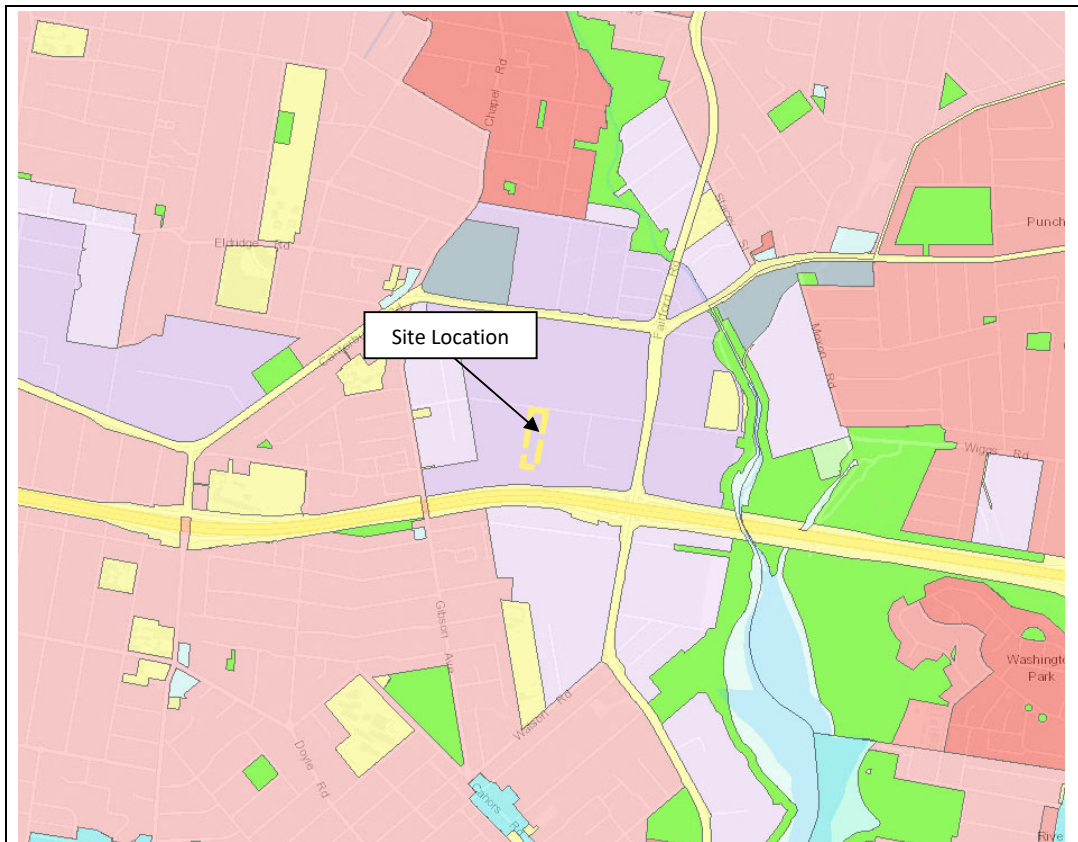
Figure 2-2: Site location showing lot boundaries



Figure 2-3: Location of Subject Site



Figure 2-4: Surrounding Land Use Zoning



Source: NSW Planning Portal 2019

LEGEND

B1 - Neighbourhood Centre	RE1 - Public Recreation
B2 - Local Centre	RE2 - Private Recreation
B3 - Commercial Core	RU1 - Primary Production
B4 - Mixed Use	RU2 - Rural Landscape
B5 - Business Development	RU3 - Forestry
B6 - Enterprise Corridor	RU4 - Primary Production Small Lots
B7 - Business Park	RU5 - Village
B8 - Metropolitan Centre	RU6 - Transition
E1 - National Parks and Nature Reserves	SP1 - Special Activities
E2 - Environmental Conservation	SP2 - Infrastructure
E3 - Environmental Management	SP3 - Tourist
E4 - Environmental Living	W1 - Natural Waterways
IN1 - General Industrial	W2 - Recreational Waterways
IN2 - Light Industrial	W3 - Working Waterways
IN3 - Heavy Industrial	
IN4 - Working Waterfront	
R1 - General Residential	
R2 - Low Density Residential	
R3 - Medium Density Residential	
R4 - High Density Residential	
R5 - Large Lot Residential	



3. DESCRIPTION OF DEVELOPMENT

The proposed development involves the construction of a concrete batching plant and drilling mud dewatering facility located at the existing Gow Street Recycling Centre site (81-87 Gow Street, Padstow NSW 2211).

There is no planned excavation, demolition or construction associated with the existing C&D resource recovery centre that is also located at the site.

Areas planned for excavation during establishment of the proposed facilities will be tested for the analytes outlined in Section 6.5.1.

3.1.1 Concrete Batching Plant

A CON-E-CO-LO-PRO 12 mobile concrete batching plant is proposed to be installed in the northern section of the site. This consists of modularised components for quick and easy setup, live-bottom aggregate batcher and cement batchers.

The main areas of excavation and soil investigation associated with the concrete batching plant are the drive over aggregate pits, the conveyor belt footings and the batch house.

Approximate excavation area:

- Drive over pit: 156 m²
- Concrete batching plant: 30 m²
- Conveyor footing: 9 m²

3.1.2 Drilling Mud Dewatering Facility

The drilling mud dewatering facility would operate as a recycling facility for drilling mud, concrete washout and capture site storm water. The dewatering plant will be located in an existing structure on the eastern side of the site and requires the excavation to facilitate an in-ground water pit.

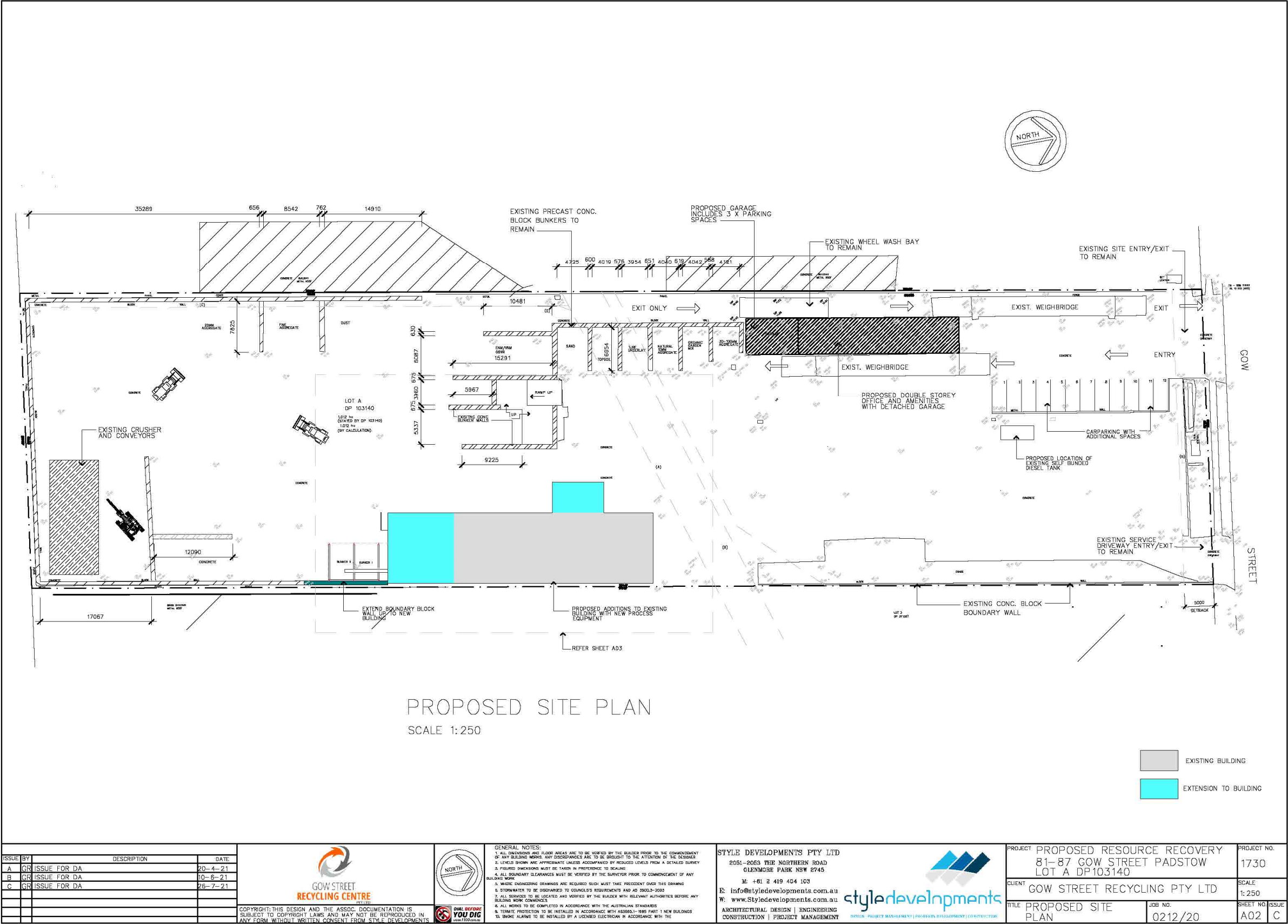
Approximate excavation area:

- Drilling mud dewatering pit: 25 m²

The proposed site plan showing structure locations can be viewed in Figure 3-1 and as Attachment 6.



Figure 3-1: Proposed site plan



4. GEOLOGY AND HYDROGEOLOGY

4.1 SOIL CLASSIFICATION AND GEOLOGY

The 'Sydney 1:100 000 Geological Map Sheet 9130' describes the geological composition of the area as *Ashfield Shale (Rwa)* which is part of the Wianamatta Group and comprises of dark-grey to black claystone-siltstone and fine sandstone-siltstone laminate.

The soil map 'Soil Landscape of Sydney 1:100,000 Sheet 9130' shows that the subject site is located in a 'Blacktown' (bt) area and is described as follows:

Blacktown (bt)

Landscape – gently undulating rises on Wianamatta Group shales and Hawkesbury shale. Local relief to 30 m, slopes are usually <5%. Broad rounded crests and ridges with gently inclined slopes. Cleared Eucalypt woodland and tall open-forest (wet sclerophyll forests).

Soils – shallow to moderately deep (<100 cm) Red and Brown Podzolic Soils (Dr3.21, Dr3.11, Db2.11) on crests, upper slopes and well-drained areas, deep (150-300 cm) Yellow Podzolic Soils and Soloths (Dy2.11, Dy3.11) on lower slopes and in areas of poor drainage.

Limitations – moderately reactive highly plastic subsoil, low soil fertility, poor soil drainage.

4.2 ACID SULFATE SOILS (ASS)

Acid Sulfate Soils (ASS) are naturally occurring soils and sediments that formed under waterlogged conditions. They contain iron sulfides (predominantly pyrite), when water logged or in an anoxic environment ASS remain benign. However, if drained, excavated or exposed to air by a lowering of the water table the sulfides react with oxygen to form sulfuric acid, sometimes in large quantities (for every tonne of sulfidic material that completely oxidises, 1.6 tonnes of pure sulfuric acid is produced). ASS contains trace metals such as iron, aluminium and arsenic. Once acid forms it mobilises any metals held within the soil. Rainfall washes this mixture into the surrounding environment potentially polluting land and nearby waterways. Accumulation of acid and metals becomes toxic to plants and animals, especially aquatic organisms. Built structures are highly susceptible to ASS, as acid will slowly corrode concrete, steel, roads and building foundations.

Information on the SEED (Sharing and Enabling Environmental Data) Map Viewer of Acid Sulfate Soils Risk indicates the site lies in an area of low probability ASS (Figure 4-1). The subject site is located on Class 5 land of the Bankstown Council's Local Environmental Plan 2015 Acid Sulfate Soil map (Figure 4-2). Class 5 areas are generally low risk of containing acid sulfate soils. As per the LEP, development consent is required for works in Class 5 areas that are located within 500 m of adjacent class 1, 2, 3 or 4 land that is below 5 metres AHD and by which the water table is likely to be lowered below 1 metre AHD on adjacent class 1, 2, 3 or 4 land. Class 2 land is approximately 365 m north-east of the site perimeter.

As the site is located on Class 5 land, sampling for ASS was undertaken at 0.5 m intervals at all sample locations.

Figure 4-1: Probability of ASS occurrence at the site

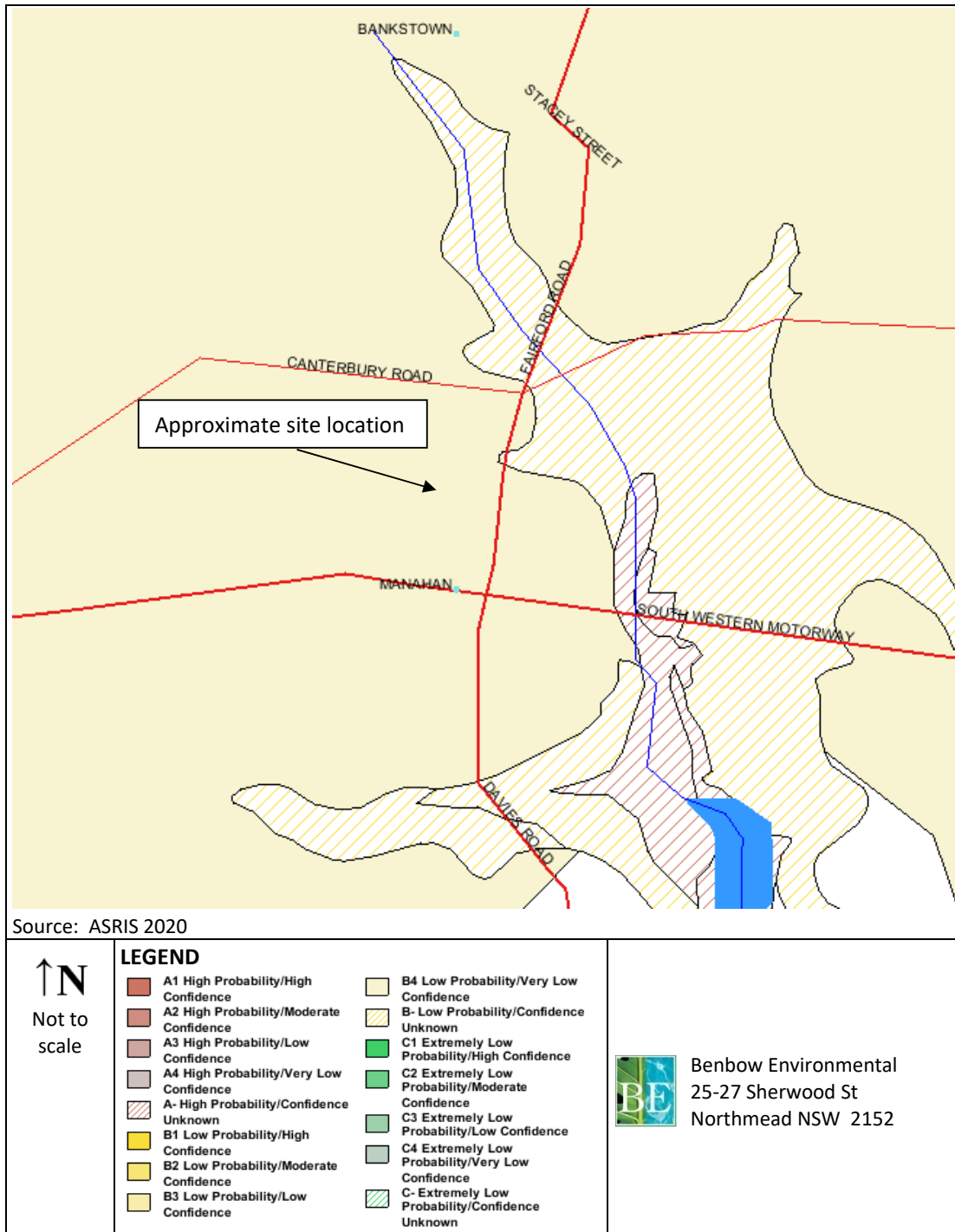
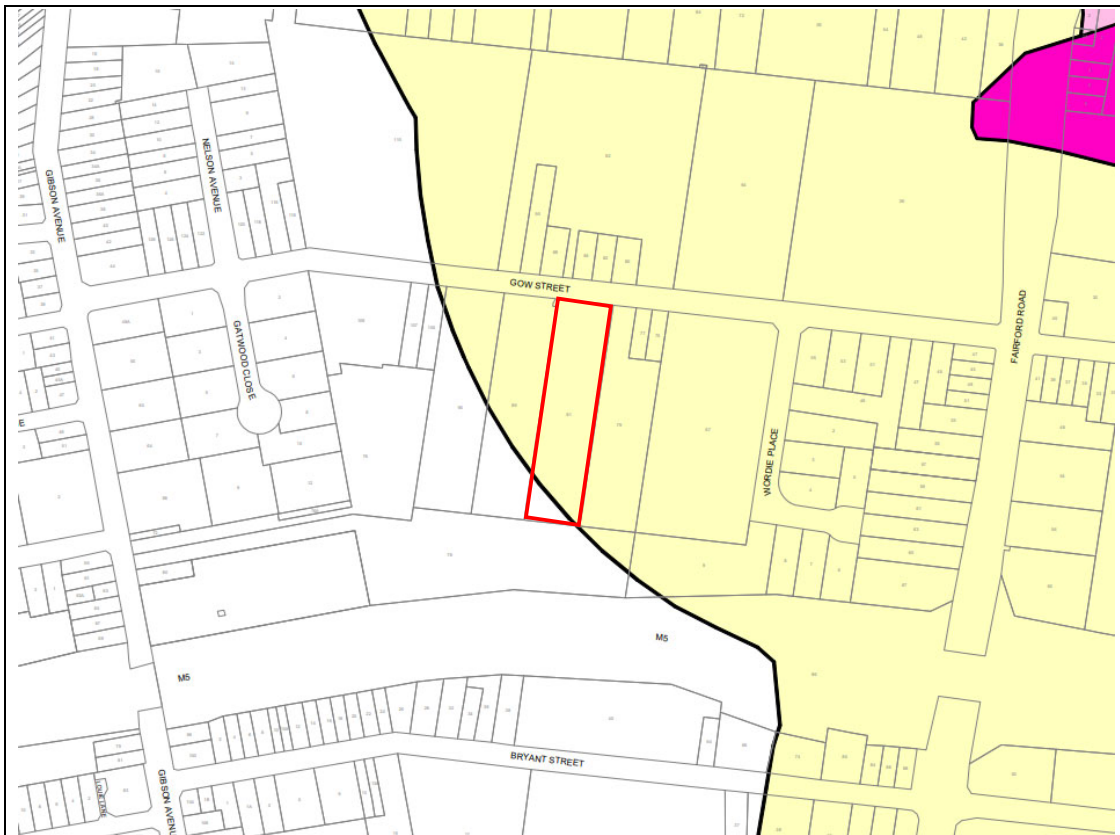
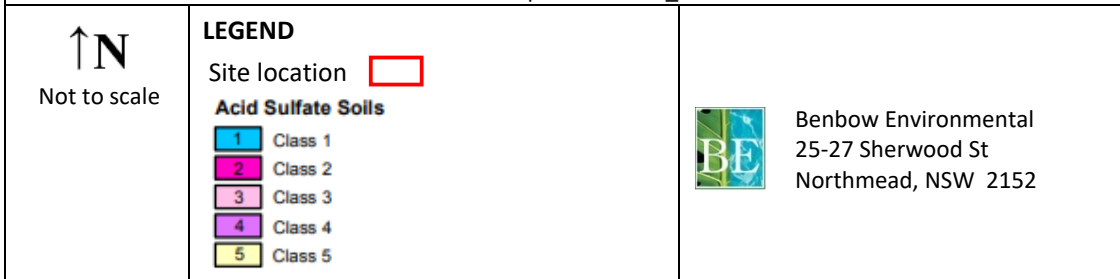


Figure 4-2: Bankstown LEP 2015 Acid Sulfate Soil Map



Source: Bankstown LEP 2015 Acid Sulfate soils Map – Sheet ASS_005



5. POTENTIAL SOURCES OF CONTAMINATION

5.1 CONTAMINATION ISSUES

5.1.1 Heavy Metals

Due to the nature of the recycling facility and the raw materials accepted, a range of heavy metals may be present on site. Contamination can occur from heavy metals through improper storage, handling or processing of scrap metals.

Lead-based paints may be present on internal and external structures prior to 1965 (legalisation passed in 1965 stipulated lead content in paint could not exceed 1% after 1965). The exact age of the office structure due for removal is unknown. However, onsite testing for lead-based paints that was conducted for this assessment, did not reveal any lead presence. Based on this assessment and inspection, the building is not considered to be a risk for lead-based paint.

5.1.2 Asbestos Materials

Asbestos containing materials (ACM) were widely used in commercial buildings throughout NSW before its total ban in 2003. Due to the age and composition of the onsite structures, ACM is unlikely to be present either inside or outside of buildings.

Likewise, fill material was often brought onto sites for landscaping and structural uses (such as levelling). Historically, fill material often contained waste that was not considered hazardous at the time, such as asbestos. However from the site history and the sealed nature of the site, ACM in fill material is not anticipated to be present above or below ground.

5.1.3 Chemicals and Fuels Storage

Improper chemical storage can lead to contamination of soil and groundwater, through leaks or spills. The site is covered by concrete hardstand which typically provides a robust barrier against contaminants from reaching the soil. However, cracks and slab expansion joints can provide potential pathways for contaminant migration into the soil.

The principal chemicals stored on site are detailed below. All chemicals are stored within a covered, self-bunded area.

Table 5-1: Chemical names and maximum storage quantities on site

Chemical name	Maximum storage quantity
Diesel fuel (self bunded tank)	65,000 L
Degreaser	200 L
Truck wash	200 L
Engine oil	1,000 L
Transmission oil	200 L
Differential oil	200 L
Grease / lubricants	200 kg



5.1.4 Soil, Surface Water and/or Groundwater Pollution

Soil contamination may potentially have occurred if contaminated fill material was brought on site prior to the facilities construction. However, the Phase I ESA found little evidence of soil contamination on site.

Offsite migration of contaminants stored onsite can occur through surface water runoff or through stormwater drains. The site is covered by concrete hardstand which typically provides a robust barrier against contaminants from reaching the soil. The only exposed earth was a small section located in the north eastern corner (where the hardstand had recently been removed). No visible sign of surface water and/or groundwater pollutants was noted during the site inspection.

5.1.5 OC/OP Pesticide Usage and/or Contamination

The Phase I ESA noted that potential historical use of pesticides *may* have occurred onsite. However, due to the concrete hardstand, current site use (no pesticides stored or used) and the nature of previous site uses, the risk of pesticide contamination is considered low.

However, organochlorine pesticide (OCP) and organophosphorus pesticide (OPP) analysis was included in soil sampling for this ESA.

5.1.6 Waste Disposal

The site has consent and holds an Environmental Protection Licence (Licence No. 10943) for the receipt and storage of C&D and asphalt waste. The maximum amount of waste for storage, processing or resource recovery cannot exceed 7,300 tonnes at any one time or 80,000 tonnes per annum.

All wastes are collected and disposed of in accordance with relevant EPA regulations. The site currently generates negligible amounts of liquid waste.

Due to the site history and usage, unlawful waste disposal or storage is not expected onsite.

5.1.7 Underground Petroleum Storage Systems (UPSS)

It is understood that a decommissioned UST (underground storage tank) remains on site. The tank had an approximate capacity of 50,000 L and was used historically as fuel storage for onsite vehicles and equipment. It is located approximately halfway along the site's western perimeter, but its precise location is unknown.

The UST was decommissioned and covered in concrete. It is not located near any areas marked for future excavation works. The UST would not be disturbed during these planned works.



5.2 CONCEPTUAL SITE MODEL

A conceptual site model (CSM) has been prepared in accordance with the National Environment Protection (Assessment of Site Contamination) Measure as amended in 2013. The CSM is a representation of site-related information regarding contamination sources, receptors and exposure pathways between those sources and receptors. The CSM is presented in the following Table 5-2.



Table 5-2: Conceptual site model (CSM)

Known and Potential Primary Sources of Contamination	Primary Release Mechanism	Potentially Impacted Media	Contaminants of Potential Concern	Potential Receptors		Exposure Pathways		Risk of Contamination
				Human	Environment	Human	Environment	
Scrap metals, fuel, lubricants, oils and fluids	Metal processing Leaks and spills	Soil Groundwater Surface Water	Heavy Metals BTEXN PAH TRH	Workers on site, neighbouring premises if contamination migrates off-site	Soil, waterways, native habitats	Dermal contact, inhalation of dust and vapours, ingestion	Surface water runoff, soils, groundwater	Medium
Lead-based paints	Disturbance of surfaces where lead-based paint is present	Surface soil	Lead	Workers on site, neighbouring premises if contamination migrates off-site	Soil, waterways, native habitats	Dermal contact, dust inhalation, ingestion	Soil, surface water runoff	Low
Asbestos	Disturbance of asbestos-containing materials	Soil Air (from released fibres)	Asbestos	Workers on site, neighbouring premises if contamination migrates off-site	Soil, air, waterways, native habitat	Inhalation of fibres	Air, surface water runoff	Low
Fill material	Disturbance of fill by excavation	Soil	OC/OP pesticides heavy metals PAH	Workers on site, neighbouring premises if contamination migrates off-site	Soil, air, waterways, native habitat	Dermal contact, inhalation of dust and vapours, ingestion	Air, surface water runoff	Low
Acid Sulfate Soils (ASS)	Disturbance of ASS	Soil	ASS	Workers on site, neighbouring premises if contamination migrates off-site	Soil	Dermal contact, dust inhalation, ingestion	Surface water runoff, soils	Low
Underground Petroleum Storage System (UPSS)	Leaks and spill Disturbance of tank by excavation	Soil Groundwater	Heavy Metals BTEXN PAH TRH	Workers on site, neighbouring premises if contamination migrates off-site	Soil, waterways, native habitats	Inhalation of vapours	Soil, groundwater runoff	Low

6. SOIL SAMPLING AND ANALYSIS

6.1 BACKGROUND

A Phase I ESA was conducted by Benbow Environmental in 2008. It found limited potential for contamination of soils and groundwater from current and historical activities on site. The site's surface is entirely covered by concrete hardstand that provides a robust barrier against contaminants from entering the soil beneath. However, contamination pathways can exist via cracks in the hardstand or through deterioration of the concrete slab expansion joints.

The findings from the Phase I conducted in 2008 are summarised below:

- There is limited subsurface contamination likely at this site. Soil sampling and analysis would be needed if this is to be quantified.
- There is limited likelihood of groundwater being contaminated from past use of the site based on operational details provided, however a more rigorous statement would require groundwater monitoring;
- There are some areas warranting cleaning of oil stains and removal of scrap materials;
- Long term monitoring of potential leakage from the UST needs to be considered by site management; and
- Residual liquids and oils need to be removed from the site and disposed of correctly, recycling being a preferred option – this mainly relates to the ongoing maintenance activities.

This limited Phase II ESA is to determine the contamination status of soils within the areas of interest for the proposed concrete batching and drilling mud dewatering facilities. It should be noted that during the Phase II ESA site activities, oil staining was now no longer evident. Additionally, the decommissioned UST will not be disturbed during the proposed works.

6.2 OBJECTIVES

The following are the objectives of the assessment.

- Determine the presence of a range of contaminants from soil samples collected from push tubes within the proposed areas of development (the "areas of interest"); and
- Recommend mitigation measures and management plans to be implemented during construction if contaminants are detected above the selected criterion.

6.3 SAMPLING RATIONALE

Samples were collected from seven (7) boreholes to a maximum approximate depth of 3.0 m for soil analysis and 4.0 m for ASS analysis.

The sampling regime adopted in the current assessment meets the minimum sampling density specified in the *Sampling Design Guidelines* (NSW EPA, 1995) for the characterisation of a site

applied to the two areas of interest at the site. Soil sampling was undertaken on 13th of February 2020.

Based on the NSW EPA *Sampling Design Guidelines* (1995), the areas of interest are approximately 0.2 ha, requiring a minimum of seven (7) sampling points. Excavations are restricted to within the specified areas for the proposed concrete batching plant and drilling mud dewatering plant footings and pits. The following planned excavation locations and respective boreholes included in this assessment are shown in Figure 6-2 and are as follows:

- Concrete batching plant (BH1 and BH2);
- Conveyor footing (BH3);
- Drive over pit (BH4 and BH5); and
- Drilling mud dewatering pit (BH6 and BH7).

Soil samples were collected at each of the above locations and at the following depths per analysis:

- Samples collected for Heavy metals, OCP/OPP, Phenol, PAH, TRH, BTEXN and PCBs testing were sampled at three (3) depths below ground level: 0.5 m, 1.5 m and 3.0 m where possible. Where drill depth was refused before 3.0 m, soil was collected at the maximum depth before stoppage; and
- Samples collected for ASS testing were sampled at 0.5 m intervals below ground level to a maximum depth of 4.0 m. Where drill depth was refused before 4.0 m, soil was collected at the maximum depth.

Figure 6-1 shows the preliminary site plan overlaying an aerial of the site. Excavation zones and perimeters are shown. Excavations are limited to establishing footings and pits for the concrete batching and drilling mud dewatering facilities, and are confined to within this area. No excavations will take place outside of these boundaries.

Figure 6-2 shows an aerial of each sampling location within the area of investigation. Note, the below Google Earth aerial photographs are dated April 2019. Currently, the large warehouse occupying the north and east of the site has since been removed. The remainder of the site remains unchanged.

Figure 6-1: Aerial view of the site plan showing excavation zones and planned structure locations

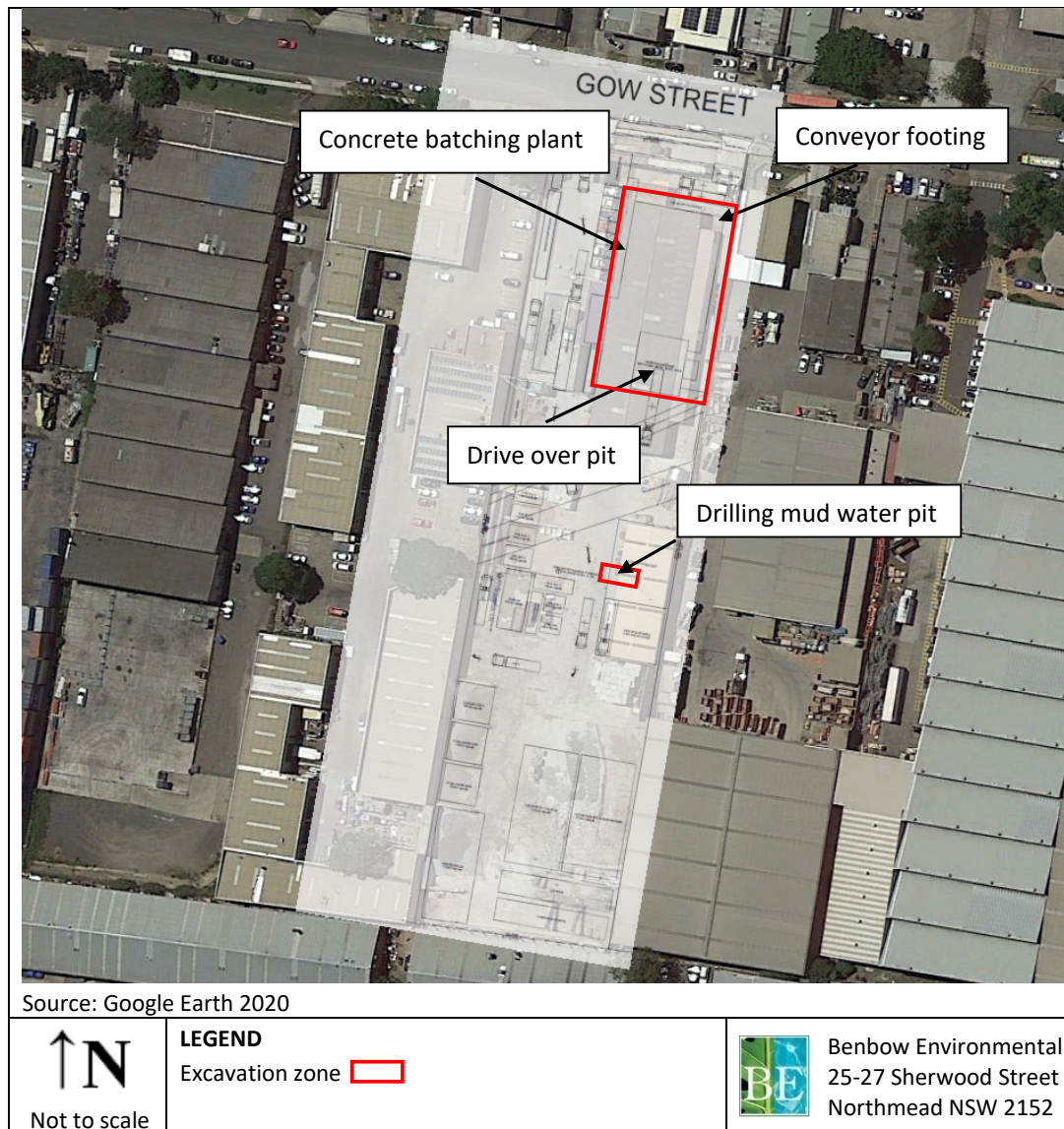
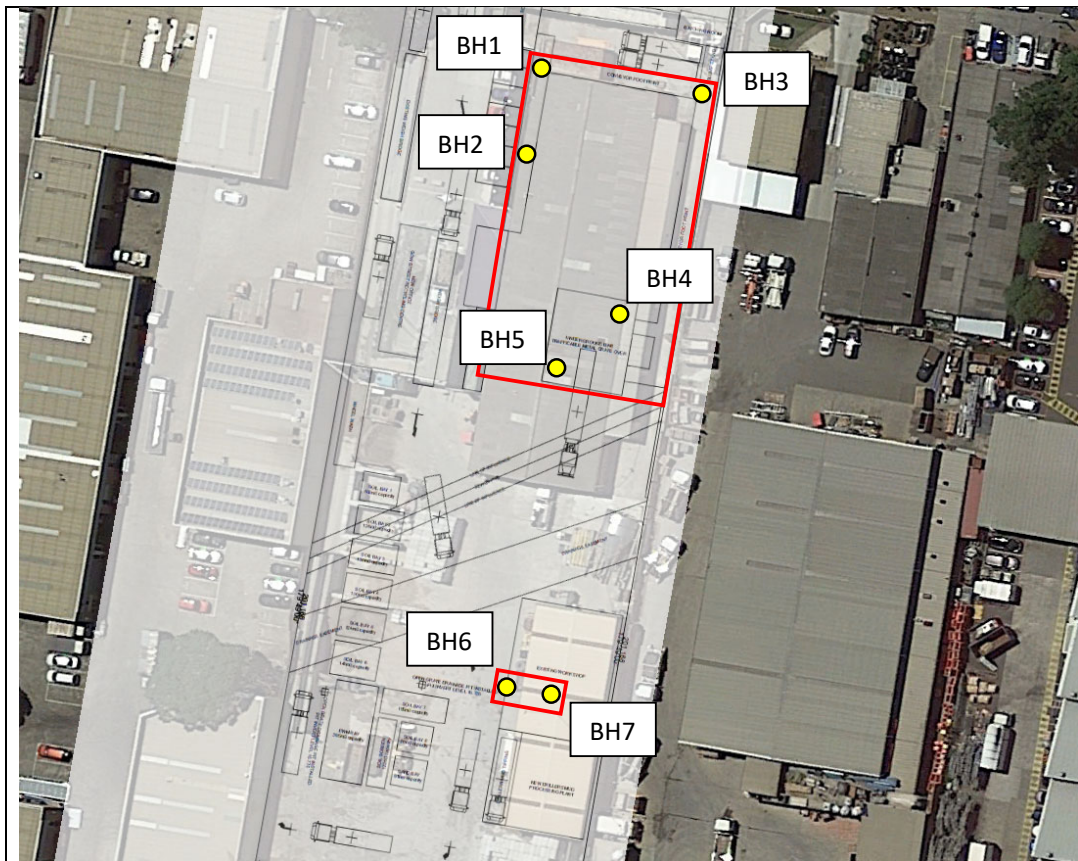


Figure 6-2: Close up of excavation zones and borehole locations



Source: Google Earth 2020

 Not to scale	LEGEND Borehole location ● Excavation zone 	 Benbow Environmental 25-27 Sherwood Street Northmead NSW 2152
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Table 6-1: Summary of soil analytes tested

Sample Location	Sample ID	PID screen (ppm)	Heavy metals	OCP/OPP	Phenol	PAH	TRH	BTEXN	PCB
1	BH1_0.5m	1.5	✓	✓	✓	✓	✓	✓	✓
	BH1_1.5m	0.7	✓	✓	✓	✓	✓	✓	✓
	BH1_2.0m	0.0	✓	✓	✓	✓	✓	✓	✓
2	BH2_0.5m	2.9	✓	✓	✓	✓	✓	✓	✓
	BH2_1.5m	3.5	✓	✓	✓	✓	✓	✓	✓
	BH2_2.0m	4.6	✓	✓	✓	✓	✓	✓	✓
3	BH3_0.5m	4.7	✓	✓	✓	✓	✓	✓	✓
	BH3_1.5m	0.3	✓	✓	✓	✓	✓	✓	✓
	BH3_2.2m	0.0	✓	✓	✓	✓	✓	✓	✓
4	BH4_0.5m	1.3	✓	✓	✓	✓	✓	✓	✓
	BH4_1.5m	0.7	✓	✓	✓	✓	✓	✓	✓
	BH4_3.0m	0.9	✓	✓	✓	✓	✓	✓	✓
5	BH5_0.5m	0.1	✓	✓	✓	✓	✓	✓	✓
	BH5_1.5m	0.9	✓	✓	✓	✓	✓	✓	✓
	BH5_3.0m	0.0	✓	✓	✓	✓	✓	✓	✓
6	BH6_0.5m	0.0	✓	✓	✓	✓	✓	✓	✓
	BH6_1.5m	1.3	✓	✓	✓	✓	✓	✓	✓
	BH6_3.0m	0.5	✓	✓	✓	✓	✓	✓	✓
7	BH7_0.5m	0.0	✓	✓	✓	✓	✓	✓	✓
	BH7_1.5m	0.0	✓	✓	✓	✓	✓	✓	✓
	BH7_3.0m	0.0	✓	✓	✓	✓	✓	✓	✓

Table 6-2: Summary of ASS samples tested

Sample Location	Sample ID	Field pH Tests	SPOCAS
1	BH1_0.5m	✓	✓
	BH1_1.0m	✓	✓
	BH1_1.5m	✓	✓
	BH1_2.0m	✓	✓
2	BH2_0.5m	✓	✓
	BH2_1.0m	✓	Not required
	BH2_1.5m	✓	Not required
	BH2_2.0m	✓	Not required
3	BH3_0.5m	✓	Not required
	BH3_1.0m	✓	✓
	BH3_1.5m	✓	Not required
	BH3_2.0m	✓	Not required
4	BH4_0.5m	✓	Not required
	BH4_1.0m	✓	✓
	BH4_1.5m	✓	✓
	BH4_2.0m	✓	✓
	BH4_2.5m	✓	✓

Table 6-2: Summary of ASS samples tested

Sample Location	Sample ID	Field pH Tests	SPOCAS
	BH4_ 3.0m	✓	Not required
5	BH5_ 0.5m	✓	✓
	BH5_ 1.0m	✓	✓
	BH5_ 1.5m	✓	✓
	BH5_ 2.0m	✓	✓
	BH5_ 2.5m	✓	✓
	BH5_ 3.0m	✓	✓
	BH5_ 3.5m	✓	Not required
6	BH6_ 0.5m	✓	Not required
	BH6_ 1.0m	✓	✓
	BH6_ 1.5m	✓	✓
	BH6_ 2.0m	✓	✓
	BH6_ 2.5m	✓	✓
	BH6_ 3.0m	✓	Not required
	BH6_ 3.5m	✓	✓
	BH6_ 4.0m	✓	Not required
7	BH7_ 0.5m	✓	Not required
	BH7_ 1.0m	✓	✓
	BH7_ 1.5m	✓	✓
	BH7_ 2.0m	✓	✓
	BH7_ 2.5m	✓	✓
	BH7_ 3.0m	✓	✓
	BH7_ 3.5m	✓	✓
	BH7_ 4.0m	✓	✓

6.4 SAMPLING METHODS

6.4.1 Soil Sampling Equipment and Methods

All soil samples were taken with a core sampler (push tubes) via drill. Samples were then collected from the cores using a stainless-steel scoop/spoons. Soil was placed into 150 mL glass jars; ASS samples were placed in 250 mL polyethylene bags. Soils were packed tightly into each glass jar/polyethylene bag to eliminate excess air space or voids. All sample containers were supplied by ALS Environmental.

ASS samples underwent initial ASS field screening analysis (pH_F and pH_{FOX}), to inform the potential for additional analysis. A total of 28 ASS samples indicated possible sulfide presence. These were subjected to further quantitative analysis to confirm the presence and extent of ASS within the areas of interest.

The analytical method used in laboratory testing for further analysis was the Suspension Peroxide Oxidation-Combined Acidity and Sulfate method (SPOCAS), in accordance with the ASS Manual.

6.4.2 Equipment Decontamination Procedures

Between each sampling event, all sampling equipment was decontaminated to avoid cross contamination. Scoops and spoons were scrubbed using a solution of 5% Decon90, rinsed with distilled water, dried with a clean paper towel and rinsed again.

6.4.3 Sample Handling Procedures

Each sample is identified by the following information, which was written on the container label:

- BE job number;
- Sampler;
- Sample ID (location number); and
- Date and time of sampling.

Samples were placed inside a cooled Esky with ice immediately after being collected in the field. Collected samples were then transported in this manner to ALS on the same day. Completed Chain of Custody (COC) forms accompanied the samples to the lab. ALS acknowledged samples were received in a satisfactory condition in relation to transport time and sample temperature. The COC is included in Attachment 2. All samples were analysed within acceptable holding times.

6.4.4 Sample Preservation Methods

Preservation of samples was achieved by keeping samples chilled with ice. No chemical preservatives were added to either soil sample jars or bags.

6.4.5 Field Screening

Each soil sample was field tested for the presence of Volatile Organic Compounds (VOCs) using a MiniRAE 3000 handheld PID (Photoionization detector).

The PID measures VOCs and other gases in concentrations of 10,000 parts per million (ppm) in real time. Any significant measure (>10 ppm) of VOC detected, the sample of the offending material is subjected for further laboratory analysis. The calibration certificate for the PID is included as Attachment 4.

6.5 LABORATORY ANALYSIS

6.5.1 Analytes

The selection of analytes is based on the current site operations and past site activities, with particular consideration to chemicals of potential concern that are generally associated with industrial activities. Selected analytes for testing included the following:

- Heavy metals: Arsenic (As), Cadmium (Cd), Chromium (Cr), Copper (Cu), Lead (Pb), Mercury (Hg), Nickel (Ni), Zinc (Zn);
- Organochlorine Pesticides (OCP) and Organophosphorus Pesticides (OPP);
- Phenol;
- Polycyclic Aromatic Hydrocarbons (PAH);
- Total Recoverable Hydrocarbons (TRH);
- Benzene, Toluene, Ethyl Benzene, Xylene, Naphthalene (BTEXN);
- Polychlorinated Biphenyls (PCB); and
- Acid Sulfate Soils (ASS).

It was determined that sample collection for asbestos in soil materials was not feasible for this limited Phase II ESA for the following reasons:

- ACM was not noted during the Phase I ESA conducted by BE in 2008, nor is it expected to be in soil beneath the hardstand;
- ACM was not noted in structures or above ground surfaces in 2008; and
- The amount of soil required for asbestos analysis in soil is a minimum 500 g per sample. The push tube collection method does not accommodate such large quantities of soil per sample.

Should ACM be encountered during sampling or planned excavations, appropriate strategy and actions will be implemented in the form of an RAP (Remedial Action Plan). During soil sample collection, BE consultants inspected extracted soils and surrounding areas across the site for ACM presence.

6.5.2 Testing Methods

Samples were analysed by ALS Environmental, an NATA accredited laboratory with testing methods conforming to international and Australian Standards and the NEPM (2013) guideline.

6.6 QA/QC EVALUATION

Quality Assurance and Quality Control applied to this project were in accordance with AS 4482.1-2005 in regard to the followings:

- **Precision** – measures the reproducibility of measurements under a given set of conditions. The precision of the laboratory data and sampling techniques is assessed by calculating the Relative Percent Difference (RPD) of duplicate samples.
- **Accuracy** – measures the bias in a measurement system. The accuracy of the laboratory data that is generated during this study is a measure of the closeness of the analytical results obtained by a method to the 'true' value. Accuracy is assessed by reference to the analytical results of laboratory control samples, laboratory spikes and analyses against reference standards.
- **Representativeness** – expresses the degree which sample data accurately and precisely represents a characteristic of a population or an environmental condition. Representativeness is achieved by collecting samples on a representative basis across the site, and by using an adequate number of sample locations to characterise the site to the required accuracy.
- **Comparability** – expresses the confidence with which one data set can be compared with another. This is achieved through maintaining a level of consistency in techniques used to collect samples; ensuring analysing laboratories use consistent analysis techniques and reporting methods.
- **Completeness** – is defined as the percentage of measurements made which are judged to be valid measurements. The completeness goal is set at there being sufficient valid data generated during the study.

6.6.1 Field Instrument Calibration

A MiniRAE 3000 handheld PID (Photoionization detector) was utilised in the sampling and monitoring program and was supplied pre-calibrated from AES. The calibration certificate is provided in Attachment 4.

6.6.2 Laboratory QA/QC

The NATA accredited laboratory, ALS Australia, was used to analyse all samples obtained during the sampling program. Quality Control reports and QA/QC Compliance Assessments for all requested analyses by ALS Environmental are included in Attachment 3.

6.6.3 QA/QC Data Evaluation

Quality assurance and quality control for the soil sampling program part of the investigation can be summarised as follows:

- No analysis holding times outliers exist;
- No method blank value outliers occur;
- No laboratory control outliers occur;
- No matrix spike outliers occur;
- No duplicate outliers occur; and
- For all regular sample matrices, no surrogate recovery outliers occur.



Quality control sample frequency outliers exist. The frequency of laboratory QC samples analysed within the analytical lots in which the submitted samples were processed. Laboratory QA/QC compliance assessments from ALS Environmental are included in Attachment 3.

6.6.4 Duplicate Results

A total of two (2) duplicate samples were collected to assess the accuracy of sampling practices for the soil sampling suite and six (6) to assess the accuracy of sampling practices for ASS. These were selected at random during each sample collection.

Duplicate samples were taken to assess the accuracy of sampling practices. In order to compare results of the duplicate samples to the original sample, the Relative Percent Difference (RPD) is calculated for each analyte that had results above the Limit of Reporting (LOR). The RPD is calculated using the following formula:

$$RPD (\%) = 100 * \frac{|X_A - X_B|}{\frac{1}{2}(X_A + X_B)}$$

where X_A and X_B are the analyte levels of original sample A and duplicate sample B, respectively.

The accuracy of RPD values for field duplicate samples are compared to a criteria of <50% RPD. RPD values for duplicate samples are presented in Table 6-3.

Some variability was observed between the sample and duplicate results with three elevated RPD values observed in the BH4_1.5m and BH4_1.5D samples for analytes arsenic, zinc and Sum of DDD, DDE and DDT. These variations in the analytical results between soil samples may occur due to the difficulty in obtaining a homogenous primary sample for splitting purposes from the soil encountered and can also result from the nature of the sample and form of the contaminant. However, the majority of samples reported values RPD values below 50%.

Similarly, there was some variability between the sample and duplicate results for acid sulfate soil results for the reaction rate for two RPD results. The remaining RPD values were well below 50%.

Table 6-3: Summary of Duplicate Soil Results and RPD Values

Compound	Sample Result	Duplicate Sample Result	Duplicate RPD %
Primary Analytes			
13/02/2020 Sampling Event (BH4_1.5m and BH4_1.5D Duplicate)			
Arsenic mg/kg	6	12	67%
Chromium mg/kg	26	29	11%
Copper mg/kg	18	20	11%
Lead mg/kg	30	40	29%
Nickel mg/kg	4	6	40%
Zinc mg/kg	18	33	59%
Sum of DDD + DDE + DDT	0.05	0.11	75%
Benzo(a)pyrene TEQ (LOR) mg/kg	1.2	1.2	0%
13/02/2020 Sampling Event (BH6_1.5m and BH6_1.5D Duplicate)			

Table 6-3: Summary of Duplicate Soil Results and RPD Values

Compound	Sample Result	Duplicate Sample Result	Duplicate RPD %
Chromium mg/kg	9	11	20%
Lead mg/kg	<5	6	18%
Sum of DDD + DDE + DDT	0.11	0.11	0%
Benzo(a)pyrene TEQ (LOR) mg/kg	1.2	1.2	0%
Acid Sulfate Soils			
13/02/2020 Sampling Event (BH5_2.0m and BH5_2.0D Duplicate)			
pH (F)	4.6	4.6	0%
pH (Fox)	3	3.7	21%
Reaction Rate	2	4	67%
13/02/2020 Sampling Event (BH5_3.5m and BH5_3.5D Duplicate)			
pH (F)	6.4	6.2	3%
pH (Fox)	5.2	4.7	10%
Reaction Rate	2	3	40%
13/02/2020 Sampling Event (BH6_0.5m and BH6_0.5D Duplicate)			
pH (F)	6.9	7.1	3%
pH (Fox)	5.9	6.8	14%
Reaction Rate	2	4	67%
13/02/2020 Sampling Event (BH6_1.5m and BH6_1.5D Duplicate)			
pH (F)	6.5	6.2	5%
pH (Fox)	2.8	3.2	13%
Reaction Rate	4	4	0%
13/02/2020 Sampling Event (BH7_0.5m and BH7_0.5D Duplicate)			
pH (F)	9	9.1	1%
pH (Fox)	7.9	7.5	5%
Reaction Rate	4	4	0%
13/02/2020 Sampling Event (BH7_3.0m and BH7_3.0D Duplicate)			
pH (F)	5.6	5.6	0%
pH (Fox)	3.6	4.6	24%
Reaction Rate	2	2	0%

7. SOIL ASSESSMENT CRITERIA

The following outlines the Soil Assessment Criteria (SAC) used in this assessment.

The laboratory results have been assessed as a Tier 1 assessment against the investigation and screening levels in Schedule B1 of National Environment Protection (Assessment of Site Contamination) Measure 1999 (ASC NEPM). These guidelines have been endorsed by the NSW EPA under the *Contaminated Land Management (CLM) Act, 1997*. The ASC NEPM provides soil investigation and screening levels for commonly encountered contaminants which are applicable to four generic land use settings and include consideration of the soil type and the depth of contamination, where relevant.

These soil investigation and screening levels are described as follows:

- **Health Investigation Level (HIL)**
Health investigation levels (HILs) are generic assessment criteria designed to be used in the first stage of an assessment of potential risks to human health from chronic exposure to contaminants. HILs are generic to all soil types. Depth is dependent upon site conditions but typically to three metres.
- **Health Screening Level (HSL)**
Health Screening Levels (HSLs) have been derived for BTEX, naphthalene and four carbon chain fractions, as adopted in NEPC (2013). HSLs have been calculated to account for depth (from below surface to >4 m), soil textures (sand, silt and clay) and the land use settings.
- **Ecological Investigation Level (EIL)**
Ecological Investigation Levels (EILs) have been developed for selected metals and organic compounds and are applicable for assessing risk to terrestrial ecosystems. EILs depend on land use scenarios and specific soil physiochemical properties, such as pH, cation exchange capacity (CEC), iron and carbon content, etc. They generally apply to the top 2 m of soil.
- **Ecological Screening Level (ESL)**
Ecological screening levels (ESLs) have been developed for selected petroleum hydrocarbon compounds and total petroleum hydrocarbon (TPH) fractions and are applicable for assessing risk to terrestrial ecosystems. ESLs broadly apply to coarse- and fine-grained soils and various land uses. They are generally applicable to the top 3 m of soil.
- **Management Limits**
Petroleum hydrocarbon management limits ('management limits') are only applicable to petroleum hydrocarbon compounds. They are valid as screening levels following evaluation of human health and ecological risks, and risks to groundwater resources. Management limits apply to all soil depth, based on site-specific considerations for land use and soil type.

The four generic land use settings include:

- HIL A – residential with garden/accessible soil (home grown produce <10% fruit and vegetable intake (no poultry) also includes children's day care centres, preschools and primary schools;
- HIL B – residential with minimal opportunities for soil access includes dwellings with fully and permanently paved yard space such as high-rise buildings and flats;

- HIL C – public open space such as parks, playgrounds, playing fields (e.g. ovals), secondary schools and footpaths. It does not include undeveloped public open space (such as urban bushland and reserves) which should be subject to a site-specific assessment where appropriate; and
- HIL D – commercial/industrial such as shops, offices, factories and industrial sites.

For the purposes of this assessment, land use scenario Commercial/industrial (D) has been adopted.

The ASC NEPM 2013 considers three different soil textures and derives HSLs for each different soil classification as per AS 1726. Table 7-1 displays the soil classification for health screening levels.

Table 7-1: HSL soil classification

Type	Description
Sand	Coarse-grained soil
Silt	Fine-grained soil - silts and clays (liquid limit <50 %)
Clay	Fine-grained soil - silts and clays (liquid limit >50 %)

The summarised investigation and screening limits for land use scenario 'Commercial (D)' and soil Texture and grain size 'Clay – Fine-grained soil, silts and clays' that are used as the Soil Assessment Criteria (SAC) are shown below in Table 7-2.

Table 7-2: Soil Assessment Criteria for soil contaminants¹ (mg/kg)

Chemical	HIL-D	HSL-D (clay)			ESL-D (fine)	EIL-D (Generic)
		0 - <1m	1m - <2m	2m - <4m		
Metals and Inorganics						
Arsenic	3,000					
Cadmium	900					
Chromium (VI)	3,600					
Copper	240,000					
Lead	1,500					
Mercury (inorganic)	730					
Nickel	6,000					
Zinc	400,000					
Polycyclic Aromatic Hydrocarbons (PAHs)						
Benzo(a)pyrene					1.4	
Benzo(a)pyrene TEQ	40					
Total PAHs	4,000					
Phenols						
Phenol	240,000					
Pentachlorophenol	660					
Other Organics						
PCB	7					

Table 7-2: Soil Assessment Criteria for soil contaminants¹ (mg/kg)

Chemical	HIL-D	HSL-D (clay)			ESL-D (fine)	EIL-D (Generic)
		0 - <1m	1m - <2m	2m - <4m		
Organochlorine Pesticides (OCP)						
DDT+DDE+DDD	3,600					
Aldrin and dieldrin	45					
Chlordane	530					
Endosulfan	2,000					
Endrin	100					
Heptachlor	50					
HCB	80					
Methoxychlor	2,500					
Organophosphorus Pesticides (OPP)						
Chlorpyrifos	2,000					
Total Recoverable Hydrocarbons						
C6 - C10 Fraction						
C6 – C10 Fraction minus BTEX (F1)		310	480		215	
>C10 - C16 Fraction					170	
>C16 - C34 Fraction					2500	
>C34 - C40 Fraction					6600	
BTEXN						
Benzene		4	6	9	95	
Toluene					135	
Ethylbenzene					185	
Total Xylenes					95	
Naphthalene						370

Note: 1. Criteria left blank where none applies.

Assessment criteria for acid sulfate soils are provided in the ASS Manual (ASSMAC, 1998) and are based on the percentage of oxidisable sulfur (S_{POS}) or equivalent titratable actual acidity (TAA), total potential acidity (TPA), or total sulfidic acidity (TSA), for broad categories of soil types. Where proposed works disturb more than 1,000 tonnes of possible ASS, the action criteria for coarse textured soils applies to all soil types. The works could potentially disturb more than 1,000 tonnes of soil and therefore the more conservative action criteria for coarse textured material have been applied.

The criteria used in this assessment are shown in Table 7-3.



Table 7-3: NSW Acid Sulfate Soils Assessment Guidelines Criteria

Type of Material		Action Criteria	
Texture	Approx. Clay Content	Sulfur trail S_{TOS} or S_{POS} (%S)	Acid trail TAA/TPA/TSA (mole H^+ /t)
Coarse Texture – Sands to loamy sands	≤ 5	0.03	18
Medium Texture – Sandy loams to light clays	5–40	0.06	36
Fine Texture – Medium to heavy clays and silty clays	≥ 40	0.1	62

8. RESULTS

The laboratory results for analytical testing of the soil samples collected by Benbow Environmental are provided in the ALS Certificate of Analysis (see Attachment 5).

8.1 SOIL SAMPLES

Results are compared to the adopted Site Assessment Criteria (SAC) detailed in Section 7.

Soil samples were screened in the field with a photo ionisation detector (PID) with all observed readings below 5 ppm. This indicates the low potential for VOC presence. Quantitative laboratory analysis for VOCs was also undertaken and results are included in Attachment 5.

Results indicate that all analytes examined were either below the limit of detection, or at concentrations below the adopted soil assessment criteria. Calculations of the average 95 % UCL concentrations for each analyte were undertaken using the relevant procedure outlined in the NSW EPA *Sample Design Guidelines (1995)*. All calculated 95% UCL values were significantly less than the assessment criteria.

8.2 ACID SULFATE SOILS (ASS)

Results of ASS samples collected are discussed below.

8.2.1 ASS Preliminary Field Test

Field pH (pH_f) and field pH peroxide (pH_{FOX}) are tests to determine the likelihood of ASS and are used as an indication of ASS presence. Results of field screening determined 28 samples required additional (SPOCAS) testing. Interpretation of field pH tests is provided in Table 8-1 below.

Table 8-1: Interpreting Field pH Tests for Acid Sulfate Soils

Field Test	Indicator (ASSMAC, 1998)	Samples of relevance	Comments
pH _F	A pH _F reading ≤ 4 indicates that actual acid sulfate soil is present.	None	There were 8 pH _F readings between 4 and 5.5.
	pH _F values >4 and <5.5 reveal soils are acidic, which may be as a result of previous sulfide oxidation, but is not confirmatory of actual ASS.	BH1_0.5, BH1_1.0, BH4_2.0, BH4_2.5, BH5_2.0, BH5_2.5, BH6_3.5, BH7_4.0	All pH _F readings for the remaining soil samples were 5.5 or above.
pH Peroxide (pH _{FOX})	pH _{FOX} readings of <3 with a strong reaction to peroxide, indicate a high level of certainty of PASS.	BH4_2.5 BH6_1.5	There were two readings below 3.
	A pH _{FOX} reading of 3-4 is less positive and requires further laboratory analysis to confirm sulfide presence.	BH1_0.5, BH1_1.0, BH1_1.5, BH1_2.0, BH4_1.0, BH4_1.5, BH4_2.0, BH5_1.0, BH5_1.5, BH5_2.0, BH5_2.5, BH6_1.0, BH6_2.0, BH6_2.5, BH7_1.5, BH7_2.0, BH7_2.5, BH7_3.0, BH7_3.5	There were 19 readings between 3-4.
	A pH _{FOX} value of 4-5 is neutral, being neither a positive or negative indicator of sulfide presence. Sulfides may be present in small quantities and be poorly reactive under quick field conditions. SPOCAS testing is required to determine presence of oxidisable sulfides.	BH2_0.5, BH3_1.0, BH5_0.5, BH5_3.0, BH6_3.5, BH7_1.0, BH7_4.0	There were 7 readings between 4-5.
	A pH _{FOX} reading >5 along with little or no drop in pH from the field value, indicates little net acid generating ability of the soil. SPOCAS is required to check samples.	All remaining samples	See below.

8.2.2 SPOCAS

Results from laboratory analysis are summarised in Table 8-2, and provided as Analytical Reports from ALS in Attachment 5.

Tabulated results have been compared to the relevant ASS assessment criteria provided in Section 7. The bold red values indicate exceedance of the assessment criteria.

Table 8-2: Laboratory Test Results

Samples		pH		Sulfur trail	Acid trail		
				Peroxide Oxidisable Sulfur (POS)	Titratable Actual Acidity (TAA)	Titratable Peroxide Acidity (TPA)	Titratable Sulfidic Acidity (TSA)
Criteria: Fine texture				0.1	62		
Sample ID	Sample Depth (m)	pH _{KCl}	pH _{FOX}	%S	mole H+/tonne		
BH1_0.5	0.5	4.3	4.8	<0.02	72	95	23
BH1_1.0	1.0	4.3	5.0	<0.02	30	47	17
BH1_1.5	1.5	4.7	5.5	0.028	13	24	11
BH1_2.0	2.0	5.1	5.6	<0.02	6	12	6
BH2_0.5	0.5	5.7	6.0	0.026	3	9	6
BH3_1.0	1.0	5.3	5.6	<0.02	4	9	5
BH4_1.0	1.0	4.8	4.6	0.050	21	64	42
BH4_1.5	1.5	4.7	5.1	0.021	21	38	17
BH4_2.0	2.0	4.6	4.9	<0.02	32	50	17
BH4_2.5	2.5	4.4	4.5	0.022	40	83	43
BH5_0.5	0.5	5.2	5.3	0.021	15	40	25
BH5_1.0	1.0	5.8	6.7	0.030	5	<2	<2
BH5_1.5	1.5	4.6	4.7	0.031	28	63	34
BH5_2.0	2.0	4.3	4.4	<0.02	60	91	31
BH5_2.5	2.5	4.3	4.4	<0.02	46	75	29
BH5_3.0	3.0	5.3	5.9	<0.02	3	8	5
BH6_1.0	1.0	4.6	4.3	0.057	33	111	78
BH6_1.5	1.5	5.4	5.4	0.024	6	<2	<2
BH6_2.0	2.0	5.4	4.4	0.072	10	76	67
BH6_2.5	2.5	4.6	5.1	<0.02	33	61	28
BH6_3.5	3.5	5.0	5.7	<0.02	9	11	2
BH7_1.0	1.0	7.6	7.2	0.067	<2	<2	<2
BH7_1.5	1.5	6.4	5.9	0.027	<2	<2	<2
BH7_2.0	2.0	4.6	5.2	<0.02	26	53	27
BH7_2.5	2.5	4.6	5.1	0.025	30	57	27
BH7_3.0	3.0	4.5	5.2	<0.02	25	47	22
BH7_3.5	3.5	4.5	5.4	<0.02	27	47	20
BH7_4.0	4.0	4.8	5.8	<0.02	15	20	5

The laboratory results confirmed the presence of actual ASS (AASS) at the subject site. The acidity trail for samples in BH1, BH4, BH5 and BH6 show exceedances of the action criteria for TAA, TPA and TSA (60 mole H+/tonnes), thus confirming the presence of AASS within these locations.

The sulfur trail showed no exceedances for the action criteria of POS (0.1 %S), thus no PASS are contained in these locations.



8.3 ASBESTOS

Laboratory analysis for asbestos was not conducted on soil samples. This was decided since the Phase I ESA found no evidence for the historical onsite use of any asbestos containing material (ACM). As a standard practise, visual inspection for ACM was performed during sampling activities.

No ACM was observed within the existing onsite structures. No fragments of ACM were observed during sampling activities.

9. CONCLUSION AND RECOMMENDATIONS

This Phase II Environmental Site Assessment evaluated the suitability of the areas of interest for the proposed development at 81-87 Gow Street, Padstow NSW 2211. The assessment was limited to a sampling regime within the areas to be developed for the proposed concrete batching and drilling mud dewatering plants.

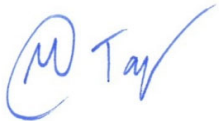
Soil sampling was undertaken on 13th February 2020. All samples were screened in the field for VOC presence before being sent to a NATA accredited laboratory for analysis of the contaminants of concern. All results were well below the adopted NEPM criteria for commercial/industrial sites. The 95% UCL calculated values were significantly less than the assessment criteria for all analytes assessed.

No asbestos containing material (ACM) was encountered during sampling, although this was limited to visual inspection only. The Phase I ESA had concluded the likelihood of ACM contamination onsite was very low.

Preliminary field ASS testing determined that 28 samples required further analysis to establish the presence or not of ASS onsite. SPOCAS testing identified ASS within the areas of interest, therefore, an Acid Sulfate Soil Management Plan is required for the proposed excavation and construction works.

The site is suitable for the proposed development provided the proposed excavation includes and implements an Acid Sulfate Soil Management Plan.

This concludes the report.



Matthew Taylor
Environmental
Scientist



Damien Thomas
Environmental
Scientist



Linda Zanotto
Senior Environmental
Engineer



R T Benbow
Principal Consultant



10. LIMITATIONS

Our services for this project are carried out in accordance with our current professional standards for site assessment investigations. No guarantees are either expressed or implied.

This report has been prepared solely for the use of Gow Street Recycling Centre, as per our agreement for providing environmental services. Only Gow Street Recycling Centre is entitled to rely upon the findings in the report within the scope of work described in this report. Otherwise, no responsibility is accepted for the use of any part of the report by another in any other context or for any other purpose.

Although all due care has been taken in the preparation of this study, no warranty is given, nor liability accepted (except that otherwise required by law) in relation to any of the information contained within this document. We accept no responsibility for the accuracy of any data or information provided to us by Gow Street Recycling Centre for the purposes of preparing this report.

Any opinions and judgements expressed herein, which are based on our understanding and interpretation of current regulatory standards, should not be construed as legal advice.

ATTACHMENTS

Attachment 1: Borehole Logs



Benbow
ENVIRONMENTAL

BOREHOLE LOG

Borehole ID: **BH1_**

Client: **Gow Street Recycling**

Job Number: **191290**

Project: **Phase II ESI**

Contractor: **Numac**

Location: **89 Gow Street Padstow NSW**

Logged by: **Damien**

Borehole Diameter.:

Borehole Depth: **2.0 m** (refusal)

Commenced:

Completed:

Depth	Graphic Log	SOIL DESCRIPTION Material Type: USCS Group, Colour, Particle Size, Moisture Content,	COMMENTS (Staining, Odour, Other)	PID (ppm)	CLASSIFICATION SYMBOL	Sample Method	Sample Intervals (m)	Monitor Well Details
0.0		GROUND SURFACE Concrete	Sampling analysis performed indoors, light rain onto site					
		Brown heavy clay (wet), with fine gravels		1.5		SC	0.5	
1.0		brown heavy clay with (grey) mottles						
1.5		Moist heavy grey-brown clay (dominant colour grey), with iron stone cobbles		0.7		SC	1.5	
2.0		Grey shale/brown - grey shale (40 cm band) - over bedrock					2.0	
3.0								

Method

SV – Solid Flight Auger with V-bit / TC-bit
ST – Solid Flight Auger with TC-bit
HT – Hollow Flight Auger with TC-bit
DC – Diamond Core
R – Roller/Tricore
VC – Vibra-core

AH – Air Hammer
W – Washbone
M – Mud Drilling
HA – Hand Auger
TP – Test Pit-excavator bucket

Sample Type

SP – Split Spoon
A – Auger (disturbed)
HA – Hand Auger
CY – Cyclone
SC – Scoop

Client: Gow Street Recycling

Job Number: 191290

Project: **Phase II ESI**

Contractor: **Numac**

Location: 89 Gow Street Padstow NSW

Logged by: **Damien**

Borehole Diameter.:

Borehole Depth: **2.0 m**

Commenced:

Completed:

Depth	Graphic Log	SOIL DESCRIPTION Material Type: USCS Group, Colour, Particle Size, Moisture Content,	COMMENTS (Staining, Odour, Other)	PID (ppm)	CLASSIFICATION SYMBOL	Sample Method	Sample Intervals (m)	Monitor Well Details
0.0		GROUND SURFACE Concrete		2.9		SC	0.5	
		Road base / clay mix (dark, dry)						
		Red and brown heavy clay - moist, becoming lighter, blue-grey over red iron stone (@1.0 m)						
1.0		1.0 -1.5 Red iron stone orange clay	Sampling was conducted inside shed, workshop activities may have influenced PID readings (due to painting)	4.6				
		1.5 - 1.75 blue grey moist clay, red and orange blotches						
		1.75 -2.0 m Dry grey shale, becoming darker						
2.0								
-3.0								

Method

SV – Solid Flight Auger with V-bit / TC-bit

ST – Solid Flight Auger with TC-bit

HT – Hollow Flight Auger with TC-bit

DC – Diamond Core

R – Roller/Tricore

VC – Vibra-core

AH – Air Hammer

W – Washbone

M – Mud Drilling

HA – Hand Auger

TP – Test Pit-excavator bucket

[illegible]

SP – Split Spoon

A – Auger (disturbed)

HA – Hand Auger

CY - Cyclone

SC – Scoop



Benbow
ENVIRONMENTAL

BOREHOLE LOG

Borehole ID: BH3_

Client: **Gow Street Recycling**

Job Number: **191290**

Project: **Phase II ESI**

Contractor: **Numac**

Location: **89 Gow Street Padstow NSW**

Logged by: **Damien**

Borehole Diameter.:

Borehole Depth: **2.2 m**

Commenced:

Completed:

Depth	Graphic Log	SOIL DESCRIPTION Material Type: USCS Group, Colour, Particle Size, Moisture Content,	COMMENTS (Staining, Odour, Other)	PID (ppm)	CLASSIFICATION SYMBOL	Sample Method	Sample Intervals (m)	Monitor Well Details
0.0		GROUND SURFACE Concrete						
		Mix of road base and brown clay over crushed (pink) sandstone^ 0.2 m band, over heavy red-brown clay (moist) with a trace of sand (0.2 m band), over red and grey mottled heavy clay.	^ possibly an old-style house brick			SC	0.5	
1.0		0.9 -1.5 m clay becoming blue -grey, with red streaks, (dry) trace of small red iron stones.				SC	1.5	
2.0		1.5 -2.2 m Dry, heavy clay blue-grey (0.6 m band) over grey shale (dry)				SC	2.2	
3.0								

Method

SV – Solid Flight Auger with V-bit / TC-bit
ST – Solid Flight Auger with TC-bit
HT – Hollow Flight Auger with TC-bit
DC – Diamond Core
R – Roller/Tricore
VC – Vibra-core

AH – Air Hammer
W – Washbone
M – Mud Drilling
HA – Hand Auger
TP – Test Pit-excavator bucket

Sample Type

SP – Split Spoon
A – Auger (disturbed)
HA – Hand Auger
CY – Cyclone
SC – Scoop



Benbow
ENVIRONMENTAL

BOREHOLE LOG

Borehole ID: **BH4_**

Client: **Gow Street Recycling**

Job Number: **191290**

Project: **Phase II ESI**

Contractor: **Numac**

Location: **89 Gow Street Padstow NSW**

Logged by: **Damien**

Borehole Diameter.:

Borehole Depth: **3.3 m**

Commenced:

Completed:

Depth	Graphic Log	SOIL DESCRIPTION Material Type: USCS Group, Colour, Particle Size, Moisture Content,	COMMENTS (Staining, Odour, Other)	PID (ppm)	CLASSIFICATION SYMBOL	Sample Method	Sample Intervals (m)	Monitor Well Details
0.0		GROUND SURFACE Concrete						
		0.0 - 0.3 m Road base with sand (wet) over 0.3 -1.5 red heavy clay				SC	0.5	
1.0		1.5 - Red-brown heavy clay, becoming grey with trace of small gravels (iron stone)					1.0	
2.0		- 3.3 m Blue - grey heavy clay, with red streaks with trace of shale						
-0								

Method

SV – Solid Flight Auger with V-bit / TC-bit
ST – Solid Flight Auger with TC-bit
HT – Hollow Flight Auger with TC-bit
DC – Diamond Core
R – Roller/Tricore
VC – Vibra-core

AH – Air Hammer
W – Washbone
M – Mud Drilling
HA – Hand Auger
TP – Test Pit-excavator bucket

Sample Type

SP – Split Spoon
A – Auger (disturbed)
HA – Hand Auger
CY – Cyclone
SC – Scoop



Benbow
ENVIRONMENTAL

BOREHOLE LOG

Borehole ID: BH5_

Client: **Gow Street Recycling**

Job Number: **191290**

Project: **Phase II ESI**

Contractor: **Numac**

Location: **89 Gow Street Padstow NSW**

Logged by: **Damien**

Borehole Diameter.:

Borehole Depth: **3.56 m**

Commenced:

Completed:

Depth	Graphic Log	SOIL DESCRIPTION Material Type: USCS Group, Colour, Particle Size, Moisture Content,	COMMENTS (Staining, Odour, Other)	PID (ppm)	CLASSIFICATION SYMBOL	Sample Method	Sample Intervals (m)	Monitor Well Details
0.0		GROUND SURFACE Concrete						
		Wet sandy road base (0.2 m band) over red heavy clays.	Found fibre at approx. 0.75 m depth.			SC	0.5	
1.0		Heavy clays, Yellow becoming orange to red with iron stones.	Found flat piece of steel (5 x 2 cm) at 2.0 m. Markings in clay indicate piece was dragged downwards from 1.5 m.					
2.0		Red clay layer transitioning to blue- grey. Narrow yellow band (1.0 cm) at approx. 3.0 m Blue -grey clay						
3.0		Yellow narrow clay band at 3.5 m (1.0 cm)						
4.0								

Method

SV – Solid Flight Auger with V-bit / TC-bit
ST – Solid Flight Auger with TC-bit
HT – Hollow Flight Auger with TC-bit
DC – Diamond Core
R – Roller/Tricore
VC – Vibra-core

AH – Air Hammer
W – Washbone
M – Mud Drilling
HA – Hand Auger
TP – Test Pit-excavator bucket

Sample Type

SP – Split Spoon
A – Auger (disturbed)
HA – Hand Auger
CY – Cyclone
SC – Scoop



Benbow
ENVIRONMENTAL

BOREHOLE LOG

Borehole ID: BH6_

Client: **Gow Street Recycling**

Job Number: **191290**

Project: **Phase II ESI**

Contractor: **Numac**

Location: **89 Gow Street Padstow NSW**

Logged by: **Damien**

Borehole Diameter.:

Borehole Depth: **3.9 m**

Commenced:

Completed:

Depth	Graphic Log	SOIL DESCRIPTION Material Type: USCS Group, Colour, Particle Size, Moisture Content,	COMMENTS (Staining, Odour, Other)	PID (ppm)	CLASSIFICATION SYMBOL	Sample Method	Sample Intervals (m)	Monitor Well Details
0.0		GROUND SURFACE Concrete				Push tube		
		Blue-grey road base mix (moist) with some clay (approx. 0.7 m band) over black fine grain sand (15.0 cm) over heavy red clay (moist).	black sand, pungent odour akin to bitumen (PID 0.3)			SC	0.5	
1.0		At approx. 1.35 - 1.5 m a band of dark brown top soil, over heavy grey clay (moist), becoming lighter,						
2.0		transitioning to light brown heavy clay to red/orange heavy clay (moist).						
		Dry red - orange clay with large iron stone gravels and one large cobble, marked transition to						
3.0		blue -grey heavy clays over heavy orange clay (moist). Cluster of iron- stone gravels and cobbles at 3.7 m.						
4.0								

Method

SV – Solid Flight Auger with V-bit / TC-bit

ST – Solid Flight Auger with TC-bit

HT – Hollow Flight Auger with TC-bit

DC – Diamond Core

R – Roller/Tricore

VC – Vibra-core

AH – Air Hammer

W – Washbone

M – Mud Drilling

HA – Hand Auger

TP – Test Pit-excavator bucket

Sample Type

SP – Split Spoon

A – Auger (disturbed)

HA – Hand Auger

CY – Cyclone

SC – Scoop



Benbow
ENVIRONMENTAL

BOREHOLE LOG

Borehole ID: BH7_

Client: **Gow Street Recycling**

Job Number: **191290**

Project: **Phase II ESI**

Contractor: **Numac**

Location: **89 Gow Street Padstow NSW**

Logged by: **Damien**

Borehole Diameter.:

Borehole Depth:

Commenced:

Completed:

Depth	Graphic Log	SOIL DESCRIPTION Material Type: USCS Group, Colour, Particle Size, Moisture Content,	COMMENTS (Staining, Odour, Other)	PID (ppm)	CLASSIFICATION SYMBOL	Sample Method	Sample Intervals (m)	Monitor Well Details
0.0		GROUND SURFACE Concrete						
		Blue-grey road base mix (moist) with grey clay. At approx. 0.6 m red dry clay band (20.0 cm) over road base gravels and sand over dark clay (approx. 20 cm band)				SC	0.5	
1.0		1.5 m Dark heavy clay (dry) continues to grey heavy clay (moist) transitioning to yellow heavy clay to red (dry).				SC		
2.0		Heavy red clay mix with iron stone (dry) gravels and fines,				SC		
3.0		Iron stone red clay mix transitioning to heavy orange clay. (Bottom 20 cm of push tube sample) blue-grey heavy clay (dry)				SC		
4.0								

Method

SV – Solid Flight Auger with V-bit / TC-bit

ST – Solid Flight Auger with TC-bit

HT – Hollow Flight Auger with TC-bit

DC – Diamond Core

R – Roller/Tricore

VC – Vibra-core

AH – Air Hammer

W – Washbone

M – Mud Drilling

HA – Hand Auger

TP – Test Pit-excavator bucket

Sample Type

SP – Split Spoon

A – Auger (disturbed)

HA – Hand Auger

CY – Cyclone

SC – Scoop

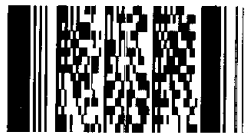
Attachment 2: Chain of Custody (COC) Forms

Hi Brisbane ALS team,

Could you please have the following samples that were ASS field screened undergo further SPOCAS testing (EA029):

BH1_0.5m
BH1_1.0m
BH1_1.5m
BH1_2.0m
BH2_0.5m
BH3_1.0m
BH4_1.0m
BH4_1.5m
BH4_2.0m
BH4_2.5m
BH5_0.5m
BH5_1.0m
BH5_1.5m
BH5_2.0m
BH5_2.5m
BH5_3.0m
BH6_1.0m
BH6_1.5m
BH6_2.0m
BH6_2.5m
BH6_3.5m
BH7_1.0m
BH7_1.5m
BH7_2.0m
BH7_2.5m
BH7_3.0m
BH7_3.5m
BH7_4.0m

Environmental Division
Brisbane
Work Order Reference
EB2005119



Telephone : + 61-7-3243 7222

This is the same work order and project number. Many thanks, please let me know if you have any questions.

Regards,
Matt

Matthew Taylor
Environmental Scientist

email: MTaylor@benbowenviro.com.au
website: www.benbowenviro.com.au

BENBOW ENVIRONMENTAL
25-27 Sherwood Street



CHAIN OF CUSTODY

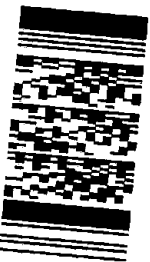
ALS Laboratory
please tick →

CLIENT: Benbow Environmental	TURNAROUND REQUIREMENTS:	☐ Standard TAT (last due date)	☐ Non Standard or urgent TAT (last due date)	
OFFICE:	(Standard TAT may be longer for some tests e.g. Ultra Trace Organics)			
PROJECT: 191290-02	ALS QUOTE NO.:			
ORDER NUMBER: 191290-02	CONTACT PH: (02) 9896 0399			
PROJECT MANAGER: Matthew Taylor	SAMPLER MOBILE: 0438 586 749			
SAMPLER: Matthew Taylor	REINQUISHED BY: Matthew Taylor			
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default):	DATE/TIME: 13/02/2020	RECEIVED BY: AS	DATE/TIME: 13/12/2020 3pm
Email Reports to: mtaylor@benbowenviro.com.au, admin@benbowenviro.com.au				
Email Invoice to: accountsreceivable@benbowenviro.com.au				

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB: Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (filtered bottle required).		Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (to codes below)	(refer	TOTAL CONTAINERS	S-19 suite NT-15 nutrient suite	Comments on likely contaminant levels, dilutions, or samples requiring specific OC analysis etc.
1	BH1_0.5m	13/02/2020 8:55	S			1	1	Environmental Division Sydney Work Order Reference ES2005101  Telephone : +61-2-8794 8655 GLASS JARS
2	BH1_1.5m	13/02/2020 9:05	S			1	1	
3	BH1_0.5m BH1_2.0	13/02/2020 9:20	S			1	1	
4	BH2_0.5m	13/02/2020 9:25	S			1	1	
5	BH2_1.5m	13/02/2020 9:30	S			1	1	
6	BH2_0.5m BH2_2.0	13/02/2020 9:40	S			1	1	
7	BH3_0.5m	13/02/2020 10:00 9:55	S	9:55		1	1	
8	BH3_1.5m	13/02/2020 10:00	S	10:00		1	1	
9	BH3_0.5m BH3_2.0	13/02/2020 10:35	S	10:05		1	1	
10	BH4_0.5m	13/02/2020 10:45	S			1	1	
11	BH4_1.5m	13/02/2020 10:30	S			1	1	
12	BH4_3.0m	13/02/2020 10:35	S			1	1	
IDENTITY / FORWARD LAB / SPILL WTR LAB / Analysis: Acid Sulphate Soils - 0 Organised By / Date: Benson Relinquished By / Date: Comnote / Counter: 7								

Telephone : + 61-2-8784 8555



Environmental Division
Sydney
Work Order Reference
ES2005101

GLASS JARS

Relinquished By / Date: Benbow

Relinquished By / Date: Benbow

47

Notes: Container Codes: P = Unpreserved Plastic, N = Nitric Preserved Plastic, ORC = Nitric Preserved ORC, SH = Sodium Hydroxide Preserved, S = Sodium Hydroxide Preserved Plastic, AG = Amber Glass Unpreserved Plastic, AGP = Amber Glass Preserved Plastic, V = VOA Vial HCl Preserved, VB = VOA Vial Sodium Bisphosphate Preserved, VS = VOA Vial Sulfuric Preserved, AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass, H = HCl Preserved Plastic, HS = HCl Preserved Specimen bottle, SP = Sulfuric Preserved Plastic, F = Formaldehyde Preserved Glass, Z = Zinc Acetate Preserved Bottle, E = EDTA Preserved Bottle, ST = Sterile Bottle, ASS = Plastic Bag for Acid Sulphate Solts, B = Unpreserved Bag



CHAIN OF CUSTODY

ALS Laboratory
please tick →

CLIENT: Benbow Environmental

OFFICE:

PROJECT: 191290-02

ORDER NUMBER: 191290-02

PROJECT MANAGER: Matthew Taylor

SAMPLER: Matthew Taylor

COC emailed to ALS? (YES / NO)

Email Reports to: mtaylor@benbowenviro.com.au, admin@benbowenviro.com.au

Email Invoice to: accountsreceivable@benbowenviro.com.au

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

TURNAROUND REQUIREMENTS : ☐ Standard TAT (List due date):

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

ALS QUOTE NO.:

CONTACT PH: (02) 9896 0399

SAMPLER MOBILE: 0438 588 749

EDD FORMAT (or default):

RELINQUISHED BY:

DATE/TIME

FOR LABORATORY USE ONLY (circle)

Custody Seal intact Yes No N/A

Free ice / freezer ice blocks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comment:

RECEIVED BY:

DATE/TIME

DATE/TIME

DATE/TIME

DATE/TIME

ALS USE MATRIX: SOLID (S) WATER (W)

CONTAINER INFORMATION

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

Additional Information

Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.

LAB ID

SAMPLE ID

DATE / TIME

MATRIX

TYPE & PRESERVATIVE (to codes below)

TOTAL CONTAINERS

S-19 suite

GRASS JARS

GRASS JARS

GRASS JARS

GRASS JARS

GRASS JARS

GRASS JARS

GRASS JARS

GRASS JARS

GRASS JARS

GRASS JARS

GRASS JARS

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GRASS JARS

GRASS JARS

GRASS JARS

GRASS JARS

GRASS JARS

GRASS JARS

GRASS JARS

GRASS JARS

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



CHAIN OF CUSTODY

ALS Laboratory
please tick →

CLIENT: Benbow Environmental

OFFICE:

PROJECT: 191290-02

ORDER NUMBER: 191290-02

PROJECT MANAGER: Matthew Taylor

SAMPLER: Matthew Taylor

COC emailed to ALS? (YES / NO)

Email Reports to: mtaylor@benbowenviro.com.au, admin@benbowenviro.com.au

Email Invoice to: accountsreceivable@benbowenviro.com.au

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

TURNAROUND REQUIREMENTS: ☐ Standard TAT (list due date): ☐ Non Standard or urgent TAT (list due date):

(Standard TAT may be longer for some tests e.g. Ultra Trace Organics)

ALS QUOTE NO.:

CONTACT PH: (02) 9896 0399

SAMPLER MOBILE: 0438 588 749

EDD FORMAT (or default):

RELINQUISHED BY: Matthew Taylor

DATE/TIME: 13/02/2020

14:30

RECEIVED BY: *MT*

DATE/TIME: 03/12/20 3pm

FOR LABORATORY USE ONLY (Circle)

Custody Seal intact?

Freeze / frozen for bricks present upon receipt?

Random Sample Temperature on Receipt:

Other comment:

RECEIVED BY:

DATE/TIME:

DATE/TIME:

DATE/TIME:

DATE/TIME:

DATE/TIME:

LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (to codes below)	(refer	TOTAL CONTAINERS	ASS field screen (EA037)	ANALYSIS REQUIRED including SUTES (NB: Sute Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (filtered bottle required).	Additional Information
--------	-----------	-------------	--------	---	--------	------------------	--------------------------	--	------------------------

24	BH1_0.5m	13/02/2020 8:55	S			1	1		Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc. PLASTIC BAGS.
25	BH1_1.0m	13/02/2020 9:00	S			1	1		
26	BH1_1.5m	13/02/2020 9:10	S			1	1		
27	BH1_2.0m	13/02/2020 9:15	S			1	1		
28	BH1_2.5m	13/02/2020	S			1	1		
29	BH1_3.0m	13/02/2020	S			1	1		
30	BH1_3.5m	13/02/2020	S			1	1		
31	BH1_4.0m	13/02/2020	S			1	1		
32	BH2_0.5m	13/02/2020 9:30	S			1	1		
33	BH2_1.0m	13/02/2020 9:35	S			1	1		

34	BH2_1.5m	13/02/2020 9:40	S			1	1	
35	BH2_2.0m	13/02/2020 9:43	S			1	1	
36	BH2_2.5m	13/02/2020	S			1	1	
37	BH2_3.0m	13/02/2020	S			1	1	
38	BH2_3.5m	13/02/2020	S			1	1	
39	BH2_4.0m	13/02/2020	S			1	1	
40	BH3_0.5m	13/02/2020 9:55	S			1	1	
41	BH3_1.0m	13/02/2020 10:00	S			1	1	
42	BH3_1.5m	13/02/2020 10:05	S			1	1	
43	BH3_2.0m	13/02/2020 10:15	S			1	1	

Water Container Codes: P = Unpreserved Plastic, N = Nitric Preserved Plastic, ORC = Nitric Preserved ORC, SH = Sodium Hydroxide Preserved, S = Sodium Hydroxide Preserved Plastic, AG = Amber Glass Unpreserved, AP = Airfreight Unpreserved Plastic, V = VOA Vial HCl Preserved, VB = VOA Vial Sodium Bisulfate Preserved, VS = VOA Vial Sulfuric Preserved, AV = Airfreight Unpreserved Vial, SD = Sulfuric Preserved, Amber Glass, H = HCl Preserved Plastic, HS = HCl Preserved Specimen bottle, SP = Sulfuric Preserved Plastic, F = Formaldehyde Preserved Glass, Z = Zinc Acetate Preserved Bottle, E = EDTA Preserved Bottle, ST = Sterile Bottle, ASS = Plastic Bag for Acid Supplie Soils, B = Unpreserved Bag.



CHAIN OF CUSTODY

ALS Laboratory
Please tick →

CLIENT: Benbow Environmental

OFFICE:

PROJECT: 191290-02

ORDER NUMBER: 191290-02

PROJECT MANAGER: Matthew Taylor

SAMPLER: Matthew Taylor

COC emailed to ALS? (YES / NO)

Email Reports to: mtaylor@benbowenviro.com.au, admin@benbowenviro.com.au

Email Invoice to: accountsreceivable@benbowenviro.com.au

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

TURNAROUND REQUIREMENTS: ☐ Standard TAT (list due date):

(Standard TAT may be longer for some tests e.g. Ultra Trace Organics)

ALS QUOTE NO.:

CONTACT PH: (02) 9896 0399

SAMPLER MOBILE: 0438 588 749

EDD FORMAT (or default):

RELINQUISHED BY: Matthew Taylor

DATE/TIME: 13/02/2020

14:30

RECEIVED BY: AJ

DATE/TIME: 13/12/20 3pm

RELINQUISHED BY:

DATE/TIME:

RECEIVED BY:

DATE/TIME:

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FOR LABORATORY USE ONLY (Circle)

Custody Seal Intact? Yes No N/A

Freeze / Frozen Ice blocks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt? Yes No N/A

Other comment:

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

ALS USE		SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)		CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB: Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (filtered bottle required).		Additional Information		
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (to codes below)	(refer	TOTAL CONTAINERS	ASS field screen (EA037)			Comments on likely contaminant levels, dilutions, or samples requiring specific O analysis etc.
-	BH3_2.5m	13/02/2020	S			1	1			PLASTIC BAG
-	BH3_3.0m	13/02/2020	S			1	1			
-	BH3_3.5m	13/02/2020	S			1	1			
-	BH3_4.0m	13/02/2020	S			1	1			
36	BH4_0.5m	13/02/2020	S			1	1			
37	BH4_1.0m	13/02/2020	S			1	1			
38	BH4_1.5m	13/02/2020	S			1	1			
39	BH4_2.0m	13/02/2020	S			1	1			
40	BH4_2.5m	13/02/2020	S			1	1			
41	BH4_3.0m	13/02/2020	S			1	1			
-	BH4_3.5m	13/02/2020	S			1	1			
-	BH4_4.0m	13/02/2020	S			1	1			
42	BH5_0.5m	13/02/2020	S			1	1			
43	BH5_1.0m	13/02/2020	S			1	1			
44	BH5_1.5m	13/02/2020	S			1	1			
45	BH5_2.0m	13/02/2020	S			1	1			
46	BH5_2.5m	13/02/2020	S			1	1			
47	BH5_3.0m	13/02/2020	S			1	1			
48	BH5_3.5m	13/02/2020	S			1	1			
-	BH5_4.0m	13/02/2020	S			1	1			
						TOTAL				



CHAIN OF CUSTODY

ALS Laboratory
Please tick →

CLIENT: Benbow Environmental

OFFICE: TURNAROUND REQUIREMENTS: ☐ Standard TAT (last due date): ☐ Non Standard or urgent TAT (last due date):

PROJECT: 191290-02 (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)

ORDER NUMBER: 191290-02 ALS QUOTE NO.:

PROJECT MANAGER: Matthew Taylor CONTACT PH: (02) 9896 0399

SAMPLER: Matthew Taylor SAMPLER MOBILE: 0438 688 749

COC emailed to ALS? (YES / NO) EDD FORMAT (or default):

Email Reports to: m.taylor@benbowenviro.com.au, admin@benbowenviro.com.au

Email Invoice to: accountsreceivable@benbowenviro.com.au

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

FOR LABORATORY USE ONLY (circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Radiation Sample Temperature on Receipt: 5

Other Comment:

RELINQUISHED BY: RECEIVED BY:

DATE/TIME: DATE/TIME:

RELINQUISHED BY: RECEIVED BY:

DATE/TIME: DATE/TIME:

RELINQUISHED BY: RECEIVED BY:

DATE/TIME: DATE/TIME:

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RELINQUISHED BY: RECEIVED BY:

Water Container Codes: P = Unpreserved Plastic, N = Nitric Preserved Plastic, ORC = Nitric Preserved ORC, SH = Sodium Hydroxide Preserved, S = Sodium Hydroxide Preserved Plastic, AG = Amber Glass Unpreserved, AF - Airtight Unpreserved Plastic, V = VOA Vial HCl Preserved, VB = VOA Vial Sodium Bisulfate Preserved, VS = VOA Vial Sulfuric Preserved, AV = Airtight Unpreserved Vial SG = Sulfuric Preserved, Amber Glass, H = HCl preserved Specimen bottle, SP = Sulfuric Preserved Plastic, F = Formaldehyde Preserved Glass, Z = Zinc Acetate Preserved Bottle, E = EDTA Preserved Bottles, ST = Sterile Bottle, ASS = Plastic Bag for Acid Suphate Solis, B = Unpreserved Bag

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)	CONTAINER INFORMATION		ANALYSIS REQUIRED including SLUTES (NB, Slute Codes must be listed to attract slute price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).				Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (to codes below)	(refer	TOTAL CONTAINERS	ASS field screen (EA037)	Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
49	BH6_0.5m	13/02/2020 11:50	S			1	1	PLASTIC BAGS
50	BH6_1.0m	13/02/2020 12:15	S			1	1	
51	BH6_1.5m	13/02/2020 12:20	S			1	1	
52	BH6_2.0m	13/02/2020 12:28	S			1	1	
53	BH6_2.5m	13/02/2020 12:30	S			1	1	
54	BH6_3.0m	13/02/2020 12:15	S			1	1	
55	BH6_3.5m	13/02/2020 12:22	S			1	1	
56	BH6_4.0m	13/02/2020 12:18	S			1	1	
57	BH7_0.5m	13/02/2020 11:50	S			1	1	
58	BH7_1.0m	13/02/2020 12:20	S			1	1	
59	BH7_1.5m	13/02/2020 12:20	S			1	1	
60	BH7_2.0m	13/02/2020 12:20	S			1	1	
61	BH7_2.5m	13/02/2020 12:30	S			1	1	
62	BH7_3.0m	13/02/2020 12:25	S			1	1	
63	BH7_3.5m	13/02/2020 12:25	S			1	1	
64	BH7_4.0m	13/02/2020 12:25	S			1	1	
65	BH5_2.00	13/02/2020 11:30	S			1	1	
66	BH6_1.50	13/02/2020 12:00	S			1	1	
67	BH7_0.50	13/02/2020 11:50	S			1	1	
68	BH6_0.50	13/02/2020 11:50	S			1	1	
69	BH7_3.00	13/02/2020 12:25	S			1	1	

Attachment 3: Laboratory Quality Assurance and Quality Control (QA/QC) Reports

QUALITY CONTROL REPORT

Work Order : **EB2005119**

Page : 1 of 9

Client : **BENBOW ENVIRONMENTAL**

Contact : Matthew Taylor

Address : 20 Byre St
AUBURN 2144

Telephone : ----

Project : 191290-02

Order number : 191290-02

C-O-C number : ----

Sampler : ----

Site : ----

Quote number : EN/222

No. of samples received : 28

No. of samples analysed : 28

Laboratory : Environmental Division Brisbane

Contact : Customer Services EB

Address : 2 Byth Street Stafford QLD Australia 4053

Telephone : +61-7-3243 7222

Date Samples Received : 24-Feb-2020

Date Analysis Commenced : 02-Mar-2020

Issue Date : 02-Mar-2020



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

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

This Quality Control Report contains the following information:

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

Signatories

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

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



General Comments

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

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

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

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **SOIL**

Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EA029-A: pH Measurements (QC Lot: 2883661)									
EB2005119-001	BH1_0.5m	EA029: pH KCl (23A)	----	0.1	pH Unit	4.3	4.3	0.00	0% - 20%
		EA029: pH OX (23B)	----	0.1	pH Unit	4.8	4.8	0.00	0% - 20%
EB2005119-011	BH5_0.5m	EA029: pH KCl (23A)	----	0.1	pH Unit	5.2	5.2	0.00	0% - 20%
		EA029: pH OX (23B)	----	0.1	pH Unit	5.3	5.4	1.87	0% - 20%
EA029-A: pH Measurements (QC Lot: 2883662)									
EB2005119-021	BH6_3.5m	EA029: pH KCl (23A)	----	0.1	pH Unit	5.0	5.0	0.00	0% - 20%
		EA029: pH OX (23B)	----	0.1	pH Unit	5.7	5.7	0.00	0% - 20%
EB2005272-003	Anonymous	EA029: pH KCl (23A)	----	0.1	pH Unit	9.5	9.5	0.00	0% - 20%
		EA029: pH OX (23B)	----	0.1	pH Unit	8.2	8.2	0.00	0% - 20%
EA029-B: Acidity Trail (QC Lot: 2883661)									
EB2005119-001	BH1_0.5m	EA029: sulfidic - Titratable Actual Acidity (s-23F)	----	0.02	% pyrite S	0.116	0.113	2.46	No Limit
		EA029: sulfidic - Titratable Peroxide Acidity (s-23G)	----	0.02	% pyrite S	0.153	0.153	0.00	No Limit
		EA029: sulfidic - Titratable Sulfidic Acidity (s-23H)	----	0.02	% pyrite S	0.037	0.040	8.38	No Limit
		EA029: Titratable Actual Acidity (23F)	----	2	mole H+ / t	72	70	2.46	0% - 20%
		EA029: Titratable Peroxide Acidity (23G)	----	2	mole H+ / t	95	96	0.00	0% - 20%
		EA029: Titratable Sulfidic Acidity (23H)	----	2	mole H+ / t	23	25	8.38	0% - 50%
EB2005119-011	BH5_0.5m	EA029: sulfidic - Titratable Actual Acidity (s-23F)	----	0.02	% pyrite S	0.024	0.022	10.5	No Limit
		EA029: sulfidic - Titratable Peroxide Acidity (s-23G)	----	0.02	% pyrite S	0.064	0.067	4.03	No Limit
		EA029: sulfidic - Titratable Sulfidic Acidity (s-23H)	----	0.02	% pyrite S	0.040	0.045	11.9	No Limit
		EA029: Titratable Actual Acidity (23F)	----	2	mole H+ / t	15	14	10.5	No Limit
		EA029: Titratable Peroxide Acidity (23G)	----	2	mole H+ / t	40	42	4.03	0% - 20%



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EA029-B: Acidity Trail (QC Lot: 2883661) - continued									
EB2005119-011	BH5_0.5m	EA029: Titratable Sulfidic Acidity (23H)	----	2	mole H+ / t	25	28	11.9	0% - 50%
EA029-B: Acidity Trail (QC Lot: 2883662)									
EB2005119-021	BH6_3.5m	EA029: sulfidic - Titratable Actual Acidity (s-23F)	----	0.02	% pyrite S	<0.020	<0.020	0.00	No Limit
		EA029: sulfidic - Titratable Peroxide Acidity (s-23G)	----	0.02	% pyrite S	<0.020	<0.020	0.00	No Limit
		EA029: sulfidic - Titratable Sulfidic Acidity (s-23H)	----	0.02	% pyrite S	<0.020	<0.020	0.00	No Limit
		EA029: Titratable Actual Acidity (23F)	----	2	mole H+ / t	9	10	12.7	No Limit
		EA029: Titratable Peroxide Acidity (23G)	----	2	mole H+ / t	11	12	0.00	No Limit
		EA029: Titratable Sulfidic Acidity (23H)	----	2	mole H+ / t	2	<2	0.00	No Limit
		EB2005272-003	Anonymous	EA029: sulfidic - Titratable Actual Acidity (s-23F)	----	0.02	% pyrite S	<0.020	<0.020
EA029: sulfidic - Titratable Peroxide Acidity (s-23G)	----			0.02	% pyrite S	<0.020	<0.020	0.00	No Limit
EA029: sulfidic - Titratable Sulfidic Acidity (s-23H)	----			0.02	% pyrite S	<0.020	<0.020	0.00	No Limit
EA029: Titratable Actual Acidity (23F)	----			2	mole H+ / t	<2	<2	0.00	No Limit
EA029: Titratable Peroxide Acidity (23G)	----			2	mole H+ / t	<2	<2	0.00	No Limit
EA029: Titratable Sulfidic Acidity (23H)	----			2	mole H+ / t	<2	<2	0.00	No Limit
EA029-C: Sulfur Trail (QC Lot: 2883661)									
EB2005119-001	BH1_0.5m	EA029: KCl Extractable Sulfur (23Ce)	----	0.02	% S	0.023	0.021	9.17	No Limit
		EA029: Peroxide Sulfur (23De)	----	0.02	% S	0.032	0.032	0.00	No Limit
		EA029: Peroxide Oxidisable Sulfur (23E)	----	0.02	% S	<0.020	<0.020	0.00	No Limit
		EA029: acidity - Peroxide Oxidisable Sulfur (a-23E)	----	10	mole H+ / t	<10	<10	0.00	No Limit
EB2005119-011	BH5_0.5m	EA029: KCl Extractable Sulfur (23Ce)	----	0.02	% S	0.029	0.029	0.00	No Limit
		EA029: Peroxide Sulfur (23De)	----	0.02	% S	0.050	0.050	0.00	No Limit
		EA029: Peroxide Oxidisable Sulfur (23E)	----	0.02	% S	0.021	0.021	0.00	No Limit
		EA029: acidity - Peroxide Oxidisable Sulfur (a-23E)	----	10	mole H+ / t	13	13	0.00	No Limit
EA029-C: Sulfur Trail (QC Lot: 2883662)									
EB2005119-021	BH6_3.5m	EA029: KCl Extractable Sulfur (23Ce)	----	0.02	% S	0.026	0.026	0.00	No Limit
		EA029: Peroxide Sulfur (23De)	----	0.02	% S	0.036	0.040	8.31	No Limit
		EA029: Peroxide Oxidisable Sulfur (23E)	----	0.02	% S	<0.020	<0.020	0.00	No Limit
		EA029: acidity - Peroxide Oxidisable Sulfur (a-23E)	----	10	mole H+ / t	<10	<10	0.00	No Limit
EB2005272-003	Anonymous	EA029: KCl Extractable Sulfur (23Ce)	----	0.02	% S	<0.020	<0.020	0.00	No Limit
		EA029: Peroxide Sulfur (23De)	----	0.02	% S	<0.020	<0.020	0.00	No Limit
		EA029: Peroxide Oxidisable Sulfur (23E)	----	0.02	% S	<0.020	<0.020	0.00	No Limit
		EA029: acidity - Peroxide Oxidisable Sulfur (a-23E)	----	10	mole H+ / t	<10	<10	0.00	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EA029-D: Calcium Values (QC Lot: 2883661)									
EB2005119-001	BH1_0.5m	EA029: KCl Extractable Calcium (23Vh)	----	0.02	% Ca	<0.020	<0.020	0.00	No Limit
		EA029: Peroxide Calcium (23Wh)	----	0.02	% Ca	<0.020	<0.020	0.00	No Limit
		EA029: Acid Reacted Calcium (23X)	----	0.02	% Ca	<0.020	<0.020	0.00	No Limit
		EA029: sulfidic - Acid Reacted Calcium (s-23X)	----	0.02	% S	<0.020	<0.020	0.00	No Limit
		EA029: acidity - Acid Reacted Calcium (a-23X)	----	10	mole H+ / t	<10	<10	0.00	No Limit
EB2005119-011	BH5_0.5m	EA029: KCl Extractable Calcium (23Vh)	----	0.02	% Ca	0.178	0.176	0.939	No Limit
		EA029: Peroxide Calcium (23Wh)	----	0.02	% Ca	0.176	0.175	0.711	No Limit
		EA029: Acid Reacted Calcium (23X)	----	0.02	% Ca	<0.020	<0.020	0.00	No Limit
		EA029: sulfidic - Acid Reacted Calcium (s-23X)	----	0.02	% S	<0.020	<0.020	0.00	No Limit
		EA029: acidity - Acid Reacted Calcium (a-23X)	----	10	mole H+ / t	<10	<10	0.00	No Limit
EA029-D: Calcium Values (QC Lot: 2883662)									
EB2005119-021	BH6_3.5m	EA029: KCl Extractable Calcium (23Vh)	----	0.02	% Ca	<0.020	<0.020	0.00	No Limit
		EA029: Peroxide Calcium (23Wh)	----	0.02	% Ca	<0.020	<0.020	0.00	No Limit
		EA029: Acid Reacted Calcium (23X)	----	0.02	% Ca	<0.020	<0.020	0.00	No Limit
		EA029: sulfidic - Acid Reacted Calcium (s-23X)	----	0.02	% S	<0.020	<0.020	0.00	No Limit
		EA029: acidity - Acid Reacted Calcium (a-23X)	----	10	mole H+ / t	<10	<10	0.00	No Limit
EB2005272-003	Anonymous	EA029: KCl Extractable Calcium (23Vh)	----	0.02	% Ca	0.152	0.160	4.97	No Limit
		EA029: Peroxide Calcium (23Wh)	----	0.02	% Ca	0.505	0.527	4.35	0% - 20%
		EA029: Acid Reacted Calcium (23X)	----	0.02	% Ca	0.352	0.367	4.08	0% - 50%
		EA029: sulfidic - Acid Reacted Calcium (s-23X)	----	0.02	% S	0.282	0.294	4.08	0% - 50%
		EA029: acidity - Acid Reacted Calcium (a-23X)	----	10	mole H+ / t	176	183	4.08	0% - 50%
EA029-E: Magnesium Values (QC Lot: 2883661)									
EB2005119-001	BH1_0.5m	EA029: KCl Extractable Magnesium (23Sm)	----	0.02	% Mg	0.053	0.050	5.72	No Limit
		EA029: Peroxide Magnesium (23Tm)	----	0.02	% Mg	0.053	0.052	0.00	No Limit
		EA029: Acid Reacted Magnesium (23U)	----	0.02	% Mg	<0.020	<0.020	0.00	No Limit
		EA029: sulfidic - Acid Reacted Magnesium (s-23U)	----	0.02	% S	<0.020	<0.020	0.00	No Limit
		EA029: Acidity - Acid Reacted Magnesium (a-23U)	----	10	mole H+ / t	<10	<10	0.00	No Limit
EB2005119-011	BH5_0.5m	EA029: KCl Extractable Magnesium (23Sm)	----	0.02	% Mg	0.082	0.081	0.00	No Limit
		EA029: Peroxide Magnesium (23Tm)	----	0.02	% Mg	0.085	0.085	0.00	No Limit
		EA029: Acid Reacted Magnesium (23U)	----	0.02	% Mg	<0.020	<0.020	0.00	No Limit
		EA029: sulfidic - Acid Reacted Magnesium (s-23U)	----	0.02	% S	<0.020	<0.020	0.00	No Limit
		EA029: Acidity - Acid Reacted Magnesium (a-23U)	----	10	mole H+ / t	<10	<10	0.00	No Limit
EA029-E: Magnesium Values (QC Lot: 2883662)									
EB2005119-021	BH6_3.5m	EA029: KCl Extractable Magnesium (23Sm)	----	0.02	% Mg	0.136	0.140	2.98	No Limit
		EA029: Peroxide Magnesium (23Tm)	----	0.02	% Mg	0.138	0.153	9.95	No Limit
		EA029: Acid Reacted Magnesium (23U)	----	0.02	% Mg	<0.020	<0.020	0.00	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EA029-E: Magnesium Values (QC Lot: 2883662) - continued									
EB2005119-021	BH6_3.5m	EA029: sulfidic - Acid Reacted Magnesium (s-23U)	----	0.02	% S	<0.020	<0.020	0.00	No Limit
		EA029: Acidity - Acid Reacted Magnesium (a-23U)	----	10	mole H+ / t	<10	11	0.00	No Limit
EB2005272-003	Anonymous	EA029: KCl Extractable Magnesium (23Sm)	----	0.02	% Mg	0.026	0.027	4.48	No Limit
		EA029: Peroxide Magnesium (23Tm)	----	0.02	% Mg	0.078	0.093	17.0	No Limit
		EA029: Acid Reacted Magnesium (23U)	----	0.02	% Mg	0.052	0.066	22.8	No Limit
		EA029: sulfidic - Acid Reacted Magnesium (s-23U)	----	0.02	% S	0.069	0.086	22.8	No Limit
		EA029: Acidity - Acid Reacted Magnesium (a-23U)	----	10	mole H+ / t	43	54	22.8	No Limit
EA029-F: Excess Acid Neutralising Capacity (QC Lot: 2883662)									
EB2005272-003	Anonymous	EA029: Excess Acid Neutralising Capacity (23Q)	----	0.02	% CaCO3	1.30	1.37	5.18	0% - 20%
		EA029: sulfidic - Excess Acid Neutralising Capacity (s-23Q)	----	0.02	% S	0.417	0.439	5.18	0% - 20%
		EA029: acidity - Excess Acid Neutralising Capacity (a-23Q)	----	10	mole H+ / t	260	274	5.18	0% - 20%
EA029-G: Retained Acidity (QC Lot: 2883661)									
EB2005119-001	BH1_0.5m	EA029: sulfidic - Net Acid Soluble Sulfur (s-20J)	----	0.02	% pyrite S	0.020	0.020	0.00	No Limit
		EA029: Net Acid Soluble Sulfur (20Je)	----	0.02	% S	0.027	0.027	0.00	No Limit
		EA029: HCl Extractable Sulfur (20Be)	----	0.02	% S	0.050	0.048	4.50	No Limit
		EA029: acidity - Net Acid Soluble Sulfur (a-20J)	----	10	mole H+ / t	13	13	0.00	No Limit
EA029-H: Acid Base Accounting (QC Lot: 2883661)									
EB2005119-001	BH1_0.5m	EA029: ANC Fineness Factor	----	0.5	-	1.5	1.5	0.00	No Limit
		EA029: Net Acidity (sulfur units)	----	0.02	% S	0.14	0.14	0.00	No Limit
		EA029: Net Acidity excluding ANC (sulfur units)	----	0.02	% S	0.14	0.14	0.00	No Limit
		EA029: Liming Rate	----	1	kg CaCO3/t	7	7	0.00	No Limit
		EA029: Liming Rate excluding ANC	----	1	kg CaCO3/t	7	7	0.00	No Limit
		EA029: Net Acidity (acidity units)	----	10	mole H+ / t	91	90	0.00	No Limit
		EA029: Net Acidity excluding ANC (acidity units)	----	10	mole H+ / t	91	90	0.00	No Limit
EB2005119-011	BH5_0.5m	EA029: ANC Fineness Factor	----	0.5	-	1.5	1.5	0.00	No Limit
		EA029: Net Acidity (sulfur units)	----	0.02	% S	0.04	0.04	0.00	No Limit
		EA029: Net Acidity excluding ANC (sulfur units)	----	0.02	% S	0.04	0.04	0.00	No Limit
		EA029: Liming Rate	----	1	kg CaCO3/t	2	2	0.00	No Limit
		EA029: Liming Rate excluding ANC	----	1	kg CaCO3/t	2	2	0.00	No Limit
		EA029: Net Acidity (acidity units)	----	10	mole H+ / t	28	27	5.56	No Limit
		EA029: Net Acidity excluding ANC (acidity units)	----	10	mole H+ / t	28	27	5.56	No Limit
EA029-H: Acid Base Accounting (QC Lot: 2883662)									
EB2005119-021	BH6_3.5m	EA029: ANC Fineness Factor	----	0.5	-	1.5	1.5	0.00	No Limit
		EA029: Net Acidity (sulfur units)	----	0.02	% S	0.02	0.03	0.00	No Limit

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 Work Order : EB2005119
 Client : BENBOW ENVIRONMENTAL
 Project : 191290-02



Sub-Matrix: SOIL					Laboratory Duplicate (DUP) Report				
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EA029-H: Acid Base Accounting (QC Lot: 2883662) - continued									
EB2005119-021	BH6_3.5m	EA029: Net Acidity excluding ANC (sulfur units)	----	0.02	% S	0.02	0.03	0.00	No Limit
		EA029: Liming Rate	----	1	kg CaCO3/t	1	1	0.00	No Limit
		EA029: Liming Rate excluding ANC	----	1	kg CaCO3/t	1	1	0.00	No Limit
		EA029: Net Acidity (acidity units)	----	10	mole H+ / t	15	18	16.4	No Limit
		EA029: Net Acidity excluding ANC (acidity units)	----	10	mole H+ / t	15	18	16.4	No Limit
EB2005272-003	Anonymous	EA029: ANC Fineness Factor	----	0.5	-	1.5	1.5	0.00	No Limit
		EA029: Net Acidity (sulfur units)	----	0.02	% S	<0.02	<0.02	0.00	No Limit
		EA029: Net Acidity excluding ANC (sulfur units)	----	0.02	% S	<0.02	<0.02	0.00	No Limit
		EA029: Liming Rate	----	1	kg CaCO3/t	<1	<1	0.00	No Limit
		EA029: Liming Rate excluding ANC	----	1	kg CaCO3/t	<1	<1	0.00	No Limit
		EA029: Net Acidity (acidity units)	----	10	mole H+ / t	<10	<10	0.00	No Limit
		EA029: Net Acidity excluding ANC (acidity units)	----	10	mole H+ / t	<10	<10	0.00	No Limit



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

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

Sub-Matrix: **SOIL**

Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result		LCS	Low	High
EA029-A: pH Measurements (QCLot: 2883661)								
EA029: pH KCl (23A)	----	0.1	pH Unit	<0.1	4.4 pH Unit	100	70.0	130
EA029: pH OX (23B)	----	0.1	pH Unit	<0.1	4.2 pH Unit	102	70.0	130
EA029-A: pH Measurements (QCLot: 2883662)								
EA029: pH KCl (23A)	----	0.1	pH Unit	<0.1	4.4 pH Unit	100	70.0	130
EA029: pH OX (23B)	----	0.1	pH Unit	<0.1	4.2 pH Unit	105	70.0	130
EA029-B: Acidity Trail (QCLot: 2883661)								
EA029: Titratable Actual Acidity (23F)	----	2	mole H+ / t	<2	20.1 mole H+ / t	81.1	70.0	130
EA029: Titratable Peroxide Acidity (23G)	----	2	mole H+ / t	<2	27.5 mole H+ / t	120	70.0	130
EA029: Titratable Sulfidic Acidity (23H)	----	2	mole H+ / t	<2	----	----	----	----
EA029: sulfidic - Titratable Actual Acidity (s-23F)	----	0.02	% pyrite S	<0.020	----	----	----	----
EA029: sulfidic - Titratable Peroxide Acidity (s-23G)	----	0.02	% pyrite S	<0.020	----	----	----	----
EA029: sulfidic - Titratable Sulfidic Acidity (s-23H)	----	0.02	% pyrite S	<0.020	----	----	----	----
EA029-B: Acidity Trail (QCLot: 2883662)								
EA029: Titratable Actual Acidity (23F)	----	2	mole H+ / t	<2	20.1 mole H+ / t	80.8	70.0	130
EA029: Titratable Peroxide Acidity (23G)	----	2	mole H+ / t	<2	27.5 mole H+ / t	123	70.0	130
EA029: Titratable Sulfidic Acidity (23H)	----	2	mole H+ / t	<2	----	----	----	----
EA029: sulfidic - Titratable Actual Acidity (s-23F)	----	0.02	% pyrite S	<0.020	----	----	----	----
EA029: sulfidic - Titratable Peroxide Acidity (s-23G)	----	0.02	% pyrite S	<0.020	----	----	----	----
EA029: sulfidic - Titratable Sulfidic Acidity (s-23H)	----	0.02	% pyrite S	<0.020	----	----	----	----
EA029-C: Sulfur Trail (QCLot: 2883661)								
EA029: KCl Extractable Sulfur (23Ce)	----	0.02	% S	<0.020	0.055 % S	89.2	70.0	130
EA029: Peroxide Sulfur (23De)	----	0.02	% S	<0.020	0.184 % S	86.0	70.0	130
EA029: Peroxide Oxidisable Sulfur (23E)	----	0.02	% S	<0.020	----	----	----	----
EA029: acidity - Peroxide Oxidisable Sulfur (a-23E)	----	10	mole H+ / t	<10	----	----	----	----
EA029-C: Sulfur Trail (QCLot: 2883662)								
EA029: KCl Extractable Sulfur (23Ce)	----	0.02	% S	<0.020	0.055 % S	86.8	70.0	130
EA029: Peroxide Sulfur (23De)	----	0.02	% S	<0.020	0.184 % S	86.1	70.0	130
EA029: Peroxide Oxidisable Sulfur (23E)	----	0.02	% S	<0.020	----	----	----	----
EA029: acidity - Peroxide Oxidisable Sulfur (a-23E)	----	10	mole H+ / t	<10	----	----	----	----
EA029-D: Calcium Values (QCLot: 2883661)								
EA029: KCl Extractable Calcium (23Vh)	----	0.02	% Ca	<0.020	0.124 % Ca	126	70.0	130
EA029: Peroxide Calcium (23Wh)	----	0.02	% Ca	<0.020	0.223 % Ca	90.2	70.0	130
EA029: Acid Reacted Calcium (23X)	----	0.02	% Ca	<0.020	----	----	----	----



Sub-Matrix: **SOIL**

Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EA029-D: Calcium Values (QCLot: 2883661) - continued								
EA029: acidity - Acid Reacted Calcium (a-23X)	----	10	mole H+ / t	<10	----	----	----	----
EA029: sulfidic - Acid Reacted Calcium (s-23X)	----	0.02	% S	<0.020	----	----	----	----
EA029-D: Calcium Values (QCLot: 2883662)								
EA029: KCl Extractable Calcium (23Vh)	----	0.02	% Ca	<0.020	0.124 % Ca	128	70.0	130
EA029: Peroxide Calcium (23Wh)	----	0.02	% Ca	<0.020	0.223 % Ca	98.2	70.0	130
EA029: Acid Reacted Calcium (23X)	----	0.02	% Ca	<0.020	----	----	----	----
EA029: acidity - Acid Reacted Calcium (a-23X)	----	10	mole H+ / t	<10	----	----	----	----
EA029: sulfidic - Acid Reacted Calcium (s-23X)	----	0.02	% S	<0.020	----	----	----	----
EA029-E: Magnesium Values (QCLot: 2883661)								
EA029: KCl Extractable Magnesium (23Sm)	----	0.02	% Mg	<0.020	0.196 % Mg	88.8	70.0	130
EA029: Peroxide Magnesium (23Tm)	----	0.02	% Mg	<0.020	0.218 % Mg	87.0	70.0	130
EA029: Acid Reacted Magnesium (23U)	----	0.02	% Mg	<0.020	----	----	----	----
EA029: Acidity - Acid Reacted Magnesium (a-23U)	----	10	mole H+ / t	<10	----	----	----	----
EA029: sulfidic - Acid Reacted Magnesium (s-23U)	----	0.02	% S	<0.020	----	----	----	----
EA029-E: Magnesium Values (QCLot: 2883662)								
EA029: KCl Extractable Magnesium (23Sm)	----	0.02	% Mg	<0.020	0.196 % Mg	89.5	70.0	130
EA029: Peroxide Magnesium (23Tm)	----	0.02	% Mg	<0.020	0.218 % Mg	95.5	70.0	130
EA029: Acid Reacted Magnesium (23U)	----	0.02	% Mg	<0.020	----	----	----	----
EA029: Acidity - Acid Reacted Magnesium (a-23U)	----	10	mole H+ / t	<10	----	----	----	----
EA029: sulfidic - Acid Reacted Magnesium (s-23U)	----	0.02	% S	<0.020	----	----	----	----
EA029-F: Excess Acid Neutralising Capacity (QCLot: 2883661)								
EA029: Excess Acid Neutralising Capacity (23Q)	----	0.02	% CaCO3	<0.020	----	----	----	----
EA029: acidity - Excess Acid Neutralising Capacity (a-23Q)	----	10	mole H+ / t	<10	----	----	----	----
EA029: sulfidic - Excess Acid Neutralising Capacity (s-23Q)	----	0.02	% S	<0.020	----	----	----	----
EA029-F: Excess Acid Neutralising Capacity (QCLot: 2883662)								
EA029: Excess Acid Neutralising Capacity (23Q)	----	0.02	% CaCO3	<0.020	----	----	----	----
EA029: acidity - Excess Acid Neutralising Capacity (a-23Q)	----	10	mole H+ / t	<10	----	----	----	----
EA029: sulfidic - Excess Acid Neutralising Capacity (s-23Q)	----	0.02	% S	<0.020	----	----	----	----
EA029-G: Retained Acidity (QCLot: 2883661)								
EA029: Net Acid Soluble Sulfur (20Je)	----	0.02	% S	<0.020	----	----	----	----
EA029: acidity - Net Acid Soluble Sulfur (a-20J)	----	10	mole H+ / t	<10	----	----	----	----
EA029: sulfidic - Net Acid Soluble Sulfur (s-20J)	----	0.02	% pyrite S	<0.020	----	----	----	----
EA029: HCl Extractable Sulfur (20Be)	----	0.02	% S	<0.020	0.279 % S	116	70.0	130
EA029-H: Acid Base Accounting (QCLot: 2883661)								
EA029: ANC Fineness Factor	----	0.5	-	<0.5	----	----	----	----
EA029: Net Acidity (sulfur units)	----	0.02	% S	<0.02	----	----	----	----



Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High	
Method: <i>Compound</i>	CAS Number	LOR	Unit	Result				
EA029-H: Acid Base Accounting (QCLot: 2883661) - continued								
EA029: Net Acidity (acidity units)	----	10	mole H+ / t	<10	----	----	----	----
EA029: Liming Rate	----	1	kg CaCO3/t	<1	----	----	----	----
EA029: Net Acidity excluding ANC (sulfur units)	----	0.02	% S	<0.02	----	----	----	----
EA029: Net Acidity excluding ANC (acidity units)	----	10	mole H+ / t	<10	----	----	----	----
EA029: Liming Rate excluding ANC	----	1	kg CaCO3/t	<1	----	----	----	----
EA029-H: Acid Base Accounting (QCLot: 2883662)								
EA029: ANC Fineness Factor	----	0.5	-	<0.5	----	----	----	----
EA029: Net Acidity (sulfur units)	----	0.02	% S	<0.02	----	----	----	----
EA029: Net Acidity (acidity units)	----	10	mole H+ / t	<10	----	----	----	----
EA029: Liming Rate	----	1	kg CaCO3/t	<1	----	----	----	----
EA029: Net Acidity excluding ANC (sulfur units)	----	0.02	% S	<0.02	----	----	----	----
EA029: Net Acidity excluding ANC (acidity units)	----	10	mole H+ / t	<10	----	----	----	----
EA029: Liming Rate excluding ANC	----	1	kg CaCO3/t	<1	----	----	----	----

Matrix Spike (MS) Report

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

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

QA/QC Compliance Assessment to assist with Quality Review

Work Order : **EB2005119**

Page : 1 of 7

Client : **BENBOW ENVIRONMENTAL**
Contact : Matthew Taylor
Project : 191290-02
Site : ----
Sampler : ----
Order number : 191290-02

Laboratory : Environmental Division Brisbane
Telephone : +61-7-3243 7222
Date Samples Received : 24-Feb-2020
Issue Date : 02-Mar-2020
No. of samples received : 28
No. of samples analysed : 28

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

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

Outliers : Analysis Holding Time Compliance

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

Outliers : Frequency of Quality Control Samples

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

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

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

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

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

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA029-A: pH Measurements								
80* dried soil (EA029)		13-Feb-2020	02-Mar-2020	08-Nov-2022	✓	02-Mar-2020	31-May-2020	✓
BH1_0.5m,	BH1_1.0m,							
BH1_1.5m,	BH1_2.0m,							
BH2_0.5m,	BH3_1.0m,							
BH4_1.0m,	BH4_1.5m,							
BH4_2.0m,	BH4_2.5m,							
BH5_0.5m,	BH5_1.0m,							
BH5_1.5m,	BH5_2.0m,							
BH5_2.5m,	BH5_3.0m,							
BH6_1.0m,	BH6_1.5m,							
BH6_2.0m,	BH6_2.5m,							
BH6_3.5m,	BH7_1.0m,							
BH7_1.5m,	BH7_2.0m,							
BH7_2.5m,	BH7_3.0m,							
BH7_3.5m,	BH7_4.0m							
EA029-B: Acidity Trail								
80* dried soil (EA029)		13-Feb-2020	02-Mar-2020	08-Nov-2022	✓	02-Mar-2020	31-May-2020	✓
BH1_0.5m,	BH1_1.0m,							
BH1_1.5m,	BH1_2.0m,							
BH2_0.5m,	BH3_1.0m,							
BH4_1.0m,	BH4_1.5m,							
BH4_2.0m,	BH4_2.5m,							
BH5_0.5m,	BH5_1.0m,							
BH5_1.5m,	BH5_2.0m,							
BH5_2.5m,	BH5_3.0m,							
BH6_1.0m,	BH6_1.5m,							
BH6_2.0m,	BH6_2.5m,							
BH6_3.5m,	BH7_1.0m,							
BH7_1.5m,	BH7_2.0m,							
BH7_2.5m,	BH7_3.0m,							
BH7_3.5m,	BH7_4.0m							

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

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA029-C: Sulfur Trail								
80* dried soil (EA029)		13-Feb-2020	02-Mar-2020	08-Nov-2022	✓	02-Mar-2020	31-May-2020	✓
BH1_0.5m,	BH1_1.0m,							
BH1_1.5m,	BH1_2.0m,							
BH2_0.5m,	BH3_1.0m,							
BH4_1.0m,	BH4_1.5m,							
BH4_2.0m,	BH4_2.5m,							
BH5_0.5m,	BH5_1.0m,							
BH5_1.5m,	BH5_2.0m,							
BH5_2.5m,	BH5_3.0m,							
BH6_1.0m,	BH6_1.5m,							
BH6_2.0m,	BH6_2.5m,							
BH6_3.5m,	BH7_1.0m,							
BH7_1.5m,	BH7_2.0m,							
BH7_2.5m,	BH7_3.0m,							
BH7_3.5m,	BH7_4.0m,							
EA029-D: Calcium Values								
80* dried soil (EA029)		13-Feb-2020	02-Mar-2020	08-Nov-2022	✓	02-Mar-2020	31-May-2020	✓
BH1_0.5m,	BH1_1.0m,							
BH1_1.5m,	BH1_2.0m,							
BH2_0.5m,	BH3_1.0m,							
BH4_1.0m,	BH4_1.5m,							
BH4_2.0m,	BH4_2.5m,							
BH5_0.5m,	BH5_1.0m,							
BH5_1.5m,	BH5_2.0m,							
BH5_2.5m,	BH5_3.0m,							
BH6_1.0m,	BH6_1.5m,							
BH6_2.0m,	BH6_2.5m,							
BH6_3.5m,	BH7_1.0m,							
BH7_1.5m,	BH7_2.0m,							
BH7_2.5m,	BH7_3.0m,							
BH7_3.5m,	BH7_4.0m,							

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

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA029-E: Magnesium Values								
80* dried soil (EA029)		13-Feb-2020	02-Mar-2020	08-Nov-2022	✓	02-Mar-2020	31-May-2020	✓
BH1_0.5m,	BH1_1.0m,							
BH1_1.5m,	BH1_2.0m,							
BH2_0.5m,	BH3_1.0m,							
BH4_1.0m,	BH4_1.5m,							
BH4_2.0m,	BH4_2.5m,							
BH5_0.5m,	BH5_1.0m,							
BH5_1.5m,	BH5_2.0m,							
BH5_2.5m,	BH5_3.0m,							
BH6_1.0m,	BH6_1.5m,							
BH6_2.0m,	BH6_2.5m,							
BH6_3.5m,	BH7_1.0m,							
BH7_1.5m,	BH7_2.0m,							
BH7_2.5m,	BH7_3.0m,							
BH7_3.5m,	BH7_4.0m,							
EA029-F: Excess Acid Neutralising Capacity								
80* dried soil (EA029)		13-Feb-2020	02-Mar-2020	08-Nov-2022	✓	02-Mar-2020	31-May-2020	✓
BH1_0.5m,	BH1_1.0m,							
BH1_1.5m,	BH1_2.0m,							
BH2_0.5m,	BH3_1.0m,							
BH4_1.0m,	BH4_1.5m,							
BH4_2.0m,	BH4_2.5m,							
BH5_0.5m,	BH5_1.0m,							
BH5_1.5m,	BH5_2.0m,							
BH5_2.5m,	BH5_3.0m,							
BH6_1.0m,	BH6_1.5m,							
BH6_2.0m,	BH6_2.5m,							
BH6_3.5m,	BH7_1.0m,							
BH7_1.5m,	BH7_2.0m,							
BH7_2.5m,	BH7_3.0m,							
BH7_3.5m,	BH7_4.0m,							

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

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA029-G: Retained Acidity								
80* dried soil (EA029)		13-Feb-2020	02-Mar-2020	08-Nov-2022	✓	02-Mar-2020	31-May-2020	✓
BH1_0.5m,	BH1_1.0m,							
BH1_1.5m,	BH1_2.0m,							
BH2_0.5m,	BH3_1.0m,							
BH4_1.0m,	BH4_1.5m,							
BH4_2.0m,	BH4_2.5m,							
BH5_0.5m,	BH5_1.0m,							
BH5_1.5m,	BH5_2.0m,							
BH5_2.5m,	BH5_3.0m,							
BH6_1.0m,	BH6_1.5m,							
BH6_2.0m,	BH6_2.5m,							
BH6_3.5m,	BH7_1.0m,							
BH7_1.5m,	BH7_2.0m,							
BH7_2.5m,	BH7_3.0m,							
BH7_3.5m,	BH7_4.0m							
EA029-H: Acid Base Accounting								
80* dried soil (EA029)		13-Feb-2020	02-Mar-2020	08-Nov-2022	✓	02-Mar-2020	31-May-2020	✓
BH1_0.5m,	BH1_1.0m,							
BH1_1.5m,	BH1_2.0m,							
BH2_0.5m,	BH3_1.0m,							
BH4_1.0m,	BH4_1.5m,							
BH4_2.0m,	BH4_2.5m,							
BH5_0.5m,	BH5_1.0m,							
BH5_1.5m,	BH5_2.0m,							
BH5_2.5m,	BH5_3.0m,							
BH6_1.0m,	BH6_1.5m,							
BH6_2.0m,	BH6_2.5m,							
BH6_3.5m,	BH7_1.0m,							
BH7_1.5m,	BH7_2.0m,							
BH7_2.5m,	BH7_3.0m,							
BH7_3.5m,	BH7_4.0m							



Quality Control Parameter Frequency Compliance

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

Matrix: **SOIL**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
Suspension Peroxide Oxidation-Combined Acidity and Sulphate	EA029	4	33	12.12	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Suspension Peroxide Oxidation-Combined Acidity and Sulphate	EA029	2	33	6.06	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Suspension Peroxide Oxidation-Combined Acidity and Sulphate	EA029	2	33	6.06	5.00	✔	NEPM 2013 B3 & ALS QC Standard



Brief Method Summaries

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

Analytical Methods	Method	Matrix	Method Descriptions
Suspension Peroxide Oxidation-Combined Acidity and Sulphate	EA029	SOIL	In house: Referenced to Ahern et al 2004 - a suspension peroxide oxidation method following the 'sulfur trail' by determining the level of 1M KCL extractable sulfur and the sulfur level after oxidation of soil sulphides. The 'acidity trail' is followed by measurement of TAA, TPA and TSA. Liming Rate is based on results for samples as submitted and incorporates a minimum safety factor of 1.5.
Preparation Methods	Method	Matrix	Method Descriptions
Drying at 85 degrees, bagging and labelling (ASS)	EN020PR	SOIL	In house

QUALITY CONTROL REPORT

Work Order	: ES2005101	Page	: 1 of 26
Client	: BENBOW ENVIRONMENTAL	Laboratory	: Environmental Division Sydney
Contact	: Matthew Taylor	Contact	: Customer Services ES
Address	: 25-27 SHERWOOD STREET NORTHMEAD NSW, AUSTRALIA 2152	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61-2-8784 8555
Project	: 191290-02	Date Samples Received	: 13-Feb-2020
Order number	: 191290-02	Date Analysis Commenced	: 14-Feb-2020
C-O-C number	: ----	Issue Date	: 24-Feb-2020
Sampler	: Matthew Taylor		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 70		
No. of samples analysed	: 70		



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

This Quality Control Report contains the following information:

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

Signatories

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

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



General Comments

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

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

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

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **SOIL**

Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 2862781)									
EP2001476-001	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	<2	<2	0.00	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	<2	<2	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	<5	<5	0.00	No Limit
ES2005101-007	BH3_0.5m	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	27	27	0.00	0% - 50%
		EG005T: Nickel	7440-02-0	2	mg/kg	<2	2	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	9	56.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	16	17	0.00	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	19	19	0.00	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	6	8	31.0	No Limit
EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 2862785)									
ES2005101-017	BH6_1.5m	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	19	19	0.00	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	2	2	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	6	<5	20.8	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	7	8	23.8	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	22	20	6.78	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	18	27	40.7	No Limit
ES2005108-004	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	8	7	0.00	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	7	6	0.00	No Limit

Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 2862785) - continued									
ES2005108-004	Anonymous	EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	8	8	0.00	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	35	34	0.00	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	73	75	2.05	0% - 50%
EA037: Ass Field Screening Analysis (QC Lot: 2868742)									
ES2005101-025	BH1_1.0m	EA037: pH (F)	----	0.1	pH Unit	5.1	5.2	0.00	0% - 20%
		EA037: pH (Fox)	----	0.1	pH Unit	3.4	3.4	0.00	0% - 20%
ES2005101-035	BH3_2.0m	EA037: pH (F)	----	0.1	pH Unit	9.1	9.1	0.00	0% - 20%
		EA037: pH (Fox)	----	0.1	pH Unit	8.2	8.2	0.00	0% - 20%
EA037: Ass Field Screening Analysis (QC Lot: 2868743)									
ES2005101-045	BH5_2.0m	EA037: pH (F)	----	0.1	pH Unit	4.6	4.6	0.00	0% - 20%
		EA037: pH (Fox)	----	0.1	pH Unit	3.0	3.1	0.00	0% - 20%
ES2005101-055	BH6_3.5m	EA037: pH (F)	----	0.1	pH Unit	5.3	5.4	0.00	0% - 20%
		EA037: pH (Fox)	----	0.1	pH Unit	4.5	4.6	0.00	0% - 20%
EA037: Ass Field Screening Analysis (QC Lot: 2868744)									
ES2005101-065	BH5_2.0D	EA037: pH (F)	----	0.1	pH Unit	4.6	4.6	0.00	0% - 20%
		EA037: pH (Fox)	----	0.1	pH Unit	3.7	3.7	0.00	0% - 20%
EA037: Ass Field Screening Analysis (QC Lot: 2871731)									
EB2004748-028	Anonymous	EA037: pH (F)	----	0.1	pH Unit	7.2	7.2	0.00	0% - 20%
		EA037: pH (Fox)	----	0.1	pH Unit	4.0	4.1	0.00	0% - 20%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 2862787)									
ES2004928-001	Anonymous	EA055: Moisture Content	----	0.1	%	3.3	2.8	17.6	No Limit
ES2005101-010	BH4_0.5m	EA055: Moisture Content	----	0.1	%	22.8	24.2	6.12	0% - 20%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 2862788)									
ES2005101-019	BH7_0.5m	EA055: Moisture Content	----	0.1	%	7.1	7.0	1.56	No Limit
ES2005108-007	Anonymous	EA055: Moisture Content	----	0.1	%	20.3	21.8	6.93	0% - 20%
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 2862783)									
EP2001476-001	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
ES2005101-007	BH3_0.5m	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 2862784)									
ES2005101-017	BH6_1.5m	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
ES2005108-004	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	0.1	0.1	0.00	No Limit
EP066: Polychlorinated Biphenyls (PCB) (QC Lot: 2860240)									
ES2005101-002	BH1_1.5m	EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
ES2005101-012	BH4_3.0m	EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EP066: Polychlorinated Biphenyls (PCB) (QC Lot: 2860265)									
ES2003009-058	Anonymous	EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EP066: Polychlorinated Biphenyls (PCB) (QC Lot: 2861100)									

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 Work Order : ES2005101
 Client : BENBOW ENVIRONMENTAL
 Project : 191290-02



Sub-Matrix: SOIL					Laboratory Duplicate (DUP) Report				
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP066: Polychlorinated Biphenyls (PCB) (QC Lot: 2861100) - continued									
ES2005101-001	BH1_0.5m	EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EP068A: Organochlorine Pesticides (OC) (QC Lot: 2860243)									
ES2005101-002	BH1_1.5m	EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4,4'-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4,4'-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4,4'-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
ES2005101-012	BH4_3.0m	EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4,4'-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4,4'-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.00	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP068A: Organochlorine Pesticides (OC) (QC Lot: 2860243) - continued									
ES2005101-012	BH4_3.0m	EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4,4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
EP068A: Organochlorine Pesticides (OC) (QC Lot: 2860264)									
ES2003009-058	Anonymous	EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4,4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4,4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4,4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.00	No Limit		
EP068A: Organochlorine Pesticides (OC) (QC Lot: 2861099)									
ES2005101-001	BH1_0.5m	EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4,4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP068A: Organochlorine Pesticides (OC) (QC Lot: 2861099) - continued									
ES2005101-001	BH1_0.5m	EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4,4'-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4,4'-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
EP068B: Organophosphorus Pesticides (OP) (QC Lot: 2860243)									
ES2005101-002	BH1_1.5m	EP068: Dichlorvos	62-73-7	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Dimethoate	60-51-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Diazinon	333-41-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Malathion	121-75-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Fenthion	55-38-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Prothiofos	34643-46-4	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Ethion	563-12-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Carbophenothion	786-19-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP068: Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
ES2005101-012	BH4_3.0m	EP068: Dichlorvos	62-73-7	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Dimethoate	60-51-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Diazinon	333-41-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Malathion	121-75-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Fenthion	55-38-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit

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 Work Order : ES2005101
 Client : BENBOW ENVIRONMENTAL
 Project : 191290-02



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP068B: Organophosphorus Pesticides (OP) (QC Lot: 2860243) - continued									
ES2005101-012	BH4_3.0m	EP068: Prothiofos	34643-46-4	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Ethion	563-12-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Carbophenothion	786-19-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP068: Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
EP068B: Organophosphorus Pesticides (OP) (QC Lot: 2860264)									
ES2003009-058	Anonymous	EP068: Dichlorvos	62-73-7	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Dimethoate	60-51-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Diazinon	333-41-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Malathion	121-75-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Fenthion	55-38-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Prothiofos	34643-46-4	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Ethion	563-12-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Carbophenothion	786-19-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP068: Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
EP068B: Organophosphorus Pesticides (OP) (QC Lot: 2861099)									
ES2005101-001	BH1_0.5m	EP068: Dichlorvos	62-73-7	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Dimethoate	60-51-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Diazinon	333-41-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Malathion	121-75-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Fenthion	55-38-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP068B: Organophosphorus Pesticides (OP) (QC Lot: 2861099) - continued									
ES2005101-001	BH1_0.5m	EP068: Prothiofos	34643-46-4	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Ethion	563-12-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Carbophenothion	786-19-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP068: Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
EP075(SIM)A: Phenolic Compounds (QC Lot: 2860242)									
ES2005101-002	BH1_1.5m	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.00	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.00	No Limit
ES2005101-012	BH4_3.0m	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.00	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.00	No Limit
EP075(SIM)A: Phenolic Compounds (QC Lot: 2860262)									
ES2003009-058	Anonymous	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP075(SIM)A: Phenolic Compounds (QC Lot: 2860262) - continued									
ES2003009-058	Anonymous	EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.00	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.00	No Limit
EP075(SIM)A: Phenolic Compounds (QC Lot: 2861098)									
ES2005122-014	Anonymous	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.00	No Limit
EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.00	No Limit		
ES2005101-001	BH1_0.5m	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.00	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.00	No Limit
		EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 2860242)							
ES2005101-002	BH1_1.5m	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)	
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 2860242) - continued										
ES2005101-002	BH1_1.5m	EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
			205-82-3							
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
	EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit		
ES2005101-012	BH4_3.0m	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
			205-82-3							
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
			EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 2860262)								
ES2003009-058	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	1.5	1.5	0.00	No Limit	
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	0.6	0.6	0.00	No Limit	
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	1.2	1.1	0.00	No Limit	
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	2.6	2.7	0.00	No Limit	
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	3.0	3.0	0.00	No Limit	



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 2860262) - continued									
ES2003009-058	Anonymous	EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	2.4	2.5	0.00	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	2.6	2.7	0.00	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2	0.5	mg/kg	5.6	5.4	3.20	0% - 50%
			205-82-3						
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	1.7	1.8	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	3.7	3.5	4.20	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	2.4	2.4	0.00	No Limit
		EP075(SIM): Dibenzo(a,h)anthracene	53-70-3	0.5	mg/kg	0.5	0.5	0.00	No Limit
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	2.7	2.7	0.00	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	30.5	30.4	0.328	0% - 20%
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	5.5	5.3	3.71	0% - 50%
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 2861098)									
ES2005122-014	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			205-82-3						
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Dibenzo(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
ES2005101-001	BH1_0.5m	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 2861098) - continued									
ES2005101-001	BH1_0.5m	EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 2860241)									
ES2005101-002	BH1_1.5m	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
ES2005101-012	BH4_3.0m	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 2860263)									
ES2003009-058	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	190	220	11.3	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 2860276)									
ES2005101-002	BH1_1.5m	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
ES2005101-012	BH4_3.0m	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 2861042)									
ES2005101-001	BH1_0.5m	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 2861097)									
ES2005122-014	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
ES2005101-001	BH1_0.5m	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 2860241)									
ES2005101-002	BH1_1.5m	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 2860241) - continued									
ES2005101-002	BH1_1.5m	EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
ES2005101-012	BH4_3.0m	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 2860263)									
ES2003009-058	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	230	250	8.10	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	190	240	20.3	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 2860276)									
ES2005101-002	BH1_1.5m	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
ES2005101-012	BH4_3.0m	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 2861042)									
ES2005101-001	BH1_0.5m	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 2861097)									
ES2005122-014	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
ES2005101-001	BH1_0.5m	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
EP080: BTEXN (QC Lot: 2860276)									
ES2005101-002	BH1_1.5m	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
ES2005101-012	BH4_3.0m	EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit
		EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit
EP080: BTEXN (QC Lot: 2861042)									
ES2005101-001	BH1_0.5m	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit

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Work Order : ES2005101
Client : BENBOW ENVIRONMENTAL
Project : 191290-02



Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP080: BTEXN (QC Lot: 2861042) - continued									
ES2005101-001	BH1_0.5m	EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit



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

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

Sub-Matrix: **SOIL**

Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result		LCS	Low	High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 2862781)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	93.5	86.0	126
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	83.9	83.0	113
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	76.4	76.0	128
EG005T: Copper	7440-50-8	5	mg/kg	<5	32 mg/kg	90.2	86.0	120
EG005T: Lead	7439-92-1	5	mg/kg	<5	40 mg/kg	90.9	80.0	114
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55 mg/kg	87.7	87.0	123
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	96.0	80.0	122
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 2862785)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	93.2	86.0	126
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	83.9	83.0	113
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	76.4	76.0	128
EG005T: Copper	7440-50-8	5	mg/kg	<5	32 mg/kg	91.2	86.0	120
EG005T: Lead	7439-92-1	5	mg/kg	<5	40 mg/kg	88.3	80.0	114
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55 mg/kg	87.7	87.0	123
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	91.3	80.0	122
ED093S: Soluble Major Cations (QCLot: 2867319)								
ED093S: Calcium	7440-70-2	10	mg/kg	<10	50 mg/kg	99.3	85.0	119
ED093S: Magnesium	7439-95-4	10	mg/kg	<10	50 mg/kg	101	85.0	119
ED093S: Sodium	7440-23-5	10	mg/kg	<10	50 mg/kg	104	81.0	123
ED093S: Potassium	7440-09-7	10	mg/kg	<10	50 mg/kg	108	83.0	125
EG035T: Total Recoverable Mercury by FIMS (QCLot: 2862783)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	77.0	70.0	105
EG035T: Total Recoverable Mercury by FIMS (QCLot: 2862784)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	86.1	70.0	105
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 2860240)								
EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	1 mg/kg	103	62.0	126
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 2860265)								
EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	1 mg/kg	83.8	62.0	126
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 2861100)								
EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	1 mg/kg	90.3	62.0	126
EP068A: Organochlorine Pesticides (OC) (QCLot: 2860243)								
EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	0.5 mg/kg	96.5	69.0	113
EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	0.5 mg/kg	106	65.0	117



Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EP068A: Organochlorine Pesticides (OC) (QCLot: 2860243) - continued								
EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	0.5 mg/kg	103	67.0	119
EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	0.5 mg/kg	100	68.0	116
EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	79.4	65.0	117
EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	0.5 mg/kg	97.0	67.0	115
EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	0.5 mg/kg	101	69.0	115
EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	0.5 mg/kg	79.4	62.0	118
EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	0.5 mg/kg	80.0	63.0	117
EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	0.5 mg/kg	76.7	66.0	116
EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	0.5 mg/kg	84.1	64.0	116
EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	0.5 mg/kg	88.8	66.0	116
EP068: 4,4'-DDE	72-55-9	0.05	mg/kg	<0.05	0.5 mg/kg	95.7	67.0	115
EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	0.5 mg/kg	104	67.0	123
EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	0.5 mg/kg	94.8	69.0	115
EP068: 4,4'-DDD	72-54-8	0.05	mg/kg	<0.05	0.5 mg/kg	90.1	69.0	121
EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	0.5 mg/kg	88.4	56.0	120
EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	0.5 mg/kg	98.7	62.0	124
EP068: 4,4'-DDT	50-29-3	0.2	mg/kg	<0.2	0.5 mg/kg	92.5	66.0	120
EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	0.5 mg/kg	83.3	64.0	122
EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	0.5 mg/kg	97.3	54.0	130
EP068A: Organochlorine Pesticides (OC) (QCLot: 2860264)								
EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	0.5 mg/kg	82.9	69.0	113
EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	0.5 mg/kg	91.5	65.0	117
EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	0.5 mg/kg	80.9	67.0	119
EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	0.5 mg/kg	78.4	68.0	116
EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	98.6	65.0	117
EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	0.5 mg/kg	86.7	67.0	115
EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	0.5 mg/kg	95.4	69.0	115
EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	0.5 mg/kg	89.5	62.0	118
EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	0.5 mg/kg	78.8	63.0	117
EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	0.5 mg/kg	101	66.0	116
EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	0.5 mg/kg	77.4	64.0	116
EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	0.5 mg/kg	91.0	66.0	116
EP068: 4,4'-DDE	72-55-9	0.05	mg/kg	<0.05	0.5 mg/kg	105	67.0	115
EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	0.5 mg/kg	85.4	67.0	123
EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	0.5 mg/kg	107	69.0	115
EP068: 4,4'-DDD	72-54-8	0.05	mg/kg	<0.05	0.5 mg/kg	104	69.0	121
EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	0.5 mg/kg	103	56.0	120
EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	0.5 mg/kg	94.4	62.0	124
EP068: 4,4'-DDT	50-29-3	0.2	mg/kg	<0.2	0.5 mg/kg	96.9	66.0	120



Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EP068A: Organochlorine Pesticides (OC) (QCLot: 2860264) - continued								
EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	0.5 mg/kg	103	64.0	122
EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	0.5 mg/kg	76.6	54.0	130
EP068A: Organochlorine Pesticides (OC) (QCLot: 2861099)								
EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	0.5 mg/kg	89.0	69.0	113
EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	0.5 mg/kg	102	65.0	117
EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	0.5 mg/kg	88.2	67.0	119
EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	0.5 mg/kg	87.6	68.0	116
EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	106	65.0	117
EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	0.5 mg/kg	103	67.0	115
EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	0.5 mg/kg	97.6	69.0	115
EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	0.5 mg/kg	97.4	62.0	118
EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	0.5 mg/kg	96.5	63.0	117
EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	0.5 mg/kg	94.2	66.0	116
EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	0.5 mg/kg	101	64.0	116
EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	0.5 mg/kg	105	66.0	116
EP068: 4,4'-DDE	72-55-9	0.05	mg/kg	<0.05	0.5 mg/kg	105	67.0	115
EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	0.5 mg/kg	81.0	67.0	123
EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	0.5 mg/kg	108	69.0	115
EP068: 4,4'-DDD	72-54-8	0.05	mg/kg	<0.05	0.5 mg/kg	103	69.0	121
EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	0.5 mg/kg	85.9	56.0	120
EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	0.5 mg/kg	108	62.0	124
EP068: 4,4'-DDT	50-29-3	0.2	mg/kg	<0.2	0.5 mg/kg	97.5	66.0	120
EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	0.5 mg/kg	98.8	64.0	122
EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	0.5 mg/kg	97.4	54.0	130
EP068B: Organophosphorus Pesticides (OP) (QCLot: 2860243)								
EP068: Dichlorvos	62-73-7	0.05	mg/kg	<0.05	0.5 mg/kg	90.4	59.0	119
EP068: Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	99.7	62.0	128
EP068: Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	0.5 mg/kg	94.0	54.0	126
EP068: Dimethoate	60-51-5	0.05	mg/kg	<0.05	0.5 mg/kg	100	67.0	119
EP068: Diazinon	333-41-5	0.05	mg/kg	<0.05	0.5 mg/kg	89.2	70.0	120
EP068: Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	0.5 mg/kg	86.2	72.0	120
EP068: Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	0.5 mg/kg	88.3	68.0	120
EP068: Malathion	121-75-5	0.05	mg/kg	<0.05	0.5 mg/kg	102	68.0	122
EP068: Fenthion	55-38-9	0.05	mg/kg	<0.05	0.5 mg/kg	94.6	69.0	117
EP068: Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	0.5 mg/kg	88.5	76.0	118
EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	0.5 mg/kg	88.1	64.0	122
EP068: Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	0.5 mg/kg	95.0	70.0	116
EP068: Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	0.5 mg/kg	92.9	69.0	121
EP068: Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	0.5 mg/kg	88.0	66.0	118



Sub-Matrix: **SOIL**

Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EP068B: Organophosphorus Pesticides (OP) (QCLot: 2860243) - continued								
EP068: Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	0.5 mg/kg	108	68.0	124
EP068: Prothiofos	34643-46-4	0.05	mg/kg	<0.05	0.5 mg/kg	95.4	62.0	112
EP068: Ethion	563-12-2	0.05	mg/kg	<0.05	0.5 mg/kg	82.3	68.0	120
EP068: Carbophenothion	786-19-6	0.05	mg/kg	<0.05	0.5 mg/kg	92.3	65.0	127
EP068: Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	0.5 mg/kg	104	41.0	123
EP068B: Organophosphorus Pesticides (OP) (QCLot: 2860264)								
EP068: Dichlorvos	62-73-7	0.05	mg/kg	<0.05	0.5 mg/kg	108	59.0	119
EP068: Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	94.9	62.0	128
EP068: Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	0.5 mg/kg	92.6	54.0	126
EP068: Dimethoate	60-51-5	0.05	mg/kg	<0.05	0.5 mg/kg	98.1	67.0	119
EP068: Diazinon	333-41-5	0.05	mg/kg	<0.05	0.5 mg/kg	81.7	70.0	120
EP068: Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	0.5 mg/kg	77.4	72.0	120
EP068: Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	0.5 mg/kg	78.6	68.0	120
EP068: Malathion	121-75-5	0.05	mg/kg	<0.05	0.5 mg/kg	91.6	68.0	122
EP068: Fenthion	55-38-9	0.05	mg/kg	<0.05	0.5 mg/kg	78.1	69.0	117
EP068: Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	0.5 mg/kg	95.5	76.0	118
EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	0.5 mg/kg	80.2	64.0	122
EP068: Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	0.5 mg/kg	82.8	70.0	116
EP068: Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	0.5 mg/kg	89.0	69.0	121
EP068: Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	0.5 mg/kg	87.5	66.0	118
EP068: Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	0.5 mg/kg	88.9	68.0	124
EP068: Prothiofos	34643-46-4	0.05	mg/kg	<0.05	0.5 mg/kg	87.0	62.0	112
EP068: Ethion	563-12-2	0.05	mg/kg	<0.05	0.5 mg/kg	82.3	68.0	120
EP068: Carbophenothion	786-19-6	0.05	mg/kg	<0.05	0.5 mg/kg	88.5	65.0	127
EP068: Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	0.5 mg/kg	63.8	41.0	123
EP068B: Organophosphorus Pesticides (OP) (QCLot: 2861099)								
EP068: Dichlorvos	62-73-7	0.05	mg/kg	<0.05	0.5 mg/kg	91.5	59.0	119
EP068: Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	80.3	62.0	128
EP068: Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	0.5 mg/kg	99.4	54.0	126
EP068: Dimethoate	60-51-5	0.05	mg/kg	<0.05	0.5 mg/kg	81.7	67.0	119
EP068: Diazinon	333-41-5	0.05	mg/kg	<0.05	0.5 mg/kg	97.6	70.0	120
EP068: Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	0.5 mg/kg	107	72.0	120
EP068: Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	0.5 mg/kg	91.4	68.0	120
EP068: Malathion	121-75-5	0.05	mg/kg	<0.05	0.5 mg/kg	85.0	68.0	122
EP068: Fenthion	55-38-9	0.05	mg/kg	<0.05	0.5 mg/kg	99.7	69.0	117
EP068: Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	0.5 mg/kg	105	76.0	118
EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	0.5 mg/kg	93.1	64.0	122
EP068: Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	0.5 mg/kg	95.6	70.0	116
EP068: Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	0.5 mg/kg	91.1	69.0	121



Sub-Matrix: **SOIL**

Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EP068B: Organophosphorus Pesticides (OP) (QCLot: 2861099) - continued								
EP068: Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	0.5 mg/kg	98.9	66.0	118
EP068: Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	0.5 mg/kg	78.0	68.0	124
EP068: Prothiofos	34643-46-4	0.05	mg/kg	<0.05	0.5 mg/kg	108	62.0	112
EP068: Ethion	563-12-2	0.05	mg/kg	<0.05	0.5 mg/kg	78.7	68.0	120
EP068: Carbophenothion	786-19-6	0.05	mg/kg	<0.05	0.5 mg/kg	89.2	65.0	127
EP068: Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	0.5 mg/kg	67.8	41.0	123
EP075(SIM)A: Phenolic Compounds (QCLot: 2860242)								
EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	6 mg/kg	108	71.0	125
EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	6 mg/kg	101	72.0	124
EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	6 mg/kg	104	71.0	123
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	12 mg/kg	112	67.0	127
EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	6 mg/kg	76.2	54.0	114
EP075(SIM): 2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	6 mg/kg	96.8	68.0	126
EP075(SIM): 2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	6 mg/kg	88.4	66.0	120
EP075(SIM): 2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	6 mg/kg	91.2	70.0	120
EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	6 mg/kg	90.6	70.0	116
EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	6 mg/kg	78.2	54.0	114
EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	6 mg/kg	84.6	60.0	114
EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	12 mg/kg	10.6	10.0	57.0
EP075(SIM)A: Phenolic Compounds (QCLot: 2860262)								
EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	6 mg/kg	91.5	71.0	125
EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	6 mg/kg	95.0	72.0	124
EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	6 mg/kg	91.9	71.0	123
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	12 mg/kg	97.9	67.0	127
EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	6 mg/kg	62.2	54.0	114
EP075(SIM): 2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	6 mg/kg	84.5	68.0	126
EP075(SIM): 2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	6 mg/kg	90.6	66.0	120
EP075(SIM): 2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	6 mg/kg	93.4	70.0	120
EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	6 mg/kg	85.1	70.0	116
EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	6 mg/kg	86.3	54.0	114
EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	6 mg/kg	85.7	60.0	114
EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	12 mg/kg	50.4	10.0	57.0
EP075(SIM)A: Phenolic Compounds (QCLot: 2861098)								
EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	6 mg/kg	89.7	71.0	125
EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	6 mg/kg	91.5	72.0	124
EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	6 mg/kg	91.3	71.0	123
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	12 mg/kg	95.2	67.0	127
EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	6 mg/kg	76.4	54.0	114



Sub-Matrix: **SOIL**

Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EP075(SIM)A: Phenolic Compounds (QCLot: 2861098) - continued								
EP075(SIM): 2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	6 mg/kg	85.3	68.0	126
EP075(SIM): 2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	6 mg/kg	85.4	66.0	120
EP075(SIM): 2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	6 mg/kg	87.2	70.0	120
EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	6 mg/kg	82.7	70.0	116
EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	6 mg/kg	79.0	54.0	114
EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	6 mg/kg	81.4	60.0	114
EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	12 mg/kg	33.8	10.0	57.0
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2860242)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	6 mg/kg	110	77.0	125
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	6 mg/kg	114	72.0	124
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	6 mg/kg	109	73.0	127
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	6 mg/kg	109	72.0	126
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	6 mg/kg	113	75.0	127
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	6 mg/kg	112	77.0	127
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	6 mg/kg	117	73.0	127
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	6 mg/kg	118	74.0	128
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	6 mg/kg	103	69.0	123
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	6 mg/kg	109	75.0	127
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2	0.5	mg/kg	<0.5	6 mg/kg	98.2	68.0	116
	205-82-3							
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	6 mg/kg	113	74.0	126
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	6 mg/kg	108	70.0	126
EP075(SIM): Indeno(1,2,3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	6 mg/kg	79.6	61.0	121
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	6 mg/kg	74.1	62.0	118
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	6 mg/kg	78.4	63.0	121
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2860262)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	6 mg/kg	98.8	77.0	125
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	6 mg/kg	96.1	72.0	124
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	6 mg/kg	95.0	73.0	127
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	6 mg/kg	96.3	72.0	126
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	6 mg/kg	97.6	75.0	127
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	6 mg/kg	95.7	77.0	127
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	6 mg/kg	95.6	73.0	127
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	6 mg/kg	94.1	74.0	128
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	6 mg/kg	88.2	69.0	123
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	6 mg/kg	86.6	75.0	127
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2	0.5	mg/kg	<0.5	6 mg/kg	83.6	68.0	116
	205-82-3							
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	6 mg/kg	90.6	74.0	126



Sub-Matrix: **SOIL**

Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2860262) - continued								
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	6 mg/kg	85.8	70.0	126
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	6 mg/kg	86.8	61.0	121
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	6 mg/kg	85.9	62.0	118
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	6 mg/kg	88.4	63.0	121
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2861098)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	6 mg/kg	94.8	77.0	125
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	6 mg/kg	92.4	72.0	124
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	6 mg/kg	85.4	73.0	127
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	6 mg/kg	91.2	72.0	126
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	6 mg/kg	91.1	75.0	127
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	6 mg/kg	89.3	77.0	127
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	6 mg/kg	90.1	73.0	127
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	6 mg/kg	88.3	74.0	128
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	6 mg/kg	81.3	69.0	123
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	6 mg/kg	80.0	75.0	127
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2	0.5	mg/kg	<0.5	6 mg/kg	78.4	68.0	116
	205-82-3							
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	6 mg/kg	84.9	74.0	126
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	6 mg/kg	81.3	70.0	126
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	6 mg/kg	73.9	61.0	121
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	6 mg/kg	70.4	62.0	118
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	6 mg/kg	76.2	63.0	121
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2860241)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	300 mg/kg	107	75.0	129
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	450 mg/kg	109	77.0	131
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	300 mg/kg	107	71.0	129
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2860263)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	300 mg/kg	109	75.0	129
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	450 mg/kg	109	77.0	131
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	300 mg/kg	98.2	71.0	129
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2860276)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	96.0	68.4	128
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2861042)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	85.4	68.4	128
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2861097)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	300 mg/kg	104	75.0	129
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	450 mg/kg	106	77.0	131
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	300 mg/kg	105	71.0	129



Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2860241)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	375 mg/kg	108	77.0	125
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	525 mg/kg	108	74.0	138
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	225 mg/kg	98.9	63.0	131
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2860263)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	375 mg/kg	106	77.0	125
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	525 mg/kg	99.8	74.0	138
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	225 mg/kg	96.5	63.0	131
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2860276)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	98.5	68.4	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2861042)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	91.3	68.4	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2861097)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	375 mg/kg	102	77.0	125
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	525 mg/kg	108	74.0	138
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	225 mg/kg	84.5	63.0	131
EP080: BTEXN (QCLot: 2860276)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	97.1	62.0	116
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	103	67.0	121
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	112	65.0	117
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	112	66.0	118
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	112	68.0	120
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	106	63.0	119
EP080: BTEXN (QCLot: 2861042)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	95.5	62.0	116
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	98.1	67.0	121
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	90.3	65.0	117
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	91.7	66.0	118
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	99.5	68.0	120
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	101	63.0	119

Matrix Spike (MS) Report

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

Sub-Matrix: SOIL				Matrix Spike (MS) Report		
				Spike	SpikeRecovery(%)	Recovery Limits (%)

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 Work Order : ES2005101
 Client : BENBOW ENVIRONMENTAL
 Project : 191290-02



Sub-Matrix: SOIL				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 2862781)							
EP2001476-001	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	97.7	70.0	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	104	70.0	130
		EG005T: Chromium	7440-47-3	50 mg/kg	104	70.0	130
		EG005T: Copper	7440-50-8	250 mg/kg	98.8	70.0	130
		EG005T: Lead	7439-92-1	250 mg/kg	104	70.0	130
		EG005T: Nickel	7440-02-0	50 mg/kg	103	70.0	130
		EG005T: Zinc	7440-66-6	250 mg/kg	106	70.0	130
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 2862785)							
ES2005101-017	BH6_1.5m	EG005T: Arsenic	7440-38-2	50 mg/kg	90.3	70.0	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	95.5	70.0	130
		EG005T: Chromium	7440-47-3	50 mg/kg	97.6	70.0	130
		EG005T: Copper	7440-50-8	250 mg/kg	97.9	70.0	130
		EG005T: Lead	7439-92-1	250 mg/kg	94.2	70.0	130
		EG005T: Nickel	7440-02-0	50 mg/kg	95.2	70.0	130
		EG005T: Zinc	7440-66-6	250 mg/kg	97.2	70.0	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 2862783)							
EP2001476-001	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	89.7	70.0	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 2862784)							
ES2005101-017	BH6_1.5m	EG035T: Mercury	7439-97-6	5 mg/kg	92.7	70.0	130
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 2860240)							
ES2005101-002	BH1_1.5m	EP066: Total Polychlorinated biphenyls	----	1 mg/kg	95.8	70.0	130
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 2860265)							
ES2003009-058	Anonymous	EP066: Total Polychlorinated biphenyls	----	1 mg/kg	86.8	70.0	130
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 2861100)							
ES2005101-001	BH1_0.5m	EP066: Total Polychlorinated biphenyls	----	1 mg/kg	97.2	70.0	130
EP068A: Organochlorine Pesticides (OC) (QCLot: 2860243)							
ES2005101-002	BH1_1.5m	EP068: gamma-BHC	58-89-9	0.5 mg/kg	110	70.0	130
		EP068: Heptachlor	76-44-8	0.5 mg/kg	86.6	70.0	130
		EP068: Aldrin	309-00-2	0.5 mg/kg	105	70.0	130
		EP068: Dieldrin	60-57-1	0.5 mg/kg	92.5	70.0	130
		EP068: Endrin	72-20-8	2 mg/kg	77.1	70.0	130
		EP068: 4,4'-DDT	50-29-3	2 mg/kg	89.7	70.0	130
EP068A: Organochlorine Pesticides (OC) (QCLot: 2860264)							
ES2003009-058	Anonymous	EP068: gamma-BHC	58-89-9	0.5 mg/kg	95.1	70.0	130
		EP068: Heptachlor	76-44-8	0.5 mg/kg	72.9	70.0	130
		EP068: Aldrin	309-00-2	0.5 mg/kg	76.0	70.0	130

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 Work Order : ES2005101
 Client : BENBOW ENVIRONMENTAL
 Project : 191290-02



Sub-Matrix: SOIL				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP068A: Organochlorine Pesticides (OC) (QCLot: 2860264) - continued							
ES2003009-058	Anonymous	EP068: Dieldrin	60-57-1	0.5 mg/kg	82.9	70.0	130
		EP068: Endrin	72-20-8	2 mg/kg	106	70.0	130
		EP068: 4,4'-DDT	50-29-3	2 mg/kg	112	70.0	130
EP068A: Organochlorine Pesticides (OC) (QCLot: 2861099)							
ES2005101-001	BH1_0.5m	EP068: gamma-BHC	58-89-9	0.5 mg/kg	116	70.0	130
		EP068: Heptachlor	76-44-8	0.5 mg/kg	93.6	70.0	130
		EP068: Aldrin	309-00-2	0.5 mg/kg	117	70.0	130
		EP068: Dieldrin	60-57-1	0.5 mg/kg	102	70.0	130
		EP068: Endrin	72-20-8	2 mg/kg	94.4	70.0	130
		EP068: 4,4'-DDT	50-29-3	2 mg/kg	105	70.0	130
EP068B: Organophosphorus Pesticides (OP) (QCLot: 2860243)							
ES2005101-002	BH1_1.5m	EP068: Diazinon	333-41-5	0.5 mg/kg	103	70.0	130
		EP068: Chlorpyrifos-methyl	5598-13-0	0.5 mg/kg	89.6	70.0	130
		EP068: Pirimphos-ethyl	23505-41-1	0.5 mg/kg	96.7	70.0	130
		EP068: Bromophos-ethyl	4824-78-6	0.5 mg/kg	86.5	70.0	130
		EP068: Prothiofos	34643-46-4	0.5 mg/kg	91.6	70.0	130
EP068B: Organophosphorus Pesticides (OP) (QCLot: 2860264)							
ES2003009-058	Anonymous	EP068: Diazinon	333-41-5	0.5 mg/kg	81.6	70.0	130
		EP068: Chlorpyrifos-methyl	5598-13-0	0.5 mg/kg	78.6	70.0	130
		EP068: Pirimphos-ethyl	23505-41-1	0.5 mg/kg	78.0	70.0	130
		EP068: Bromophos-ethyl	4824-78-6	0.5 mg/kg	75.1	70.0	130
		EP068: Prothiofos	34643-46-4	0.5 mg/kg	76.2	70.0	130
EP068B: Organophosphorus Pesticides (OP) (QCLot: 2861099)							
ES2005101-001	BH1_0.5m	EP068: Diazinon	333-41-5	0.5 mg/kg	115	70.0	130
		EP068: Chlorpyrifos-methyl	5598-13-0	0.5 mg/kg	99.4	70.0	130
		EP068: Pirimphos-ethyl	23505-41-1	0.5 mg/kg	102	70.0	130
		EP068: Bromophos-ethyl	4824-78-6	0.5 mg/kg	95.0	70.0	130
		EP068: Prothiofos	34643-46-4	0.5 mg/kg	105	70.0	130
EP075(SIM)A: Phenolic Compounds (QCLot: 2860242)							
ES2005101-002	BH1_1.5m	EP075(SIM): Phenol	108-95-2	10 mg/kg	100	70.0	130
		EP075(SIM): 2-Chlorophenol	95-57-8	10 mg/kg	96.6	70.0	130
		EP075(SIM): 2-Nitrophenol	88-75-5	10 mg/kg	78.4	60.0	130
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	10 mg/kg	81.3	70.0	130
		EP075(SIM): Pentachlorophenol	87-86-5	10 mg/kg	21.2	20.0	130
EP075(SIM)A: Phenolic Compounds (QCLot: 2860262)							
ES2003009-058	Anonymous	EP075(SIM): Phenol	108-95-2	10 mg/kg	85.1	70.0	130
		EP075(SIM): 2-Chlorophenol	95-57-8	10 mg/kg	88.7	70.0	130

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 Work Order : ES2005101
 Client : BENBOW ENVIRONMENTAL
 Project : 191290-02



Sub-Matrix: SOIL				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP075(SIM)A: Phenolic Compounds (QCLot: 2860262) - continued							
ES2003009-058	Anonymous	EP075(SIM): 2-Nitrophenol	88-75-5	10 mg/kg	70.5	60.0	130
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	10 mg/kg	81.3	70.0	130
		EP075(SIM): Pentachlorophenol	87-86-5	10 mg/kg	55.6	20.0	130
EP075(SIM)A: Phenolic Compounds (QCLot: 2861098)							
ES2005101-001	BH1_0.5m	EP075(SIM): Phenol	108-95-2	10 mg/kg	95.5	70.0	130
		EP075(SIM): 2-Chlorophenol	95-57-8	10 mg/kg	98.4	70.0	130
		EP075(SIM): 2-Nitrophenol	88-75-5	10 mg/kg	79.2	60.0	130
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	10 mg/kg	89.6	70.0	130
		EP075(SIM): Pentachlorophenol	87-86-5	10 mg/kg	55.3	20.0	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2860242)							
ES2005101-002	BH1_1.5m	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	104	70.0	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	115	70.0	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2860262)							
ES2003009-058	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	88.5	70.0	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	84.3	70.0	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2861098)							
ES2005101-001	BH1_0.5m	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	92.0	70.0	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	94.0	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2860241)							
ES2005101-002	BH1_1.5m	EP071: C10 - C14 Fraction	----	523 mg/kg	86.4	73.0	137
		EP071: C15 - C28 Fraction	----	2319 mg/kg	75.2	53.0	131
		EP071: C29 - C36 Fraction	----	1714 mg/kg	73.4	52.0	132
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2860263)							
ES2003009-058	Anonymous	EP071: C10 - C14 Fraction	----	523 mg/kg	73.3	73.0	137
		EP071: C15 - C28 Fraction	----	2319 mg/kg	90.6	53.0	131
		EP071: C29 - C36 Fraction	----	1714 mg/kg	110	52.0	132
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2860276)							
ES2005101-002	BH1_1.5m	EP080: C6 - C9 Fraction	----	32.5 mg/kg	101	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2861042)							
ES2005101-001	BH1_0.5m	EP080: C6 - C9 Fraction	----	32.5 mg/kg	97.4	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2861097)							
ES2005101-001	BH1_0.5m	EP071: C10 - C14 Fraction	----	523 mg/kg	81.1	73.0	137
		EP071: C15 - C28 Fraction	----	2319 mg/kg	72.4	53.0	131
		EP071: C29 - C36 Fraction	----	1714 mg/kg	66.3	52.0	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2860241)							
ES2005101-002	BH1_1.5m						

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 Work Order : ES2005101
 Client : BENBOW ENVIRONMENTAL
 Project : 191290-02



Sub-Matrix: SOIL				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2860241) - continued							
ES2005101-002	BH1_1.5m	EP071: >C10 - C16 Fraction	----	860 mg/kg	82.9	73.0	137
		EP071: >C16 - C34 Fraction	----	3223 mg/kg	75.1	53.0	131
		EP071: >C34 - C40 Fraction	----	1058 mg/kg	61.7	52.0	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2860263)							
ES2003009-058	Anonymous	EP071: >C10 - C16 Fraction	----	860 mg/kg	82.8	73.0	137
		EP071: >C16 - C34 Fraction	----	3223 mg/kg	102	53.0	131
		EP071: >C34 - C40 Fraction	----	1058 mg/kg	97.2	52.0	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2860276)							
ES2005101-002	BH1_1.5m	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	101	70.0	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2861042)							
ES2005101-001	BH1_0.5m	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	102	70.0	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2861097)							
ES2005101-001	BH1_0.5m	EP071: >C10 - C16 Fraction	----	860 mg/kg	81.4	73.0	137
		EP071: >C16 - C34 Fraction	----	3223 mg/kg	70.4	53.0	131
		EP071: >C34 - C40 Fraction	----	1058 mg/kg	53.0	52.0	132
EP080: BTEXN (QCLot: 2860276)							
ES2005101-002	BH1_1.5m	EP080: Benzene	71-43-2	2.5 mg/kg	97.1	70.0	130
		EP080: Toluene	108-88-3	2.5 mg/kg	96.8	70.0	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	100	70.0	130
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	102	70.0	130
			106-42-3				
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	102	70.0	130
	EP080: Naphthalene	91-20-3	2.5 mg/kg	95.9	70.0	130	
EP080: BTEXN (QCLot: 2861042)							
ES2005101-001	BH1_0.5m	EP080: Benzene	71-43-2	2.5 mg/kg	86.7	70.0	130
		EP080: Toluene	108-88-3	2.5 mg/kg	92.1	70.0	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	83.9	70.0	130
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	84.2	70.0	130
			106-42-3				
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	91.1	70.0	130
	EP080: Naphthalene	91-20-3	2.5 mg/kg	90.2	70.0	130	

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: ES2005101	Page	: 1 of 11
Client	: BENBOW ENVIRONMENTAL	Laboratory	: Environmental Division Sydney
Contact	: Matthew Taylor	Telephone	: +61-2-8784 8555
Project	: 191290-02	Date Samples Received	: 13-Feb-2020
Site	: ----	Issue Date	: 24-Feb-2020
Sampler	: Matthew Taylor	No. of samples received	: 70
Order number	: 191290-02	No. of samples analysed	: 70

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

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

Outliers : Analysis Holding Time Compliance

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

Outliers : Frequency of Quality Control Samples

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

Matrix: SOIL

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
Method	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
Cations - soluble by ICP-AES	0	1	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	4	41	9.76	10.00	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)					
Total Metals by ICP-AES	2	41	4.88	5.00	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)					
Total Metals by ICP-AES	2	41	4.88	5.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Total Metals by ICP-AES	2	41	4.88	5.00	NEPM 2013 B3 & ALS QC Standard

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

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

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

Matrix: SOIL

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

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA037: Ass Field Screening Analysis								
Snap Lock Bag - frozen (EA037)								

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

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA037: Ass Field Screening Analysis - Continued								
BH1_1.0m, BH1_2.0m, BH2_1.0m, BH2_2.0m, BH3_1.0m, BH3_2.0m, BH4_1.0m, BH4_2.0m, BH4_3.0m, BH5_1.0m, BH5_2.0m, BH5_3.0m, BH6_0.5m, BH6_1.5m, BH6_2.5m, BH6_3.5m, BH7_0.5m, BH7_1.5m, BH7_2.5m, BH7_3.5m, BH5_2.0D, BH7_0.5D, BH7_3.0D,	BH1_1.5m, BH2_0.5m, BH2_1.5m, BH3_0.5m, BH3_1.5m, BH4_0.5m, BH4_1.5m, BH4_2.5m, BH5_0.5m, BH5_1.5m, BH5_2.5m, BH5_3.5m, BH6_1.0m, BH6_2.0m, BH6_3.0m, BH6_4.0m, BH7_1.0m, BH7_2.0m, BH7_3.0m, BH7_4.0m, BH6_1.5D, BH6_0.5D, BH5_3.5D	13-Feb-2020	20-Feb-2020	11-Aug-2020	✓	20-Feb-2020	11-Aug-2020	✓
Snap Lock Bag - frozen (EA037) BH1_0.5m		13-Feb-2020	21-Feb-2020	11-Aug-2020	✓	21-Feb-2020	11-Aug-2020	✓
EA055: Moisture Content (Dried @ 105-110°C)								
Soil Glass Jar - Unpreserved (EA055)		13-Feb-2020	----	----	----	17-Feb-2020	27-Feb-2020	✓
BH1_0.5m, BH1_2.0, BH2_1.5m, BH3_0.5m, BH3_2.2, BH4_1.5m, BH5_0.5m, BH5_3.0m, BH6_1.5m, BH7_0.5m, BH7_3.0m, BH6_3.0D	BH1_1.5m, BH2_0.5m, BH2_2.0, BH3_1.5m, BH4_0.5m, BH4_3.0m, BH5_1.5m, BH6_0.5m, BH6_3.0m, BH7_1.5m, BH4_1.5D,							

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

Method	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED093S: Soluble Major Cations							
Soil Glass Jar - Unpreserved (ED093S) BH1_0.5m	13-Feb-2020	19-Feb-2020	11-Aug-2020	✓	19-Feb-2020	11-Aug-2020	✓
EG005(ED093)T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved (EG005T) BH1_0.5m, BH1_2.0, BH2_1.5m, BH3_0.5m, BH3_2.2, BH4_1.5m, BH5_0.5m, BH5_3.0m, BH6_1.5m, BH7_0.5m, BH7_3.0m, BH6_3.0D	13-Feb-2020	18-Feb-2020	11-Aug-2020	✓	18-Feb-2020	11-Aug-2020	✓
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved (EG035T) BH1_0.5m, BH1_2.0, BH2_1.5m, BH3_0.5m, BH3_2.2, BH4_1.5m, BH5_0.5m, BH5_3.0m, BH6_1.5m, BH7_0.5m, BH7_3.0m, BH6_3.0D	13-Feb-2020	18-Feb-2020	12-Mar-2020	✓	19-Feb-2020	12-Mar-2020	✓



Matrix: **SOIL**

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

Method	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP066: Polychlorinated Biphenyls (PCB)							
Soil Glass Jar - Unpreserved (EP066) BH4_1.5D, BH6_3.0D	13-Feb-2020	14-Feb-2020	27-Feb-2020	✓	18-Feb-2020	25-Mar-2020	✓
Soil Glass Jar - Unpreserved (EP066) BH1_0.5m, BH1_2.0, BH2_1.5m, BH3_0.5m, BH3_2.2, BH4_1.5m, BH5_0.5m, BH5_3.0m, BH6_1.5m, BH7_0.5m, BH7_3.0m BH1_1.5m, BH2_0.5m, BH2_2.0, BH3_1.5m, BH4_0.5m, BH4_3.0m, BH5_1.5m, BH6_0.5m, BH6_3.0m, BH7_1.5m	13-Feb-2020	17-Feb-2020	27-Feb-2020	✓	18-Feb-2020	28-Mar-2020	✓
EP068A: Organochlorine Pesticides (OC)							
Soil Glass Jar - Unpreserved (EP068) BH4_1.5D, BH6_3.0D	13-Feb-2020	14-Feb-2020	27-Feb-2020	✓	18-Feb-2020	25-Mar-2020	✓
Soil Glass Jar - Unpreserved (EP068) BH1_0.5m, BH1_2.0, BH2_1.5m, BH3_0.5m, BH3_2.2, BH4_1.5m, BH5_0.5m, BH5_3.0m, BH6_1.5m, BH7_0.5m, BH7_3.0m BH1_1.5m, BH2_0.5m, BH2_2.0, BH3_1.5m, BH4_0.5m, BH4_3.0m, BH5_1.5m, BH6_0.5m, BH6_3.0m, BH7_1.5m	13-Feb-2020	17-Feb-2020	27-Feb-2020	✓	18-Feb-2020	28-Mar-2020	✓



Matrix: **SOIL**

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

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP068B: Organophosphorus Pesticides (OP)								
Soil Glass Jar - Unpreserved (EP068)								
BH4_1.5D,	BH6_3.0D	13-Feb-2020	14-Feb-2020	27-Feb-2020	✓	18-Feb-2020	25-Mar-2020	✓
Soil Glass Jar - Unpreserved (EP068)								
BH1_0.5m,	BH1_1.5m,	13-Feb-2020	17-Feb-2020	27-Feb-2020	✓	18-Feb-2020	28-Mar-2020	✓
BH1_2.0,	BH2_0.5m,							
BH2_1.5m,	BH2_2.0,							
BH3_0.5m,	BH3_1.5m,							
BH3_2.2,	BH4_0.5m,							
BH4_1.5m,	BH4_3.0m,							
BH5_0.5m,	BH5_1.5m,							
BH5_3.0m,	BH6_0.5m,							
BH6_1.5m,	BH6_3.0m,							
BH7_0.5m,	BH7_1.5m,							
BH7_3.0m								
EP075(SIM)A: Phenolic Compounds								
Soil Glass Jar - Unpreserved (EP075(SIM))								
BH4_1.5D,	BH6_3.0D	13-Feb-2020	14-Feb-2020	27-Feb-2020	✓	17-Feb-2020	25-Mar-2020	✓
Soil Glass Jar - Unpreserved (EP075(SIM))								
BH1_0.5m,	BH1_1.5m,	13-Feb-2020	17-Feb-2020	27-Feb-2020	✓	18-Feb-2020	28-Mar-2020	✓
BH1_2.0,	BH2_0.5m,							
BH2_1.5m,	BH2_2.0,							
BH3_0.5m,	BH3_1.5m,							
BH3_2.2,	BH4_0.5m,							
BH4_1.5m,	BH4_3.0m,							
BH5_0.5m,	BH5_1.5m,							
BH5_3.0m,	BH6_0.5m,							
BH6_1.5m,	BH6_3.0m,							
BH7_0.5m,	BH7_1.5m,							
BH7_3.0m								



Matrix: **SOIL**

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

Method	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved (EP075(SIM)) BH4_1.5D, BH6_3.0D	13-Feb-2020	14-Feb-2020	27-Feb-2020	✓	17-Feb-2020	25-Mar-2020	✓
Soil Glass Jar - Unpreserved (EP075(SIM)) BH1_0.5m, BH1_2.0, BH2_1.5m, BH3_0.5m, BH3_2.2, BH4_1.5m, BH5_0.5m, BH5_3.0m, BH6_1.5m, BH7_0.5m, BH7_3.0m BH1_1.5m, BH2_0.5m, BH2_2.0, BH3_1.5m, BH4_0.5m, BH4_3.0m, BH5_1.5m, BH6_0.5m, BH6_3.0m, BH7_1.5m	13-Feb-2020	17-Feb-2020	27-Feb-2020	✓	18-Feb-2020	28-Mar-2020	✓
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP071) BH4_1.5D, BH6_3.0D	13-Feb-2020	14-Feb-2020	27-Feb-2020	✓	17-Feb-2020	25-Mar-2020	✓
Soil Glass Jar - Unpreserved (EP080) BH1_0.5m, BH1_2.0, BH2_1.5m, BH3_0.5m, BH3_2.2, BH4_1.5m, BH5_0.5m, BH5_3.0m, BH6_1.5m, BH7_0.5m, BH7_3.0m, BH6_3.0D BH1_1.5m, BH2_0.5m, BH2_2.0, BH3_1.5m, BH4_0.5m, BH4_3.0m, BH5_1.5m, BH6_0.5m, BH6_3.0m, BH7_1.5m, BH4_1.5D	13-Feb-2020	14-Feb-2020	27-Feb-2020	✓	18-Feb-2020	27-Feb-2020	✓
Soil Glass Jar - Unpreserved (EP071) BH1_0.5m, BH1_2.0, BH2_1.5m, BH3_0.5m, BH3_2.2, BH4_1.5m, BH5_0.5m, BH5_3.0m, BH6_1.5m, BH7_0.5m, BH7_3.0m BH1_1.5m, BH2_0.5m, BH2_2.0, BH3_1.5m, BH4_0.5m, BH4_3.0m, BH5_1.5m, BH6_0.5m, BH6_3.0m, BH7_1.5m	13-Feb-2020	17-Feb-2020	27-Feb-2020	✓	18-Feb-2020	28-Mar-2020	✓



Matrix: **SOIL**

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

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
Soil Glass Jar - Unpreserved (EP071)								
BH4_1.5D,	BH6_3.0D	13-Feb-2020	14-Feb-2020	27-Feb-2020	✓	17-Feb-2020	25-Mar-2020	✓
Soil Glass Jar - Unpreserved (EP080)								
BH1_0.5m,	BH1_1.5m,	13-Feb-2020	14-Feb-2020	27-Feb-2020	✓	18-Feb-2020	27-Feb-2020	✓
BH1_2.0,	BH2_0.5m,							
BH2_1.5m,	BH2_2.0,							
BH3_0.5m,	BH3_1.5m,							
BH3_2.2,	BH4_0.5m,							
BH4_1.5m,	BH4_3.0m,							
BH5_0.5m,	BH5_1.5m,							
BH5_3.0m,	BH6_0.5m,							
BH6_1.5m,	BH6_3.0m,							
BH7_0.5m,	BH7_1.5m,							
BH7_3.0m,	BH4_1.5D,							
BH6_3.0D								
Soil Glass Jar - Unpreserved (EP071)								
BH1_0.5m,	BH1_1.5m,	13-Feb-2020	17-Feb-2020	27-Feb-2020	✓	18-Feb-2020	28-Mar-2020	✓
BH1_2.0,	BH2_0.5m,							
BH2_1.5m,	BH2_2.0,							
BH3_0.5m,	BH3_1.5m,							
BH3_2.2,	BH4_0.5m,							
BH4_1.5m,	BH4_3.0m,							
BH5_0.5m,	BH5_1.5m,							
BH5_3.0m,	BH6_0.5m,							
BH6_1.5m,	BH6_3.0m,							
BH7_0.5m,	BH7_1.5m,							
BH7_3.0m								
EP080: BTEXN								
Soil Glass Jar - Unpreserved (EP080)								
BH1_0.5m,	BH1_1.5m,	13-Feb-2020	14-Feb-2020	27-Feb-2020	✓	18-Feb-2020	27-Feb-2020	✓
BH1_2.0,	BH2_0.5m,							
BH2_1.5m,	BH2_2.0,							
BH3_0.5m,	BH3_1.5m,							
BH3_2.2,	BH4_0.5m,							
BH4_1.5m,	BH4_3.0m,							
BH5_0.5m,	BH5_1.5m,							
BH5_3.0m,	BH6_0.5m,							
BH6_1.5m,	BH6_3.0m,							
BH7_0.5m,	BH7_1.5m,							
BH7_3.0m,	BH4_1.5D,							
BH6_3.0D								



Quality Control Parameter Frequency Compliance

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

Matrix: **SOIL**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
ASS Field Screening Analysis	EA037	6	56	10.71	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Cations - soluble by ICP-AES	ED093S	0	1	0.00	10.00	✗	NEPM 2013 B3 & ALS QC Standard
Moisture Content	EA055	4	40	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	5	46	10.87	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	4	34	11.76	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	4	32	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	4	39	10.26	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	4	41	9.76	10.00	✗	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	5	46	10.87	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	3	23	13.04	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Cations - soluble by ICP-AES	ED093S	1	1	100.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	3	46	6.52	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	3	34	8.82	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	3	32	9.38	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	39	5.13	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	41	4.88	5.00	✗	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	3	46	6.52	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	23	8.70	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Cations - soluble by ICP-AES	ED093S	1	1	100.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	3	46	6.52	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	3	34	8.82	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	3	32	9.38	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	39	5.13	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	41	4.88	5.00	✗	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	3	46	6.52	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	23	8.70	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	3	46	6.52	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	3	34	8.82	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	3	32	9.38	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	39	5.13	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	41	4.88	5.00	✗	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	3	46	6.52	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	23	8.70	5.00	✓	NEPM 2013 B3 & ALS QC Standard



Brief Method Summaries

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

Analytical Methods	Method	Matrix	Method Descriptions
ASS Field Screening Analysis	* EA037	SOIL	In house: Referenced to Acid Sulfate Soils Laboratory Methods Guidelines, version 2.1 June 2004. As received samples are tested for pH field and pH fox and assessed for a reaction rating.
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 6.1 and Table 1 (14 day holding time).
Cations - soluble by ICP-AES	ED093S	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010 (ICPAES) Water extracts of the soil are analyzed for major cations by ICPAES. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (2013) Schedule B(3)
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (2013) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl ₂) (Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl ₂ which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
Polychlorinated Biphenyls (PCB)	EP066	SOIL	In house: Referenced to USEPA SW 846 - 8270D Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 504)
Pesticides by GCMS	EP068	SOIL	In house: Referenced to USEPA SW 846 - 8270D Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This technique is compliant with NEPM (2013) Schedule B(3) (Method 504,505)
TRH - Semivolatile Fraction	EP071	SOIL	In house: Referenced to USEPA SW 846 - 8015A Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C40. Compliant with NEPM amended 2013.
PAH/Phenols (SIM)	EP075(SIM)	SOIL	In house: Referenced to USEPA SW 846 - 8270D. Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 502 and 507)
TRH Volatiles/BTEX	EP080	SOIL	In house: Referenced to USEPA SW 846 - 8260B. Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. Compliant with NEPM amended 2013.

Preparation Methods	Method	Matrix	Method Descriptions
Drying only	EN020D	SOIL	In house
1:5 solid / water leach for soluble analytes	EN34	SOIL	10 g of soil is mixed with 50 mL of reagent grade water and tumbled end over end for 1 hour. Water soluble salts are leached from the soil by the continuous suspension. Samples are settled and the water filtered off for analysis.



<i>Preparation Methods</i>	<i>Method</i>	<i>Matrix</i>	<i>Method Descriptions</i>
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	In house: Referenced to USEPA 200.2. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (2013) Schedule B(3) (Method 202)
Methanolic Extraction of Soils for Purge and Trap	ORG16	SOIL	In house: Referenced to USEPA SW 846 - 5030A. 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids	ORG17	SOIL	In house: Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 30mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.

Attachment 4: PID Calibration Certificate

Company: Active Environmental Solutions Hire
Contact: Aleks Todorovic
Address: 2 Merchant Avenue
 Thomastown Vic 3074
Phone: 03 9464 2300 | **Fax:** 03 9464 3421
Email: Hire@aesolutions.com.au

Manufacturer: RAE Systems
Instrument: MiniRAE 3000
Model: PGM 7320
Configuration: VOC
Wireless: -
Network ID: -
Unit ID: -

Serial #: 592-901211
Asset #: -
Part #: -
Sold: -
Last Cal: -
Job #: -
Cal Spec: Std

Item	Test	Pass/Fail	Comments
Battery	Li Ion	✓	
Charger	Charger, Power supply	✓	
	Cradle	✓	
Pump	Flow	✓	>500 mL/min
Filter	Filter, fitting, etc	✓	
Alarms	Audible, visual, vibration	✓	
Display	Operation	✓	
PCB	Operation	✓	
Connectors	Condition	✓	
Firmware	Version	✓	2.16
Datalogger	Operation	✓	
Monitor Housing	Condition	✓	
Case	Condition/Type	✓	
Sensors			
Oxygen		-	
LEL		-	
PID	10.6eV	✓	
Toxic 1		-	
Toxic 2		-	
Toxic 3		-	
Toxic 4		-	
Toxic 5		-	

Engineer's Report

Setup, service and calibration for hire

Calibration Certificate

Sensor	Type	Serial No:	Span Gas	Concentration	Traceability Lot #	CF	Reading	
							Zero	Span
Oxygen								
LEL								
PID	10.6eV	23030131UB	Isobutylene	100 PPM	2440-3-1	1	0	100 PPM
Toxic 1								
Toxic 2								
Toxic 3								
Toxic 4								
Toxic 5								

Calibrated/Repaired by: Milenko Sisic

Date: 28/11/2019

Next due: 28/05/2020

Head Office – Melbourne
 2 Merchant Avenue
 Thomastown VIC 3074 Australia
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 Ashfield NSW 2131 Australia
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 Unit 17, 23 Ashtan Place
 Banyo QLD 4014 Australia
 T: +61 7 3267 1433

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Attachment 5: Soil sampling results (COA)

CERTIFICATE OF ANALYSIS

Work Order : **EB2005119**
Client : **BENBOW ENVIRONMENTAL**
Contact : Matthew Taylor
Address : 20 Byre St
 AUBURN 2144
Telephone : ----
Project : 191290-02
Order number : 191290-02
C-O-C number : ----
Sampler : ----
Site : ----
Quote number : EN/222
No. of samples received : 28
No. of samples analysed : 28

Page : 1 of 14
Laboratory : Environmental Division Brisbane
Contact : Customer Services EB
Address : 2 Byth Street Stafford QLD Australia 4053
Telephone : +61-7-3243 7222
Date Samples Received : 24-Feb-2020 14:39
Date Analysis Commenced : 02-Mar-2020
Issue Date : 02-Mar-2020 12:45



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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

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

Signatories

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

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



General Comments

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

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

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

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

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

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

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

Ø = ALS is not NATA accredited for these tests.

~ = Indicates an estimated value.

- ASS: EA029 (SPOCAS): Laboratory determinations of ANC needs to be corroborated by effectiveness of the measured ANC in relation to incubation ANC. Unless corroborated, the results of ANC testing should be discounted when determining Net Acidity for comparison with action criteria, or for the determination of the acidity hazard and required liming amounts.
- ASS: EA029 (SPOCAS): Liming rate is calculated and reported on a dry weight basis assuming use of fine agricultural lime (CaCO_3) and using a safety factor of 1.5 to allow for non-homogeneous mixing and poor reactivity of lime. For conversion of Liming Rate from kg/t dry weight to kg/m³ in-situ soil, multiply reported results x wet bulk density of soil in t/m³.



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH1_0.5m	BH1_1.0m	BH1_1.5m	BH1_2.0m	BH2_0.5m
Client sampling date / time					13-Feb-2020 08:55	13-Feb-2020 09:00	13-Feb-2020 09:10	13-Feb-2020 09:15	13-Feb-2020 09:30
Compound	CAS Number	LOR	Unit		EB2005119-001	EB2005119-002	EB2005119-003	EB2005119-004	EB2005119-005
					Result	Result	Result	Result	Result
EA029-A: pH Measurements									
pH KCl (23A)	----	0.1	pH Unit		4.3	4.3	4.7	5.1	5.7
pH OX (23B)	----	0.1	pH Unit		4.8	5.0	5.5	5.6	6.0
EA029-B: Acidity Trail									
Titrateable Actual Acidity (23F)	----	2	mole H+ / t		72	30	13	6	3
Titrateable Peroxide Acidity (23G)	----	2	mole H+ / t		95	47	24	12	9
Titrateable Sulfidic Acidity (23H)	----	2	mole H+ / t		23	17	11	6	6
sulfidic - Titrateable Actual Acidity (s-23F)	----	0.020	% pyrite S		0.116	0.048	0.020	<0.020	<0.020
sulfidic - Titrateable Peroxide Acidity (s-23G)	----	0.020	% pyrite S		0.153	0.075	0.038	<0.020	<0.020
sulfidic - Titrateable Sulfidic Acidity (s-23H)	----	0.020	% pyrite S		0.037	0.027	<0.020	<0.020	<0.020
EA029-C: Sulfur Trail									
KCl Extractable Sulfur (23Ce)	----	0.020	% S		0.023	0.022	<0.020	0.021	<0.020
Peroxide Sulfur (23De)	----	0.020	% S		0.032	0.041	0.028	0.033	0.026
Peroxide Oxidisable Sulfur (23E)	----	0.020	% S		<0.020	<0.020	0.028	<0.020	0.026
acidity - Peroxide Oxidisable Sulfur (a-23E)	----	10	mole H+ / t		<10	12	18	<10	16
EA029-D: Calcium Values									
KCl Extractable Calcium (23Vh)	----	0.020	% Ca		<0.020	<0.020	<0.020	<0.020	0.037
Peroxide Calcium (23Wh)	----	0.020	% Ca		<0.020	<0.020	<0.020	<0.020	0.039
Acid Reacted Calcium (23X)	----	0.020	% Ca		<0.020	<0.020	<0.020	<0.020	<0.020
acidity - Acid Reacted Calcium (a-23X)	----	10	mole H+ / t		<10	<10	<10	<10	<10
sulfidic - Acid Reacted Calcium (s-23X)	----	0.020	% S		<0.020	<0.020	<0.020	<0.020	<0.020
EA029-E: Magnesium Values									
KCl Extractable Magnesium (23Sm)	----	0.020	% Mg		0.053	0.107	0.085	0.080	0.192
Peroxide Magnesium (23Tm)	----	0.020	% Mg		0.053	0.110	0.094	0.086	0.205
Acid Reacted Magnesium (23U)	----	0.020	% Mg		<0.020	<0.020	<0.020	<0.020	<0.020
Acidity - Acid Reacted Magnesium (a-23U)	----	10	mole H+ / t		<10	<10	<10	<10	10
sulfidic - Acid Reacted Magnesium (s-23U)	----	0.020	% S		<0.020	<0.020	<0.020	<0.020	<0.020
EA029-G: Retained Acidity									
HCl Extractable Sulfur (20Be)	----	0.020	% S		0.050	0.049	----	----	----
Net Acid Soluble Sulfur (20Je)	----	0.020	% S		0.027	0.028	----	----	----
acidity - Net Acid Soluble Sulfur (a-20J)	----	10	mole H+ / t		13	13	----	----	----
sulfidic - Net Acid Soluble Sulfur (s-20J)	----	0.020	% pyrite S		0.020	0.021	----	----	----



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Client sample ID

				BH1_0.5m	BH1_1.0m	BH1_1.5m	BH1_2.0m	BH2_0.5m
Client sampling date / time				13-Feb-2020 08:55	13-Feb-2020 09:00	13-Feb-2020 09:10	13-Feb-2020 09:15	13-Feb-2020 09:30
Compound	CAS Number	LOR	Unit	EB2005119-001	EB2005119-002	EB2005119-003	EB2005119-004	EB2005119-005
				Result	Result	Result	Result	Result
EA029-H: Acid Base Accounting								
ANC Fineness Factor	----	0.5	-	1.5	1.5	1.5	1.5	1.5
Net Acidity (sulfur units)	----	0.02	% S	0.14	0.09	0.05	0.02	0.03
Net Acidity (acidity units)	----	10	mole H+ / t	91	55	30	14	19
Liming Rate	----	1	kg CaCO3/t	7	4	2	1	1
Net Acidity excluding ANC (sulfur units)	----	0.02	% S	0.14	0.09	0.05	0.02	0.03
Net Acidity excluding ANC (acidity units)	----	10	mole H+ / t	91	55	30	14	19
Liming Rate excluding ANC	----	1	kg CaCO3/t	7	4	2	1	1



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Client sample ID

				BH3_1.0m	BH4_1.0m	BH4_1.5m	BH4_2.0m	BH4_2.5m
Client sampling date / time				13-Feb-2020 10:00	13-Feb-2020 10:30	13-Feb-2020 10:35	13-Feb-2020 10:50	13-Feb-2020 10:55
Compound	CAS Number	LOR	Unit	EB2005119-006	EB2005119-007	EB2005119-008	EB2005119-009	EB2005119-010
				Result	Result	Result	Result	Result
EA029-A: pH Measurements								
pH KCl (23A)	----	0.1	pH Unit	5.3	4.8	4.7	4.6	4.4
pH OX (23B)	----	0.1	pH Unit	5.6	4.6	5.1	4.9	4.5
EA029-B: Acidity Trail								
Titrateable Actual Acidity (23F)	----	2	mole H+ / t	4	21	21	32	40
Titrateable Peroxide Acidity (23G)	----	2	mole H+ / t	9	64	38	50	83
Titrateable Sulfidic Acidity (23H)	----	2	mole H+ / t	5	42	17	17	43
sulfidic - Titrateable Actual Acidity (s-23F)	----	0.020	% pyrite S	<0.020	0.034	0.034	0.052	0.065
sulfidic - Titrateable Peroxide Acidity (s-23G)	----	0.020	% pyrite S	<0.020	0.102	0.060	0.080	0.133
sulfidic - Titrateable Sulfidic Acidity (s-23H)	----	0.020	% pyrite S	<0.020	0.068	0.027	0.028	0.068
EA029-C: Sulfur Trail								
KCl Extractable Sulfur (23Ce)	----	0.020	% S	0.034	<0.020	<0.020	0.030	0.070
Peroxide Sulfur (23De)	----	0.020	% S	0.044	0.050	0.021	0.039	0.091
Peroxide Oxidisable Sulfur (23E)	----	0.020	% S	<0.020	0.050	0.021	<0.020	0.022
acidity - Peroxide Oxidisable Sulfur (a-23E)	----	10	mole H+ / t	<10	31	13	<10	13
EA029-D: Calcium Values								
KCl Extractable Calcium (23Vh)	----	0.020	% Ca	0.036	0.074	0.032	<0.020	<0.020
Peroxide Calcium (23Wh)	----	0.020	% Ca	0.035	0.070	0.032	<0.020	<0.020
Acid Reacted Calcium (23X)	----	0.020	% Ca	<0.020	<0.020	<0.020	<0.020	<0.020
acidity - Acid Reacted Calcium (a-23X)	----	10	mole H+ / t	<10	<10	<10	<10	<10
sulfidic - Acid Reacted Calcium (s-23X)	----	0.020	% S	<0.020	<0.020	<0.020	<0.020	<0.020
EA029-E: Magnesium Values								
KCl Extractable Magnesium (23Sm)	----	0.020	% Mg	0.133	0.049	0.046	0.048	0.069
Peroxide Magnesium (23Tm)	----	0.020	% Mg	0.137	0.048	0.050	0.052	0.068
Acid Reacted Magnesium (23U)	----	0.020	% Mg	<0.020	<0.020	<0.020	<0.020	<0.020
Acidity - Acid Reacted Magnesium (a-23U)	----	10	mole H+ / t	<10	<10	<10	<10	<10
sulfidic - Acid Reacted Magnesium (s-23U)	----	0.020	% S	<0.020	<0.020	<0.020	<0.020	<0.020
EA029-G: Retained Acidity								
HCl Extractable Sulfur (20Be)	----	0.020	% S	----	----	----	----	0.092
Net Acid Soluble Sulfur (20Je)	----	0.020	% S	----	----	----	----	0.022
acidity - Net Acid Soluble Sulfur (a-20J)	----	10	mole H+ / t	----	----	----	----	10
sulfidic - Net Acid Soluble Sulfur (s-20J)	----	0.020	% pyrite S	----	----	----	----	<0.020



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Client sample ID

				BH3_1.0m	BH4_1.0m	BH4_1.5m	BH4_2.0m	BH4_2.5m
Client sampling date / time				13-Feb-2020 10:00	13-Feb-2020 10:30	13-Feb-2020 10:35	13-Feb-2020 10:50	13-Feb-2020 10:55
Compound	CAS Number	LOR	Unit	EB2005119-006	EB2005119-007	EB2005119-008	EB2005119-009	EB2005119-010
				Result	Result	Result	Result	Result
EA029-H: Acid Base Accounting								
ANC Fineness Factor	----	0.5	-	1.5	1.5	1.5	1.5	1.5
Net Acidity (sulfur units)	----	0.02	% S	<0.02	0.08	0.05	0.06	0.10
Net Acidity (acidity units)	----	10	mole H+ / t	10	52	34	38	64
Liming Rate	----	1	kg CaCO3/t	<1	4	2	3	5
Net Acidity excluding ANC (sulfur units)	----	0.02	% S	<0.02	0.08	0.05	0.06	0.10
Net Acidity excluding ANC (acidity units)	----	10	mole H+ / t	10	52	34	38	64
Liming Rate excluding ANC	----	1	kg CaCO3/t	<1	4	2	3	5



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH5_0.5m	BH5_1.0m	BH5_1.5m	BH5_2.0m	BH5_2.5m
Client sampling date / time					13-Feb-2020 11:00	13-Feb-2020 11:10	13-Feb-2020 11:20	13-Feb-2020 11:30	13-Feb-2020 11:25
Compound	CAS Number	LOR	Unit		EB2005119-011	EB2005119-012	EB2005119-013	EB2005119-014	EB2005119-015
					Result	Result	Result	Result	Result
EA029-A: pH Measurements									
pH KCl (23A)	----	0.1	pH Unit		5.2	5.8	4.6	4.3	4.3
pH OX (23B)	----	0.1	pH Unit		5.3	6.7	4.7	4.4	4.4
EA029-B: Acidity Trail									
Titrateable Actual Acidity (23F)	----	2	mole H+ / t		15	5	28	60	46
Titrateable Peroxide Acidity (23G)	----	2	mole H+ / t		40	<2	63	91	75
Titrateable Sulfidic Acidity (23H)	----	2	mole H+ / t		25	<2	34	31	29
sulfidic - Titrateable Actual Acidity (s-23F)	----	0.020	% pyrite S		0.024	<0.020	0.045	0.096	0.073
sulfidic - Titrateable Peroxide Acidity (s-23G)	----	0.020	% pyrite S		0.064	<0.020	0.100	0.146	0.120
sulfidic - Titrateable Sulfidic Acidity (s-23H)	----	0.020	% pyrite S		0.040	<0.020	0.055	0.050	0.046
EA029-C: Sulfur Trail									
KCl Extractable Sulfur (23Ce)	----	0.020	% S		0.029	<0.020	<0.020	0.035	0.078
Peroxide Sulfur (23De)	----	0.020	% S		0.050	0.030	0.031	0.049	0.092
Peroxide Oxidisable Sulfur (23E)	----	0.020	% S		0.021	0.030	0.031	<0.020	<0.020
acidity - Peroxide Oxidisable Sulfur (a-23E)	----	10	mole H+ / t		13	19	19	<10	<10
EA029-D: Calcium Values									
KCl Extractable Calcium (23Vh)	----	0.020	% Ca		0.178	0.134	0.050	<0.020	<0.020
Peroxide Calcium (23Wh)	----	0.020	% Ca		0.176	0.237	0.049	<0.020	<0.020
Acid Reacted Calcium (23X)	----	0.020	% Ca		<0.020	0.102	<0.020	<0.020	<0.020
acidity - Acid Reacted Calcium (a-23X)	----	10	mole H+ / t		<10	51	<10	<10	<10
sulfidic - Acid Reacted Calcium (s-23X)	----	0.020	% S		<0.020	0.082	<0.020	<0.020	<0.020
EA029-E: Magnesium Values									
KCl Extractable Magnesium (23Sm)	----	0.020	% Mg		0.082	0.033	0.060	0.069	0.050
Peroxide Magnesium (23Tm)	----	0.020	% Mg		0.085	0.044	0.062	0.074	0.048
Acid Reacted Magnesium (23U)	----	0.020	% Mg		<0.020	<0.020	<0.020	<0.020	<0.020
Acidity - Acid Reacted Magnesium (a-23U)	----	10	mole H+ / t		<10	<10	<10	<10	<10
sulfidic - Acid Reacted Magnesium (s-23U)	----	0.020	% S		<0.020	<0.020	<0.020	<0.020	<0.020
EA029-F: Excess Acid Neutralising Capacity									
Excess Acid Neutralising Capacity (23Q)	----	0.020	% CaCO3		----	0.458	----	----	----
acidity - Excess Acid Neutralising Capacity (a-23Q)	----	10	mole H+ / t		----	92	----	----	----
sulfidic - Excess Acid Neutralising Capacity (s-23Q)	----	0.020	% S		----	0.147	----	----	----



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Client sample ID

				BH5_0.5m	BH5_1.0m	BH5_1.5m	BH5_2.0m	BH5_2.5m
Client sampling date / time				13-Feb-2020 11:00	13-Feb-2020 11:10	13-Feb-2020 11:20	13-Feb-2020 11:30	13-Feb-2020 11:25
Compound	CAS Number	LOR	Unit	EB2005119-011	EB2005119-012	EB2005119-013	EB2005119-014	EB2005119-015
				Result	Result	Result	Result	Result

EA029-F: Excess Acid Neutralising Capacity - Continued

EA029-G: Retained Acidity

HCl Extractable Sulfur (20Be)	----	0.020	% S	----	----	----	0.050	0.107
Net Acid Soluble Sulfur (20Je)	----	0.020	% S	----	----	----	<0.020	0.030
acidity - Net Acid Soluble Sulfur (a-20J)	----	10	mole H+ / t	----	----	----	<10	14
sulfidic - Net Acid Soluble Sulfur (s-20J)	----	0.020	% pyrite S	----	----	----	<0.020	0.022

EA029-H: Acid Base Accounting

ANC Fineness Factor	----	0.5	-	1.5	1.5	1.5	1.5	1.5
Net Acidity (sulfur units)	----	0.02	% S	0.04	0.04	0.08	0.12	0.11
Net Acidity (acidity units)	----	10	mole H+ / t	28	24	48	75	69
Liming Rate	----	1	kg CaCO3/t	2	2	4	6	5
Net Acidity excluding ANC (sulfur units)	----	0.02	% S	0.04	0.04	0.08	0.12	0.11
Net Acidity excluding ANC (acidity units)	----	10	mole H+ / t	28	24	48	75	69
Liming Rate excluding ANC	----	1	kg CaCO3/t	2	2	4	6	5



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Client sample ID

				BH5_3.0m	BH6_1.0m	BH6_1.5m	BH6_2.0m	BH6_2.5m
Client sampling date / time				13-Feb-2020 11:05	13-Feb-2020 12:15	13-Feb-2020 12:00	13-Feb-2020 12:28	13-Feb-2020 12:30
Compound	CAS Number	LOR	Unit	EB2005119-016	EB2005119-017	EB2005119-018	EB2005119-019	EB2005119-020
				Result	Result	Result	Result	Result
EA029-A: pH Measurements								
pH KCl (23A)	----	0.1	pH Unit	5.3	4.6	5.4	5.4	4.6
pH OX (23B)	----	0.1	pH Unit	5.9	4.3	5.4	4.4	5.1
EA029-B: Acidity Trail								
Titrateable Actual Acidity (23F)	----	2	mole H+ / t	3	33	6	10	33
Titrateable Peroxide Acidity (23G)	----	2	mole H+ / t	8	111	<2	76	61
Titrateable Sulfidic Acidity (23H)	----	2	mole H+ / t	5	78	<2	67	28
sulfidic - Titrateable Actual Acidity (s-23F)	----	0.020	% pyrite S	<0.020	0.053	<0.020	<0.020	0.053
sulfidic - Titrateable Peroxide Acidity (s-23G)	----	0.020	% pyrite S	<0.020	0.178	<0.020	0.123	0.097
sulfidic - Titrateable Sulfidic Acidity (s-23H)	----	0.020	% pyrite S	<0.020	0.124	<0.020	0.107	0.045
EA029-C: Sulfur Trail								
KCl Extractable Sulfur (23Ce)	----	0.020	% S	<0.020	0.033	<0.020	<0.020	<0.020
Peroxide Sulfur (23De)	----	0.020	% S	<0.020	0.090	0.024	0.072	<0.020
Peroxide Oxidisable Sulfur (23E)	----	0.020	% S	<0.020	0.057	0.024	0.072	<0.020
acidity - Peroxide Oxidisable Sulfur (a-23E)	----	10	mole H+ / t	<10	35	15	45	<10
EA029-D: Calcium Values								
KCl Extractable Calcium (23Vh)	----	0.020	% Ca	<0.020	0.067	0.079	0.085	<0.020
Peroxide Calcium (23Wh)	----	0.020	% Ca	<0.020	0.061	0.108	0.043	<0.020
Acid Reacted Calcium (23X)	----	0.020	% Ca	<0.020	<0.020	0.029	<0.020	<0.020
acidity - Acid Reacted Calcium (a-23X)	----	10	mole H+ / t	<10	<10	14	<10	<10
sulfidic - Acid Reacted Calcium (s-23X)	----	0.020	% S	<0.020	<0.020	0.023	<0.020	<0.020
EA029-E: Magnesium Values								
KCl Extractable Magnesium (23Sm)	----	0.020	% Mg	0.090	0.044	0.024	0.038	0.065
Peroxide Magnesium (23Tm)	----	0.020	% Mg	0.095	0.042	0.026	0.038	0.068
Acid Reacted Magnesium (23U)	----	0.020	% Mg	<0.020	<0.020	<0.020	<0.020	<0.020
Acidity - Acid Reacted Magnesium (a-23U)	----	10	mole H+ / t	<10	<10	<10	<10	<10
sulfidic - Acid Reacted Magnesium (s-23U)	----	0.020	% S	<0.020	<0.020	<0.020	<0.020	<0.020
EA029-H: Acid Base Accounting								
ANC Fineness Factor	----	0.5	-	1.5	1.5	1.5	1.5	1.5
Net Acidity (sulfur units)	----	0.02	% S	<0.02	0.11	0.03	0.09	0.05
Net Acidity (acidity units)	----	10	mole H+ / t	<10	69	21	55	33
Liming Rate	----	1	kg CaCO3/t	<1	5	2	4	2



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Client sample ID

				BH5_3.0m	BH6_1.0m	BH6_1.5m	BH6_2.0m	BH6_2.5m
Client sampling date / time				13-Feb-2020 11:05	13-Feb-2020 12:15	13-Feb-2020 12:00	13-Feb-2020 12:28	13-Feb-2020 12:30
Compound	CAS Number	LOR	Unit	EB2005119-016	EB2005119-017	EB2005119-018	EB2005119-019	EB2005119-020
				Result	Result	Result	Result	Result
EA029-H: Acid Base Accounting - Continued								
Net Acidity excluding ANC (sulfur units)	----	0.02	% S	<0.02	0.11	0.03	0.09	0.05
Net Acidity excluding ANC (acidity units)	----	10	mole H+ / t	<10	69	21	55	33
Liming Rate excluding ANC	----	1	kg CaCO3/t	<1	5	2	4	2



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH6_3.5m	BH7_1.0m	BH7_1.5m	BH7_2.0m	BH7_2.5m
Client sampling date / time					13-Feb-2020 12:15	13-Feb-2020 01:20	13-Feb-2020 12:00	13-Feb-2020 12:20	13-Feb-2020 12:30
Compound	CAS Number	LOR	Unit		EB2005119-021	EB2005119-022	EB2005119-023	EB2005119-024	EB2005119-025
					Result	Result	Result	Result	Result
EA029-A: pH Measurements									
pH KCl (23A)	----	0.1	pH Unit		5.0	7.6	6.4	4.6	4.6
pH OX (23B)	----	0.1	pH Unit		5.7	7.2	5.9	5.2	5.1
EA029-B: Acidity Trail									
Titratable Actual Acidity (23F)	----	2	mole H+ / t		9	<2	<2	26	30
Titratable Peroxide Acidity (23G)	----	2	mole H+ / t		11	<2	<2	53	57
Titratable Sulfidic Acidity (23H)	----	2	mole H+ / t		2	<2	<2	27	27
sulfidic - Titratable Actual Acidity (s-23F)	----	0.020	% pyrite S		<0.020	<0.020	<0.020	0.041	0.048
sulfidic - Titratable Peroxide Acidity (s-23G)	----	0.020	% pyrite S		<0.020	<0.020	<0.020	0.084	0.091
sulfidic - Titratable Sulfidic Acidity (s-23H)	----	0.020	% pyrite S		<0.020	<0.020	<0.020	0.043	0.043
EA029-C: Sulfur Trail									
KCl Extractable Sulfur (23Ce)	----	0.020	% S		0.026	<0.020	<0.020	<0.020	<0.020
Peroxide Sulfur (23De)	----	0.020	% S		0.036	0.067	0.027	<0.020	0.025
Peroxide Oxidisable Sulfur (23E)	----	0.020	% S		<0.020	0.067	0.027	<0.020	0.025
acidity - Peroxide Oxidisable Sulfur (a-23E)	----	10	mole H+ / t		<10	42	17	<10	15
EA029-D: Calcium Values									
KCl Extractable Calcium (23Vh)	----	0.020	% Ca		<0.020	0.401	0.165	0.024	<0.020
Peroxide Calcium (23Wh)	----	0.020	% Ca		<0.020	0.488	0.149	<0.020	<0.020
Acid Reacted Calcium (23X)	----	0.020	% Ca		<0.020	0.087	<0.020	<0.020	<0.020
acidity - Acid Reacted Calcium (a-23X)	----	10	mole H+ / t		<10	43	<10	<10	<10
sulfidic - Acid Reacted Calcium (s-23X)	----	0.020	% S		<0.020	0.069	<0.020	<0.020	<0.020
EA029-E: Magnesium Values									
KCl Extractable Magnesium (23Sm)	----	0.020	% Mg		0.136	0.044	0.036	0.046	0.051
Peroxide Magnesium (23Tm)	----	0.020	% Mg		0.138	0.067	0.039	0.044	0.046
Acid Reacted Magnesium (23U)	----	0.020	% Mg		<0.020	0.023	<0.020	<0.020	<0.020
Acidity - Acid Reacted Magnesium (a-23U)	----	10	mole H+ / t		<10	19	<10	<10	<10
sulfidic - Acid Reacted Magnesium (s-23U)	----	0.020	% S		<0.020	0.031	<0.020	<0.020	<0.020
EA029-F: Excess Acid Neutralising Capacity									
Excess Acid Neutralising Capacity (23Q)	----	0.020	% CaCO3		----	0.526	----	----	----
acidity - Excess Acid Neutralising Capacity (a-23Q)	----	10	mole H+ / t		----	105	----	----	----
sulfidic - Excess Acid Neutralising Capacity (s-23Q)	----	0.020	% S		----	0.168	----	----	----



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Client sample ID

				BH6_3.5m	BH7_1.0m	BH7_1.5m	BH7_2.0m	BH7_2.5m
Client sampling date / time				13-Feb-2020 12:15	13-Feb-2020 01:20	13-Feb-2020 12:00	13-Feb-2020 12:20	13-Feb-2020 12:30
Compound	CAS Number	LOR	Unit	EB2005119-021	EB2005119-022	EB2005119-023	EB2005119-024	EB2005119-025
				Result	Result	Result	Result	Result

EA029-F: Excess Acid Neutralising Capacity - Continued

EA029-H: Acid Base Accounting

ANC Fineness Factor	----	0.5	-	1.5	1.5	1.5	1.5	1.5
Net Acidity (sulfur units)	----	0.02	% S	0.02	<0.02	0.03	0.04	0.07
Net Acidity (acidity units)	----	10	mole H+ / t	15	<10	17	26	45
Liming Rate	----	1	kg CaCO3/t	1	<1	1	2	3
Net Acidity excluding ANC (sulfur units)	----	0.02	% S	0.02	0.07	0.03	0.04	0.07
Net Acidity excluding ANC (acidity units)	----	10	mole H+ / t	15	42	17	26	45
Liming Rate excluding ANC	----	1	kg CaCO3/t	1	3	1	2	3



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH7_3.0m	BH7_3.5m	BH7_4.0m	----	----
Client sampling date / time					13-Feb-2020 12:05	13-Feb-2020 12:25	13-Feb-2020 12:25	----	----
Compound	CAS Number	LOR	Unit		EB2005119-026	EB2005119-027	EB2005119-028	-----	-----
					Result	Result	Result	----	----
EA029-A: pH Measurements									
pH KCl (23A)	----	0.1	pH Unit		4.5	4.5	4.8	----	----
pH OX (23B)	----	0.1	pH Unit		5.2	5.4	5.8	----	----
EA029-B: Acidity Trail									
Titrateable Actual Acidity (23F)	----	2	mole H+ / t		25	27	15	----	----
Titrateable Peroxide Acidity (23G)	----	2	mole H+ / t		47	47	20	----	----
Titrateable Sulfidic Acidity (23H)	----	2	mole H+ / t		22	20	5	----	----
sulfidic - Titrateable Actual Acidity (s-23F)	----	0.020	% pyrite S		0.041	0.043	0.024	----	----
sulfidic - Titrateable Peroxide Acidity (s-23G)	----	0.020	% pyrite S		0.075	0.075	0.033	----	----
sulfidic - Titrateable Sulfidic Acidity (s-23H)	----	0.020	% pyrite S		0.034	0.032	<0.020	----	----
EA029-C: Sulfur Trail									
KCl Extractable Sulfur (23Ce)	----	0.020	% S		0.049	0.040	0.032	----	----
Peroxide Sulfur (23De)	----	0.020	% S		0.065	0.053	0.039	----	----
Peroxide Oxidisable Sulfur (23E)	----	0.020	% S		<0.020	<0.020	<0.020	----	----
acidity - Peroxide Oxidisable Sulfur (a-23E)	----	10	mole H+ / t		10	<10	<10	----	----
EA029-D: Calcium Values									
KCl Extractable Calcium (23Vh)	----	0.020	% Ca		<0.020	<0.020	<0.020	----	----
Peroxide Calcium (23Wh)	----	0.020	% Ca		<0.020	<0.020	<0.020	----	----
Acid Reacted Calcium (23X)	----	0.020	% Ca		<0.020	<0.020	<0.020	----	----
acidity - Acid Reacted Calcium (a-23X)	----	10	mole H+ / t		<10	<10	<10	----	----
sulfidic - Acid Reacted Calcium (s-23X)	----	0.020	% S		<0.020	<0.020	<0.020	----	----
EA029-E: Magnesium Values									
KCl Extractable Magnesium (23Sm)	----	0.020	% Mg		0.075	0.072	0.122	----	----
Peroxide Magnesium (23Tm)	----	0.020	% Mg		0.076	0.081	0.127	----	----
Acid Reacted Magnesium (23U)	----	0.020	% Mg		<0.020	<0.020	<0.020	----	----
Acidity - Acid Reacted Magnesium (a-23U)	----	10	mole H+ / t		<10	<10	<10	----	----
sulfidic - Acid Reacted Magnesium (s-23U)	----	0.020	% S		<0.020	<0.020	<0.020	----	----
EA029-H: Acid Base Accounting									
ANC Fineness Factor	----	0.5	-		1.5	1.5	1.5	----	----
Net Acidity (sulfur units)	----	0.02	% S		0.06	0.06	0.03	----	----
Net Acidity (acidity units)	----	10	mole H+ / t		36	36	20	----	----
Liming Rate	----	1	kg CaCO3/t		3	3	1	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH7_3.0m	BH7_3.5m	BH7_4.0m	----	----
Client sampling date / time					13-Feb-2020 12:05	13-Feb-2020 12:25	13-Feb-2020 12:25	----	----
Compound	CAS Number	LOR	Unit		EB2005119-026	EB2005119-027	EB2005119-028	-----	-----
					Result	Result	Result	----	----
EA029-H: Acid Base Accounting - Continued									
Net Acidity excluding ANC (sulfur units)	----	0.02	% S		0.06	0.06	0.03	----	----
Net Acidity excluding ANC (acidity units)	----	10	mole H+ / t		36	36	20	----	----
Liming Rate excluding ANC	----	1	kg CaCO3/t		3	3	1	----	----

CERTIFICATE OF ANALYSIS

Work Order : **ES2005101**
Client : **BENBOW ENVIRONMENTAL**
Contact : Matthew Taylor
Address : 25-27 SHERWOOD STREET
 NORTHMEAD NSW, AUSTRALIA 2152
Telephone : ----
Project : 191290-02
Order number : 191290-02
C-O-C number : ----
Sampler : Matthew Taylor
Site : ----
Quote number : EN/222
No. of samples received : 70
No. of samples analysed : 70

Page : 1 of 37
Laboratory : Environmental Division Sydney
Contact : Customer Services ES
Address : 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone : +61-2-8784 8555
Date Samples Received : 13-Feb-2020 15:00
Date Analysis Commenced : 14-Feb-2020
Issue Date : 24-Feb-2020 13:48



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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

Signatories

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

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



General Comments

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

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

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

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

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

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

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

Ø = ALS is not NATA accredited for these tests.

~ = Indicates an estimated value.

- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) per the NEPM (2013) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a,h)anthracene (1.0), Benzo(g,h,i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero, for 'TEQ 1/2LOR' are treated as half the reported LOR, and for 'TEQ LOR' are treated as being equal to the reported LOR. Note: TEQ 1/2LOR and TEQ LOR will calculate as 0.6mg/Kg and 1.2mg/Kg respectively for samples with non-detects for all of the eight TEQ PAHs.
- EP080: Positive results for sample ES2005101_16 has been confirmed by re-analysis.
- ASS: EA037 (Rapid Field and F(ox) screening): pH F(ox) Reaction Rate: 1 - Slight; 2 - Moderate; 3 - Strong; 4 - Extreme
- EA037 ASS Field Screening: NATA accreditation does not cover performance of this service.



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH1_0.5m	BH1_1.5m	BH1_2.0	BH2_0.5m	BH2_1.5m
Client sampling date / time					13-Feb-2020 08:55	13-Feb-2020 09:05	13-Feb-2020 09:20	13-Feb-2020 09:25	13-Feb-2020 09:30
Compound	CAS Number	LOR	Unit		ES2005101-001	ES2005101-002	ES2005101-003	ES2005101-004	ES2005101-005
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		14.3	18.3	7.0	20.3	16.4
ED093S: Soluble Major Cations									
Calcium	7440-70-2	10	mg/kg		<10	----	----	----	----
Magnesium	7439-95-4	10	mg/kg		50	----	----	----	----
Sodium	7440-23-5	10	mg/kg		130	----	----	----	----
Potassium	7440-09-7	10	mg/kg		160	----	----	----	----
EG005(ED093)T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		<5	<5	<5	6	<5
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg		3	<2	6	13	4
Copper	7440-50-8	5	mg/kg		14	17	92	15	25
Lead	7439-92-1	5	mg/kg		24	<5	14	15	8
Nickel	7440-02-0	2	mg/kg		<2	<2	26	4	13
Zinc	7440-66-6	5	mg/kg		<5	7	150	14	73
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	<0.1
EP066: Polychlorinated Biphenyls (PCB)									
Total Polychlorinated biphenyls	----	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	<0.1
EP068A: Organochlorine Pesticides (OC)									
alpha-BHC	319-84-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
beta-BHC	319-85-7	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
gamma-BHC	58-89-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
delta-BHC	319-86-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor	76-44-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Aldrin	309-00-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
[^] Total Chlordane (sum)	----	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
alpha-Endosulfan	959-98-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Dieldrin	60-57-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
4,4'-DDE	72-55-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Endrin	72-20-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Client sample ID

				BH1_0.5m	BH1_1.5m	BH1_2.0	BH2_0.5m	BH2_1.5m
Client sampling date / time				13-Feb-2020 08:55	13-Feb-2020 09:05	13-Feb-2020 09:20	13-Feb-2020 09:25	13-Feb-2020 09:30
Compound	CAS Number	LOR	Unit	ES2005101-001	ES2005101-002	ES2005101-003	ES2005101-004	ES2005101-005
				Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued								
beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
^ Endosulfan (sum)	115-29-7	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
EP068B: Organophosphorus Pesticides (OP)								
Dichlorvos	62-73-7	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Dimethoate	60-51-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Diazinon	333-41-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Malathion	121-75-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Fenthion	55-38-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Parathion	56-38-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Prothiofos	34643-46-4	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Ethion	563-12-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Carbophenothion	786-19-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
EP075(SIM)A: Phenolic Compounds								
Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Client sample ID

				BH1_0.5m	BH1_1.5m	BH1_2.0	BH2_0.5m	BH2_1.5m
Client sampling date / time				13-Feb-2020 08:55	13-Feb-2020 09:05	13-Feb-2020 09:20	13-Feb-2020 09:25	13-Feb-2020 09:30
Compound	CAS Number	LOR	Unit	ES2005101-001	ES2005101-002	ES2005101-003	ES2005101-004	ES2005101-005
				Result	Result	Result	Result	Result
EP075(SIM)A: Phenolic Compounds - Continued								
3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	<1	<1	<1
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	<2	<2	<2
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	0.6	0.6	0.6	0.6	0.6
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	1.2	1.2	1.2	1.2	1.2
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH1_0.5m	BH1_1.5m	BH1_2.0	BH2_0.5m	BH2_1.5m
Client sampling date / time					13-Feb-2020 08:55	13-Feb-2020 09:05	13-Feb-2020 09:20	13-Feb-2020 09:25	13-Feb-2020 09:30
Compound	CAS Number	LOR	Unit		ES2005101-001	ES2005101-002	ES2005101-003	ES2005101-004	ES2005101-005
					Result	Result	Result	Result	Result
EP080/071: Total Petroleum Hydrocarbons - Continued									
C29 - C36 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg		<50	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		<10	<10	<10	<10	<10
>C10 - C16 Fraction	----	50	mg/kg		<50	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		<50	<50	<50	<50	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		<50	<50	<50	<50	<50
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	----	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg		<1	<1	<1	<1	<1
EP066S: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	0.1	%		86.4	125	99.9	116	128
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		92.4	108	120	90.5	97.0
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		104	86.3	84.6	114	91.3
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		83.3	80.8	82.6	78.9	82.5
2-Chlorophenol-D4	93951-73-6	0.5	%		87.7	83.1	83.4	79.2	83.1
2,4,6-Tribromophenol	118-79-6	0.5	%		61.1	41.2	44.1	42.3	41.6
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		94.7	98.6	102	97.3	95.5
Anthracene-d10	1719-06-8	0.5	%		83.4	100	105	97.1	104



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH1_0.5m	BH1_1.5m	BH1_2.0	BH2_0.5m	BH2_1.5m
Client sampling date / time					13-Feb-2020 08:55	13-Feb-2020 09:05	13-Feb-2020 09:20	13-Feb-2020 09:25	13-Feb-2020 09:30
Compound	CAS Number	LOR	Unit		ES2005101-001	ES2005101-002	ES2005101-003	ES2005101-004	ES2005101-005
					Result	Result	Result	Result	Result
EP075(SIM)T: PAH Surrogates - Continued									
4-Terphenyl-d14	1718-51-0	0.5	%		100	102	104	102	105
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.2	%		99.0	92.9	94.6	112	95.5
Toluene-D8	2037-26-5	0.2	%		94.3	102	102	113	95.4
4-Bromofluorobenzene	460-00-4	0.2	%		100	108	108	115	98.8



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH2_2.0	BH3_0.5m	BH3_1.5m	BH3_2.2	BH4_0.5m
Client sampling date / time					13-Feb-2020 09:40	13-Feb-2020 09:55	13-Feb-2020 10:00	13-Feb-2020 10:05	13-Feb-2020 10:25
Compound	CAS Number	LOR	Unit		ES2005101-006	ES2005101-007	ES2005101-008	ES2005101-009	ES2005101-010
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		9.0	18.3	12.6	12.4	22.8
EG005(ED093)T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		<5	<5	5	<5	<5
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg		4	27	4	5	24
Copper	7440-50-8	5	mg/kg		46	16	59	34	10
Lead	7439-92-1	5	mg/kg		29	19	27	21	38
Nickel	7440-02-0	2	mg/kg		400	<2	93	70	2
Zinc	7440-66-6	5	mg/kg		917	6	440	260	28
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	<0.1
EP066: Polychlorinated Biphenyls (PCB)									
Total Polychlorinated biphenyls	----	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	<0.1
EP068A: Organochlorine Pesticides (OC)									
alpha-BHC	319-84-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
beta-BHC	319-85-7	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
gamma-BHC	58-89-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
delta-BHC	319-86-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor	76-44-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Aldrin	309-00-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
^ Total Chlordane (sum)	----	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
alpha-Endosulfan	959-98-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Dieldrin	60-57-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
4,4'-DDE	72-55-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Endrin	72-20-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
beta-Endosulfan	33213-65-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
^ Endosulfan (sum)	115-29-7	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
4,4'-DDD	72-54-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Client sample ID

				BH2_2.0	BH3_0.5m	BH3_1.5m	BH3_2.2	BH4_0.5m
Client sampling date / time				13-Feb-2020 09:40	13-Feb-2020 09:55	13-Feb-2020 10:00	13-Feb-2020 10:05	13-Feb-2020 10:25
Compound	CAS Number	LOR	Unit	ES2005101-006	ES2005101-007	ES2005101-008	ES2005101-009	ES2005101-010
				Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued								
4.4'-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/5 0-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
EP068B: Organophosphorus Pesticides (OP)								
Dichlorvos	62-73-7	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Dimethoate	60-51-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Diazinon	333-41-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Malathion	121-75-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Fenthion	55-38-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Parathion	56-38-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Prothiofos	34643-46-4	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Ethion	563-12-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Carbophenothion	786-19-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
EP075(SIM)A: Phenolic Compounds								
Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	<1	<1	<1
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Client sample ID

				BH2_2.0	BH3_0.5m	BH3_1.5m	BH3_2.2	BH4_0.5m
Client sampling date / time				13-Feb-2020 09:40	13-Feb-2020 09:55	13-Feb-2020 10:00	13-Feb-2020 10:05	13-Feb-2020 10:25
Compound	CAS Number	LOR	Unit	ES2005101-006	ES2005101-007	ES2005101-008	ES2005101-009	ES2005101-010
				Result	Result	Result	Result	Result
EP075(SIM)A: Phenolic Compounds - Continued								
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	<2	<2	<2
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	0.6	0.6	0.6	0.6	0.6
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	1.2	1.2	1.2	1.2	1.2
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	<10	<10



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH2_2.0	BH3_0.5m	BH3_1.5m	BH3_2.2	BH4_0.5m
Client sampling date / time					13-Feb-2020 09:40	13-Feb-2020 09:55	13-Feb-2020 10:00	13-Feb-2020 10:05	13-Feb-2020 10:25
Compound	CAS Number	LOR	Unit		ES2005101-006	ES2005101-007	ES2005101-008	ES2005101-009	ES2005101-010
					Result	Result	Result	Result	Result
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued									
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		<10	<10	<10	<10	<10
>C10 - C16 Fraction	----	50	mg/kg		<50	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		<50	<50	<50	<50	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		<50	<50	<50	<50	<50
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	----	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg		<1	<1	<1	<1	<1
EP066S: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	0.1	%		127	124	107	110	82.2
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		100	103	98.2	98.9	86.1
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		108	106	106	106	71.0
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		81.8	85.4	81.8	84.0	81.8
2-Chlorophenol-D4	93951-73-6	0.5	%		85.1	85.9	83.7	85.6	86.7
2,4,6-Tribromophenol	118-79-6	0.5	%		43.2	41.9	41.9	42.4	41.7
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		102	103	100	103	97.3
Anthracene-d10	1719-06-8	0.5	%		108	106	105	107	104
4-Terphenyl-d14	1718-51-0	0.5	%		104	107	104	107	106
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.2	%		106	94.3	104	107	89.1
Toluene-D8	2037-26-5	0.2	%		105	97.2	103	107	89.6

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 Work Order : ES2005101
 Client : BENBOW ENVIRONMENTAL
 Project : 191290-02



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH2_2.0	BH3_0.5m	BH3_1.5m	BH3_2.2	BH4_0.5m
Client sampling date / time					13-Feb-2020 09:40	13-Feb-2020 09:55	13-Feb-2020 10:00	13-Feb-2020 10:05	13-Feb-2020 10:25
Compound	CAS Number	LOR	Unit		ES2005101-006	ES2005101-007	ES2005101-008	ES2005101-009	ES2005101-010
					Result	Result	Result	Result	Result
EP080S: TPH(V)/BTEX Surrogates - Continued									
4-Bromofluorobenzene	460-00-4	0.2	%		108	101	105	111	95.8



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH4_1.5m	BH4_3.0m	BH5_0.5m	BH5_1.5m	BH5_3.0m
Client sampling date / time					13-Feb-2020 10:30	13-Feb-2020 10:35	13-Feb-2020 10:50	13-Feb-2020 10:55	13-Feb-2020 11:05
Compound	CAS Number	LOR	Unit		ES2005101-011	ES2005101-012	ES2005101-013	ES2005101-014	ES2005101-015
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		17.5	11.3	25.9	14.9	14.6
EG005(ED093)T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		6	<5	<5	10	<5
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg		26	3	29	20	4
Copper	7440-50-8	5	mg/kg		18	<5	9	11	11
Lead	7439-92-1	5	mg/kg		30	<5	21	39	10
Nickel	7440-02-0	2	mg/kg		4	<2	2	3	3
Zinc	7440-66-6	5	mg/kg		18	<5	<5	569	11
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	<0.1
EP066: Polychlorinated Biphenyls (PCB)									
Total Polychlorinated biphenyls	----	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	<0.1
EP068A: Organochlorine Pesticides (OC)									
alpha-BHC	319-84-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
beta-BHC	319-85-7	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
gamma-BHC	58-89-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
delta-BHC	319-86-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor	76-44-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Aldrin	309-00-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
^ Total Chlordane (sum)	----	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
alpha-Endosulfan	959-98-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Dieldrin	60-57-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
4,4'-DDE	72-55-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Endrin	72-20-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
beta-Endosulfan	33213-65-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
^ Endosulfan (sum)	115-29-7	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
4,4'-DDD	72-54-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Client sample ID

				BH4_1.5m	BH4_3.0m	BH5_0.5m	BH5_1.5m	BH5_3.0m
Client sampling date / time				13-Feb-2020 10:30	13-Feb-2020 10:35	13-Feb-2020 10:50	13-Feb-2020 10:55	13-Feb-2020 11:05
Compound	CAS Number	LOR	Unit	ES2005101-011	ES2005101-012	ES2005101-013	ES2005101-014	ES2005101-015
				Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued								
4,4'-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/5 0-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
EP068B: Organophosphorus Pesticides (OP)								
Dichlorvos	62-73-7	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Dimethoate	60-51-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Diazinon	333-41-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Malathion	121-75-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Fenthion	55-38-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Parathion	56-38-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Prothiofos	34643-46-4	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Ethion	563-12-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Carbophenothion	786-19-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
EP075(SIM)A: Phenolic Compounds								
Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	<1	<1	<1
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Client sample ID

				BH4_1.5m	BH4_3.0m	BH5_0.5m	BH5_1.5m	BH5_3.0m
Client sampling date / time				13-Feb-2020 10:30	13-Feb-2020 10:35	13-Feb-2020 10:50	13-Feb-2020 10:55	13-Feb-2020 11:05
Compound	CAS Number	LOR	Unit	ES2005101-011	ES2005101-012	ES2005101-013	ES2005101-014	ES2005101-015
				Result	Result	Result	Result	Result
EP075(SIM)A: Phenolic Compounds - Continued								
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	<2	<2	<2
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	0.6	0.6	0.6	0.6	0.6
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	1.2	1.2	1.2	1.2	1.2
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	<10	<10



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH4_1.5m	BH4_3.0m	BH5_0.5m	BH5_1.5m	BH5_3.0m
Client sampling date / time					13-Feb-2020 10:30	13-Feb-2020 10:35	13-Feb-2020 10:50	13-Feb-2020 10:55	13-Feb-2020 11:05
Compound	CAS Number	LOR	Unit		ES2005101-011	ES2005101-012	ES2005101-013	ES2005101-014	ES2005101-015
					Result	Result	Result	Result	Result
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued									
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		<10	<10	<10	<10	<10
>C10 - C16 Fraction	----	50	mg/kg		<50	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		<50	<50	<50	<50	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		<50	<50	<50	<50	<50
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	----	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg		<1	<1	<1	<1	<1
EP066S: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	0.1	%		83.2	108	84.0	79.3	87.6
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		90.0	100	114	118	97.1
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		111	88.2	94.2	83.4	127
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		81.1	80.5	81.9	84.1	81.8
2-Chlorophenol-D4	93951-73-6	0.5	%		86.5	82.2	85.5	87.1	82.9
2,4,6-Tribromophenol	118-79-6	0.5	%		40.8	40.5	41.1	43.4	43.5
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		103	99.2	102	97.4	97.1
Anthracene-d10	1719-06-8	0.5	%		103	105	104	102	102
4-Terphenyl-d14	1718-51-0	0.5	%		106	102	106	105	99.7
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.2	%		100	113	94.3	98.4	120
Toluene-D8	2037-26-5	0.2	%		100.0	108	90.1	96.0	108

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Work Order : ES2005101
Client : BENBOW ENVIRONMENTAL
Project : 191290-02



Analytical Results

Sub-Matrix: SOIL
(Matrix: SOIL)

Client sample ID

				BH4_1.5m	BH4_3.0m	BH5_0.5m	BH5_1.5m	BH5_3.0m
Client sampling date / time				13-Feb-2020 10:30	13-Feb-2020 10:35	13-Feb-2020 10:50	13-Feb-2020 10:55	13-Feb-2020 11:05
Compound	CAS Number	LOR	Unit	ES2005101-011	ES2005101-012	ES2005101-013	ES2005101-014	ES2005101-015
				Result	Result	Result	Result	Result
EP080S: TPH(V)/BTEX Surrogates - Continued								
4-Bromofluorobenzene	460-00-4	0.2	%	106	113	96.2	95.2	112



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH6_0.5m	BH6_1.5m	BH6_3.0m	BH7_0.5m	BH7_1.5m
Client sampling date / time					13-Feb-2020 11:20	13-Feb-2020 11:30	13-Feb-2020 11:35	13-Feb-2020 11:45	13-Feb-2020 11:55
Compound	CAS Number	LOR	Unit		ES2005101-016	ES2005101-017	ES2005101-018	ES2005101-019	ES2005101-020
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		22.5	17.9	18.4	7.1	19.5
EG005(ED093)T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		<5	6	<5	<5	7
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg		22	19	9	95	25
Copper	7440-50-8	5	mg/kg		27	7	<5	39	8
Lead	7439-92-1	5	mg/kg		56	22	<5	18	29
Nickel	7440-02-0	2	mg/kg		4	2	<2	117	<2
Zinc	7440-66-6	5	mg/kg		43	18	<5	115	18
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	<0.1
EP066: Polychlorinated Biphenyls (PCB)									
Total Polychlorinated biphenyls	----	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	<0.1
EP068A: Organochlorine Pesticides (OC)									
alpha-BHC	319-84-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
beta-BHC	319-85-7	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
gamma-BHC	58-89-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
delta-BHC	319-86-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor	76-44-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Aldrin	309-00-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
^ Total Chlordane (sum)	----	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
alpha-Endosulfan	959-98-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Dieldrin	60-57-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
4,4'-DDE	72-55-9	0.05	mg/kg		<0.05	0.10	<0.05	<0.05	0.09
Endrin	72-20-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
beta-Endosulfan	33213-65-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
^ Endosulfan (sum)	115-29-7	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
4,4'-DDD	72-54-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH6_0.5m	BH6_1.5m	BH6_3.0m	BH7_0.5m	BH7_1.5m
Client sampling date / time					13-Feb-2020 11:20	13-Feb-2020 11:30	13-Feb-2020 11:35	13-Feb-2020 11:45	13-Feb-2020 11:55
Compound	CAS Number	LOR	Unit		ES2005101-016	ES2005101-017	ES2005101-018	ES2005101-019	ES2005101-020
					Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued									
4,4'-DDT	50-29-3	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Methoxychlor	72-43-5	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/5 0-2	0.05	mg/kg		<0.05	0.10	<0.05	<0.05	0.09
EP068B: Organophosphorus Pesticides (OP)									
Dichlorvos	62-73-7	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Demeton-S-methyl	919-86-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Monocrotophos	6923-22-4	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Dimethoate	60-51-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Diazinon	333-41-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Parathion-methyl	298-00-0	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Malathion	121-75-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Fenthion	55-38-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Chlorpyrifos	2921-88-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Parathion	56-38-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Pirimphos-ethyl	23505-41-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Chlorfenvinphos	470-90-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Bromophos-ethyl	4824-78-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Fenamiphos	22224-92-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Prothiofos	34643-46-4	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Ethion	563-12-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Carbophenothion	786-19-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Azinphos Methyl	86-50-0	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
EP075(SIM)A: Phenolic Compounds									
Phenol	108-95-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2-Chlorophenol	95-57-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2-Methylphenol	95-48-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
3- & 4-Methylphenol	1319-77-3	1	mg/kg		<1	<1	<1	<1	<1
2-Nitrophenol	88-75-5	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2,4-Dimethylphenol	105-67-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2,4-Dichlorophenol	120-83-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2,6-Dichlorophenol	87-65-0	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH6_0.5m	BH6_1.5m	BH6_3.0m	BH7_0.5m	BH7_1.5m
Client sampling date / time					13-Feb-2020 11:20	13-Feb-2020 11:30	13-Feb-2020 11:35	13-Feb-2020 11:45	13-Feb-2020 11:55
Compound	CAS Number	LOR	Unit		ES2005101-016	ES2005101-017	ES2005101-018	ES2005101-019	ES2005101-020
					Result	Result	Result	Result	Result
EP075(SIM)A: Phenolic Compounds - Continued									
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Pentachlorophenol	87-86-5	2	mg/kg		<2	<2	<2	<2	<2
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		0.6	0.6	0.6	0.6	0.6
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		1.2	1.2	1.2	1.2	1.2
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		12	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg		<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg		<50	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		12	<10	<10	<10	<10



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH6_0.5m	BH6_1.5m	BH6_3.0m	BH7_0.5m	BH7_1.5m
Client sampling date / time					13-Feb-2020 11:20	13-Feb-2020 11:30	13-Feb-2020 11:35	13-Feb-2020 11:45	13-Feb-2020 11:55
Compound	CAS Number	LOR	Unit		ES2005101-016	ES2005101-017	ES2005101-018	ES2005101-019	ES2005101-020
					Result	Result	Result	Result	Result
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued									
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		12	<10	<10	<10	<10
>C10 - C16 Fraction	----	50	mg/kg		<50	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		<50	<50	<50	<50	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		<50	<50	<50	<50	<50
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	----	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg		<1	<1	<1	<1	<1
EP066S: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	0.1	%		71.7	88.8	80.3	82.6	74.5
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		89.0	129	88.9	95.5	105
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		102	131	108	116	86.3
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		81.6	86.8	86.6	85.9	86.6
2-Chlorophenol-D4	93951-73-6	0.5	%		84.4	87.5	88.1	86.3	86.5
2,4,6-Tribromophenol	118-79-6	0.5	%		50.9	54.2	43.9	47.8	61.2
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		94.4	102	96.3	101	98.4
Anthracene-d10	1719-06-8	0.5	%		96.4	100	97.9	99.2	96.5
4-Terphenyl-d14	1718-51-0	0.5	%		103	104	104	103	104
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.2	%		101	96.5	108	110	108
Toluene-D8	2037-26-5	0.2	%		98.8	94.5	97.0	105	102

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 Work Order : ES2005101
 Client : BENBOW ENVIRONMENTAL
 Project : 191290-02



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH6_0.5m	BH6_1.5m	BH6_3.0m	BH7_0.5m	BH7_1.5m
Client sampling date / time					13-Feb-2020 11:20	13-Feb-2020 11:30	13-Feb-2020 11:35	13-Feb-2020 11:45	13-Feb-2020 11:55
Compound	CAS Number	LOR	Unit		ES2005101-016	ES2005101-017	ES2005101-018	ES2005101-019	ES2005101-020
					Result	Result	Result	Result	Result
EP080S: TPH(V)/BTEX Surrogates - Continued									
4-Bromofluorobenzene	460-00-4	0.2	%		104	97.4	96.4	106	101



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH7_3.0m	BH4_1.5D	BH6_3.0D	BH1_0.5m	BH1_1.0m
Client sampling date / time					13-Feb-2020 12:00	13-Feb-2020 10:30	13-Feb-2020 11:35	13-Feb-2020 08:55	13-Feb-2020 09:00
Compound	CAS Number	LOR	Unit		ES2005101-021	ES2005101-022	ES2005101-023	ES2005101-024	ES2005101-025
					Result	Result	Result	Result	Result
EA037: Ass Field Screening Analysis									
ø pH (F)	----	0.1	pH Unit		----	----	----	5.2	5.1
ø pH (Fox)	----	0.1	pH Unit		----	----	----	3.4	3.4
ø Reaction Rate	----	1	-		----	----	----	3	2
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		11.9	16.2	19.6	----	----
EG005(ED093)T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		11	12	<5	----	----
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	----	----
Chromium	7440-47-3	2	mg/kg		11	29	11	----	----
Copper	7440-50-8	5	mg/kg		7	20	5	----	----
Lead	7439-92-1	5	mg/kg		9	40	6	----	----
Nickel	7440-02-0	2	mg/kg		<2	6	<2	----	----
Zinc	7440-66-6	5	mg/kg		<5	33	5	----	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	<0.1	----	----
EP066: Polychlorinated Biphenyls (PCB)									
Total Polychlorinated biphenyls	----	0.1	mg/kg		<0.1	<0.1	<0.1	----	----
EP068A: Organochlorine Pesticides (OC)									
alpha-BHC	319-84-6	0.05	mg/kg		<0.05	<0.05	<0.05	----	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg		<0.05	<0.05	<0.05	----	----
beta-BHC	319-85-7	0.05	mg/kg		<0.05	<0.05	<0.05	----	----
gamma-BHC	58-89-9	0.05	mg/kg		<0.05	<0.05	<0.05	----	----
delta-BHC	319-86-8	0.05	mg/kg		<0.05	<0.05	<0.05	----	----
Heptachlor	76-44-8	0.05	mg/kg		<0.05	<0.05	<0.05	----	----
Aldrin	309-00-2	0.05	mg/kg		<0.05	<0.05	<0.05	----	----
Heptachlor epoxide	1024-57-3	0.05	mg/kg		<0.05	<0.05	<0.05	----	----
^ Total Chlordane (sum)	----	0.05	mg/kg		<0.05	<0.05	<0.05	----	----
trans-Chlordane	5103-74-2	0.05	mg/kg		<0.05	<0.05	<0.05	----	----
alpha-Endosulfan	959-98-8	0.05	mg/kg		<0.05	<0.05	<0.05	----	----
cis-Chlordane	5103-71-9	0.05	mg/kg		<0.05	<0.05	<0.05	----	----
Dieldrin	60-57-1	0.05	mg/kg		<0.05	<0.05	<0.05	----	----
4,4'-DDE	72-55-9	0.05	mg/kg		<0.05	0.11	<0.05	----	----
Endrin	72-20-8	0.05	mg/kg		<0.05	<0.05	<0.05	----	----
beta-Endosulfan	33213-65-9	0.05	mg/kg		<0.05	<0.05	<0.05	----	----



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Client sample ID

				BH7_3.0m	BH4_1.5D	BH6_3.0D	BH1_0.5m	BH1_1.0m
Client sampling date / time				13-Feb-2020 12:00	13-Feb-2020 10:30	13-Feb-2020 11:35	13-Feb-2020 08:55	13-Feb-2020 09:00
Compound	CAS Number	LOR	Unit	ES2005101-021	ES2005101-022	ES2005101-023	ES2005101-024	ES2005101-025
				Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued								
^ Endosulfan (sum)	115-29-7	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
4.4'-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
4.4'-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	<0.2	----	----
Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	<0.2	----	----
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/5 0-2	0.05	mg/kg	<0.05	0.11	<0.05	----	----
EP068B: Organophosphorus Pesticides (OP)								
Dichlorvos	62-73-7	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	<0.2	<0.2	----	----
Dimethoate	60-51-5	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
Diazinon	333-41-5	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	<0.2	<0.2	----	----
Malathion	121-75-5	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
Fenthion	55-38-9	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
Parathion	56-38-2	0.2	mg/kg	<0.2	<0.2	<0.2	----	----
Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
Prothiofos	34643-46-4	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
Ethion	563-12-2	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
Carbophenothion	786-19-6	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
EP075(SIM)A: Phenolic Compounds								
Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	<1	----	----



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Client sample ID

				BH7_3.0m	BH4_1.5D	BH6_3.0D	BH1_0.5m	BH1_1.0m
Client sampling date / time				13-Feb-2020 12:00	13-Feb-2020 10:30	13-Feb-2020 11:35	13-Feb-2020 08:55	13-Feb-2020 09:00
Compound	CAS Number	LOR	Unit	ES2005101-021	ES2005101-022	ES2005101-023	ES2005101-024	ES2005101-025
				Result	Result	Result	Result	Result
EP075(SIM)A: Phenolic Compounds - Continued								
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	<2	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Benzo(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	0.6	0.6	0.6	----	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	1.2	1.2	1.2	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	----	----
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	----	----
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<100	----	----
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH7_3.0m	BH4_1.5D	BH6_3.0D	BH1_0.5m	BH1_1.0m
Client sampling date / time					13-Feb-2020 12:00	13-Feb-2020 10:30	13-Feb-2020 11:35	13-Feb-2020 08:55	13-Feb-2020 09:00
Compound	CAS Number	LOR	Unit		ES2005101-021	ES2005101-022	ES2005101-023	ES2005101-024	ES2005101-025
					Result	Result	Result	Result	Result
EP080/071: Total Petroleum Hydrocarbons - Continued									
^ C10 - C36 Fraction (sum)	----	50	mg/kg		<50	<50	<50	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	<10	<10	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		<10	<10	<10	----	----
>C10 - C16 Fraction	----	50	mg/kg		<50	<50	<50	----	----
>C16 - C34 Fraction	----	100	mg/kg		<100	<100	<100	----	----
>C34 - C40 Fraction	----	100	mg/kg		<100	<100	<100	----	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		<50	<50	<50	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		<50	<50	<50	----	----
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	----	----
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
^ Sum of BTEX	----	0.2	mg/kg		<0.2	<0.2	<0.2	----	----
^ Total Xylenes	----	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
Naphthalene	91-20-3	1	mg/kg		<1	<1	<1	----	----
EP066S: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	0.1	%		79.5	86.7	72.2	----	----
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		93.2	123	107	----	----
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		102	131	69.4	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		84.2	85.6	83.8	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%		82.4	89.2	87.9	----	----
2,4,6-Tribromophenol	118-79-6	0.5	%		45.2	80.6	73.4	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		97.1	100	98.8	----	----
Anthracene-d10	1719-06-8	0.5	%		95.7	89.4	79.9	----	----
4-Terphenyl-d14	1718-51-0	0.5	%		102	104	100.0	----	----



Analytical Results

Sub-Matrix: **SOIL**
 (Matrix: **SOIL**)

Client sample ID

				BH7_3.0m	BH4_1.5D	BH6_3.0D	BH1_0.5m	BH1_1.0m
Client sampling date / time				13-Feb-2020 12:00	13-Feb-2020 10:30	13-Feb-2020 11:35	13-Feb-2020 08:55	13-Feb-2020 09:00
Compound	CAS Number	LOR	Unit	ES2005101-021	ES2005101-022	ES2005101-023	ES2005101-024	ES2005101-025
				Result	Result	Result	Result	Result
EP080S: TPH(V)/BTEX Surrogates								
1,2-Dichloroethane-D4	17060-07-0	0.2	%	103	96.8	105	----	----
Toluene-D8	2037-26-5	0.2	%	100.0	90.8	95.6	----	----
4-Bromofluorobenzene	460-00-4	0.2	%	102	96.6	102	----	----



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Client sample ID

				BH1_1.5m	BH1_2.0m	BH2_0.5m	BH2_1.0m	BH2_1.5m
Client sampling date / time				13-Feb-2020 09:10	13-Feb-2020 09:15	13-Feb-2020 09:30	13-Feb-2020 09:35	13-Feb-2020 09:40
Compound	CAS Number	LOR	Unit	ES2005101-026	ES2005101-027	ES2005101-028	ES2005101-029	ES2005101-030
				Result	Result	Result	Result	Result
EA037: Ass Field Screening Analysis								
ø pH (F)	----	0.1	pH Unit	5.6	5.8	6.7	8.1	8.4
ø pH (Fox)	----	0.1	pH Unit	3.5	3.9	4.9	5.7	5.7
ø Reaction Rate	----	1	-	4	2	2	3	3



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Client sample ID

				BH2_2.0m	BH3_0.5m	BH3_1.0m	BH3_1.5m	BH3_2.0m
Client sampling date / time				13-Feb-2020 09:43	13-Feb-2020 09:55	13-Feb-2020 10:00	13-Feb-2020 10:05	13-Feb-2020 10:15
Compound	CAS Number	LOR	Unit	ES2005101-031	ES2005101-032	ES2005101-033	ES2005101-034	ES2005101-035
				Result	Result	Result	Result	Result
EA037: Ass Field Screening Analysis								
ø pH (F)	----	0.1	pH Unit	8.5	7.4	6.9	7.8	9.1
ø pH (Fox)	----	0.1	pH Unit	9.2	5.1	4.5	5.6	8.2
ø Reaction Rate	----	1	-	4	2	2	2	4



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Client sample ID

				BH4_0.5m	BH4_1.0m	BH4_1.5m	BH4_2.0m	BH4_2.5m
Client sampling date / time				13-Feb-2020 10:25	13-Feb-2020 11:00	13-Feb-2020 10:35	13-Feb-2020 10:50	13-Feb-2020 10:55
Compound	CAS Number	LOR	Unit	ES2005101-036	ES2005101-037	ES2005101-038	ES2005101-039	ES2005101-040
				Result	Result	Result	Result	Result
EA037: Ass Field Screening Analysis								
ø pH (F)	----	0.1	pH Unit	8.0	7.0	5.7	5.1	4.9
ø pH (Fox)	----	0.1	pH Unit	5.5	3.3	3.4	3.4	2.4
ø Reaction Rate	----	1	-	4	2	2	2	2



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Client sample ID

				BH4_3.0m	BH5_0.5m	BH5_1.0m	BH5_1.5m	BH5_2.0m
Client sampling date / time				13-Feb-2020 10:40	13-Feb-2020 11:00	13-Feb-2020 11:10	13-Feb-2020 11:20	13-Feb-2020 11:30
Compound	CAS Number	LOR	Unit	ES2005101-041	ES2005101-042	ES2005101-043	ES2005101-044	ES2005101-045
				Result	Result	Result	Result	Result
EA037: Ass Field Screening Analysis								
ø pH (F)	----	0.1	pH Unit	6.8	7.2	6.9	6.4	4.6
ø pH (Fox)	----	0.1	pH Unit	5.4	4.5	3.4	3.6	3.0
ø Reaction Rate	----	1	-	2	2	4	2	2



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Client sample ID

				BH5_2.5m	BH5_3.0m	BH5_3.5m	BH6_0.5m	BH6_1.0m
Client sampling date / time				13-Feb-2020 11:25	13-Feb-2020 11:05	13-Feb-2020 11:40	13-Feb-2020 11:50	13-Feb-2020 12:15
Compound	CAS Number	LOR	Unit	ES2005101-046	ES2005101-047	ES2005101-048	ES2005101-049	ES2005101-050
				Result	Result	Result	Result	Result
EA037: Ass Field Screening Analysis								
ø pH (F)	----	0.1	pH Unit	4.6	5.8	6.4	6.9	6.7
ø pH (Fox)	----	0.1	pH Unit	3.1	4.1	5.2	5.9	3.0
ø Reaction Rate	----	1	-	2	2	2	2	4



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Client sample ID

				BH6_1.5m	BH6_2.0m	BH6_2.5m	BH6_3.0m	BH6_3.5m
Client sampling date / time				13-Feb-2020 12:00	13-Feb-2020 12:28	13-Feb-2020 12:30	13-Feb-2020 12:15	13-Feb-2020 12:22
Compound	CAS Number	LOR	Unit	ES2005101-051	ES2005101-052	ES2005101-053	ES2005101-054	ES2005101-055
				Result	Result	Result	Result	Result
EA037: Ass Field Screening Analysis								
ø pH (F)	----	0.1	pH Unit	6.5	7.0	6.0	5.7	5.3
ø pH (Fox)	----	0.1	pH Unit	2.8	3.3	3.8	5.0	4.5
ø Reaction Rate	----	1	-	4	4	2	3	2



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Client sample ID

				BH6_4.0m	BH7_0.5m	BH7_1.0m	BH7_1.5m	BH7_2.0m
Client sampling date / time				13-Feb-2020 12:18	13-Feb-2020 11:50	13-Feb-2020 12:20	13-Feb-2020 12:00	13-Feb-2020 12:20
Compound	CAS Number	LOR	Unit	ES2005101-056	ES2005101-057	ES2005101-058	ES2005101-059	ES2005101-060
				Result	Result	Result	Result	Result
EA037: Ass Field Screening Analysis								
ø pH (F)	----	0.1	pH Unit	5.9	9.0	7.8	7.5	6.7
ø pH (Fox)	----	0.1	pH Unit	5.2	7.9	4.3	3.8	3.6
ø Reaction Rate	----	1	-	2	4	2	3	2



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Client sample ID

				BH7_2.5m	BH7_3.0m	BH7_3.5m	BH7_4.0m	BH5_2.0D
Client sampling date / time				13-Feb-2020 12:30	13-Feb-2020 12:05	13-Feb-2020 12:25	13-Feb-2020 12:25	13-Feb-2020 11:30
Compound	CAS Number	LOR	Unit	ES2005101-061	ES2005101-062	ES2005101-063	ES2005101-064	ES2005101-065
				Result	Result	Result	Result	Result
EA037: Ass Field Screening Analysis								
ø pH (F)	----	0.1	pH Unit	6.5	5.6	5.5	5.4	4.6
ø pH (Fox)	----	0.1	pH Unit	3.5	3.6	3.6	4.8	3.7
ø Reaction Rate	----	1	-	4	2	2	2	4



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Client sample ID

				BH6_1.5D	BH7_0.5D	BH6_0.5D	BH7_3.0D	BH5_3.5D
Client sampling date / time				13-Feb-2020 12:00	13-Feb-2020 11:50	13-Feb-2020 11:50	13-Feb-2020 12:05	13-Feb-2020 08:55
Compound	CAS Number	LOR	Unit	ES2005101-066	ES2005101-067	ES2005101-068	ES2005101-069	ES2005101-070
				Result	Result	Result	Result	Result
EA037: Ass Field Screening Analysis								
ø pH (F)	----	0.1	pH Unit	6.2	9.1	7.1	5.6	6.2
ø pH (Fox)	----	0.1	pH Unit	3.2	7.5	6.8	4.6	4.7
ø Reaction Rate	----	1	-	4	4	4	2	3

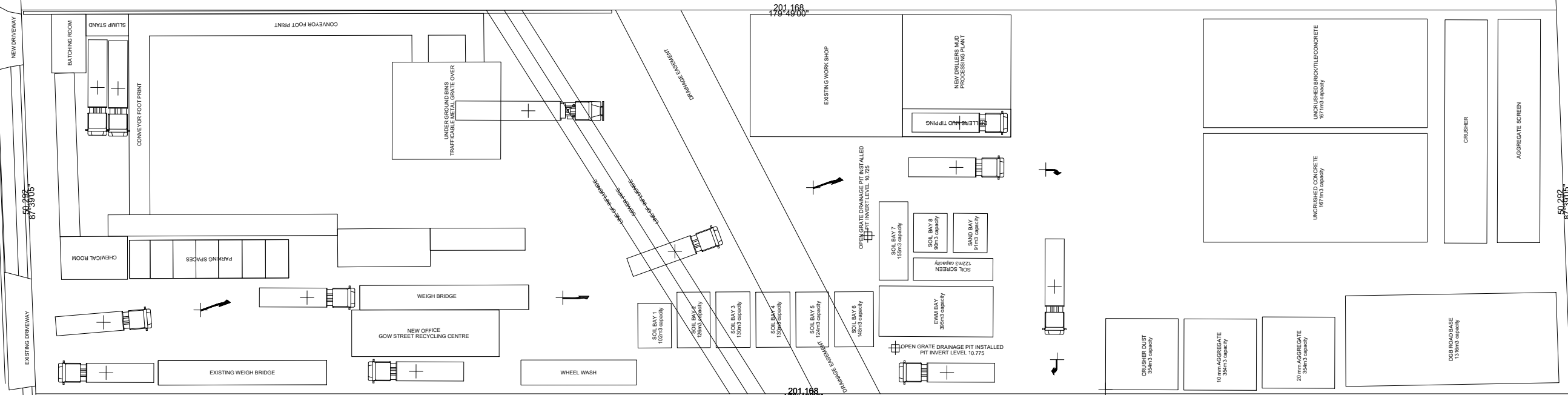


Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP066S: PCB Surrogate			
Decachlorobiphenyl	2051-24-3	39	149
EP068S: Organochlorine Pesticide Surrogate			
Dibromo-DDE	21655-73-2	49	147
EP068T: Organophosphorus Pesticide Surrogate			
DEF	78-48-8	35	143
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	63	123
2-Chlorophenol-D4	93951-73-6	66	122
2,4,6-Tribromophenol	118-79-6	40	138
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	70	122
Anthracene-d10	1719-06-8	66	128
4-Terphenyl-d14	1718-51-0	65	129
EP080S: TPH(V)/BTEX Surrogates			
1,2-Dichloroethane-D4	17060-07-0	73	133
Toluene-D8	2037-26-5	74	132
4-Bromofluorobenzene	460-00-4	72	130



GOW STREET



NOTES:
ALL LEVELS SHOWN TO AHD 71
VOLUMES DERIVED FROM 4.0m HEIGHT LIMIT
SURVEYED 26/10/2019
SURVEYOR CHAD FERRETT SSSI #8617

PROJECT NAME:
PROJECT NUMBER:
GOW STREET RECYCLING CENTRE
85 GOW ST PADSTOW DETAIL SURVEY
LOT A DP 103140



A3 HORZ SCALE: 1 : 600
A3 VERT SCALE: 1 : 600

DRAINAGE MODEL:
DESIGN A.R.I. (years):



DRAWING: GOW ST DETAIL 001
SHEET: 1
CHAINAGE: CH to CH
DESIGNER:
REVISION: 1