

10 November 2020

**Mackellar Excavations**

PO Box 259  
16 Torrens Road  
Gunnedah NSW 2380

Attention: **Jacques Lotter**

**Waste classification of stockpiled material –  
85 Byron Road and 63 Ingleburn Road, Leppington NSW.**

## 1 INTRODUCTION & BACKGROUND

Environmental Earth Sciences NSW were commissioned by Mackellar Excavations Pty Ltd (MEX) to characterise and manage materials at the site surface at 85 Byron Road and 63 Ingleburn Road, Leppington NSW (the “site”).

Assessment was required in order to classify the fly-tipped surface material located in the central area of site, for offsite disposal. The site locality is presented on **Figure 1** at the rear of this report.

## 2 OBJECTIVE

Undertake chemical characterisation of stockpiled material at the site surface to provide waste classification and disposal advice in accordance with NSW EPA (2014) - *Waste Classification Guidelines: Part 1 – Classifying Waste* (the “Waste Guidelines”).

## 3 APPLICABLE CRITERIA

### 3.1 Chemical criteria

Waste classification was undertaken in accordance with the Waste Guidelines. The following statistical values were derived if required:

- Maximum, minimum and mean.
- Coefficient of variation.
- Standard deviation.
- 95% upper confidence limit (UCL) of the arithmetic mean (95% UCL).



Where results were reported below the laboratory limit of reporting (<LOR), the LOR value was substituted as the concentration to apply a level of conservatism for statistical appraisal. The Waste Guidelines initially require analytical results for contaminants to be compared to the following contaminant threshold (CT) total concentrations for classification:

- value < CT1 = general solid waste (GSW).
- value > CT1, but below CT2 = restricted solid waste (RSW).
- value > CT2 = hazardous waste (HAZ).

If the total concentration for a contaminant exceeds the CT1 or CT2 threshold, the potential leachability of the contaminant (using the toxicity characteristic leaching procedure – TCLP) can be used in conjunction with the specific contaminant concentrations (SCC) to derive a waste classification with regard to potential leachate risk:

- value < SCC1 / TCLP1 = GSW.
- value > SCC1 / TCLP1 but below SCC2 / TCLP2 = RSW.
- value > SCC2 / TCLP2 = HAZ.

If the presence of asbestos is confirmed, the classification of ‘Special Waste – Asbestos’ is applied in addition to the classification derived from chemical analysis as explained above.

### 3.2 Sample frequency requirements

The minimum sampling densities for chemical characterisation of soil material for waste classification purposes is summarised in the **Table 1**.

**Table 1: Material volumes and required sample frequency**

Soil volume (m3)	No. of samples at (1:25 m3)	Minimum sampling frequency utilising 95% UCL
25	3	-
50	3	-
75	3	-
100	4	-
125	5	-
150	6	-
175	7	-
200	8	-
>200 -2,500	-	10 **
>2,500	-	1 sample : 250 m3 **
<b>Soil volume (m3)</b>	<b>No. of samples at (1:25 m3)</b>	<b>Minimum sampling frequency utilising 95% UCL</b>

**Notes:** \*\* 10 samples is considered suitable for classifying up to 2,500 m<sup>3</sup> of material using statistical appraisal including the 95% Upper Confidence Limit of the data set for each analyte.

## 4 SCOPE OF WORKS

### 4.1 Fieldworks

Environmental Earth Sciences representatives completed a walkover of the whole site on 28 October 2020. This confirmed the presence of fly-tipped stockpiled located in the central portion of site, and one grass covered stockpile in the central eastern portion of site nearby Byron Road.

Material was characterised in to four separate classes of soil (ID: Group 1-4) with soil descriptions and inclusions noted. Volume calculations were conducted, and samples were collected from each material group in compliance with **Table 1**. Results are discussed in Section 5.

### 4.2 Laboratory analysis

All samples were analysed at ALS Environmental Pty Ltd Smithfield for the following analytes:

- Heavy metals (As, Cd, CrTOTAL, Cu, Hg, Ni, Pb and Zn).
- Total recoverable hydrocarbons (TRH) (Fractions C6-C36).
- Benzene, toluene, ethylbenzene and total xylenes (BTEX).
- Polycyclic aromatic hydrocarbons (PAH).
- Organochlorine pesticides (OC)
- Organophosphorus pesticides (OP)
- Polychlorinated Biphenyls (PCBs)

All samples were analysed at Australian Safer Environment and Technology Pty Ltd (ASET) for the following analyses:

- Asbestos (presence/ absence in soil).

Additional assessment was undertaken to ascertain potential leachability using the toxicity characteristic leaching procedure (TCLP), as initially reported total concentrations were above general solid waste (GSW) thresholds:

- Leachable lead for ten samples (ID: Group 3-1, Group 3-2, Group 3-3, Group 3-6, Group 3-7, Group 3-8, Group 3-9, Group 3-11, Group 3-12 and Group 4-2).
- Leachable chromium for four samples (ID: Group 3-7, Group 3-9, Group 3-11, Group 3-12).
- Leachable benzo(a)pyrene (BaP) for four samples (ID: Group 3-3, Group 3-4, Group 3-7, Group 3-11).

## 5 RESULTS

### 5.1 Observations

After a visual assessment of all fly-tipped material, it was characterised into four different groups to be sampled and classified for disposal separately. **Table 2** includes a material description for each group, the number of small stockpiles which comprise the material group and volume estimates. Photo plates (**Attachment 1**) present photos of each representative material group. **Figure 2** shows an overview of sample locations and Groups 1-4.

**Table 2: Stockpile material observations**

Group #	Material Description	No. of Stockpiles	~ Volume (m <sup>3</sup> )
1	<b>REWORKED NATURAL:</b> Soft brown-red-grey CLAY with shale gravels. No observed visual and/or olfactory signs of contamination.	10	~ 60m <sup>3</sup>
2	<b>REWORKED NATURAL:</b> Loose brown-yellow SAND with inclusions of sandstone gravels, cobbles and boulders. No observed visual and/or olfactory signs of contamination.	10	~ 75 m <sup>3</sup>
3	<b>FILL:</b> Brown clayey sand with inclusions of potential asbestos containing material (PACM) fragments, tyres, glass bottles and fragments, plastic sheets, timber, cement, concrete cobbles, bricks, scrap metal.	33	~ 247.5 m <sup>3</sup>
4	<b>REWORKED NATURAL:</b> Soft dark brown loam. No inclusions observed; however, the stockpile was completely covered in grass.	1	~ 12 m <sup>3</sup>

### 5.2 Laboratory results

Results of laboratory analyses against Waste Criteria are summarised in the following tables:

- Analytes compared to CT criteria (**Table A** in **Attachment 3**).
- Analytes compared to SCC / TCLP criteria (**Table B** in **Attachment 3**).

Full laboratory transcripts and chain of custody documentation are presented in **Attachment 3**.

#### 5.2.1 GROUP 1

Results reported all analytes below either the laboratory limit of reporting and/or below applicable threshold for General Solid Waste (GSW).

No asbestos was observed or detected in this material.

#### 5.2.2 GROUP 2

Results reported all analytes below either the laboratory limit of reporting and/or below applicable threshold for GSW.

No asbestos was observed or detected in this material.

### 5.2.3 GROUP 3

Results reported all analytes below either the laboratory limit of reporting and/or below applicable threshold for GSW with the exception of the following:

- Cadmium (ID: Group3-8 and Group3-9)
- Chromium (ID: Group 3-7, Group 3-9, Group 3-11, Group 3-12).
- Lead (ID: Group 3-1, Group 3-2, Group 3-3, Group 3-6, Group 3-7, Group 3-8, Group 3-9, Group 3-11, Group 3-12).
- B(A)p (ID: Group 3-3, Group 3-4, Group 3-7, Group 3-11).

Asbestos results are reported as follows:

- Asbestos in soil (ID: Group 3-1, Group 3-3, Group 3-4, Group 3-6, Group 3-7, Group 3-8, Group 3-9, Group 3-11, Group 3-12). Confirmed to be in bonded, loose fibres and friable form.
- Asbestos in materials (ID: PACM-1, PACM-2, PACM-3)

### 5.2.4 GROUP 4

Results reported all analytes below either the laboratory limit of reporting and/or below applicable threshold for GSW with the exception of the following:

- Lead (ID: Group 4-2).

No asbestos was observed or detected in this material.

## 5.3 Statistical results

To chemically characterise the material, statistical assessment (including calculation of the 95% UCL<sub>AVERAGE</sub>) was undertaken for the dataset for Total Recoverable Hydrocarbons (TRH) and Cadmium and as shown in **Table 3** are within acceptable chemical limits for GSW. Complete statistical output is located in **Attachment 4**.

**Table 3: Statistical calculations summary**

Analyte	Count	Min.	Max.	Mean	Standard Deviation	Coefficient of Variation	95% UCL <sub>AVERAGE</sub>
Cadmium	10	1	25	9	8.406	0.934	13.87
TRH	10	50	13500	3640	4231	1.162	6093

#### 5.4 TCLP Laboratory results

Based upon the abovementioned exceedances for lead, chromium and BaP, which failed statistical testing, additional analyses using TCLP was undertaken to ascertain the respective leachable concentrations. Results of this additional analyses reported concentrations for lead, chromium and B(a)P within acceptable SCC1 / TCLP1 for selected samples tested from Group 3 and Group 4.

## 6 CONCLUSIONS AND RECOMMENDATIONS

### 6.1 Offsite management

Based on the findings and results of this assessment the following options for offsite management have been made and summarised in **Table 4**:

**Table 4: Waste classification**

Group #	~ Volume (m <sup>3</sup> )	Chemical classification	Special waste
1	60	General Solid Waste	No
2	75	General Solid Waste	No
3	247.5	General Solid Waste	YES – Special waste asbestos*
4	12	General Solid Waste	No

**Note:** \*Asbestos was found in bonded, friable and fibrous form in Group 3 samples.

The following general information in-line with the POEO Act should be considered if offsite management is opted:

- Material must be transported to a facility that is licensed to accept the class of waste.
- Approval to accept the material must be provided by the receiving facility prior to shipment.
- Material must be weighed prior to dispatch at the receiving facility (as standard).
- This waste classification advice letter and any waste tracking documentation (including weighbridge dockets), must be kept by the generator and receiver of this waste for a minimum period of 7 years.

For further information on EPA NSW waste classification and waste regulations refer to <https://www.epa.nsw.gov.au/your-environment/waste/classifying-waste/waste-classification-guidelines>.

## 6.2 Asbestos removal works

Any asbestos removal works must be performed in accordance with all legislative requirements. The statutory requirements for asbestos removal are prescribed in the *Section 274* of the Work Health and Safety Act (2011) (WHS Act). A summary of procedures for appropriate removal of asbestos is provided below:

- All contractors are to ensure that they have the correct PPE for the asbestos removal task, including appropriate handling gloves, P3 respirators and disposable overalls (all PPE to be sealed in a bag with contaminated material and removed and disposed appropriately).
- Impacted areas should be isolated and barricaded prior to removal works commencing with signage erected.
- Only appropriate licensed and competent contractors will remove/dispose of asbestos. In the case of AF / FA, only a SafeWork NSW 'Class A' licensed asbestos removalist may undertake these works. Qualifications of the individuals are to be obtained and checked prior to any removal work commencing.
- The preferred SafeWork NSW 'Class A' licensed asbestos removalist to provide a detailed Asbestos Removal Control Plan (ARCP) for the intended works for review by the construction project manager (or delegate) prior to commencement.
- All hazardous materials, including PPE, will be sent to a licensed facility as soon as possible with full waste transfer traceability.
- All vehicles and equipment which have (or potentially have) come into contact with asbestos materials will be cleaned down in a designated decontamination area prior to exiting the work zone.
- The waste shall be tracked and disposed of at a landfill carrying a license appropriate for the type of waste needed to be disposed of. In accordance with NSW legislation the waste class (type of waste) shall be predetermined through testing prior to disposal. To demonstrate proof of appropriate disposal, copies of waste disposal receipts are to be kept for inspection by SafeWork NSW, NSW EPA, the local council or project team.

## 7 LIMITATIONS

This report has been prepared by Environmental Earth Sciences NSW ACN 109 404 006 in response to and subject to the following limitations:

1. The specific instructions received from Mackellar Excavations Pty Ltd;
2. The specific scope of works set out in PO120181\_V1 (dated 28 August 2020) issued by Environmental Earth Sciences NSW via email for and on behalf of Mackellar Excavations Pty Ltd;

3. May not be relied upon by any third party not named in this report for any purpose except with the prior written consent of Environmental Earth Sciences NSW (which consent may or may not be given at the discretion of Environmental Earth Sciences NSW);
4. This report comprises the formal report, documentation sections, tables, figures and appendices as referred to in the index to this report and must not be released to any third party or copied in part without all the material included in this report for any reason;
5. The report only relates to the site referred to in the scope of works being located at 85 Byron Road and 63 Ingleburn Road, Leppington NSW (“the site”);
6. The report relates to the site as at the date of the report as conditions may change thereafter due to natural processes and/or site activities;
7. No warranty or guarantee is made in regard to any other use than as specified in the scope of works and only applies to the depth tested and reported in this report;
8. Fill, soil, groundwater and rock to the depth tested on the site may be fit for the use specified in this report. Unless it is expressly stated in this report, the fill, soil and/or rock may not be suitable for classification as clean fill, excavated natural material (ENM) or virgin excavated natural material (VENM) if deposited off site;
9. This report is not a geotechnical or planning report suitable for planning or zoning purposes; and
10. Our General Limitations set out at the back of the body of this report.

Should you have any queries, please do not hesitate to contact us on (02) 9922 1777.

For and on behalf of  
**Environmental Earth Sciences NSW**

**Author**  
Nina Potts  
Environmental Scientist

**Project Director / Internal Reviewer**  
James Barwood  
NSW Manager

**Co-Author / Project Manager**  
Natalie Eldridge  
Environmental Scientist

120110\_WASTE No.1\_V1

FIGURES

- ATTACHMENT 1 – Photo plates
- ATTACHMENT 2 – Results summary tables
- ATTACHMENT 3 – Complete laboratory transcripts
- ATTACHMENT 4 – Statistical analysis

## 8 REFERENCES

GeoEnviro Consultancy Pty Ltd (GeoEnviro) (May 2019a) – *Stage 1 and 2 Contamination Assessment Proposed New Amity College Campus Lot 1 DP 525996 No 85 Byron Rd and Lot 2 DP 525996 No 63 Ingleburn Road Leppington NSW* (ref: JC18322AB-rl(rev2), dated 30 May 2019).

GeoEnviro (May 2019b) – *Remediation Action Plan (RAP) Proposed New Amity College Campus Lot 1 DP 525996 No 85 Byron Rd and Lot 2 DP 525996 No 63 Ingleburn Road Leppington NSW* (ref: JC18322B-rl(rev2), dated 30 May 2019).

NSW EPA (2014) - *Waste classification guidelines: Part 1 – Classifying Waste*.

NSW Government - *Work Health and Safety Act* (2011)

# ENVIRONMENTAL EARTH SCIENCES GENERAL LIMITATIONS

## **Scope of services**

The work presented in this report is Environmental Earth Sciences response to the specific scope of works requested by, planned with and approved by the client. It cannot be relied on by any other third party for any purpose except with our prior written consent. Client may distribute this report to other parties and in doing so warrants that the report is suitable for the purpose it was intended for. However, any party wishing to rely on this report should contact us to determine the suitability of this report for their specific purpose.

## **Data should not be separated from the report**

A report is provided inclusive of all documentation sections, limitations, tables, figures and appendices and should not be provided or copied in part without all supporting documentation for any reason, because misinterpretation may occur.

## **Subsurface conditions change**

Understanding an environmental study will reduce exposure to the risk of the presence of contaminated soil and or groundwater. However, contaminants may be present in areas that were not investigated, or may migrate to other areas. Analysis cannot cover every type of contaminant that could possibly be present. When combined with field observations, field measurements and professional judgement, this approach increases the probability of identifying contaminated soil and or groundwater. Under no circumstances can it be considered that these findings represent the actual condition of the site at all points.

Environmental studies identify actual sub-surface conditions only at those points where samples are taken, when they are taken. Actual conditions between sampling locations differ from those inferred because no professional, no matter how qualified, and no sub-surface exploration program, no matter how comprehensive, can reveal what is hidden below the ground surface. The actual interface between materials may be far more gradual or abrupt than an assessment indicates. Actual conditions in areas not sampled may differ from that predicted. Nothing can be done to prevent the unanticipated. However, steps can be taken to help minimize the impact. For this reason, site owners should retain our services.

## **Problems with interpretation by others**

Advice and interpretation is provided on the basis that subsequent work will be undertaken by Environmental Earth Sciences NSW. This will identify variances, maintain consistency in how data is interpreted, conduct additional tests that may be necessary and recommend solutions to problems encountered on site. Other parties may misinterpret our work and we cannot be responsible for how the information in this report is used. If further data is collected or comes to light we reserve the right to alter their conclusions.

## **Obtain regulatory approval**

The investigation and remediation of contaminated sites is a field in which legislation and interpretation of legislation is changing rapidly. Our interpretation of the investigation findings should not be taken to be that of any other party. When approval from a statutory authority is required for a project, that approval should be directly sought by the client.

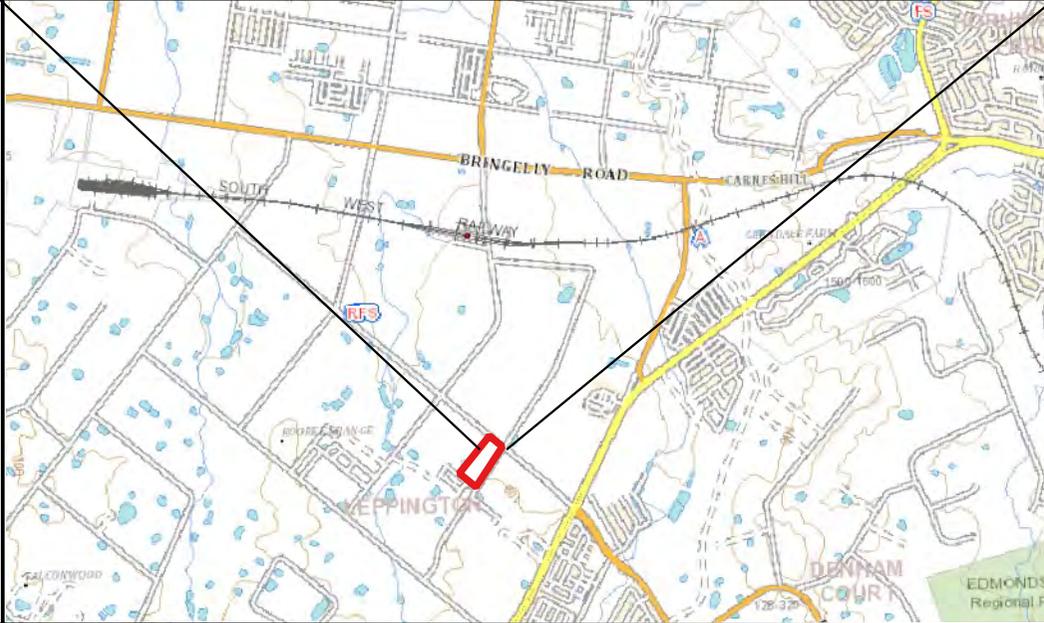
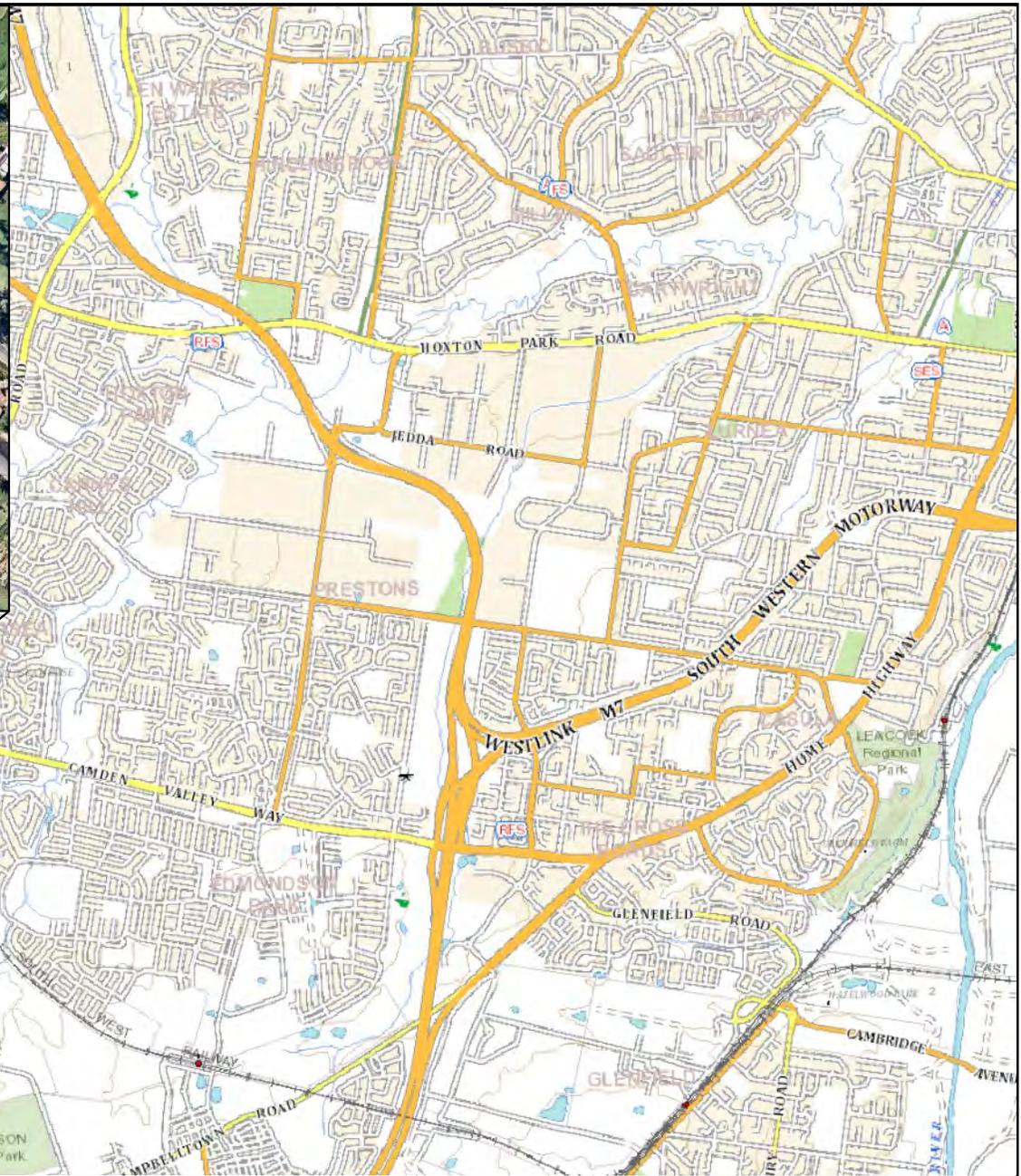
## **Limit of liability**

This study has been carried out to a particular scope of works at a specified site and should not be used for any other purpose. This report is provided on the condition that Environmental Earth Sciences NSW disclaims all liability to any person or entity other than the client in respect of anything done or omitted to be done and of the consequence of anything done or omitted to be done by any such person in reliance, whether in whole or in part, on the contents of this report. Furthermore, Environmental Earth Sciences NSW disclaims all liability in respect of anything done or omitted to be done and of the consequence of anything done or omitted to be done by the client, or any such person in reliance, whether in whole or any part of the contents of this report of all matters not stated in the brief outlined in Environmental Earth Sciences NSW's proposal number and according to Environmental Earth Sciences general terms and conditions and special terms and conditions for contaminated sites.

To the maximum extent permitted by law, we exclude all liability of whatever nature, whether in contract, tort or otherwise, for the acts, omissions or default, whether negligent or otherwise for any loss or damage whatsoever that may arise in any way in connection with the supply of services. Under circumstances where liability cannot be excluded, such liability is limited to the value of the purchased service.

## FIGURES

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**Legend**  
 site boundary



0 1 2 km  


Coordinate Reference System: GDA 94  
 Projection: Transverse Mercator (MGA zone 54)  
 Datum: GDA 94

 ENVIRONMENTAL EARTH SCIENCES  
 CONTAMINATION RESOLVED

Client: **Mackellar Excavations Pty Ltd**  
 Drawn By: **NP**  
 Project Manager: **NE**  
 Reviewed by: **JB**

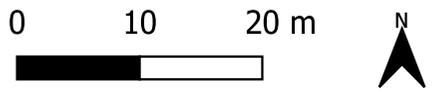
Scale: **as shown**  
 Date: **Oct 2020**

Title: **Site Location**  
 Location: **85 Byron Rd, Leppington NSW**  
 Job No: **120110**  
 Source: **QGIS, Nearmap March 2019**

**Figure 1**



- Sampling locations
- ▭ site boundary
- ▨ group 3 stockpiles
- ▨ group 2 stockpiles
- ▨ group 1 stockpiles
- ▨ group 4 stockpile



Coordinate Reference System: GDA 94  
 Projection: Transverse Mercator (MGA zone 56)  
 Datum: GDA 94



Client: **Mackellar Excavations Pty Ltd**  
 Drawn By: **NP**  
 Project Manager: **NE**  
 Reviewed by: **JB**

Scale: **as shown**  
 Date: **Nov 2020**

Title: **Stockpiled material sampling locations**

Location: **85 Byron Rd, Leppington NSW**

Job No: **120110**

Source: **QGIS, Nearmap**

**Figure 2**

## ATTACHMENT 1 – PHOTO PLATES

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**Photo plate 1** – Background = Representative stockpiled material for Group 1  
Foreground = Special waste tyres



**Photo plate 2** – Representative material for GROUP 2



**Photo plate 3** – Representative material for GROUP 3



**Photo plate 4** – PACM located within GROUP 3 stockpiles.



**Photo plate 5** – Photo of grass covered stockpile (GROUP 4)



## ATTACHMENT 2 – RESULTS SUMMARY TABLES

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**TABLE B - WASTE RESULTS SUMMARY (SCC / TCLP)**

Sample ID: Matrix: Sample date: TSSC/TCLP Units:	Group 3 - 1		Group 3 - 2		Group 3 - 3		Group 3 - 4		Group 3 - 6		Group 3 - 7		Group 3 - 8		Group 3 - 9		Group 3 - 11		Group 3 - 12		Group 4 - 2					
	Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil					
	29/10/2020		29/10/2020		29/10/2020		29/10/2020		29/10/2020		29/10/2020		29/10/2020		29/10/2020		29/10/2020		29/10/2020		29/10/2020					
	SCC	TCLP	SCC	TCLP	SCC	TCLP	SCC	TCLP	SCC	TCLP	SCC	TCLP	SCC	TCLP	SCC	TCLP	SCC	TCLP	SCC	TCLP	SCC	TCLP	SCC	TCLP		
mg/kg		mg/L		mg/kg		mg/L		mg/kg		mg/L		mg/kg		mg/L		mg/kg		mg/L		mg/kg		mg/L				
Analyte grouping/Analyte	GSW SCC1	GSW TCLP1	RSW SCC2	RSW TCLP2	HAZ >SSC2	HAZ >TCLP2																				
Heavy metals	mg/kg	mg/L	mg/kg	mg/L	mg/kg	mg/L																				
Chromium	< 1,900	< 5	1,900 - 7,600	5 - 20	> 7,600	>20	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---			
Lead	< 1,500	< 5	1,500 - 6,000	5 - 20	> 6,000	>20	309	<0.1	139	<0.1	223	<0.1	---	---	171	0.6	618	0.2	256	<0.1	376	<0.1	430	<0.1		
Polycyclic Aromatic Hydrocarbons	mg/kg	µg/L	mg/kg	µg/L	mg/kg	µg/L																				
Benzo(a)pyrene	< 10	< 40	10 - 23	40 - 160	> 23	> 160	---	---	---	---	0.9	<0.5	0.9	<0.5	---	---	0.8	<0.5	---	---	---	---	1.2	<0.5	---	---

**Notes:**

- LOR Laboratory limit of reporting
- SCC Specific contaminant concentration
- GSW General Solid Waste classification
- RSW Restricted Solid Waste classification
- HAZ Hazardous Waste classification
- TCLP Toxicity characteristic leaching procedure
- mg/kg Milligrams per kilogram
- mg/L Milligrams per litre
- µg/L Micrograms per litre

Guideline values from NSW EPA (2014) - Waste classification guidelines

Shaded results equal exceedance of particular criteria

NOTE: Where samples did not exceed CT1, their SCC was only presented in TABLE A

## ATTACHMENT 3 – LABORATORY TRANSCRIPTS

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Our ref : ASET89217 / 92397 / 1 - 23  
Your ref : 120110 - Leppington  
**NATA Accreditation No: 14484**

30 October 2020

Environmental & Earth Sciences  
P O Box 380  
North Sydney NSW 2059



**Attn: Ms Natalie Eldridge**

**Accredited for compliance with ISO/IEC 17025 - Testing.**

Dear Natalie

**Asbestos Identification**

This report presents the results of twenty three samples, forwarded by Environmental & Earth Sciences on 29 October 2020, for analysis for asbestos.

**1.Introduction:** Twenty three samples forwarded were examined and analysed for the presence of asbestos.

**2. Methods :** The samples were examined under a Stereo Microscope and selected fibres were analysed by Polarized Light Microscopy in conjunction with Dispersion Staining method (**Australian Standard AS 4964 - 2004 and Safer Environment Method 1 as the supplementary work instruction**) (**Qualitative Analysis only**).

**3. Results :** **Sample No. 1. ASET89217 / 92397 / 1. 120110 - GROUP1-1.**

Approx dimensions 8.0 cm x 8.0 cm x 5.0 cm

The sample consisted of a mixture of clayish soil, char, shale, fragments of sandstone, stones and plant matter.

**No asbestos detected.**

**Sample No. 2. ASET89217 / 92397 / 2. 120110 - GROUP1-2.**

Approx dimensions 8.0 cm x 8.0 cm x 3.5 cm

The sample consisted of a mixture of clayish soil, char, fragments of sandstone, organic fibres, stones and plant matter.

**No asbestos detected.**

**Sample No. 3. ASET89217 / 92397 / 3. 120110 - GROUP1-3.**

Approx dimensions 8.0 cm x 8.0 cm x 4.0 cm

The sample consisted of a mixture of clayish soil, organic fibres, fragments of sandstone, char, stones and plant matter.

**No asbestos detected.**

**Sample No. 4. ASET89217 / 92397 / 4. 120110 - GROUP2-1.**

Approx dimensions 8.0 cm x 8.0 cm x 3.7 cm

The sample consisted of a mixture of clayish soil, char, organic fibres, fragments of sandstone, stones and plant matter.

**No asbestos detected.**

**Sample No. 5. ASET89217 / 92397 / 5. 120110 - GROUP2-2.**

Approx dimensions 8.0 cm x 8.0 cm x 3.7 cm

The sample consisted of a mixture of clayish sandy soil, wood chips, organic fibres, char, fragments of sandstone, stones and plant matter.

**No asbestos detected.**



**Sample No. 6. ASET89217 / 92397 / 6. 120110 - GROUP2-3.**

Approx dimensions 8.0 cm x 8.0 cm x 3.8 cm

The sample consisted of a mixture of clayish sandy soil, wood chips, char, organic fibres, fragments of sandstone, stones and plant matter.

**No asbestos detected.**

**Sample No. 7. ASET89217 / 92397 / 7. 120110 - GROUP2-4.**

Approx dimensions 8.0 cm x 8.0 cm x 3.5 cm

The sample consisted of a mixture of sandy soil, wood chips, char, organic fibres, fragments of sandstone, stones and plant matter.

**No asbestos detected.**

**Sample No. 8. ASET89217 / 92397 / 8. 120110 - GROUP3-1.**

Approx dimensions 8.0 cm x 8.0 cm x 3.6 cm

The sample consisted of a mixture of sandy soil, stones, char, fragments of fibre cement<sup>\*1</sup> (Approximate dimensions = 5.0cm x 3.2cm x 0.6cm), wood chips, fibre cement<sup>\*2</sup> (Approximate dimensions = 1.6cm x 0.7cm x 0.4cm), fibres<sup>^</sup>, synthetic mineral fibres, soft fibrous material containing organic fibres, fragments of brick, cement, sandstone and plant matter.

**Chrysotile<sup>^, \*1, \*2</sup> (Approximate estimated weight as loose fibres = 0.0003g) asbestos, Amosite<sup>\*1</sup> asbestos and Crocidolite<sup>^, \*1</sup> (Approximate estimated weight as loose fibres = 0.0004g) asbestos detected.**

**Sample No. 9. ASET89217 / 92397 / 9. 120110 - GROUP3-2.**

Approx dimensions 8.0 cm x 8.0 cm x 3.6 cm

The sample consisted of a mixture of sandy soil, stones, wood chips, char, organic fibres, fragments of cement, brick, sandstone and plant matter.

**No asbestos detected.**

**Sample No. 10. ASET89217 / 92397 / 10. 120110 - GROUP3-3.**

Approx dimensions 8.0 cm x 8.0 cm x 3.8 cm

The sample consisted of a mixture of sandy soil, stones, char, fragments of fibre cement<sup>\*1</sup> (Approximate dimensions = 1.5cm x 1.5cm x 0.5cm), fibro plaster<sup>#</sup> (Approximate dimensions = 1.2cm x 1.2cm x 0.4cm), fibre cement<sup>\*2</sup> (Approximate dimensions = 0.9cm x 0.5cm x 0.2cm), soft fibrous material containing organic fibres and plant matter.

**Chrysotile<sup>#, \*1, \*2</sup> asbestos, Amosite<sup>#</sup> asbestos and Crocidolite<sup>#</sup> asbestos detected.**

**Sample No. 11. ASET89217 / 92397 / 11. 120110 - GROUP3-4.**

Approx dimensions 8.0 cm x 8.0 cm x 3.8 cm

The sample consisted of a mixture of clayish sandy soil, stones, char, glass pieces, fragments of fibre cement\* (Approximate dimensions = 4.0cm x 1.8cm x 0.5cm), cement, sandstone, soft fibrous material containing organic fibre, wood chips and plant matter.

**Chrysotile\* asbestos and Crocidolite\* asbestos detected.**

**Sample No. 12. ASET89217 / 92397 / 12. 120110 - GROUP3-6.**

Approx dimensions 8.0 cm x 8.0 cm x 4.0 cm

The sample consisted of a mixture of sandy soil, stones, char, ceramic tiles, glass pieces, fragments of fibre cement\* (Approximate dimensions = 1.5cm x 1.0cm x 0.2cm), synthetic mineral fibres, soft fibrous material containing organic fibres, wood chips and plant matter.

**Chrysotile\* asbestos detected.**

**Sample No. 13. ASET89217 / 92397 / 13. 120110 - GROUP3-7.**

Approx dimensions 8.0 cm x 8.0 cm x 3.7 cm

The sample consisted of a mixture of sandy soil, stones, char, wood chips, synthetic mineral fibres, fragments of fibre cement\* (Approximate dimensions = 5.7cm x 3.4cm x 0.5cm), brick, soft fibrous material containing organic fibres and plant matter.

**Chrysotile\* asbestos detected.**

**Sample No. 14. ASET89217 / 92397 / 14. 120110 - GROUP3-8.**

Approx dimensions 8.0 cm x 8.0 cm x 3.7 cm

The sample consisted of a mixture of sandy soil, char, wood chips, synthetic mineral fibres, fragments of fibre cement<sup>\*1</sup> (Approximate dimensions = 6.0cm x 2.4cm x 0.5cm), fibre cement<sup>\*2</sup> (Approximate dimensions = 5.5cm x 3.0cm x 0.5cm), fibre cement<sup>\*3</sup> (Approximate dimensions = 4.1cm x 2.4cm x 0.5cm), soft fibrous material containing organic fibres, stones and plant matter.

**Chrysotile<sup>\*1, \*2, \*3</sup> asbestos, Amosite<sup>\*1, \*2, \*3</sup> asbestos and Crocidolite<sup>\*1, \*2, \*3</sup> asbestos detected.**

**Sample No. 15. ASET89217 / 92397 / 15. 120110 - GROUP3-9.**

Approx dimensions 8.0 cm x 8.0 cm x 4.0 cm

The sample consisted of a mixture of sandy soil, stones, char, synthetic mineral fibres, fragments of fibre cement<sup>\*1</sup> (Approximate dimensions = 4.5cm x 3.0cm x 0.6cm), fibre cement<sup>\*2</sup> (Approximate dimensions = 1.2cm x 0.6cm x 0.3cm), fibres<sup>^</sup>, soft fibrous material containing organic fibres, wood chips, brick, cement, sandstone and plant matter.

**Chrysotile<sup>\*1, \*2</sup> asbestos, Amosite<sup>\*1</sup> asbestos and Crocidolite<sup>^ \*1</sup> (Approximate estimated weight as loose fibres = 0.0005g) asbestos detected.**

**Sample No. 16. ASET89217 / 92397 / 16. 120110 - GROUP3-11.**

Approx dimensions 8.0 cm x 8.0 cm x 3.8 cm

The sample consisted of a mixture of sandy soil, char, wood chips, fragments of fibre cement<sup>\*1</sup> (Approximate dimensions = 3.2cm x 1.6cm x 0.6cm), fibre cement<sup>\*2</sup> (Approximate dimensions = 2.0cm x 2.0cm x 0.7cm), synthetic mineral fibres, soft fibrous material containing organic fibres, stones and plant matter.

**Chrysotile<sup>\*1, \*2</sup> asbestos and Amosite<sup>\*1, \*2</sup> asbestos detected.**

**Sample No. 17. ASET89217 / 92397 / 17. 120110 - GROUP3-12.**

Approx dimensions 8.0 cm x 8.0 cm x 4.0 cm

The sample consisted of a mixture of sandy soil, wood chips, char, synthetic mineral fibres, fragments of fibre cement\* (Approximate dimensions = 6.5cm x 4.5cm x 0.7cm), soft fibrous material containing organic fibres, cement, stones and plant matter.

**Chrysotile\* asbestos, Amosite\* asbestos and Crocidolite\* asbestos detected.**

**Sample No. 18. ASET89217 / 92397 / 18. 120110 - PACM1.**

Approx dimensions 9.5 cm x 5.0 cm x 0.6 cm

The sample consisted of a fragment of a fibre cement material.

**Chrysotile asbestos detected.**

**Sample No. 19. ASET89217 / 92397 / 19. 120110 - PACM2.**

Approx dimensions 8.5 cm x 7.0 cm x 0.5 cm

The sample consisted of a fragment of a fibre cement material.

**Chrysotile asbestos detected.**

**Sample No. 20. ASET89217 / 92397 / 20. 120110 - PACM3.**

Approx dimensions 14.4 cm x 4.0 cm x 0.5 cm

The sample consisted of a fragment of a fibre cement material.

**Chrysotile asbestos detected.**

**Sample No. 21. ASET89217 / 92397 / 21. 120110 - GROUP4-1.**

Approx dimensions 8.0 cm x 8.0 cm x 4.1 cm

The sample consisted of a mixture of sandy soil, wood chips, char, organic fibres, fragments of sandstone, stones and plant matter.

**No asbestos detected.**

**Sample No. 22. ASET89217 / 92397 / 22. 120110 - GROUP4-2.**

Approx dimensions 8.0 cm x 8.0 cm x 4.2 cm

The sample consisted of a mixture of sandy soil, char, animal matter, wood chips, organic fibres, fragments of sandstone, stones and plant matter.

**No asbestos detected.**

**Sample No. 23. ASET89217 / 92397 / 23. 120110 - GROUP4-3.**

Approx dimensions 8.0 cm x 8.0 cm x 4.0 cm

The sample consisted of a mixture of sandy soil, char, organic fibres, wood chips, animal matter, fragments of sandstone, stones and plant matter.

**No asbestos detected.**

Reported by,



**Mahen De Silva. BSc, MSc, Grad Dip (Occ Hyg)  
Occupational Hygienist / Approved Identifier.  
Approved Signatory**

**Accredited for compliance with ISO/IEC 17025 - Testing.**

*The results contained in this report relate only to the sample/s submitted for testing. Australian Safer Environment & Technology accepts no responsibility for whether or not the submitted sample/s is/are representative. Results indicating "No asbestos detected" indicates a reporting limit specified in AS4964 -2004 which is 0.1g/ Kg (0.01%). Any amounts detected at assumed lower level than that would be reported, however those assumed lower levels may be treated as "No asbestos detected" as specified and recommended by A4964-2004. Trace / respirable level asbestos will be reported only when detected and trace analysis have been performed on each sample as required by AS4964-2004. When loose asbestos fibres/ fibre bundles are detected and reported that means they are larger handpicked fibres/ fibre bundles, and they do not represent respirable fibres. Dust/soil samples are always subjected to trace analysis except where the amounts involved are extremely minute and trace analysis is not possible to be carried out. When trace analysis is not performed on dust samples it will be indicated in the report that trace analysis has not been carried out due to the volume of the sample being extremely minute.*

*Estimation of asbestos weights involves the use of following assumptions;*

*Volume of each kind of Asbestos present in broken edges have been visually estimated and it has been assumed that volumes remain similar throughout the binding matrix and those volumes are only approximate and not exact. Material densities have been assumed to be similar to commonly found similar materials and may not be exact.*

***The approx; weights given above can be used only as a guide. They do not represent absolute weights of each kind of asbestos, as it is impossible to extract all loose fibres from soil and other asbestos containing building material samples using this method. However above figures may be used as closest approximations to the exact values in each case. Estimation and/ or reporting of asbestos fibre weights in asbestos containing materials and soil is out of the Scope of the NATA Accreditation. NATA Accreditation only covers the qualitative part of the results reported. This weight disclaimer also covers weight / weight percentages given.***



- ^ denotes loose fibres of relevant asbestos types detected in soil/dust.**
- \* denotes asbestos detected in ACM in bonded form.**
- # denotes friable asbestos as soft fibro plaster and/ or highly weathered ACM that will easily crumble.**

# CHAIN OF CUSTODY - ANALYSIS REQUEST FORM

Job No: 120110

Laboratory: ASET

Project Manager: NE

Sampler: NPINE

Site Location: Leppington

Sheet: 1 of 2

No. of samples	Sample ID/ Depth	Anticipated Result (PID)/EC reading	Date sampled	Time sampled	Sample Matrix			Analysis Required				Sample-specific instructions/ notes	
					Soil	Water	Sediment	Asbestos Pres/abs in soil	Asbestos Pres/abs in water	Asbestos Pres/abs in sediment	Asbestos Pres/abs in dust		Asbestos Pres/abs in air
1	GROUP 1-1		28/10/20		X								<p>ASET89217/92397/1-23</p> <p>29 OCT 2020</p> <p>BY: <i>[Signature]</i></p>
2	GROUP 1-2								X	X			
3	GROUP 1-3								X	X			
4	GROUP 1-4								X	X			
5	GROUP 2-1								X	X			
6	GROUP 2-2								X	X			
7	GROUP 2-3								X	X			
8	GROUP 2-4								X	X			
9	GROUP 3-1								X	X			
10	GROUP 3-2								X	X			
11	GROUP 3-3								X	X			
12	GROUP 3-4								X	X			
13	GROUP 3-5								X	X			
14	GROUP 3-6								X	X			
15	GROUP 3-7								X	X			
16	GROUP 3-8								X	X			
17	GROUP 3-9								X	X			
18	GROUP 3-10								X	X			
19	GROUP 3-11								X	X			
20	GROUP 3-12								X	X			
TOTAL													

Turn Around (circle): NORMAL / 3 DAYS / 48 HRS / 24 HRS (confirm with lab in advance if quick turn-around is required)

Comments/ Instructions: \_\_\_\_\_

Lab Quotation No. (if applicable): npotts@eesigroup.com  
 Send report to (email address): heldridge@eesigroup.com  
 Cc: report to (email address): jbarwood@eesigroup.com  
 Cc: invoice to (email address): accounts@eesigroup.com

Sent off Site/Office by: Stevender Signature: *[Signature]* Date: 28/10/20 Time: \_\_\_\_\_  
 Receiving Lab: ASET  
 Receiving Lab: Kirk Signature: *[Signature]* Date: 29/10/20 Time: 8:30am

Phone: (02) 9922 1777  
 Fax: (02) 9922 1010  
 PO Box: 380, North Sydney NSW 2059  
 Email: eesNSW@eesigroup.com







SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : ES2037885

Client	: ENVIRONMENTAL EARTH SCIENCES	Laboratory	: Environmental Division Sydney
Contact	: Natalie Eldridge	Contact	: Shane Ellis
Address	: 82-84 Dickson Avenue ARTARMON NSW, AUSTRALIA 2064	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: neldridge@eesigroup.com	E-mail	: Shane.Ellis@ALSGlobal.com
Telephone	: ----	Telephone	: +61 2 8784 8555
Facsimile	: ----	Facsimile	: +61-2-8784 8500
Project	: 120110	Page	: 1 of 3
Order number	: ----	Quote number	: ES2020ENVEAR0009 (EN/010/20)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Leppington		
Sampler	: Nina Potts		

Dates

Date Samples Received	: 28-Oct-2020 14:00	Issue Date	: 29-Oct-2020
Client Requested Due Date	: 04-Nov-2020	Scheduled Reporting Date	: <b>04-Nov-2020</b>

Delivery Details

Mode of Delivery	: Client Drop Off	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: 2.5 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 24 / 21

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.



## Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- No sample container / preservation non-compliance exists.

## Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: SOIL

Laboratory sample ID	Client sampling date / time	Client sample ID	(On Hold) SOIL No analysis requested	SOIL - EA055-103 Moisture Content	SOIL - S-16 TRH/BTEXN/PAH/OC/OP/PCB/8Metals
ES2037885-001	28-Oct-2020 00:00	GROUP 1-1		✓	✓
ES2037885-002	28-Oct-2020 00:00	GROUP 1-2		✓	✓
ES2037885-003	28-Oct-2020 00:00	GROUP 1-3		✓	✓
ES2037885-004	28-Oct-2020 00:00	GROUP 1-4	✓		
ES2037885-005	28-Oct-2020 00:00	GROUP 2-1		✓	✓
ES2037885-006	28-Oct-2020 00:00	GROUP 2-2		✓	✓
ES2037885-007	28-Oct-2020 00:00	GROUP 2-3		✓	✓
ES2037885-008	28-Oct-2020 00:00	GROUP 2-4		✓	✓
ES2037885-009	28-Oct-2020 00:00	GROUP 3-1		✓	✓
ES2037885-010	28-Oct-2020 00:00	GROUP 3-2		✓	✓
ES2037885-011	28-Oct-2020 00:00	GROUP 3-3		✓	✓
ES2037885-012	28-Oct-2020 00:00	GROUP 3-4		✓	✓
ES2037885-013	28-Oct-2020 00:00	GROUP 3-5	✓		
ES2037885-014	28-Oct-2020 00:00	GROUP 3-6		✓	✓
ES2037885-015	28-Oct-2020 00:00	GROUP 3-7		✓	✓
ES2037885-016	28-Oct-2020 00:00	GROUP 3-8		✓	✓
ES2037885-017	28-Oct-2020 00:00	GROUP 3-9		✓	✓
ES2037885-018	28-Oct-2020 00:00	GROUP 3-10	✓		
ES2037885-019	28-Oct-2020 00:00	GROUP 3-11		✓	✓
ES2037885-020	28-Oct-2020 00:00	GROUP 3-12		✓	✓
ES2037885-021	28-Oct-2020 00:00	FD1		✓	✓
ES2037885-022	28-Oct-2020 00:00	GROUP 4-1		✓	✓
ES2037885-023	28-Oct-2020 00:00	GROUP 4-2		✓	✓
ES2037885-024	28-Oct-2020 00:00	GROUP 4-3		✓	✓

## Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.



## CERTIFICATE OF ANALYSIS

**Work Order** : **ES2037885**  
**Client** : **ENVIRONMENTAL EARTH SCIENCES**  
**Contact** : Natalie Eldridge  
**Address** : 82-84 Dickson Avenue  
 ARTARMON NSW, AUSTRALIA 2064  
  
**Telephone** : ----  
**Project** : 120110  
**Order number** : ----  
**C-O-C number** : ----  
**Sampler** : Nina Potts  
**Site** : Leppington  
**Quote number** : EN/010/20  
**No. of samples received** : 24  
**No. of samples analysed** : 21

**Page** : 1 of 23  
**Laboratory** : Environmental Division Sydney  
**Contact** : Shane Ellis  
**Address** : 277-289 Woodpark Road Smithfield NSW Australia 2164  
  
**Telephone** : +61 2 8784 8555  
**Date Samples Received** : 28-Oct-2020 14:00  
**Date Analysis Commenced** : 30-Oct-2020  
**Issue Date** : 04-Nov-2020 18:02



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>
Edwandy Fadjar	Organic Coordinator	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Wisam Marassa	Inorganics Coordinator	Sydney Inorganics, Smithfield, NSW



## General Comments

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

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

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

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

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

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

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

- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) per the NEPM (2013) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a,h)anthracene (1.0), Benzo(g,h,i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero, for 'TEQ 1/2LOR' are treated as half the reported LOR, and for 'TEQ LOR' are treated as being equal to the reported LOR. Note: TEQ 1/2LOR and TEQ LOR will calculate as 0.6mg/Kg and 1.2mg/Kg respectively for samples with non-detects for all of the eight TEQ PAHs.
- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- EP068: Where reported, Total Chlordane (sum) is the sum of the reported concentrations of cis-Chlordane and trans-Chlordane at or above the LOR.
- EP068: Where reported, Total OCP is the sum of the reported concentrations of all Organochlorine Pesticides at or above LOR.
- EP075(SIM): Where reported, Total Cresol is the sum of the reported concentrations of 2-Methylphenol and 3- & 4-Methylphenol at or above the LOR.
- EP066 : Particular sample positive PCB result is confirmed by re-extraction and re-analysis.
- EP068: Positive results have been confirmed by re-extraction and re-analysis.
- EG035: Positive Hg results ES2037885 #16 and #19 have been confirmed by reanalysis
- EP068: Particular samples required dilution due to matrix interferences. LOR values have been adjusted accordingly.



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	GROUP 1-1	GROUP 1-2	GROUP 1-3	GROUP 2-1	GROUP 2-2
Client sampling date / time					28-Oct-2020 00:00				
Compound	CAS Number	LOR	Unit	ES2037885-001	ES2037885-002	ES2037885-003	ES2037885-005	ES2037885-006	
				Result	Result	Result	Result	Result	
<b>EA055: Moisture Content (Dried @ 105-110°C)</b>									
Moisture Content	----	1.0	%	8.9	12.7	9.9	9.7	12.6	
<b>EG005(ED093)T: Total Metals by ICP-AES</b>									
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	5	4	4	6	8	
Copper	7440-50-8	5	mg/kg	30	24	26	<5	<5	
Lead	7439-92-1	5	mg/kg	45	31	18	7	5	
Nickel	7440-02-0	2	mg/kg	<2	<2	<2	<2	<2	
Zinc	7440-66-6	5	mg/kg	<5	<5	<5	9	<5	
<b>EG035T: Total Recoverable Mercury by FIMS</b>									
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	
<b>EP066: Polychlorinated Biphenyls (PCB)</b>									
Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	
<b>EP068A: Organochlorine Pesticides (OC)</b>									
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	GROUP 1-1	GROUP 1-2	GROUP 1-3	GROUP 2-1	GROUP 2-2
Client sampling date / time					28-Oct-2020 00:00				
Compound	CAS Number	LOR	Unit		ES2037885-001	ES2037885-002	ES2037885-003	ES2037885-005	ES2037885-006
					Result	Result	Result	Result	Result
<b>EP068A: Organochlorine Pesticides (OC) - Continued</b>									
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
<b>EP068B: Organophosphorus Pesticides (OP)</b>									
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
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>									
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





## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	GROUP 1-1	GROUP 1-2	GROUP 1-3	GROUP 2-1	GROUP 2-2
Client sampling date / time					28-Oct-2020 00:00				
Compound	CAS Number	LOR	Unit		ES2037885-001	ES2037885-002	ES2037885-003	ES2037885-005	ES2037885-006
					Result	Result	Result	Result	Result
<b>EP080: BTEXN - Continued</b>									
^ 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
<b>EP066S: PCB Surrogate</b>									
Decachlorobiphenyl	2051-24-3	0.1	%		88.4	70.7	120	106	122
<b>EP068S: Organochlorine Pesticide Surrogate</b>									
Dibromo-DDE	21655-73-2	0.05	%		107	73.4	118	118	123
<b>EP068T: Organophosphorus Pesticide Surrogate</b>									
DEF	78-48-8	0.05	%		64.6	60.2	53.0	96.2	85.0
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>									
Phenol-d6	13127-88-3	0.5	%		99.4	95.2	92.1	92.3	96.7
2-Chlorophenol-D4	93951-73-6	0.5	%		105	101	97.9	98.7	102
2,4,6-Tribromophenol	118-79-6	0.5	%		79.8	73.1	69.4	64.6	65.6
<b>EP075(SIM)T: PAH Surrogates</b>									
2-Fluorobiphenyl	321-60-8	0.5	%		112	110	105	109	109
Anthracene-d10	1719-06-8	0.5	%		117	114	110	112	113
4-Terphenyl-d14	1718-51-0	0.5	%		105	102	99.4	101	102
<b>EP080S: TPH(V)/BTEX Surrogates</b>									
1,2-Dichloroethane-D4	17060-07-0	0.2	%		118	116	119	103	118
Toluene-D8	2037-26-5	0.2	%		98.5	98.2	102	93.9	99.1
4-Bromofluorobenzene	460-00-4	0.2	%		112	112	115	110	111



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	GROUP 2-3	GROUP 2-4	GROUP 3-1	GROUP 3-2	GROUP 3-3
Client sampling date / time				28-Oct-2020 00:00					
Compound	CAS Number	LOR	Unit	ES2037885-007	ES2037885-008	ES2037885-009	ES2037885-010	ES2037885-011	
				Result	Result	Result	Result	Result	
<b>EA055: Moisture Content (Dried @ 105-110°C)</b>									
Moisture Content	----	1.0	%	9.8	8.8	21.9	17.8	21.8	
<b>EG005(ED093)T: Total Metals by ICP-AES</b>									
Arsenic	7440-38-2	5	mg/kg	<5	<5	16	14	12	
Cadmium	7440-43-9	1	mg/kg	<1	<1	5	<1	10	
Chromium	7440-47-3	2	mg/kg	6	7	74	14	55	
Copper	7440-50-8	5	mg/kg	<5	<5	448	31	358	
Lead	7439-92-1	5	mg/kg	7	7	309	139	223	
Nickel	7440-02-0	2	mg/kg	<2	<2	36	8	27	
Zinc	7440-66-6	5	mg/kg	10	6	1270	70	601	
<b>EG035T: Total Recoverable Mercury by FIMS</b>									
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.2	<0.1	0.2	
<b>EP066: Polychlorinated Biphenyls (PCB)</b>									
Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	
<b>EP068A: Organochlorine Pesticides (OC)</b>									
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	GROUP 2-3	GROUP 2-4	GROUP 3-1	GROUP 3-2	GROUP 3-3
Client sampling date / time					28-Oct-2020 00:00				
Compound	CAS Number	LOR	Unit		ES2037885-007	ES2037885-008	ES2037885-009	ES2037885-010	ES2037885-011
					Result	Result	Result	Result	Result
<b>EP068A: Organochlorine Pesticides (OC) - Continued</b>									
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
<b>EP068B: Organophosphorus Pesticides (OP)</b>									
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
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>									
Naphthalene	91-20-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<b>0.6</b>
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	<b>1.3</b>
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	<b>0.6</b>	<b>0.8</b>	<b>1.7</b>
Pyrene	129-00-0	0.5	mg/kg		<0.5	<0.5	<b>0.6</b>	<b>0.7</b>	<b>2.1</b>



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	GROUP 2-3	GROUP 2-4	GROUP 3-1	GROUP 3-2	GROUP 3-3
Client sampling date / time					28-Oct-2020 00:00				
Compound	CAS Number	LOR	Unit	ES2037885-007	ES2037885-008	ES2037885-009	ES2037885-010	ES2037885-011	
				Result	Result	Result	Result	Result	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued</b>									
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<b>0.9</b>	
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<b>0.6</b>	
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<b>0.9</b>	
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	<b>0.9</b>	
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	<b>0.5</b>	
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	<b>1.2</b>	<b>1.5</b>	<b>9.5</b>	
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<b>1.1</b>	
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>	<b>1.4</b>	
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>	<b>1.7</b>	
<b>EP080/071: Total Petroleum Hydrocarbons</b>									
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	<b>900</b>	<100	<b>2470</b>	
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<b>970</b>	<100	<b>2440</b>	
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	<b>1870</b>	<50	<b>4910</b>	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions</b>									
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	<b>60</b>	
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	<b>1610</b>	<100	<b>4260</b>	
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	<b>570</b>	<100	<b>1450</b>	
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	<b>2180</b>	<50	<b>5770</b>	
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	<50	<50	<50	<b>60</b>	
<b>EP080: BTEXN</b>									
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	



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	GROUP 2-3	GROUP 2-4	GROUP 3-1	GROUP 3-2	GROUP 3-3
Client sampling date / time					28-Oct-2020 00:00				
Compound	CAS Number	LOR	Unit	ES2037885-007	ES2037885-008	ES2037885-009	ES2037885-010	ES2037885-011	
				Result	Result	Result	Result	Result	
<b>EP080: BTEXN - Continued</b>									
^ 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	
<b>EP066S: PCB Surrogate</b>									
Decachlorobiphenyl	2051-24-3	0.1	%	108	115	106	124	97.6	
<b>EP068S: Organochlorine Pesticide Surrogate</b>									
Dibromo-DDE	21655-73-2	0.05	%	124	124	92.0	116	100	
<b>EP068T: Organophosphorus Pesticide Surrogate</b>									
DEF	78-48-8	0.05	%	101	106	101	101	82.2	
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>									
Phenol-d6	13127-88-3	0.5	%	94.1	94.4	91.2	93.4	94.4	
2-Chlorophenol-D4	93951-73-6	0.5	%	99.4	98.8	95.0	99.5	98.3	
2,4,6-Tribromophenol	118-79-6	0.5	%	62.3	71.0	68.1	71.4	71.0	
<b>EP075(SIM)T: PAH Surrogates</b>									
2-Fluorobiphenyl	321-60-8	0.5	%	108	109	105	112	109	
Anthracene-d10	1719-06-8	0.5	%	110	110	99.6	119	108	
4-Terphenyl-d14	1718-51-0	0.5	%	100	101	95.7	106	103	
<b>EP080S: TPH(V)/BTEX Surrogates</b>									
1,2-Dichloroethane-D4	17060-07-0	0.2	%	114	126	116	112	119	
Toluene-D8	2037-26-5	0.2	%	98.8	103	96.7	93.5	96.5	
4-Bromofluorobenzene	460-00-4	0.2	%	113	119	109	111	106	



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	GROUP 3-4	GROUP 3-6	GROUP 3-7	GROUP 3-8	GROUP 3-9
Client sampling date / time				28-Oct-2020 00:00					
Compound	CAS Number	LOR	Unit	ES2037885-012	ES2037885-014	ES2037885-015	ES2037885-016	ES2037885-017	
				Result	Result	Result	Result	Result	
<b>EA055: Moisture Content (Dried @ 105-110°C)</b>									
Moisture Content	----	1.0	%	17.2	16.3	24.5	25.2	33.1	
<b>EG005(ED093)T: Total Metals by ICP-AES</b>									
Arsenic	7440-38-2	5	mg/kg	12	11	14	18	12	
Cadmium	7440-43-9	1	mg/kg	<1	2	15	25	20	
Chromium	7440-47-3	2	mg/kg	16	39	114	60	122	
Copper	7440-50-8	5	mg/kg	40	148	355	388	268	
Lead	7439-92-1	5	mg/kg	70	171	618	256	376	
Nickel	7440-02-0	2	mg/kg	18	42	35	36	39	
Zinc	7440-66-6	5	mg/kg	111	1070	3530	2140	2060	
<b>EG035T: Total Recoverable Mercury by FIMS</b>									
Mercury	7439-97-6	0.1	mg/kg	0.1	0.1	0.5	0.3	0.2	
<b>EP066: Polychlorinated Biphenyls (PCB)</b>									
Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	1.3	<0.1	<0.1	<0.1	
<b>EP068A: Organochlorine Pesticides (OC)</b>									
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	<0.25	<0.05	<0.05	
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	<0.25	<0.05	<0.05	
beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	<0.25	<0.05	<0.05	
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	<0.25	<0.05	<0.05	
delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	<0.25	<0.05	<0.05	
Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	<0.25	<0.05	<0.05	
Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	<0.25	<0.05	<0.05	
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	<0.25	<0.05	<0.05	
^ Total Chlordane (sum)	----	0.05	mg/kg	<0.05	<0.05	<0.08	<0.05	<0.05	
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	<0.25	<0.05	<0.05	
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	<0.25	<0.05	<0.05	
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	<0.25	<0.05	<0.05	
Dieldrin	60-57-1	0.05	mg/kg	<0.05	0.14	<0.25	<0.05	<0.05	
4,4'-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	<0.25	<0.05	<0.05	
Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	<0.25	<0.05	<0.05	
beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	<0.25	<0.05	<0.05	
^ Endosulfan (sum)	115-29-7	0.05	mg/kg	<0.05	<0.05	<0.15	<0.05	<0.05	
4,4'-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	<0.25	<0.05	<0.05	
Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	<0.25	<0.05	<0.05	
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	<0.25	<0.05	<0.05	



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	GROUP 3-4	GROUP 3-6	GROUP 3-7	GROUP 3-8	GROUP 3-9
Client sampling date / time					28-Oct-2020 00:00				
Compound	CAS Number	LOR	Unit	ES2037885-012	ES2037885-014	ES2037885-015	ES2037885-016	ES2037885-017	
				Result	Result	Result	Result	Result	
<b>EP068A: Organochlorine Pesticides (OC) - Continued</b>									
4,4'-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	<1.0	<0.2	<0.2	
Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	<0.25	<0.05	<0.05	
Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	<1.0	<0.2	<0.2	
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg	<0.05	<b>0.14</b>	<0.08	<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	<0.08	<0.05	<0.05	
<b>EP068B: Organophosphorus Pesticides (OP)</b>									
Dichlorvos	62-73-7	0.05	mg/kg	<0.05	<0.05	<0.25	<0.05	<0.05	
Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	<0.05	<0.25	<0.05	<0.05	
Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	<0.2	<1.0	<0.2	<0.2	
Dimethoate	60-51-5	0.05	mg/kg	<0.05	<0.05	<0.25	<0.05	<0.05	
Diazinon	333-41-5	0.05	mg/kg	<0.05	<0.05	<0.25	<0.05	<0.05	
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	<0.05	<0.25	<0.05	<0.05	
Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	<0.2	<1.0	<0.2	<0.2	
Malathion	121-75-5	0.05	mg/kg	<0.05	<0.05	<0.25	<0.05	<0.05	
Fenthion	55-38-9	0.05	mg/kg	<0.05	<0.05	<0.25	<0.05	<0.05	
Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	<0.05	<0.25	<0.05	<0.05	
Parathion	56-38-2	0.2	mg/kg	<0.2	<0.2	<1.0	<0.2	<0.2	
Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	<0.05	<0.25	<0.05	<0.05	
Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	<0.05	<0.25	<0.05	<0.05	
Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	<0.05	<0.25	<0.05	<0.05	
Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	<0.05	<0.25	<0.05	<0.05	
Prothiofos	34643-46-4	0.05	mg/kg	<0.05	<0.05	<0.25	<0.05	<0.05	
Ethion	563-12-2	0.05	mg/kg	<0.05	<0.05	<0.25	<0.05	<0.05	
Carbophenothion	786-19-6	0.05	mg/kg	<0.05	<0.05	<0.25	<0.05	<0.05	
Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	<0.05	<0.25	<0.05	<0.05	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>									
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<b>1.6</b>	
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	<b>0.7</b>	<b>0.5</b>	<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	<b>1.9</b>	<b>0.8</b>	<b>0.8</b>	<b>0.6</b>	<b>0.9</b>	
Pyrene	129-00-0	0.5	mg/kg	<b>1.8</b>	<b>0.9</b>	<b>1.2</b>	<b>1.1</b>	<b>1.0</b>	



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	GROUP 3-4	GROUP 3-6	GROUP 3-7	GROUP 3-8	GROUP 3-9
Client sampling date / time					28-Oct-2020 00:00				
Compound	CAS Number	LOR	Unit		ES2037885-012	ES2037885-014	ES2037885-015	ES2037885-016	ES2037885-017
					Result	Result	Result	Result	Result
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued</b>									
Benz(a)anthracene	56-55-3	0.5	mg/kg		1.0	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg		0.8	<0.5	<0.5	<0.5	<0.5
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		1.1	<0.5	0.8	0.6	0.6
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		0.9	<0.5	0.8	0.6	<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		0.6	<0.5	0.7	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		9.3	2.2	4.3	2.9	4.1
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		1.2	<0.5	0.9	0.7	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		1.4	0.6	1.2	1.0	0.6
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		1.7	1.2	1.5	1.3	1.2
<b>EP080/071: Total Petroleum Hydrocarbons</b>									
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	120	3550	2320	1180
C29 - C36 Fraction	----	100	mg/kg		<100	200	3830	2280	1430
^ C10 - C36 Fraction (sum)	----	50	mg/kg		<50	320	7380	4600	2610
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions</b>									
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	80	<50	60
>C16 - C34 Fraction	----	100	mg/kg		170	260	6380	4140	2200
>C34 - C40 Fraction	----	100	mg/kg		<100	160	2180	1060	1020
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		170	420	8640	5200	3280
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		<50	<50	80	<50	60
<b>EP080: BTEXN</b>									
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	1.1	<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



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	GROUP 3-4	GROUP 3-6	GROUP 3-7	GROUP 3-8	GROUP 3-9
Client sampling date / time				28-Oct-2020 00:00					
Compound	CAS Number	LOR	Unit	ES2037885-012	ES2037885-014	ES2037885-015	ES2037885-016	ES2037885-017	
				Result	Result	Result	Result	Result	
<b>EP080: BTEXN - Continued</b>									
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	1.1	<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	
<b>EP066S: PCB Surrogate</b>									
Decachlorobiphenyl	2051-24-3	0.1	%	109	125	107	115	116	
<b>EP068S: Organochlorine Pesticide Surrogate</b>									
Dibromo-DDE	21655-73-2	0.05	%	91.3	115	110	69.0	81.7	
<b>EP068T: Organophosphorus Pesticide Surrogate</b>									
DEF	78-48-8	0.05	%	96.6	93.1	110	99.0	88.6	
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>									
Phenol-d6	13127-88-3	0.5	%	88.9	89.0	88.8	94.0	92.2	
2-Chlorophenol-D4	93951-73-6	0.5	%	95.9	95.1	91.7	102	99.8	
2,4,6-Tribromophenol	118-79-6	0.5	%	81.6	81.1	74.4	90.0	83.5	
<b>EP075(SIM)T: PAH Surrogates</b>									
2-Fluorobiphenyl	321-60-8	0.5	%	106	108	108	109	106	
Anthracene-d10	1719-06-8	0.5	%	112	114	108	110	112	
4-Terphenyl-d14	1718-51-0	0.5	%	103	101	102	103	98.9	
<b>EP080S: TPH(V)/BTEX Surrogates</b>									
1,2-Dichloroethane-D4	17060-07-0	0.2	%	126	114	115	121	116	
Toluene-D8	2037-26-5	0.2	%	103	92.4	92.4	95.9	97.3	
4-Bromofluorobenzene	460-00-4	0.2	%	117	105	109	106	110	



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	GROUP 3-11	GROUP 3-12	FD1	GROUP 4-1	GROUP 4-2
Client sampling date / time				28-Oct-2020 00:00					
Compound	CAS Number	LOR	Unit	ES2037885-019	ES2037885-020	ES2037885-021	ES2037885-022	ES2037885-023	
				Result	Result	Result	Result	Result	
<b>EA055: Moisture Content (Dried @ 105-110°C)</b>									
Moisture Content	----	1.0	%	23.0	19.0	7.0	26.5	37.6	
<b>EG005(ED093)T: Total Metals by ICP-AES</b>									
Arsenic	7440-38-2	5	mg/kg	28	11	<5	<5	8	
Cadmium	7440-43-9	1	mg/kg	7	4	<1	<1	<1	
Chromium	7440-47-3	2	mg/kg	142	205	3	10	17	
Copper	7440-50-8	5	mg/kg	679	238	15	29	42	
Lead	7439-92-1	5	mg/kg	430	748	13	26	132	
Nickel	7440-02-0	2	mg/kg	72	43	<2	8	11	
Zinc	7440-66-6	5	mg/kg	1730	1240	<5	241	572	
<b>EG035T: Total Recoverable Mercury by FIMS</b>									
Mercury	7439-97-6	0.1	mg/kg	0.4	0.3	<0.1	<0.1	<0.1	
<b>EP066: Polychlorinated Biphenyls (PCB)</b>									
Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	
<b>EP068A: Organochlorine Pesticides (OC)</b>									
alpha-BHC	319-84-6	0.05	mg/kg	<0.25	<0.05	<0.05	<0.05	<0.05	
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.25	<0.05	<0.05	<0.05	<0.05	
beta-BHC	319-85-7	0.05	mg/kg	<0.25	<0.05	<0.05	<0.05	<0.05	
gamma-BHC	58-89-9	0.05	mg/kg	<0.25	<0.05	<0.05	<0.05	<0.05	
delta-BHC	319-86-8	0.05	mg/kg	<0.25	<0.05	<0.05	<0.05	<0.05	
Heptachlor	76-44-8	0.05	mg/kg	<0.25	<0.05	<0.05	<0.05	<0.05	
Aldrin	309-00-2	0.05	mg/kg	<0.25	<0.05	<0.05	<0.05	<0.05	
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.25	<0.05	<0.05	<0.05	<0.05	
^ Total Chlordane (sum)	----	0.05	mg/kg	<0.08	<0.05	<0.05	<0.05	<0.05	
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.25	<0.05	<0.05	<0.05	<0.05	
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.25	<0.05	<0.05	<0.05	<0.05	
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.25	<0.05	<0.05	<0.05	<0.05	
Dieldrin	60-57-1	0.05	mg/kg	<0.25	0.38	<0.05	<0.05	<0.05	
4,4'-DDE	72-55-9	0.05	mg/kg	<0.25	<0.05	<0.05	<0.05	<0.05	
Endrin	72-20-8	0.05	mg/kg	<0.25	<0.05	<0.05	<0.05	<0.05	
beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.25	<0.05	<0.05	<0.05	<0.05	
^ Endosulfan (sum)	115-29-7	0.05	mg/kg	<0.15	<0.05	<0.05	<0.05	<0.05	
4,4'-DDD	72-54-8	0.05	mg/kg	<0.25	<0.05	<0.05	<0.05	<0.05	
Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.25	<0.05	<0.05	<0.05	<0.05	
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.25	<0.05	<0.05	<0.05	<0.05	



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	GROUP 3-11	GROUP 3-12	FD1	GROUP 4-1	GROUP 4-2
Client sampling date / time					28-Oct-2020 00:00				
Compound	CAS Number	LOR	Unit		ES2037885-019	ES2037885-020	ES2037885-021	ES2037885-022	ES2037885-023
					Result	Result	Result	Result	Result
<b>EP068A: Organochlorine Pesticides (OC) - Continued</b>									
4.4'-DDT	50-29-3	0.2	mg/kg		<1.0	<0.2	<0.2	<0.2	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg		<0.25	<0.05	<0.05	<0.05	<0.05
Methoxychlor	72-43-5	0.2	mg/kg		<1.0	<0.2	<0.2	<0.2	<0.2
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg		<0.08	<b>0.38</b>	<0.05	<0.05	<0.05
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/5 0-2	0.05	mg/kg		<0.08	<0.05	<0.05	<0.05	<0.05
<b>EP068B: Organophosphorus Pesticides (OP)</b>									
Dichlorvos	62-73-7	0.05	mg/kg		<0.25	<0.05	<0.05	<0.05	<0.05
Demeton-S-methyl	919-86-8	0.05	mg/kg		<0.25	<0.05	<0.05	<0.05	<0.05
Monocrotophos	6923-22-4	0.2	mg/kg		<1.0	<0.2	<0.2	<0.2	<0.2
Dimethoate	60-51-5	0.05	mg/kg		<0.25	<0.05	<0.05	<0.05	<0.05
Diazinon	333-41-5	0.05	mg/kg		<0.25	<0.05	<0.05	<0.05	<0.05
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg		<0.25	<0.05	<0.05	<0.05	<0.05
Parathion-methyl	298-00-0	0.2	mg/kg		<1.0	<0.2	<0.2	<0.2	<0.2
Malathion	121-75-5	0.05	mg/kg		<0.25	<0.05	<0.05	<0.05	<0.05
Fenthion	55-38-9	0.05	mg/kg		<0.25	<0.05	<0.05	<0.05	<0.05
Chlorpyrifos	2921-88-2	0.05	mg/kg		<0.25	<0.05	<0.05	<0.05	<0.05
Parathion	56-38-2	0.2	mg/kg		<1.0	<0.2	<0.2	<0.2	<0.2
Pirimphos-ethyl	23505-41-1	0.05	mg/kg		<0.25	<0.05	<0.05	<0.05	<0.05
Chlorfenvinphos	470-90-6	0.05	mg/kg		<0.25	<0.05	<0.05	<0.05	<0.05
Bromophos-ethyl	4824-78-6	0.05	mg/kg		<0.25	<0.05	<0.05	<0.05	<0.05
Fenamiphos	22224-92-6	0.05	mg/kg		<0.25	<0.05	<0.05	<0.05	<0.05
Prothiofos	34643-46-4	0.05	mg/kg		<0.25	<0.05	<0.05	<0.05	<0.05
Ethion	563-12-2	0.05	mg/kg		<0.25	<0.05	<0.05	<0.05	<0.05
Carbophenothion	786-19-6	0.05	mg/kg		<0.25	<0.05	<0.05	<0.05	<0.05
Azinphos Methyl	86-50-0	0.05	mg/kg		<0.25	<0.05	<0.05	<0.05	<0.05
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>									
Naphthalene	91-20-3	0.5	mg/kg		<b>0.6</b>	<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		<b>0.7</b>	<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		<b>1.8</b>	<b>0.6</b>	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg		<b>2.9</b>	<b>0.7</b>	<0.5	<0.5	<0.5



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	GROUP 3-11	GROUP 3-12	FD1	GROUP 4-1	GROUP 4-2
Client sampling date / time					28-Oct-2020 00:00				
Compound	CAS Number	LOR	Unit		ES2037885-019	ES2037885-020	ES2037885-021	ES2037885-022	ES2037885-023
					Result	Result	Result	Result	Result
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued</b>									
Benz(a)anthracene	56-55-3	0.5	mg/kg		1.4	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg		1.2	<0.5	<0.5	<0.5	<0.5
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		1.2	<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		1.2	<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		0.8	<0.5	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		11.8	1.3	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		1.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		1.8	0.6	0.6	0.6	0.6
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		2.1	1.2	1.2	1.2	1.2
<b>EP080/071: Total Petroleum Hydrocarbons</b>									
C6 - C9 Fraction	----	10	mg/kg		<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg		<50	<50	<50	70	<50
C15 - C28 Fraction	----	100	mg/kg		7410	160	<100	460	310
C29 - C36 Fraction	----	100	mg/kg		6120	950	<100	790	600
^ C10 - C36 Fraction (sum)	----	50	mg/kg		13500	1110	<50	1320	910
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions</b>									
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		100	<50	<50	120	80
>C16 - C34 Fraction	----	100	mg/kg		12300	1040	<100	840	610
>C34 - C40 Fraction	----	100	mg/kg		3190	150	<100	760	500
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		15600	1190	<50	1720	1190
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		100	<50	<50	120	80
<b>EP080: BTEXN</b>									
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



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	GROUP 3-11	GROUP 3-12	FD1	GROUP 4-1	GROUP 4-2
Client sampling date / time				28-Oct-2020 00:00					
Compound	CAS Number	LOR	Unit	ES2037885-019	ES2037885-020	ES2037885-021	ES2037885-022	ES2037885-023	
				Result	Result	Result	Result	Result	
<b>EP080: BTEXN - Continued</b>									
^ 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	
<b>EP066S: PCB Surrogate</b>									
Decachlorobiphenyl	2051-24-3	0.1	%	129	128	102	124	127	
<b>EP068S: Organochlorine Pesticide Surrogate</b>									
Dibromo-DDE	21655-73-2	0.05	%	82.1	101	121	109	138	
<b>EP068T: Organophosphorus Pesticide Surrogate</b>									
DEF	78-48-8	0.05	%	85.0	74.3	90.1	57.2	53.2	
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>									
Phenol-d6	13127-88-3	0.5	%	92.6	90.3	89.5	89.4	93.1	
2-Chlorophenol-D4	93951-73-6	0.5	%	98.1	96.5	97.4	97.5	99.3	
2,4,6-Tribromophenol	118-79-6	0.5	%	86.7	81.1	84.9	94.9	94.3	
<b>EP075(SIM)T: PAH Surrogates</b>									
2-Fluorobiphenyl	321-60-8	0.5	%	106	104	104	106	106	
Anthracene-d10	1719-06-8	0.5	%	104	107	112	104	106	
4-Terphenyl-d14	1718-51-0	0.5	%	100	95.7	98.4	100	101	
<b>EP080S: TPH(V)/BTEX Surrogates</b>									
1,2-Dichloroethane-D4	17060-07-0	0.2	%	113	118	117	122	116	
Toluene-D8	2037-26-5	0.2	%	88.0	95.3	94.6	100	93.1	
4-Bromofluorobenzene	460-00-4	0.2	%	102	108	107	111	101	



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)		Client sample ID			GROUP 4-3	----	----	----	----
Client sampling date / time		28-Oct-2020 00:00			----	----	----	----	----
Compound	CAS Number	LOR	Unit	ES2037885-024	-----	-----	-----	-----	-----
				Result	----	----	----	----	----
<b>EA055: Moisture Content (Dried @ 105-110°C)</b>									
Moisture Content	----	1.0	%	37.0	----	----	----	----	----
<b>EG005(ED093)T: Total Metals by ICP-AES</b>									
Arsenic	7440-38-2	5	mg/kg	6	----	----	----	----	----
Cadmium	7440-43-9	1	mg/kg	<1	----	----	----	----	----
Chromium	7440-47-3	2	mg/kg	9	----	----	----	----	----
Copper	7440-50-8	5	mg/kg	28	----	----	----	----	----
Lead	7439-92-1	5	mg/kg	48	----	----	----	----	----
Nickel	7440-02-0	2	mg/kg	5	----	----	----	----	----
Zinc	7440-66-6	5	mg/kg	386	----	----	----	----	----
<b>EG035T: Total Recoverable Mercury by FIMS</b>									
Mercury	7439-97-6	0.1	mg/kg	<0.1	----	----	----	----	----
<b>EP066: Polychlorinated Biphenyls (PCB)</b>									
Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	----	----	----	----	----
<b>EP068A: Organochlorine Pesticides (OC)</b>									
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	----	----	----	----	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	----	----	----	----	----
beta-BHC	319-85-7	0.05	mg/kg	<0.05	----	----	----	----	----
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	----	----	----	----	----
delta-BHC	319-86-8	0.05	mg/kg	<0.05	----	----	----	----	----
Heptachlor	76-44-8	0.05	mg/kg	<0.05	----	----	----	----	----
Aldrin	309-00-2	0.05	mg/kg	<0.05	----	----	----	----	----
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	----	----	----	----	----
^ Total Chlordane (sum)	----	0.05	mg/kg	<0.05	----	----	----	----	----
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	----	----	----	----	----
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	----	----	----	----	----
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	----	----	----	----	----
Dieldrin	60-57-1	0.05	mg/kg	<0.05	----	----	----	----	----
4,4'-DDE	72-55-9	0.05	mg/kg	<0.05	----	----	----	----	----
Endrin	72-20-8	0.05	mg/kg	<0.05	----	----	----	----	----
beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	----	----	----	----	----
^ Endosulfan (sum)	115-29-7	0.05	mg/kg	<0.05	----	----	----	----	----
4,4'-DDD	72-54-8	0.05	mg/kg	<0.05	----	----	----	----	----
Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	----	----	----	----	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	----	----	----	----	----



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	GROUP 4-3	----	----	----	----
Client sampling date / time				28-Oct-2020 00:00	----	----	----	----	----
Compound	CAS Number	LOR	Unit	ES2037885-024	-----	-----	-----	-----	-----
				Result	----	----	----	----	----
<b>EP068A: Organochlorine Pesticides (OC) - Continued</b>									
4,4'-DDT	50-29-3	0.2	mg/kg	<0.2	----	----	----	----	----
Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	----	----	----	----	----
Methoxychlor	72-43-5	0.2	mg/kg	<0.2	----	----	----	----	----
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg	<0.05	----	----	----	----	----
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/5 0-2	0.05	mg/kg	<0.05	----	----	----	----	----
<b>EP068B: Organophosphorus Pesticides (OP)</b>									
Dichlorvos	62-73-7	0.05	mg/kg	<0.05	----	----	----	----	----
Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	----	----	----	----	----
Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	----	----	----	----	----
Dimethoate	60-51-5	0.05	mg/kg	<0.05	----	----	----	----	----
Diazinon	333-41-5	0.05	mg/kg	<0.05	----	----	----	----	----
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	----	----	----	----	----
Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	----	----	----	----	----
Malathion	121-75-5	0.05	mg/kg	<0.05	----	----	----	----	----
Fenthion	55-38-9	0.05	mg/kg	<0.05	----	----	----	----	----
Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	----	----	----	----	----
Parathion	56-38-2	0.2	mg/kg	<0.2	----	----	----	----	----
Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	----	----	----	----	----
Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	----	----	----	----	----
Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	----	----	----	----	----
Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	----	----	----	----	----
Prothiofos	34643-46-4	0.05	mg/kg	<0.05	----	----	----	----	----
Ethion	563-12-2	0.05	mg/kg	<0.05	----	----	----	----	----
Carbophenothion	786-19-6	0.05	mg/kg	<0.05	----	----	----	----	----
Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	----	----	----	----	----
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>									
Naphthalene	91-20-3	0.5	mg/kg	<0.5	----	----	----	----	----
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	----	----	----	----	----
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	----	----	----	----	----
Fluorene	86-73-7	0.5	mg/kg	<0.5	----	----	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	----	----	----	----	----
Anthracene	120-12-7	0.5	mg/kg	<0.5	----	----	----	----	----
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	----	----	----	----	----
Pyrene	129-00-0	0.5	mg/kg	<0.5	----	----	----	----	----



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	GROUP 4-3	----	----	----	----
Client sampling date / time				28-Oct-2020 00:00	----	----	----	----	----
Compound	CAS Number	LOR	Unit	ES2037885-024	-----	-----	-----	-----	-----
				Result	----	----	----	----	----
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued</b>									
Benzo(a)anthracene	56-55-3	0.5	mg/kg	<0.5	----	----	----	----	----
Chrysene	218-01-9	0.5	mg/kg	<0.5	----	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	----	----	----	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	----	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	----	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	----	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	----	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	----	----	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	----	----	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	----	----	----	----	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	<b>0.6</b>	----	----	----	----	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	<b>1.2</b>	----	----	----	----	----
<b>EP080/071: Total Petroleum Hydrocarbons</b>									
C6 - C9 Fraction	----	10	mg/kg	<10	----	----	----	----	----
C10 - C14 Fraction	----	50	mg/kg	<50	----	----	----	----	----
C15 - C28 Fraction	----	100	mg/kg	<b>380</b>	----	----	----	----	----
C29 - C36 Fraction	----	100	mg/kg	<b>600</b>	----	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<b>980</b>	----	----	----	----	----
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions</b>									
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	----	----	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	----	----	----	----	----
>C10 - C16 Fraction	----	50	mg/kg	<b>110</b>	----	----	----	----	----
>C16 - C34 Fraction	----	100	mg/kg	<b>650</b>	----	----	----	----	----
>C34 - C40 Fraction	----	100	mg/kg	<b>450</b>	----	----	----	----	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<b>1210</b>	----	----	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<b>110</b>	----	----	----	----	----
<b>EP080: BTEXN</b>									
Benzene	71-43-2	0.2	mg/kg	<0.2	----	----	----	----	----
Toluene	108-88-3	0.5	mg/kg	<0.5	----	----	----	----	----
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	----	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	----	----	----	----	----
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	----	----	----	----	----



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	GROUP 4-3	----	----	----	----
Client sampling date / time				28-Oct-2020 00:00	----	----	----	----	----
Compound	CAS Number	LOR	Unit	ES2037885-024	-----	-----	-----	-----	-----
				Result	----	----	----	----	----
<b>EP080: BTEXN - Continued</b>									
^ Sum of BTEX	----	0.2	mg/kg	<0.2	----	----	----	----	----
^ Total Xylenes	----	0.5	mg/kg	<0.5	----	----	----	----	----
Naphthalene	91-20-3	1	mg/kg	<1	----	----	----	----	----
<b>EP066S: PCB Surrogate</b>									
Decachlorobiphenyl	2051-24-3	0.1	%	79.8	----	----	----	----	----
<b>EP068S: Organochlorine Pesticide Surrogate</b>									
Dibromo-DDE	21655-73-2	0.05	%	90.7	----	----	----	----	----
<b>EP068T: Organophosphorus Pesticide Surrogate</b>									
DEF	78-48-8	0.05	%	80.7	----	----	----	----	----
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>									
Phenol-d6	13127-88-3	0.5	%	98.8	----	----	----	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%	99.9	----	----	----	----	----
2,4,6-Tribromophenol	118-79-6	0.5	%	74.2	----	----	----	----	----
<b>EP075(SIM)T: PAH Surrogates</b>									
2-Fluorobiphenyl	321-60-8	0.5	%	91.6	----	----	----	----	----
Anthracene-d10	1719-06-8	0.5	%	92.0	----	----	----	----	----
4-Terphenyl-d14	1718-51-0	0.5	%	92.3	----	----	----	----	----
<b>EP080S: TPH(V)/BTEX Surrogates</b>									
1,2-Dichloroethane-D4	17060-07-0	0.2	%	93.9	----	----	----	----	----
Toluene-D8	2037-26-5	0.2	%	95.5	----	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.2	%	110	----	----	----	----	----



## Surrogate Control Limits

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

## QUALITY CONTROL REPORT

<b>Work Order</b>	: <b>ES2037885</b>	<b>Page</b>	: 1 of 19
<b>Client</b>	: <b>ENVIRONMENTAL EARTH SCIENCES</b>	<b>Laboratory</b>	: Environmental Division Sydney
<b>Contact</b>	: Natalie Eldridge	<b>Contact</b>	: Shane Ellis
<b>Address</b>	: 82-84 Dickson Avenue ARTARMON NSW, AUSTRALIA 2064	<b>Address</b>	: 277-289 Woodpark Road Smithfield NSW Australia 2164
<b>Telephone</b>	: ----	<b>Telephone</b>	: +61 2 8784 8555
<b>Project</b>	: 120110	<b>Date Samples Received</b>	: 28-Oct-2020
<b>Order number</b>	: ----	<b>Date Analysis Commenced</b>	: 30-Oct-2020
<b>C-O-C number</b>	: ----	<b>Issue Date</b>	: 04-Nov-2020
<b>Sampler</b>	: Nina Potts		
<b>Site</b>	: Leppington		
<b>Quote number</b>	: EN/010/20		
<b>No. of samples received</b>	: 24		
<b>No. of samples analysed</b>	: 21		



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
Edwandy Fadjar	Organic Coordinator	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Wisam Marassa	Inorganics Coordinator	Sydney Inorganics, Smithfield, NSW



## General Comments

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

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

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

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

## Laboratory Duplicate (DUP) Report

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

Sub-Matrix: SOIL

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 3339921)</b>									
ES2037885-001	GROUP 1-1	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	5	4	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	30	25	19.5	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	45	43	5.14	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	<5	<5	0.00	No Limit
ES2037885-012	GROUP 3-4	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	16	20	22.4	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	18	22	19.0	0% - 50%
		EG005T: Arsenic	7440-38-2	5	mg/kg	12	12	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	40	49	21.1	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	70	80	12.9	0% - 50%
		EG005T: Zinc	7440-66-6	5	mg/kg	111	133	18.1	0% - 20%
<b>EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 3340964)</b>									
ES2037475-001	Anonymous	EG005T: Arsenic	7440-38-2	5	mg/kg	15	14	12.6	No Limit
ES2037475-001	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	88	87	0.00	0% - 20%
		EG005T: Nickel	7440-02-0	2	mg/kg	7	8	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	6	6	0.00	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	28	28	0.00	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	8	7	0.00	No Limit
		ES2037869-001	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1
EG005T: Chromium	7440-47-3			2	mg/kg	19	24	23.8	0% - 50%
EG005T: Nickel	7440-02-0			2	mg/kg	4	6	51.8	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 (%)
<b>EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 3340964) - continued</b>									
ES2037869-001	Anonymous	EG005T: Arsenic	7440-38-2	5	mg/kg	<5	6	24.6	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	15	34	78.5	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	68	47	36.9	0% - 50%
		EG005T: Zinc	7440-66-6	5	mg/kg	178	150	17.4	0% - 20%
<b>EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 3339925)</b>									
ES2037885-003	GROUP 1-3	EA055: Moisture Content	----	0.1	%	9.9	10.0	0.00	0% - 50%
ES2037885-016	GROUP 3-8	EA055: Moisture Content	----	0.1	%	25.2	26.3	4.07	0% - 20%
<b>EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 3340967)</b>									
ES2037475-005	Anonymous	EA055: Moisture Content	----	0.1	%	5.4	5.8	7.02	No Limit
ES2037869-010	Anonymous	EA055: Moisture Content	----	0.1	%	27.1	27.4	0.897	0% - 20%
<b>EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3339922)</b>									
ES2037885-001	GROUP 1-1	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
ES2037885-012	GROUP 3-4	EG035T: Mercury	7439-97-6	0.1	mg/kg	0.1	<0.1	0.00	No Limit
<b>EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3340963)</b>									
ES2037475-001	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
ES2037869-001	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
<b>EP066: Polychlorinated Biphenyls (PCB) (QC Lot: 3335567)</b>									
ES2037885-001	GROUP 1-1	EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
ES2037885-012	GROUP 3-4	EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
<b>EP066: Polychlorinated Biphenyls (PCB) (QC Lot: 3336607)</b>									
ES2038200-017	Anonymous	EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
ES2038200-031	Anonymous	EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
<b>EP068A: Organochlorine Pesticides (OC) (QC Lot: 3335566)</b>									
ES2037885-001	GROUP 1-1	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



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 (%)
<b>EP068A: Organochlorine Pesticides (OC) (QC Lot: 3335566) - continued</b>									
ES2037885-001	GROUP 1-1	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
ES2037885-012	GROUP 3-4	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		
<b>EP068A: Organochlorine Pesticides (OC) (QC Lot: 3336606)</b>									
ES2038200-017	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



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 (%)
<b>EP068A: Organochlorine Pesticides (OC) (QC Lot: 3336606) - continued</b>									
ES2038200-017	Anonymous	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
ES2038200-031	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		
<b>EP068B: Organophosphorus Pesticides (OP) (QC Lot: 3335566)</b>									
ES2037885-001	GROUP 1-1	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



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 (%)
<b>EP068B: Organophosphorus Pesticides (OP) (QC Lot: 3335566) - continued</b>									
ES2037885-001	GROUP 1-1	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
ES2037885-012	GROUP 3-4	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
		<b>EP068B: Organophosphorus Pesticides (OP) (QC Lot: 3336606)</b>							
ES2038200-017	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



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 (%)	
<b>EP068B: Organophosphorus Pesticides (OP) (QC Lot: 3336606) - continued</b>										
ES2038200-017	Anonymous	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	
ES2038200-031	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			
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3335565)</b>										
ES2037885-001	GROUP 1-1	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							



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 (%)		
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3335565) - continued</b>											
ES2037885-001	GROUP 1-1	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		
ES2037885-012	GROUP 3-4	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	0.7	1.2	56.4	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	1.9	1.9	0.00	No Limit		
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	1.8	1.6	8.10	No Limit		
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	1.0	0.9	0.00	No Limit		
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	0.8	0.7	15.4	No Limit		
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2	0.5	mg/kg	1.1	0.9	24.1	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	0.9	0.8	21.8	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	0.6	<0.5	0.00	No Limit		
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	9.3	8.0	15.0	0% - 50%		
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	1.2	1.0	17.3	No Limit		
		<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3336605)</b>									
		ES2038200-017	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		



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 (%)
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3336605) - continued</b>									
ES2038200-017	Anonymous	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
ES2038200-031	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): 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
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3335564)</b>									
ES2037885-001	GROUP 1-1	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
ES2037885-012	GROUP 3-4	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
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3336381)</b>									
ES2037885-001	GROUP 1-1	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
ES2037885-012	GROUP 3-4	EP080: C6 - C9 Fraction	----	10	mg/kg	<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 (%)	
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3336403)</b>										
ES2037475-001	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit	
ES2037707-001	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit	
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3336604)</b>										
ES2038200-017	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	
ES2038200-031	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	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 3335564)</b>										
ES2037885-001	GROUP 1-1	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	
ES2037885-012	GROUP 3-4	EP071: >C16 - C34 Fraction	----	100	mg/kg	170	140	15.0	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	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 3336381)</b>										
ES2037885-001	GROUP 1-1	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit	
ES2037885-012	GROUP 3-4	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 3336403)</b>										
ES2037475-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit	
ES2037707-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 3336604)</b>										
ES2038200-017	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	
ES2038200-031	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	
<b>EP080: BTEXN (QC Lot: 3336381)</b>										
ES2037885-001	GROUP 1-1	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	
ES2037885-012	GROUP 3-4	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	



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 (%)
<b>EP080: BTEXN (QC Lot: 3336381) - continued</b>									
ES2037885-012	GROUP 3-4	EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		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
<b>EP080: BTEXN (QC Lot: 3336403)</b>									
ES2037475-001	Anonymous	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	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		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
ES2037707-001	Anonymous	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	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		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**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
<b>EG005(ED093)T: Total Metals by ICP-AES (QCLot: 3339921)</b>									
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	121.1 mg/kg	88.7	88.0	113	
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	0.74 mg/kg	94.7	70.0	130	
EG005T: Chromium	7440-47-3	2	mg/kg	<2	20.2 mg/kg	84.3	68.0	132	
EG005T: Copper	7440-50-8	5	mg/kg	<5	52.9 mg/kg	97.8	89.0	111	
EG005T: Lead	7439-92-1	5	mg/kg	<5	62.1 mg/kg	88.7	82.0	119	
EG005T: Nickel	7440-02-0	2	mg/kg	<2	15.4 mg/kg	81.5	80.0	120	
EG005T: Zinc	7440-66-6	5	mg/kg	<5	162 mg/kg	69.9	66.0	133	
<b>EG005(ED093)T: Total Metals by ICP-AES (QCLot: 3340964)</b>									
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	121.1 mg/kg	89.0	88.0	113	
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	0.74 mg/kg	81.6	70.0	130	
EG005T: Chromium	7440-47-3	2	mg/kg	<2	20.2 mg/kg	97.6	68.0	132	
EG005T: Copper	7440-50-8	5	mg/kg	<5	52.9 mg/kg	97.2	89.0	111	
EG005T: Lead	7439-92-1	5	mg/kg	<5	62.1 mg/kg	93.6	82.0	119	
EG005T: Nickel	7440-02-0	2	mg/kg	<2	15.4 mg/kg	89.6	80.0	120	
EG005T: Zinc	7440-66-6	5	mg/kg	<5	162 mg/kg	71.8	66.0	133	
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3339922)</b>									
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	0.0847 mg/kg	118	70.0	130	
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3340963)</b>									
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	0.0847 mg/kg	70.8	70.0	130	
<b>EP066: Polychlorinated Biphenyls (PCB) (QCLot: 3335567)</b>									
EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	1 mg/kg	105	62.0	126	
<b>EP066: Polychlorinated Biphenyls (PCB) (QCLot: 3336607)</b>									
EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	1 mg/kg	109	62.0	126	
<b>EP068A: Organochlorine Pesticides (OC) (QCLot: 3335566)</b>									
EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	0.5 mg/kg	95.1	69.0	113	
EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	0.5 mg/kg	95.4	65.0	117	
EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	0.5 mg/kg	101	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	95.5	65.0	117	
EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	0.5 mg/kg	92.6	67.0	115	
EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	0.5 mg/kg	90.1	69.0	115	
EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	0.5 mg/kg	93.2	62.0	118	
EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	0.5 mg/kg	91.0	63.0	117	



Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report				
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
<b>EP068A: Organochlorine Pesticides (OC) (QCLot: 3335566) - continued</b>									
EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	0.5 mg/kg	92.5	66.0	116	
EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	0.5 mg/kg	93.3	64.0	116	
EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	0.5 mg/kg	91.7	66.0	116	
EP068: 4.4'-DDE	72-55-9	0.05	mg/kg	<0.05	0.5 mg/kg	91.1	67.0	115	
EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	0.5 mg/kg	94.6	67.0	123	
EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	0.5 mg/kg	94.7	69.0	115	
EP068: 4.4'-DDD	72-54-8	0.05	mg/kg	<0.05	0.5 mg/kg	92.7	69.0	121	
EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	0.5 mg/kg	87.9	56.0	120	
EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	0.5 mg/kg	102	62.0	124	
EP068: 4.4'-DDT	50-29-3	0.2	mg/kg	<0.2	0.5 mg/kg	96.3	66.0	120	
EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	0.5 mg/kg	96.1	64.0	122	
EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	0.5 mg/kg	106	54.0	130	
<b>EP068A: Organochlorine Pesticides (OC) (QCLot: 3336606)</b>									
EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	0.5 mg/kg	86.7	69.0	113	
EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	0.5 mg/kg	89.1	65.0	117	
EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	0.5 mg/kg	93.4	67.0	119	
EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	0.5 mg/kg	105	68.0	116	
EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	88.7	65.0	117	
EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	0.5 mg/kg	84.8	67.0	115	
EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	0.5 mg/kg	84.8	69.0	115	
EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	0.5 mg/kg	89.2	62.0	118	
EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	0.5 mg/kg	87.3	63.0	117	
EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	0.5 mg/kg	86.6	66.0	116	
EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	0.5 mg/kg	84.7	64.0	116	
EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	0.5 mg/kg	86.5	66.0	116	
EP068: 4.4'-DDE	72-55-9	0.05	mg/kg	<0.05	0.5 mg/kg	87.9	67.0	115	
EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	0.5 mg/kg	82.9	67.0	123	
EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	0.5 mg/kg	83.4	69.0	115	
EP068: 4.4'-DDD	72-54-8	0.05	mg/kg	<0.05	0.5 mg/kg	89.1	69.0	121	
EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	0.5 mg/kg	88.9	56.0	120	
EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	0.5 mg/kg	84.3	62.0	124	
EP068: 4.4'-DDT	50-29-3	0.2	mg/kg	<0.2	0.5 mg/kg	82.4	66.0	120	
EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	0.5 mg/kg	87.9	64.0	122	
EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	0.5 mg/kg	85.2	54.0	130	
<b>EP068B: Organophosphorus Pesticides (OP) (QCLot: 3335566)</b>									
EP068: Dichlorvos	62-73-7	0.05	mg/kg	<0.05	0.5 mg/kg	89.6	59.0	119	
EP068: Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	100.0	62.0	128	
EP068: Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	0.5 mg/kg	77.4	54.0	126	
EP068: Dimethoate	60-51-5	0.05	mg/kg	<0.05	0.5 mg/kg	98.8	67.0	119	



Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report				
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	High
<b>EP068B: Organophosphorus Pesticides (OP) (QCLot: 3335566) - continued</b>									
EP068: Diazinon	333-41-5	0.05	mg/kg	<0.05	0.5 mg/kg	85.1	70.0	120	
EP068: Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	0.5 mg/kg	97.1	72.0	120	
EP068: Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	0.5 mg/kg	102	68.0	120	
EP068: Malathion	121-75-5	0.05	mg/kg	<0.05	0.5 mg/kg	98.4	68.0	122	
EP068: Fenthion	55-38-9	0.05	mg/kg	<0.05	0.5 mg/kg	91.6	69.0	117	
EP068: Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	0.5 mg/kg	92.0	76.0	118	
EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	0.5 mg/kg	96.0	64.0	122	
EP068: Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	0.5 mg/kg	92.2	70.0	116	
EP068: Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	0.5 mg/kg	95.4	69.0	121	
EP068: Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	0.5 mg/kg	93.3	66.0	118	
EP068: Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	0.5 mg/kg	96.1	68.0	124	
EP068: Prothiofos	34643-46-4	0.05	mg/kg	<0.05	0.5 mg/kg	96.2	62.0	112	
EP068: Ethion	563-12-2	0.05	mg/kg	<0.05	0.5 mg/kg	93.6	68.0	120	
EP068: Carbophenothion	786-19-6	0.05	mg/kg	<0.05	0.5 mg/kg	102	65.0	127	
EP068: Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	0.5 mg/kg	104	41.0	123	
<b>EP068B: Organophosphorus Pesticides (OP) (QCLot: 3336606)</b>									
EP068: Dichlorvos	62-73-7	0.05	mg/kg	<0.05	0.5 mg/kg	101	59.0	119	
EP068: Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	81.8	62.0	128	
EP068: Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	0.5 mg/kg	81.2	54.0	126	
EP068: Dimethoate	60-51-5	0.05	mg/kg	<0.05	0.5 mg/kg	105	67.0	119	
EP068: Diazinon	333-41-5	0.05	mg/kg	<0.05	0.5 mg/kg	83.3	70.0	120	
EP068: Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	0.5 mg/kg	88.4	72.0	120	
EP068: Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	0.5 mg/kg	91.8	68.0	120	
EP068: Malathion	121-75-5	0.05	mg/kg	<0.05	0.5 mg/kg	90.0	68.0	122	
EP068: Fenthion	55-38-9	0.05	mg/kg	<0.05	0.5 mg/kg	88.3	69.0	117	
EP068: Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	0.5 mg/kg	87.5	76.0	118	
EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	0.5 mg/kg	90.1	64.0	122	
EP068: Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	0.5 mg/kg	87.3	70.0	116	
EP068: Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	0.5 mg/kg	89.2	69.0	121	
EP068: Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	0.5 mg/kg	89.8	66.0	118	
EP068: Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	0.5 mg/kg	91.0	68.0	124	
EP068: Prothiofos	34643-46-4	0.05	mg/kg	<0.05	0.5 mg/kg	92.6	62.0	112	
EP068: Ethion	563-12-2	0.05	mg/kg	<0.05	0.5 mg/kg	87.6	68.0	120	
EP068: Carbophenothion	786-19-6	0.05	mg/kg	<0.05	0.5 mg/kg	88.4	65.0	127	
EP068: Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	0.5 mg/kg	77.3	41.0	123	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3335565)</b>									
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	6 mg/kg	108	77.0	125	
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	6 mg/kg	112	72.0	124	
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	6 mg/kg	105	73.0	127	



Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3335565) - continued</b>									
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	6 mg/kg	111	72.0	126	
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	6 mg/kg	107	75.0	127	
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	6 mg/kg	110	77.0	127	
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	6 mg/kg	113	73.0	127	
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	6 mg/kg	112	74.0	128	
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	6 mg/kg	106	69.0	123	
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	6 mg/kg	106	75.0	127	
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	6 mg/kg	104	68.0	116	
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	6 mg/kg	110	74.0	126	
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	6 mg/kg	110	70.0	126	
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	6 mg/kg	105	61.0	121	
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	6 mg/kg	104	62.0	118	
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	6 mg/kg	103	63.0	121	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3336605)</b>									
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	6 mg/kg	93.4	77.0	125	
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	6 mg/kg	102	72.0	124	
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	6 mg/kg	99.0	73.0	127	
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	6 mg/kg	100	72.0	126	
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	6 mg/kg	104	75.0	127	
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	6 mg/kg	101	77.0	127	
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	6 mg/kg	103	73.0	127	
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	6 mg/kg	99.6	74.0	128	
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	6 mg/kg	94.8	69.0	123	
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	6 mg/kg	94.4	75.0	127	
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	6 mg/kg	97.1	68.0	116	
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	6 mg/kg	101	74.0	126	
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	6 mg/kg	94.1	70.0	126	
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	6 mg/kg	82.8	61.0	121	
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	6 mg/kg	76.7	62.0	118	
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	6 mg/kg	86.3	63.0	121	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3335564)</b>									
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	300 mg/kg	88.8	75.0	129	
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	450 mg/kg	94.3	77.0	131	
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	300 mg/kg	94.9	71.0	129	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3336381)</b>									
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	107	68.4	128	



Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%)	Recovery Limits (%)	
						LCS	Low	High
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3336403)</b>								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	112	68.4	128
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3336604)</b>								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	300 mg/kg	87.7	75.0	129
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	450 mg/kg	93.7	77.0	131
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	300 mg/kg	90.8	71.0	129
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3335564)</b>								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	375 mg/kg	90.4	77.0	125
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	525 mg/kg	96.0	74.0	138
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	225 mg/kg	80.0	63.0	131
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3336381)</b>								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	107	68.4	128
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3336403)</b>								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	114	68.4	128
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3336604)</b>								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	375 mg/kg	92.7	77.0	125
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	525 mg/kg	90.3	74.0	138
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	225 mg/kg	94.2	63.0	131
<b>EP080: BTEXN (QCLot: 3336381)</b>								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	107	62.0	116
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	96.2	67.0	121
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	99.7	65.0	117
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	99.1	66.0	118
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	102	68.0	120
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	106	63.0	119
<b>EP080: BTEXN (QCLot: 3336403)</b>								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	106	62.0	116
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	106	67.0	121
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	111	65.0	117
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	107	66.0	118
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	110	68.0	120
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	106	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 (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
<b>EG005(ED093)T: Total Metals by ICP-AES (QCLot: 3339921)</b>							
ES2037885-001	GROUP 1-1	EG005T: Arsenic	7440-38-2	50 mg/kg	106	70.0	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	101	70.0	130
		EG005T: Chromium	7440-47-3	50 mg/kg	98.8	68.0	132
		EG005T: Copper	7440-50-8	250 mg/kg	110	70.0	130
		EG005T: Lead	7439-92-1	250 mg/kg	101	70.0	130
		EG005T: Nickel	7440-02-0	50 mg/kg	100	70.0	130
		EG005T: Zinc	7440-66-6	250 mg/kg	103	66.0	133
<b>EG005(ED093)T: Total Metals by ICP-AES (QCLot: 3340964)</b>							
ES2037475-001	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	71.4	70.0	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	85.1	70.0	130
		EG005T: Chromium	7440-47-3	50 mg/kg	78.7	68.0	132
		EG005T: Copper	7440-50-8	250 mg/kg	91.1	70.0	130
		EG005T: Lead	7439-92-1	250 mg/kg	85.2	70.0	130
		EG005T: Nickel	7440-02-0	50 mg/kg	86.3	70.0	130
		EG005T: Zinc	7440-66-6	250 mg/kg	82.4	66.0	133
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3339922)</b>							
ES2037885-001	GROUP 1-1	EG035T: Mercury	7439-97-6	5 mg/kg	87.1	70.0	130
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3340963)</b>							
ES2037475-001	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	85.7	70.0	130
<b>EP066: Polychlorinated Biphenyls (PCB) (QCLot: 3335567)</b>							
ES2037885-001	GROUP 1-1	EP066: Total Polychlorinated biphenyls	----	1 mg/kg	# 230	70.0	130
<b>EP066: Polychlorinated Biphenyls (PCB) (QCLot: 3336607)</b>							
ES2038200-017	Anonymous	EP066: Total Polychlorinated biphenyls	----	1 mg/kg	128	70.0	130
<b>EP068A: Organochlorine Pesticides (OC) (QCLot: 3335566)</b>							
ES2037885-001	GROUP 1-1	EP068: gamma-BHC	58-89-9	0.5 mg/kg	101	70.0	130
		EP068: Heptachlor	76-44-8	0.5 mg/kg	73.0	70.0	130
		EP068: Aldrin	309-00-2	0.5 mg/kg	78.0	70.0	130
		EP068: Dieldrin	60-57-1	0.5 mg/kg	89.2	70.0	130
		EP068: Endrin	72-20-8	2 mg/kg	80.0	70.0	130
		EP068: 4,4'-DDT	50-29-3	2 mg/kg	87.0	70.0	130
<b>EP068A: Organochlorine Pesticides (OC) (QCLot: 3336606)</b>							
ES2038200-017	Anonymous	EP068: gamma-BHC	58-89-9	0.5 mg/kg	71.9	70.0	130
		EP068: Heptachlor	76-44-8	0.5 mg/kg	98.8	70.0	130
		EP068: Aldrin	309-00-2	0.5 mg/kg	107	70.0	130
		EP068: Dieldrin	60-57-1	0.5 mg/kg	77.3	70.0	130
		EP068: Endrin	72-20-8	2 mg/kg	92.1	70.0	130
		EP068: 4,4'-DDT	50-29-3	2 mg/kg	95.5	70.0	130



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
<b>EP068B: Organophosphorus Pesticides (OP) (QCLot: 3335566)</b>							
ES2037885-001	GROUP 1-1	EP068: Diazinon	333-41-5	0.5 mg/kg	103	70.0	130
		EP068: Chlorpyrifos-methyl	5598-13-0	0.5 mg/kg	80.9	70.0	130
		EP068: Pirimphos-ethyl	23505-41-1	0.5 mg/kg	78.2	70.0	130
		EP068: Bromophos-ethyl	4824-78-6	0.5 mg/kg	72.4	70.0	130
		EP068: Prothiofos	34643-46-4	0.5 mg/kg	92.6	70.0	130
<b>EP068B: Organophosphorus Pesticides (OP) (QCLot: 3336606)</b>							
ES2038200-017	Anonymous	EP068: Diazinon	333-41-5	0.5 mg/kg	77.4	70.0	130
		EP068: Chlorpyrifos-methyl	5598-13-0	0.5 mg/kg	94.3	70.0	130
		EP068: Pirimphos-ethyl	23505-41-1	0.5 mg/kg	85.8	70.0	130
		EP068: Bromophos-ethyl	4824-78-6	0.5 mg/kg	72.5	70.0	130
		EP068: Prothiofos	34643-46-4	0.5 mg/kg	92.8	70.0	130
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3335565)</b>							
ES2037885-001	GROUP 1-1	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	99.4	70.0	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	102	70.0	130
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3336605)</b>							
ES2038200-017	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	96.0	70.0	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	98.5	70.0	130
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3335564)</b>							
ES2037885-001	GROUP 1-1	EP071: C10 - C14 Fraction	----	523 mg/kg	90.8	73.0	137
		EP071: C15 - C28 Fraction	----	2319 mg/kg	110	53.0	131
		EP071: C29 - C36 Fraction	----	1714 mg/kg	113	52.0	132
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3336381)</b>							
ES2037885-001	GROUP 1-1	EP080: C6 - C9 Fraction	----	32.5 mg/kg	106	70.0	130
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3336403)</b>							
ES2037475-001	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	123	70.0	130
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3336604)</b>							
ES2038200-017	Anonymous	EP071: C10 - C14 Fraction	----	523 mg/kg	73.4	73.0	137
		EP071: C15 - C28 Fraction	----	2319 mg/kg	103	53.0	131
		EP071: C29 - C36 Fraction	----	1714 mg/kg	117	52.0	132
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3335564)</b>							
ES2037885-001	GROUP 1-1	EP071: >C10 - C16 Fraction	----	860 mg/kg	113	73.0	137
		EP071: >C16 - C34 Fraction	----	3223 mg/kg	114	53.0	131
		EP071: >C34 - C40 Fraction	----	1058 mg/kg	104	52.0	132
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3336381)</b>							
ES2037885-001	GROUP 1-1	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	105	70.0	130
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3336403)</b>							



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
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3336403) - continued</b>							
ES2037475-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	122	70.0	130
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3336604)</b>							
ES2038200-017	Anonymous	EP071: >C10 - C16 Fraction	----	860 mg/kg	90.2	73.0	137
		EP071: >C16 - C34 Fraction	----	3223 mg/kg	107	53.0	131
		EP071: >C34 - C40 Fraction	----	1058 mg/kg	117	52.0	132
<b>EP080: BTEXN (QCLot: 3336381)</b>							
ES2037885-001	GROUP 1-1	EP080: Benzene	71-43-2	2.5 mg/kg	102	70.0	130
		EP080: Toluene	108-88-3	2.5 mg/kg	92.7	70.0	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	95.1	70.0	130
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	96.2	70.0	130
			106-42-3				
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	99.8	70.0	130
		EP080: Naphthalene	91-20-3	2.5 mg/kg	88.1	70.0	130
<b>EP080: BTEXN (QCLot: 3336403)</b>							
ES2037475-001	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	105	70.0	130
		EP080: Toluene	108-88-3	2.5 mg/kg	106	70.0	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	113	70.0	130
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	109	70.0	130
			106-42-3				
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	112	70.0	130
		EP080: Naphthalene	91-20-3	2.5 mg/kg	98.9	70.0	130

## QA/QC Compliance Assessment to assist with Quality Review

Work Order	: ES2037885	Page	: 1 of 7
Client	: ENVIRONMENTAL EARTH SCIENCES	Laboratory	: Environmental Division Sydney
Contact	: Natalie Eldridge	Telephone	: +61 2 8784 8555
Project	: 120110	Date Samples Received	: 28-Oct-2020
Site	: Leppington	Issue Date	: 04-Nov-2020
Sampler	: Nina Potts	No. of samples received	: 24
Order number	: ----	No. of samples analysed	: 21

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

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

### Summary of Outliers

#### Outliers : Quality Control Samples

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

- **NO** Method Blank value outliers occur.
- **NO** Duplicate outliers occur.
- **NO** Laboratory Control outliers occur.
- Matrix Spike outliers exist - please see following pages for full details.
- For all regular sample matrices, **NO** surrogate recovery outliers occur.

#### Outliers : Analysis Holding Time Compliance

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

#### Outliers : Frequency of Quality Control Samples

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



**Outliers : Quality Control Samples**

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
<b>Matrix Spike (MS) Recoveries</b>							
EP066: Polychlorinated Biphenyls (PCB)	ES2037885--001	GROUP 1-1	<b>Total Polychlorinated biphenyls</b>	----	230 %	70.0-130%	<b>Recovery greater than upper data quality objective</b>

**Analysis Holding Time Compliance**

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

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

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

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

Matrix: **SOIL**

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

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>EA055: Moisture Content (Dried @ 105-110°C)</b>								
<b>Soil Glass Jar - Unpreserved (EA055)</b>								
GROUP 1-1, GROUP 1-3, GROUP 2-2, GROUP 2-4, GROUP 3-2, GROUP 3-4, GROUP 3-7, GROUP 3-9, GROUP 3-12, GROUP 4-1, GROUP 4-3	GROUP 1-2, GROUP 2-1, GROUP 2-3, GROUP 3-1, GROUP 3-3, GROUP 3-6, GROUP 3-8, GROUP 3-11, FD1, GROUP 4-2,	28-Oct-2020	----	----	----	02-Nov-2020	11-Nov-2020	✔



Matrix: **SOIL**

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

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
<b>EG005(ED093)T: Total Metals by ICP-AES</b>							
<b>Soil Glass Jar - Unpreserved (EG005T)</b>							
GROUP 1-1, GROUP 1-3, GROUP 2-2, GROUP 2-4, GROUP 3-2, GROUP 3-4, GROUP 3-7, GROUP 3-9, GROUP 3-12, GROUP 4-1, GROUP 1-2, GROUP 2-1, GROUP 2-3, GROUP 3-1, GROUP 3-3, GROUP 3-6, GROUP 3-8, GROUP 3-11, FD1, GROUP 4-2	28-Oct-2020	02-Nov-2020	26-Apr-2021	✓	02-Nov-2020	26-Apr-2021	✓
<b>Soil Glass Jar - Unpreserved (EG005T)</b>							
GROUP 4-3	28-Oct-2020	02-Nov-2020	26-Apr-2021	✓	03-Nov-2020	26-Apr-2021	✓
<b>EG035T: Total Recoverable Mercury by FIMS</b>							
<b>Soil Glass Jar - Unpreserved (EG035T)</b>							
GROUP 1-1, GROUP 1-3, GROUP 2-2, GROUP 2-4, GROUP 3-2, GROUP 3-4, GROUP 3-7, GROUP 3-9, GROUP 3-12, GROUP 4-1, GROUP 1-2, GROUP 2-1, GROUP 2-3, GROUP 3-1, GROUP 3-3, GROUP 3-6, GROUP 3-8, GROUP 3-11, FD1, GROUP 4-2	28-Oct-2020	02-Nov-2020	25-Nov-2020	✓	03-Nov-2020	25-Nov-2020	✓
<b>Soil Glass Jar - Unpreserved (EG035T)</b>							
GROUP 4-3	28-Oct-2020	02-Nov-2020	25-Nov-2020	✓	04-Nov-2020	25-Nov-2020	✓
<b>EP066: Polychlorinated Biphenyls (PCB)</b>							
<b>Soil Glass Jar - Unpreserved (EP066)</b>							
GROUP 4-3	28-Oct-2020	30-Oct-2020	11-Nov-2020	✓	02-Nov-2020	09-Dec-2020	✓
<b>Soil Glass Jar - Unpreserved (EP066)</b>							
GROUP 1-1, GROUP 1-3, GROUP 2-2, GROUP 2-4, GROUP 3-2, GROUP 3-4, GROUP 3-7, GROUP 3-9, GROUP 3-12, GROUP 4-1, GROUP 1-2, GROUP 2-1, GROUP 2-3, GROUP 3-1, GROUP 3-3, GROUP 3-6, GROUP 3-8, GROUP 3-11, FD1, GROUP 4-2	28-Oct-2020	30-Oct-2020	11-Nov-2020	✓	03-Nov-2020	09-Dec-2020	✓



Matrix: SOIL

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

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
<b>EP068A: Organochlorine Pesticides (OC)</b>							
<b>Soil Glass Jar - Unpreserved (EP068)</b> GROUP 4-3	28-Oct-2020	30-Oct-2020	11-Nov-2020	✓	02-Nov-2020	09-Dec-2020	✓
<b>Soil Glass Jar - Unpreserved (EP068)</b> GROUP 1-1, GROUP 1-3, GROUP 2-2, GROUP 2-4, GROUP 3-2, GROUP 3-4, GROUP 3-7, GROUP 3-9, GROUP 3-12, GROUP 4-1, GROUP 1-2, GROUP 2-1, GROUP 2-3, GROUP 3-1, GROUP 3-3, GROUP 3-6, GROUP 3-8, GROUP 3-11, FD1, GROUP 4-2	28-Oct-2020	30-Oct-2020	11-Nov-2020	✓	03-Nov-2020	09-Dec-2020	✓
<b>EP068B: Organophosphorus Pesticides (OP)</b>							
<b>Soil Glass Jar - Unpreserved (EP068)</b> GROUP 4-3	28-Oct-2020	30-Oct-2020	11-Nov-2020	✓	02-Nov-2020	09-Dec-2020	✓
<b>Soil Glass Jar - Unpreserved (EP068)</b> GROUP 1-1, GROUP 1-3, GROUP 2-2, GROUP 2-4, GROUP 3-2, GROUP 3-4, GROUP 3-7, GROUP 3-9, GROUP 3-12, GROUP 4-1, GROUP 1-2, GROUP 2-1, GROUP 2-3, GROUP 3-1, GROUP 3-3, GROUP 3-6, GROUP 3-8, GROUP 3-11, FD1, GROUP 4-2	28-Oct-2020	30-Oct-2020	11-Nov-2020	✓	03-Nov-2020	09-Dec-2020	✓
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>							
<b>Soil Glass Jar - Unpreserved (EP075(SIM))</b> GROUP 1-1, GROUP 1-3, GROUP 2-2, GROUP 2-4, GROUP 3-2, GROUP 3-4, GROUP 3-7, GROUP 3-9, GROUP 3-12, GROUP 4-1, GROUP 1-2, GROUP 2-1, GROUP 2-3, GROUP 3-1, GROUP 3-3, GROUP 3-6, GROUP 3-8, GROUP 3-11, FD1, GROUP 4-2	28-Oct-2020	30-Oct-2020	11-Nov-2020	✓	02-Nov-2020	09-Dec-2020	✓
<b>Soil Glass Jar - Unpreserved (EP075(SIM))</b> GROUP 4-3	28-Oct-2020	30-Oct-2020	11-Nov-2020	✓	31-Oct-2020	09-Dec-2020	✓



Matrix: **SOIL**

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

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
<b>Soil Glass Jar - Unpreserved (EP080)</b>								
GROUP 1-1, GROUP 1-3, GROUP 2-2, GROUP 2-4, GROUP 3-2, GROUP 3-4, GROUP 3-7, GROUP 3-9, GROUP 3-12, GROUP 4-1, GROUP 4-3	GROUP 1-2, GROUP 2-1, GROUP 2-3, GROUP 3-1, GROUP 3-3, GROUP 3-6, GROUP 3-8, GROUP 3-11, FD1, GROUP 4-2,	28-Oct-2020	30-Oct-2020	11-Nov-2020	✓	02-Nov-2020	11-Nov-2020	✓
<b>Soil Glass Jar - Unpreserved (EP071)</b>								
GROUP 4-3		28-Oct-2020	30-Oct-2020	11-Nov-2020	✓	31-Oct-2020	09-Dec-2020	✓
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions</b>								
<b>Soil Glass Jar - Unpreserved (EP080)</b>								
GROUP 1-1, GROUP 1-3, GROUP 2-2, GROUP 2-4, GROUP 3-2, GROUP 3-4, GROUP 3-7, GROUP 3-9, GROUP 3-12, GROUP 4-1, GROUP 4-3	GROUP 1-2, GROUP 2-1, GROUP 2-3, GROUP 3-1, GROUP 3-3, GROUP 3-6, GROUP 3-8, GROUP 3-11, FD1, GROUP 4-2,	28-Oct-2020	30-Oct-2020	11-Nov-2020	✓	02-Nov-2020	11-Nov-2020	✓
<b>Soil Glass Jar - Unpreserved (EP071)</b>								
GROUP 4-3		28-Oct-2020	30-Oct-2020	11-Nov-2020	✓	31-Oct-2020	09-Dec-2020	✓
<b>EP080: BTEXN</b>								
<b>Soil Glass Jar - Unpreserved (EP080)</b>								
GROUP 1-1, GROUP 1-3, GROUP 2-2, GROUP 2-4, GROUP 3-2, GROUP 3-4, GROUP 3-7, GROUP 3-9, GROUP 3-12, GROUP 4-1, GROUP 4-3	GROUP 1-2, GROUP 2-1, GROUP 2-3, GROUP 3-1, GROUP 3-3, GROUP 3-6, GROUP 3-8, GROUP 3-11, FD1, GROUP 4-2,	28-Oct-2020	30-Oct-2020	11-Nov-2020	✓	02-Nov-2020	11-Nov-2020	✓



## Quality Control Parameter Frequency Compliance

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

Matrix: **SOIL**

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

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Reaular	Actual	Expected	Evaluation	
<b>Analytical Methods</b>							
<b>Laboratory Duplicates (DUP)</b>							
Moisture Content	EA055	4	40	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	4	40	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	4	40	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	4	40	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	4	40	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	5	40	12.50	10.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	4	40	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	4	40	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
<b>Laboratory Control Samples (LCS)</b>							
PAH/Phenols (SIM)	EP075(SIM)	2	40	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	2	40	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	2	40	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	40	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	40	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	40	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	40	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
<b>Method Blanks (MB)</b>							
PAH/Phenols (SIM)	EP075(SIM)	2	40	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	2	40	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	2	40	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	40	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	40	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	40	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	40	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
<b>Matrix Spikes (MS)</b>							
PAH/Phenols (SIM)	EP075(SIM)	2	40	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	2	40	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	2	40	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	40	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	40	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	40	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	40	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard



## Brief Method Summaries

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

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl <sub>2</sub> ) (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 <sub>2</sub> which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM Schedule B(3)
Polychlorinated Biphenyls (PCB)	EP066	SOIL	In house: Referenced to USEPA SW 846 - 8270 Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM Schedule B(3).
Pesticides by GCMS	EP068	SOIL	In house: Referenced to USEPA SW 846 - 8270 Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This technique is compliant with NEPM Schedule B(3).
TRH - Semivolatile Fraction	EP071	SOIL	In house: Referenced to USEPA SW 846 - 8015 Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C40. Compliant with NEPM Schedule B(3).
PAH/Phenols (SIM)	EP075(SIM)	SOIL	In house: Referenced to USEPA SW 846 - 8270. Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM Schedule B(3)
TRH Volatiles/BTEX	EP080	SOIL	In house: Referenced to USEPA SW 846 - 8260. Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. Compliant with NEPM Schedule B(3) amended.

Preparation Methods	Method	Matrix	Method Descriptions
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	In house: Referenced to USEPA 200.2. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM Schedule B(3).
Methanolic Extraction of Soils for Purge and Trap	ORG16	SOIL	In house: Referenced to USEPA SW 846 - 5030A. 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids	ORG17	SOIL	In house: Mechanical agitation (tumbler). 10g of sample, Na <sub>2</sub> SO <sub>4</sub> 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.

# CHAIN OF CUSTODY - ANALYSIS REQUEST FORM

Job No: 120110  
LEPPINGTON  
~~28/10/20~~ 28/10/20

Laboratory: ALS

Project Manager: Natalie E.

Sampler: Nina Potts

Site Location: 28/10/20

Sheet: 1 of 2

No. of samples	Sample ID/ Depth	Anticipated Result (PID/EC reading)	Date sampled	Time sampled	Sample Matrix			Analysis Required										Sample-specific instructions/ notes								
					Soil	Water	Sediment	1	2	3	4	5	6	7	8	9	10		11	12	13	14	15	16	17	18
1	GROUP 1-1		28/10/20		X			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
2	GROUP 1-2							X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
3	GROUP 1-3							X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
4	GROUP 1-4							X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
5	GROUP 2-1							X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
6	GROUP 2-2							X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
7	GROUP 2-3							X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
8	GROUP 2-4							X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
9	GROUP 3-1							X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
10	GROUP 3-2							X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
11	GROUP 3-3							X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
12	GROUP 3-4							X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
13	GROUP 3-5							X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
14	GROUP 3-6							X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
15	GROUP 3-7							X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
16	GROUP 3-8							X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
17	GROUP 3-9							X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
18	GROUP 3-10							X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
19	GROUP 3-11							X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
20	GROUP 3-12							X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
21	FD 1							X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Environmental Division  
 Sydney  
 Work Order Reference  
**ES2037885**



Telephone : - 61-2-8784 8555

Turn Around (circle): **NORMAL** 3 DAYS / 48 HRS / 24 HRS (confirm with lab in advance if quick turn-around is required)

Comments/ Instructions: \_\_\_\_\_

Lab Quotation No. (if applicable): \_\_\_\_\_  
 Send report to (email address): npotts@eesigroup.com  
 Cc: report to (email address): neldridge@eesigroup.com  
 Cc: invoice to (email address): jbarwood@eesigroup.com  
 Cc: accounts@eesigroup.com

Sent off Site/Office by: Nina Potts  
 Receiving Lab: sarin  
 Receiving Lab: \_\_\_\_\_

Name: Nina Potts Signature: [Signature] Date: 28/10/20 Time: \_\_\_\_\_  
 Signature: [Signature] Date: 28/10/20 Time: 2:00pm

ENVIRONMENTAL EARTH SCIENCES  
 CONTAMINATION RESOLVED  
 Phone: (02) 9922 1777  
 Fax: (02) 9922 1010  
 PO Box: 380, North Sydney NSW 2059  
 Email: eesNSW@eesigroup.com





SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : ES2039189

Client	: ENVIRONMENTAL EARTH SCIENCES	Laboratory	: Environmental Division Sydney
Contact	: Natalie Eldridge	Contact	: Shane Ellis
Address	: 82-84 Dickson Avenue ARTARMON NSW, AUSTRALIA 2064	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: neldridge@eesigroup.com	E-mail	: Shane.Ellis@ALSGlobal.com
Telephone	: ----	Telephone	: +61 2 8784 8555
Facsimile	: ----	Facsimile	: +61-2-8784 8500
Project	: 120110	Page	: 1 of 3
Order number	: ----	Quote number	: ES2020ENVEAR0009 (EN/010/20)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: ----		
Sampler	:		

Dates

Date Samples Received	: 05-Nov-2020 12:10	Issue Date	: 05-Nov-2020
Client Requested Due Date	: 09-Nov-2020	Scheduled Reporting Date	: <b>09-Nov-2020</b>

Delivery Details

Mode of Delivery	: Samples On Hand	Security Seal	: Not Available
No. of coolers/boxes	: ----	Temperature	: ----
Receipt Detail	:	No. of samples received / analysed	: 11 / 11

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- **This is rebatch of ES2037885.**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.



## Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

## Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	SOIL - EG005C Leachable Metals by ICPAES	SOIL - EN33a-G TCLP Leachate - Glass Leaching Vessel	SOIL - EP075 SIM PAH only SIM - PAH only
ES2039189-001	28-Oct-2020 00:00	Group 3-1	✓	✓	
ES2039189-002	28-Oct-2020 00:00	Group 3-2	✓	✓	
ES2039189-003	28-Oct-2020 00:00	Group 3-3	✓	✓	✓
ES2039189-004	28-Oct-2020 00:00	Group 3-4		✓	✓
ES2039189-005	28-Oct-2020 00:00	Group 3-6	✓	✓	
ES2039189-006	28-Oct-2020 00:00	Group 3-7	✓	✓	✓
ES2039189-007	28-Oct-2020 00:00	Group 3-8	✓	✓	
ES2039189-008	28-Oct-2020 00:00	Group 3-9	✓	✓	
ES2039189-009	28-Oct-2020 00:00	Group 3-11	✓	✓	✓
ES2039189-010	28-Oct-2020 00:00	Group 3-12	✓	✓	
ES2039189-011	28-Oct-2020 00:00	Group 4-2	✓	✓	

## Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.



## Requested Deliverables

### ACCOUNTS EESI GROUP

- A4 - AU Tax Invoice (INV) Email accounts@eesigroup.com

### ALL INVOICES MELB ADDRESS

- A4 - AU Tax Invoice (INV) Email accounts@eesigroup.com

### JAMES BARWOOD

- \*AU Certificate of Analysis - NATA (COA) Email jbarwood@eesigroup.com

- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email jbarwood@eesigroup.com

- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email jbarwood@eesigroup.com

- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email jbarwood@eesigroup.com

- Chain of Custody (CoC) (COC) Email jbarwood@eesigroup.com

- EDI Format - ENMRG (ENMRG) Email jbarwood@eesigroup.com

- EDI Format - ESDAT (ESDAT) Email jbarwood@eesigroup.com

### Natalie Eldridge

- \*AU Certificate of Analysis - NATA (COA) Email neldridge@eesigroup.com

- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email neldridge@eesigroup.com

- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email neldridge@eesigroup.com

- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email neldridge@eesigroup.com

- Chain of Custody (CoC) (COC) Email neldridge@eesigroup.com

- EDI Format - ENMRG (ENMRG) Email neldridge@eesigroup.com

- EDI Format - ESDAT (ESDAT) Email neldridge@eesigroup.com

### NEENA POTTS

- \*AU Certificate of Analysis - NATA (COA) Email npotts@eesigroup.com

- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email npotts@eesigroup.com

- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email npotts@eesigroup.com

- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email npotts@eesigroup.com

- Chain of Custody (CoC) (COC) Email npotts@eesigroup.com

- EDI Format - ENMRG (ENMRG) Email npotts@eesigroup.com

- EDI Format - ESDAT (ESDAT) Email npotts@eesigroup.com

## CERTIFICATE OF ANALYSIS

**Work Order** : **ES2039189**  
**Client** : **ENVIRONMENTAL EARTH SCIENCES**  
**Contact** : Natalie Eldridge  
**Address** : 82-84 Dickson Avenue  
 ARTARMON NSW, AUSTRALIA 2064  
  
**Telephone** : ----  
**Project** : 120110  
**Order number** : ----  
**C-O-C number** : ----  
**Sampler** : ----  
**Site** : ----  
**Quote number** : EN/010/20  
**No. of samples received** : 11  
**No. of samples analysed** : 11

**Page** : 1 of 9  
**Laboratory** : Environmental Division Sydney  
**Contact** : Shane Ellis  
**Address** : 277-289 Woodpark Road Smithfield NSW Australia 2164  
  
**Telephone** : +61 2 8784 8555  
**Date Samples Received** : 05-Nov-2020 12:10  
**Date Analysis Commenced** : 07-Nov-2020  
**Issue Date** : 09-Nov-2020 14:53



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>
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW



## General Comments

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

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

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

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

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

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

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

- EP075 (SIM): Where reported, 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.
- EP075(SIM): Where reported, Total Cresol is the sum of the reported concentrations of 2-Methylphenol and 3- & 4-Methylphenol at or above the LOR.



**Analytical Results**

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	Group 3-1	Group 3-2	Group 3-3	Group 3-4	Group 3-6
Client sampling date / time				28-Oct-2020 00:00					
Compound	CAS Number	LOR	Unit	ES2039189-001	ES2039189-002	ES2039189-003	ES2039189-004	ES2039189-005	ES2039189-005
				Result	Result	Result	Result	Result	Result
<b>EN33: TCLP Leach - Inorganics/Non-Volatile Organics (Glass Vessel)</b>									
Initial pH	----	0.1	pH Unit	8.8	8.4	8.9	8.9	9.0	9.0
After HCl pH	----	0.1	pH Unit	5.0	1.3	5.5	1.4	1.5	1.5
Extraction Fluid Number	----	1	-	2	1	2	1	1	1
Final pH	----	0.1	pH Unit	4.9	5.0	5.9	5.1	5.3	5.3



**Analytical Results**

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	Group 3-7	Group 3-8	Group 3-9	Group 3-11	Group 3-12
Client sampling date / time				28-Oct-2020 00:00					
Compound	CAS Number	LOR	Unit	ES2039189-006	ES2039189-007	ES2039189-008	ES2039189-009	ES2039189-010	
				Result	Result	Result	Result	Result	
<b>EN33: TCLP Leach - Inorganics/Non-Volatile Organics (Glass Vessel)</b>									
Initial pH	----	0.1	pH Unit	9.2	8.8	8.9	9.0	9.0	
After HCl pH	----	0.1	pH Unit	5.4	5.5	5.9	2.2	1.5	
Extraction Fluid Number	----	1	-	2	2	2	1	1	
Final pH	----	0.1	pH Unit	4.7	5.7	5.9	6.3	5.3	



**Analytical Results**

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	Group 4-2	----	----	----	----
Client sampling date / time				28-Oct-2020 00:00	----	----	----	----	----
Compound	CAS Number	LOR	Unit	ES2039189-011	-----	-----	-----	-----	-----
				Result	----	----	----	----	----
<b>EN33: TCLP Leach - Inorganics/Non-Volatile Organics (Glass Vessel)</b>									
Initial pH	----	0.1	pH Unit	6.9	----	----	----	----	----
After HCl pH	----	0.1	pH Unit	1.5	----	----	----	----	----
Extraction Fluid Number	----	1	-	1	----	----	----	----	----
Final pH	----	0.1	pH Unit	5.1	----	----	----	----	----



## Analytical Results

Sub-Matrix: **TCLP LEACHATE**  
 (Matrix: **WATER**)

Client sample ID

				Group 3-1	Group 3-2	Group 3-3	Group 3-4	Group 3-6
Client sampling date / time				28-Oct-2020 00:00				
Compound	CAS Number	LOR	Unit	ES2039189-001	ES2039189-002	ES2039189-003	ES2039189-004	ES2039189-005
				Result	Result	Result	Result	Result
<b>EG005(ED093)C: Leachable Metals by ICPAES</b>								
Lead	7439-92-1	0.1	mg/L	<0.1	<0.1	<0.1	----	<b>0.6</b>
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Benzo(a)pyrene	50-32-8	0.5	µg/L	----	----	<0.5	<0.5	----
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	1.0	%	----	----	<b>21.3</b>	<b>26.7</b>	----
2-Chlorophenol-D4	93951-73-6	1.0	%	----	----	<b>54.0</b>	<b>58.4</b>	----
2,4,6-Tribromophenol	118-79-6	1.0	%	----	----	<b>52.5</b>	<b>45.3</b>	----
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	1.0	%	----	----	<b>62.6</b>	<b>67.4</b>	----
Anthracene-d10	1719-06-8	1.0	%	----	----	<b>69.2</b>	<b>83.1</b>	----
4-Terphenyl-d14	1718-51-0	1.0	%	----	----	<b>63.7</b>	<b>67.9</b>	----



## Analytical Results

Sub-Matrix: **TCLP LEACHATE**  
 (Matrix: **WATER**)

Client sample ID

				Group 3-7	Group 3-8	Group 3-9	Group 3-11	Group 3-12
Client sampling date / time				28-Oct-2020 00:00				
Compound	CAS Number	LOR	Unit	ES2039189-006	ES2039189-007	ES2039189-008	ES2039189-009	ES2039189-010
				Result	Result	Result	Result	Result
<b>EG005(ED093)C: Leachable Metals by ICPAES</b>								
Chromium	7440-47-3	0.1	mg/L	<0.1	----	<0.1	<0.1	<0.1
Lead	7439-92-1	0.1	mg/L	<b>0.2</b>	<0.1	<0.1	<0.1	<b>0.1</b>
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	----	----	<0.5	----
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	1.0	%	<b>28.4</b>	----	----	<b>23.5</b>	----
2-Chlorophenol-D4	93951-73-6	1.0	%	<b>59.7</b>	----	----	<b>50.1</b>	----
2,4,6-Tribromophenol	118-79-6	1.0	%	<b>58.0</b>	----	----	<b>49.4</b>	----
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	1.0	%	<b>71.1</b>	----	----	<b>62.7</b>	----
Anthracene-d10	1719-06-8	1.0	%	<b>93.9</b>	----	----	<b>83.4</b>	----
4-Terphenyl-d14	1718-51-0	1.0	%	<b>72.2</b>	----	----	<b>62.6</b>	----



**Analytical Results**

Sub-Matrix: <b>TCLP LEACHATE</b> (Matrix: <b>WATER</b> )				Client sample ID	Group 4-2	----	----	----	----
Client sampling date / time				28-Oct-2020 00:00	----	----	----	----	
Compound	CAS Number	LOR	Unit	ES2039189-011	-----	-----	-----	-----	
				Result	----	----	----	----	
<b>EG005(ED093)C: Leachable Metals by ICPAES</b>									
<b>Lead</b>	7439-92-1	0.1	mg/L	<0.1	----	----	----	----	



## Surrogate Control Limits

Sub-Matrix: TCLP LEACHATE		Recovery Limits (%)	
Compound	CAS Number	Low	High
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>			
Phenol-d6	13127-88-3	10	44
2-Chlorophenol-D4	93951-73-6	14	94
2,4,6-Tribromophenol	118-79-6	17	125
<b>EP075(SIM)T: PAH Surrogates</b>			
2-Fluorobiphenyl	321-60-8	20	104
Anthracene-d10	1719-06-8	27	113
4-Terphenyl-d14	1718-51-0	32	112

## QUALITY CONTROL REPORT

<b>Work Order</b>	: <b>ES2039189</b>	Page	: 1 of 3
<b>Client</b>	: <b>ENVIRONMENTAL EARTH SCIENCES</b>	<b>Laboratory</b>	: Environmental Division Sydney
<b>Contact</b>	: Natalie Eldridge	<b>Contact</b>	: Shane Ellis
<b>Address</b>	: 82-84 Dickson Avenue ARTARMON NSW, AUSTRALIA 2064	<b>Address</b>	: 277-289 Woodpark Road Smithfield NSW Australia 2164
<b>Telephone</b>	: ----	<b>Telephone</b>	: +61 2 8784 8555
<b>Project</b>	: 120110	<b>Date Samples Received</b>	: 05-Nov-2020
<b>Order number</b>	: ----	<b>Date Analysis Commenced</b>	: 07-Nov-2020
<b>C-O-C number</b>	: ----	<b>Issue Date</b>	: 09-Nov-2020
<b>Sampler</b>	: ----		
<b>Site</b>	: ----		
<b>Quote number</b>	: EN/010/20		
<b>No. of samples received</b>	: 11		
<b>No. of samples analysed</b>	: 11		



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>
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW



### General Comments

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

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

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

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

### Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EG005(ED093)C: Leachable Metals by ICPAES (QC Lot: 3351601)</b>									
EM2019174-065	Anonymous	EG005C: Chromium	7440-47-3	0.1	mg/L	<0.1	<0.1	0.00	No Limit
		EG005C: Lead	7439-92-1	0.1	mg/L	<0.1	<0.1	0.00	No Limit
ES2039189-006	Group 3-7	EG005C: Chromium	7440-47-3	0.1	mg/L	<0.1	<0.1	0.00	No Limit
		EG005C: Lead	7439-92-1	0.1	mg/L	0.2	0.2	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**

				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
<b>EN33: TCLP Leach - Inorganics/Non-Volatile Organics (Glass Vessel) (QCLot: 3350820)</b>								
EN33a-G: Initial pH	----	0.1	pH Unit	1.0	----	----	----	----
EN33a-G: After HCl pH	----	0.1	pH Unit	1.0	----	----	----	----
EN33a-G: Final pH	----	0.1	pH Unit	1.0	----	----	----	----
<b>EN33: TCLP Leach - Inorganics/Non-Volatile Organics (Glass Vessel) (QCLot: 3350821)</b>								
EN33a-G: Initial pH	----	0.1	pH Unit	1.0	----	----	----	----
EN33a-G: After HCl pH	----	0.1	pH Unit	1.0	----	----	----	----
EN33a-G: Final pH	----	0.1	pH Unit	1.0	----	----	----	----

Sub-Matrix: **WATER**

				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
<b>EG005(ED093)C: Leachable Metals by ICPAES (QCLot: 3351601)</b>								
EG005C: Chromium	7440-47-3	0.1	mg/L	<0.1	0.1 mg/L	114	88.0	114
EG005C: Lead	7439-92-1	0.1	mg/L	<0.1	0.1 mg/L	104	80.0	118
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3351708)</b>								
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	5 µg/L	73.1	63.3	117

### 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: **WATER**

				Matrix Spike (MS) Report			
				Spike Concentration	Spike Recovery (%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
<b>EG005(ED093)C: Leachable Metals by ICPAES (QCLot: 3351601)</b>							
EM2019174-066	Anonymous	EG005C: Chromium	7440-47-3	1 mg/L	98.1	70.0	130
		EG005C: Lead	7439-92-1	1 mg/L	96.9	70.0	130

## QA/QC Compliance Assessment to assist with Quality Review

Work Order	: ES2039189	Page	: 1 of 4
Client	: ENVIRONMENTAL EARTH SCIENCES	Laboratory	: Environmental Division Sydney
Contact	: Natalie Eldridge	Telephone	: +61 2 8784 8555
Project	: 120110	Date Samples Received	: 05-Nov-2020
Site	: ----	Issue Date	: 09-Nov-2020
Sampler	: ----	No. of samples received	: 11
Order number	: ----	No. of samples analysed	: 11

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

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

### Summary of Outliers

#### Outliers : Quality Control Samples

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

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

#### Outliers : Analysis Holding Time Compliance

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

#### Outliers : Frequency of Quality Control Samples

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



### Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type Method	Count		Rate (%)		Quality Control Specification
	QC	Regular	Actual	Expected	
<b>Laboratory Duplicates (DUP)</b>					
PAH/Phenols (GC/MS - SIM)	0	10	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
<b>Matrix Spikes (MS)</b>					
PAH/Phenols (GC/MS - SIM)	0	10	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

### Analysis Holding Time Compliance

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

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

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

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

Matrix: **SOIL**

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

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
<b>EN33: TCLP Leach - Inorganics/Non-Volatile Organics (Glass Vessel)</b>							
<b>Non-Volatile Leach: 14 day HT(e.g. SV organics) (EN33a-G)</b>							
Group 3-3, Group 3-7,	28-Oct-2020	07-Nov-2020	11-Nov-2020	✔	----	----	----
Group 3-1, Group 3-6, Group 3-9, Group 4-2	28-Oct-2020	07-Nov-2020	26-Apr-2021	✔	----	----	----

Matrix: **WATER**

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

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
<b>EG005(ED093)C: Leachable Metals by ICPAES</b>							
<b>Clear Plastic Bottle - Nitric Acid; Unfiltered (EG005C)</b>							
Group 3-1, Group 3-3, Group 3-7, Group 3-9, Group 3-12,	07-Nov-2020	09-Nov-2020	06-May-2021	✔	09-Nov-2020	06-May-2021	✔
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>							
<b>Amber Glass Bottle - Unpreserved (EP075(SIM))</b>							
Group 3-3, Group 3-7,	07-Nov-2020	09-Nov-2020	14-Nov-2020	✔	09-Nov-2020	19-Dec-2020	✔



## Quality Control Parameter Frequency Compliance

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

### Matrix: SOIL

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

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Reaular	Actual	Expected	Evaluation	
<i>Analytical Methods</i>							
<b>Method Blanks (MB)</b>							
TCLP for Non & Semivolatile Analytes - Glass Leaching Vessel	EN33a-G	2	22	9.09	9.09	✔	NEPM 2013 B3 & ALS QC Standard

### Matrix: WATER

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

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Reaular	Actual	Expected	Evaluation	
<i>Analytical Methods</i>							
<b>Laboratory Duplicates (DUP)</b>							
Leachable Metals by ICPAES	EG005C	2	15	13.33	10.00	✔	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	0	10	0.00	10.00	✖	NEPM 2013 B3 & ALS QC Standard
<b>Laboratory Control Samples (LCS)</b>							
Leachable Metals by ICPAES	EG005C	1	15	6.67	5.00	✔	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	10	10.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
<b>Method Blanks (MB)</b>							
Leachable Metals by ICPAES	EG005C	1	15	6.67	5.00	✔	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	10	10.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
<b>Matrix Spikes (MS)</b>							
Leachable Metals by ICPAES	EG005C	1	15	6.67	5.00	✔	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	0	10	0.00	5.00	✖	NEPM 2013 B3 & ALS QC Standard



## Brief Method Summaries

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

<i>Analytical Methods</i>	<i>Method</i>	<i>Matrix</i>	<i>Method Descriptions</i>
Leachable Metals by ICPAES	EG005C	SOIL	In house: referenced to APHA 3120; USEPA SW 846 - 6010: The ICPAES technique ionises leachate sample atoms emitting a characteristic spectrum. This spectrum is then compared against matrix matched standards for quantification. This method is compliant with NEPM Schedule B(3).
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	SOIL	In house: Referenced to USEPA SW 846 - 8270 Sample extracts are analysed by Capillary GC/MS in SIM Mode and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM Schedule B(3)
<i>Preparation Methods</i>	<i>Method</i>	<i>Matrix</i>	<i>Method Descriptions</i>
Digestion for Total Recoverable Metals in TCLP Leachate	EN25C	SOIL	In house: Referenced to USEPA SW846-3005. Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM Schedule B(3)
TCLP for Non & Semivolatile Analytes - Glass Leaching Vessel	EN33a-G	SOIL	In house QWI-EN/33 referenced to USEPA SW846-1311: The TCLP procedure is designed to determine the mobility of both organic and inorganic analytes present in wastes. The standard TCLP leach is for non-volatile and Semivolatile test parameters.
Separatory Funnel Extraction of Liquids	ORG14	SOIL	In house: Referenced to USEPA SW 846 - 3510 100 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM Schedule B(3) . ALS default excludes sediment which may be resident in the container.

Vishal  
05/11/2020 12:10

**Vishal Patel**

**From:** Shane Ellis  
**Sent:** Thursday, 5 November 2020 12:08 PM  
**To:** Vishal Patel  
**Cc:** Samples Sydney  
**Subject:** ES2037885 - TCLP Rebatch

Hi Vishal,

Can you please organise the rebatch below?

# 9 - 12, 14 - 17, 19, 20, 23  
S - 1260 - 1261

ES2037885			
Sample ID	TCLP Cr	TCLP Pb	TCLP B(a)P
1 Group 3-1		X	
2 Group 3-2		X	
3 Group 3-3		X	X
7 Group 3-4			X
5 Group 3-6		X	
6 Group 3-7	X	X	X
7 Group 3-8		X	
8 Group 3-9	X	X	
3 Group 3-11	X	X	X
0 Group 3-12	X	X	
1 Group 4-2		X	

Cheers,

Shane Ellis  
Client Services Officer, Environmental

TAT

Environmental Division  
Sydney  
Work Order Reference  
**ES2039189**



Telephone : + 61-2-8784 8556



T +61 2 8784 8555 F +61 2 8784 8500  
D +61 2 8784 8509

[shane.ellis@alsglobal.com](mailto:shane.ellis@alsglobal.com)  
277-289 Woodpark Road  
Smithfield NSW 2164 AUSTRALIA

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**From:** Nina Potts [<mailto:npotts@eesigroup.com>]

**Sent:** Thursday, 5 November 2020 11:38 AM

**To:** Shane Ellis <[shane.ellis@ALSGlobal.com](mailto:shane.ellis@ALSGlobal.com)>

**Cc:** Natalie Eldridge <[neldridge@eesigroup.com](mailto:neldridge@eesigroup.com)>; James Barwood <[jbarwood@eesigroup.com](mailto:jbarwood@eesigroup.com)>

**Subject:** [EXTERNAL] - 120110- TCLP requests

---

**CAUTION:** This email originated from outside of ALS. Do not click links or open attachments unless you recognize the sender and are sure content is relevant to you.

Hi Shane,

Thanks for sending us the lab results yesterday for the ALS work order ES2037885- everything looks good!  
Can we please schedule TCLP analyses for the following analytes and samples:

Chromium:

- Group3-7
- Group 3-9
- Group3-11
- Group 3-12

Lead:

- Group 3-1
- Group3-2
- Group3-3
- Group3-6
- Group3-7
- Group3-8
- Group 3-9
- Group3-11
- Group 3-12
- Group4-2

benzo(a)pyrene:

- Group3-3
- Group 3-4
- Group3-7
- Group 3-11

Hope you're having a good day!

Regards,

Nina



**Nina Potts – Environmental Scientist**

82-84 Dickson Ave Artarmon NSW 2064

P: +61 2 9922 1777

[npotts@eesigroup.com](mailto:npotts@eesigroup.com)

[www.eesigroup.com](http://www.eesigroup.com)

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## ATTACHMENT 4 – STATISTICAL ANALYSIS

---

**UCL Statistics for Total Recoverable Hydrocarbons**

User Selected Options  
 Date/Time of Computation ProUCL 5.15/11/2020 10:06:30 AM  
 From File WorkSheet.xls  
 Full Precision OFF  
 Confidence Coefficient 95%  
 Number of Bootstrap Operations 2000

C1

**General Statistics**

Total Number of Observations	10	Number of Distinct Observations	9
		Number of Missing Observations	0
Minimum	50	Mean	3640
Maximum	13500	Median	2240
SD	4231	Std. Error of Mean	1338
Coefficient of Variation	1.162	Skewness	1.58

**Normal GOF Test**

Shapiro Wilk Test Statistic	0.831	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.842	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.198	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.262	Data appear Normal at 5% Significance Level	
Data appear Approximate Normal at 5% Significance Level			

**Assuming Normal Distribution**

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	6093	95% Adjusted-CLT UCL (Chen-1995)	6555
		95% Modified-t UCL (Johnson-1978)	6204

**Gamma GOF Test**

A-D Test Statistic	0.235	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.77	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.133	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.279	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			

**Gamma Statistics**

k hat (MLE)	0.583	k star (bias corrected MLE)	0.475
Theta hat (MLE)	6243	Theta star (bias corrected MLE)	7666
nu hat (MLE)	11.66	nu star (bias corrected)	9.496
MLE Mean (bias corrected)	3640	MLE Sd (bias corrected)	5283
		Approximate Chi Square Value (0.05)	3.629
Adjusted Level of Significance	0.0267	Adjusted Chi Square Value	3.027

**Assuming Gamma Distribution**

95% Approximate Gamma UCL (use when n>=50)	9524	95% Adjusted Gamma UCL (use when n<50)	11421
--	------	--	-------

**Lognormal GOF Test**

Shapiro Wilk Test Statistic	0.888	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.842	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.179	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.262	Data appear Lognormal at 5% Significance Level	
Data appear Lognormal at 5% Significance Level			

**Lognormal Statistics**

Minimum of Logged Data	3.912	Mean of logged Data	7.136
Maximum of Logged Data	9.51	SD of logged Data	1.991

**Assuming Lognormal Distribution**

95% H-UCL	322840	90% Chebyshev (MVUE) UCL	17728
95% Chebyshev (MVUE) UCL	23029	97.5% Chebyshev (MVUE) UCL	30387
99% Chebyshev (MVUE) UCL	44840		

**Nonparametric Distribution Free UCL Statistics**

Data appear to follow a Discernible Distribution at 5% Significance Level

**Nonparametric Distribution Free UCLs**

95% CLT UCL	5841	95% Jackknife UCL	6093
95% Standard Bootstrap UCL	5701	95% Bootstrap-t UCL	7820
95% Hall's Bootstrap UCL	15157	95% Percentile Bootstrap UCL	5911
95% BCA Bootstrap UCL	6272		
90% Chebyshev(Mean, Sd) UCL	7654	95% Chebyshev(Mean, Sd) UCL	9472
97.5% Chebyshev(Mean, Sd) UCL	11996	99% Chebyshev(Mean, Sd) UCL	16953

**Suggested UCL to Use**

95% Student's-t UCL **6093**

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test  
 When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.  
 Recommendations are based upon data size, data distribution, and skewness.

### UCL Statistics for Cadmium

User Selected Options  
 Date/Time of Computation ProUCL 5.15/11/2020 10:12:56 AM  
 From File WorkSheet.xls  
 Full Precision OFF  
 Confidence Coefficient 95%  
 Number of Bootstrap Operations 2000

C3

#### General Statistics

Total Number of Observations	10	Number of Distinct Observations	9
Minimum	1	Number of Missing Observations	0
Maximum	25	Mean	9
SD	8.406	Median	6
Coefficient of Variation	0.934	Std. Error of Mean	2.658
		Skewness	0.954

#### Normal GOF Test

Shapiro Wilk Test Statistic	0.878	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.842	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.194	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.262	Data appear Normal at 5% Significance Level	
Data appear Normal at 5% Significance Level			

#### Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	13.87	95% Adjusted-CLT UCL (Chen-1995)	14.23
		95% Modified-t UCL (Johnson-1978)	14.01

#### Gamma GOF Test

A-D Test Statistic	0.233	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.746	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.124	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.273	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			

#### Gamma Statistics

k hat (MLE)	1.115	k star (bias corrected MLE)	0.847
Theta hat (MLE)	8.07	Theta star (bias corrected MLE)	10.62
nu hat (MLE)	22.3	nu star (bias corrected)	16.95
MLE Mean (bias corrected)	9	MLE Sd (bias corrected)	9.777
Adjusted Level of Significance	0.0267	Approximate Chi Square Value (0.05)	8.634
		Adjusted Chi Square Value	7.624

#### Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	17.67	95% Adjusted Gamma UCL (use when n<50)	20
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#### Lognormal GOF Test

Shapiro Wilk Test Statistic	0.933	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.842	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.125	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.262	Data appear Lognormal at 5% Significance Level	
Data appear Lognormal at 5% Significance Level			

#### Lognormal Statistics

Minimum of Logged Data	0	Mean of logged Data	1.686
Maximum of Logged Data	3.219	SD of logged Data	1.17

#### Assuming Lognormal Distribution

95% H-UCL	41.32	90% Chebyshev (MVUE) UCL	21.05
95% Chebyshev (MVUE) UCL	26.19	97.5% Chebyshev (MVUE) UCL	33.32
99% Chebyshev (MVUE) UCL	47.34		

#### Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

#### Nonparametric Distribution Free UCLs

95% CLT UCL	13.37	95% Jackknife UCL	13.87
95% Standard Bootstrap UCL	13.09	95% Bootstrap-t UCL	16.25
95% Hall's Bootstrap UCL	14.71	95% Percentile Bootstrap UCL	13.2
95% BCA Bootstrap UCL	13.8		
90% Chebyshev(Mean, Sd) UCL	16.97	95% Chebyshev(Mean, Sd) UCL	20.59
97.5% Chebyshev(Mean, Sd) UCL	25.6	99% Chebyshev(Mean, Sd) UCL	35.45

#### Suggested UCL to Use

95% Student's-t UCL **13.87**

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test

When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.