Information Required		Summary of Information
		• 510403: Laboratory RPD acceptance criteria exceeded for TRH C6 – C9 (53%), 1.2.4 Trimethylbenzene (84%) and TRH C6 – C10 (47%) • 510838: Laboratory RPD acceptance criteria exceeded for TRH C6 – C9 (200%), Toluene (42%), o-Xylene (37%), TRH C6 – C10 (36%) and TRH >C34 – C40 (33%) • 510847: Laboratory RPD acceptance criteria exceeded for Benzene (36%) • 511710: Laboratory RPD acceptance criteria exceeded for Anthracene (51%), Phenenthrene (35%) and Pyrene (38%) • 511830: Laboratory RPD acceptance criteria exceeded for TRH C10 - C14 (49%), TRH C15 - C28 (50%), TRH >C10 - C16 (48%) and TRH >C16 - C34 (46%) • 511834: Laboratory RPD acceptance criteria exceeded for TRH C10 - C14 (49%), TRH C15 - C28 (50%), TRH >C10 - C16 (48%) and TRH >C16 - C34 (46%) • 510847: Laboratory RPD acceptance criteria exceeded for TRH C10 – C6 (61%) • 512189: Laboratory RPD acceptance criteria exceeded for Phenanthrene (33%) • 512196: Laboratory RPD acceptance criteria exceeded for Phenanthrene (33%) • 512528: Laboratory RPD acceptance criteria exceeded for Anthracene (51%), Phenanthrene (35%) and Pyrene (38%) • 512666: Laboratory RPD acceptance criteria exceeded for Dieldrin (31%) and Lead (41%) • 512683: Laboratory RPD acceptance criteria exceeded for TRH C29 – C36 (47%) Overall, the results of laboratory duplicate sample analyses were considered acceptable for the purpose of the validation program.
12	Laboratory blank results	The laboratory reagent blank is used to correct for possible contamination resulting from the preparation or processing of the sample. The laboratory blank typically comprises an organic or aqueous solution that is as free as possible of analytes of interest to which is added all the reagents, in the same volume, as used in the preparation and subsequent analysis of the samples. During the course of the analyses, laboratory blank samples were carried through the complete sample preparation procedure and contained the same reagent concentrations in the final solution as in the sample solution used for analysis. The results of the laboratory blank sample analyses are presented in **Appendix I**. The laboratory blank samples were all within the laboratory specifications and no errors were reported.
13	Data Suitability	Overall, the results of field and laboratory sample analyses are considered acceptable for the purpose of the validation program. There were no issues identified on the laboratory certificates that could compromise the quality of the data set.

5.3 Air quality monitoring

The remediation contractor undertook air quality monitoring for asbestos fibres whilst any asbestos works was occurring, including excavation of asbestos contaminated, movements onsite and loading for offsite disposal.

Air monitoring was conducted during the excavation and transport of the asbestos contaminated sand material from tank farm 1 between the dates of 7/07/2016, 8/07/2016, 19/07/2016, 21/07/2016 and 22/07/2016.

These samples were collected in accordance with the *Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres, 2nd Edition [NOHSC:3003 (2005)]* and analysed by a NATA accredited laboratory.

GHD note that all air monitoring results returned less than 0.01 fibres per millilitre of air (f/mL) which is the lowest detectable limit for the method used.

The air monitoring certificates and documents are supplied in **Appendix J**.

Appendix J – Asbestos air quality monitoring

AIRSAFE

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ABN 84 164 293 690

TEST REPORT

July 8, 2016

OPEC Systems
3/ 4 Aquatic Drive
FRENCHS FOREST NSW 2086

Your Reference:	DNSDC Refueling Depot - Moorebank
Job Number:	32121

Attention: s22

Dear Dave,

In accordance with your instructions, Airsafe conducted air monitoring for airborne lead at the above site.

The following samples were processed on the dates indicated.

Samples:	4 Filters
Date of Sampling:	07/07/16
Date of Analysis:	08/07/16
Date of Preliminary Report Sent:	Not Issued

The results are contained in the following pages of this report.

Should you have any queries regarding this report please contact the undersigned.

Yours faithfully
AIRSAFE OHC PTY LTD

s22

s22
Approved Counter and Signatory

AIRSAFE

PROJECT: **DNSDC Refueling Depot - Moorebank** **JOB NO:** **32121**

Sample No	Location/Reference	Time		Fields	Fibres	Concentration (Fibres/mL)
		On	Off			
32121-1	Star picket north west of work area	0800	1530	100	0	<0.01
32121-2	Star picket north east of work area	0801	1531	100	0	<0.01
32121-3	Star picket south east of work area	0802	1532	100	0	<0.01
32121-4	Star picket south west of work area	0803	1533	100	0	<0.01

Method: Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres [NOHSC: 3003 (2005)] and in-house method AS101 – Membrane Filter Method for Estimating Airborne Asbestos Fibres.

Sampling: All samples have been taken by Airsafe personnel in accordance with the sampling plan detailed in method AS101.

Quality Control: A field blank is taken and analysed for each batch of samples.

Note: The results relate only to the samples tested. Times are provided for customer reference only and do not form part of the facility's accreditation for volume measurement.

Environmental Conditions: Air monitoring during the removal of asbestos containing material at the above site.

Comment: These calculated concentrations are less than the reporting limit of 0.01 fibres/mL for control and exposure monitoring as stated in the Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres [NOHSC: 3003 (2005)].

AIRSAFE

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ABN 84 164 293 690

TEST REPORT

July 11, 2016

OPEC Systems
3/ 4 Aquatic Drive
FRENCHS FOREST NSW 2086

Your Reference:	DNSDC Refueling Depot - Moorebank
Job Number:	32121

Attention: s22

Dear Dave,

In accordance with your instructions, Airsafe conducted air monitoring for airborne lead at the above site.

The following samples were processed on the dates indicated.

Samples:	4 Filters
Date of Sampling:	08/07/16
Date of Analysis:	11/07/16
Date of Preliminary Report Sent:	Not Issued

The results are contained in the following pages of this report.

Should you have any queries regarding this report please contact the undersigned.

Yours faithfully
AIRSAFE OHC PTY LTD

s22

s22
Approved Counter and Signatory

AIRSAFE

PROJECT: **DNSDC Refueling Depot - Moorebank** **JOB NO:** **32121**

Sample No	Location/Reference	Time		Fields	Fibres	Concentration (Fibres/mL)
		On	Off			
32121-5	Star picket north west of work area	0800	1515	100	0	<0.01
32121-6	Star picket north east of work area	0801	1516	100	0	<0.01
32121-7	Star picket south east of work area	0802	1517	100	0	<0.01
32121-8	Star picket south west of work area	0803	1518	100	0	<0.01

Method: Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres [NOHSC: 3003 (2005)] and in-house method AS101 – Membrane Filter Method for Estimating Airborne Asbestos Fibres.

Sampling: All samples have been taken by Airsafe personnel in accordance with the sampling plan detailed in method AS101.

Quality Control: A field blank is taken and analysed for each batch of samples.

Note: The results relate only to the samples tested. Times are provided for customer reference only and do not form part of the facility's accreditation for volume measurement.

Environmental Conditions: Air monitoring during the removal of asbestos containing material at the above site.

Comment: These calculated concentrations are less than the reporting limit of 0.01 fibres/mL for control and exposure monitoring as stated in the Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres [NOHSC: 3003 (2005)].

AIRSAFE

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TEST REPORT

July 20, 2016

OPEC Systems
3/ 4 Aquatic Drive
FRENCHS FOREST NSW 2086

Your Reference:	DNSDC Refueling Depot - Moorebank
Job Number:	32121

Attention: s22

Dear Dave,

In accordance with your instructions, Airsafe conducted air monitoring for airborne lead at the above site.

The following samples were processed on the dates indicated.

Samples:	5 Filters
Date of Sampling:	19/07/16
Date of Analysis:	20/07/16
Date of Preliminary Report Sent:	Not Issued

The results are contained in the following pages of this report.

Should you have any queries regarding this report please contact the undersigned.

Yours faithfully
AIRSAFE OHC PTY LTD

s22

s22
Approved Counter and Signatory

AIRSAFE

PROJECT: DNSDC Refueling Depot - Moorebank **JOB NO:** 32121

Sample No	Location/Reference	Time		Fields	Fibres	Concentration (Fibres/mL)
		On	Off			
32121-9	Perimeter fence – North west of work area	0700	1430	100	0	<0.01
32121-10	Perimeter fence – North east of work area	0701	1431	100	0	<0.01
32121-11	Perimeter fence – South west of work area	0702	1432	100	0	<0.01
32121-12	Perimeter fence – South east of work area	0703	1433	100	0	<0.01
32121-13	Perimeter fence – South of work area adj. site sheds.	0704	1434	100	0	<0.01

Method: Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres [NOHSC: 3003 (2005)] and in-house method AS101 – Membrane Filter Method for Estimating Airborne Asbestos Fibres.

Sampling: All samples have been taken by Airsafe personnel in accordance with the sampling plan detailed in method AS101.

Quality Control: A field blank is taken and analysed for each batch of samples.

Note: The results relate only to the samples tested. Times are provided for customer reference only and do not form part of the facility's accreditation for volume measurement.

Environmental Conditions: Air monitoring during the removal of asbestos contaminated soil.

Comment: These calculated concentrations are less than the reporting limit of 0.01 fibres/mL for control and exposure monitoring as stated in the Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres [NOHSC: 3003 (2005)].

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ABN 84 164 293 690

TEST REPORT

July 22, 2016

OPEC Systems
3/ 4 Aquatic Drive
FRENCHS FOREST NSW 2086

Your Reference: DNSDC Refueling Depot - Moorebank
Job Number: 32121

Attention: s22

Dear Dave,

In accordance with your instructions, Airsafe conducted air monitoring for airborne lead at the above site.

The following samples were processed on the dates indicated.

Samples:	5 Filters
Date of Sampling:	21/07/16
Date of Analysis:	22/07/16
Date of Preliminary Report Sent:	Not Issued

The results are contained in the following pages of this report.

Should you have any queries regarding this report please contact the undersigned.

Yours faithfully
AIRSAFE OHC PTY LTD

s22

s22
Approved Counter and Signatory

AIRSAFE

PROJECT: **DNSDC Refueling Depot - Moorebank** **JOB NO:** **32121**

Sample No	Location/Reference	Time		Fields	Fibres	Concentration (Fibres/mL)
		On	Off			
32121-14	Perimeter fence – North west of work area	0700	1430	100	0	<0.01
32121-15	Perimeter fence – North east of work area	0701	1431	100	0	<0.01
32121-16	Perimeter fence – South west of work area	0702	1432	100	0	<0.01
32121-17	Perimeter fence – South east of work area	0703	1433	100	0	<0.01
32121-18	Perimeter fence – South of work area adj. site sheds.	0704	1434	100	0	<0.01

Method: Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres [NOHSC: 3003 (2005)] and in-house method AS101 – Membrane Filter Method for Estimating Airborne Asbestos Fibres.

Sampling: All samples have been taken by Airsafe personnel in accordance with the sampling plan detailed in method AS101.

Quality Control: A field blank is taken and analysed for each batch of samples.

Note: The results relate only to the samples tested. Times are provided for customer reference only and do not form part of the facility's accreditation for volume measurement.

Environmental Conditions: Air monitoring during the removal of asbestos contaminated soil.

Comment: These calculated concentrations are less than the reporting limit of 0.01 fibres/mL for control and exposure monitoring as stated in the Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres [NOHSC: 3003 (2005)].

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TEST REPORT

July 25, 2016

OPEC Systems
3/ 4 Aquatic Drive
FRENCHS FOREST NSW 2086

Your Reference: DNSDC Refueling Depot - Moorebank
Job Number: 32121

Attention: s22

Dear Dave,

In accordance with your instructions, Airsafe conducted air monitoring for airborne lead at the above site.

The following samples were processed on the dates indicated.

Samples:	5 Filters
Date of Sampling:	22/07/16
Date of Analysis:	25/07/16
Date of Preliminary Report Sent:	Not Issued

The results are contained in the following pages of this report.

Should you have any queries regarding this report please contact the undersigned.

Yours faithfully
AIRSAFE OHC PTY LTD

s22

s22
Approved Counter and Signatory

AIRSAFE

PROJECT: DNSDC Refueling Depot - Moorebank **JOB NO:** 32121

Sample No	Location/Reference	Time		Fields	Fibres	Concentration (Fibres/mL)
		On	Off			
32121-19	Perimeter fence – North west of work area	0700	1430	100	0	<0.01
32121-20	Perimeter fence – North east of work area	0701	1431	100	0	<0.01
32121-21	Perimeter fence – South west of work area	0702	1432	100	0	<0.01
32121-22	Perimeter fence – South east of work area	0703	1433	100	0	<0.01
32121-23	Perimeter fence – South of work area adj. site sheds.	0704	1434	100	0	<0.01

Method: Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres [NOHSC: 3003 (2005)] and in-house method AS101 – Membrane Filter Method for Estimating Airborne Asbestos Fibres.

Sampling: All samples have been taken by Airsafe personnel in accordance with the sampling plan detailed in method AS101.

Quality Control: A field blank is taken and analysed for each batch of samples.

Note: The results relate only to the samples tested. Times are provided for customer reference only and do not form part of the facility's accreditation for volume measurement.

Environmental Conditions: Air monitoring during the removal of asbestos contaminated soil.

Comment: These calculated concentrations are less than the reporting limit of 0.01 fibres/mL for control and exposure monitoring as stated in the Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres [NOHSC: 3003 (2005)].

- Ten characterisation samples (IS01-IS11) were collected by the consultant and analysed for TRH, BTEX, PAH, 8 metals and asbestos.

VENM (Crushed Shale)

- Approx. 6008.22 tonnes of VENM comprising of natural Bringelly Shale (which was processed to a sandy clayey gravel, grey / dark grey, coarse to cobble gravels of shale, low plasticity, slightly moist) was imported to site to backfill all the excavations.
- 29 characterisation samples (VIS01 to VIS29) were collected by the consultant and analysed for TRH, BTEX, PAH, 8 metals and asbestos.

8.4.5 Groundwater Sampling

The consultant (GHD 2016b) reported that two groundwater monitoring events were required to be undertaken as per the RAP. The first round was completed by the consultant on 9-12 August 2016, with second round anticipated to be completed in November 2016 and results to be provided as an addendum to the validation report (GHD 2016b).

A total of 23 groundwater samples were collected and analysed for TRH, BTEX, PAH with methane, sulphate, nitrate, ferrous iron, manganese and TOC analysed on selected samples.

The consultant reported that LNAPL was detected in 13 wells BHHP3401 (0.195 m), DNSDC2 (4.425 m), GW115 (3.195 m), GW116 (0.805 m), GW117 (0.110 m), GW118 (1.815 m), GW119 (0.885 m), GW120 (1.675 m), GW121 (0.860 m), GW124 (2.163 m), GW126 (0.985 m), GW129 (0.630 m), GW140 (0.220 m).

The following summary of field parameters were reported:

- pH – ranged from 3.91 to 6.38 pH units.
- Dissolved oxygen – ranged from 0.05 mg/L to 1.68 mg/L.
- Electrical conductivity – ranged from 332.2 µs/cm to 8223 µs/cm.
- Redox – ranged from -190.7 mv to 449.3 mv.

The groundwater analytical results were reported as follows:

- Benzene concentrations were exceeding the criteria of 950 µg/L in eight wells sampled, with the highest concentration of 16,000 µg/L in GW121 and GW129.
- Xylene (o) concentrations were exceeding the criteria of 350 µg/L in four wells sampled, with the highest concentration of 1900 µg/L in GW121.
- TRH C_6-C_{10} (F1) concentrations were exceeding the criteria of 6000 µg/L in nine wells sampled, with the highest concentration of 47,000 µg/L in GW118.
- Naphthalene concentrations were exceeding the criteria of 16 µg/L in 18 wells sampled, with the highest concentration of 350 µg/L in GW115.

8.4.6 Air Quality Monitoring

The consultant (GHD 2016b) reported that air quality monitoring for asbestos fibres was undertaken by the remediation contractor whilst any asbestos works was occurring, including excavation of asbestos contaminated, movements onsite and loading for offsite disposal, on 07/2016, 8/07/2016, 19/07/2016, 21/07/2016 and 22/07/2016, undertaken in accordance with the *Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres, 2nd Edition [NOHSC:3003 (2005)]* and analysed by a NATA accredited laboratory.

All air monitoring results returned less than 0.01 fibres per millilitre of air (f/mL) which is the lowest detectable limit for the method used. The consultant provided daily air monitoring reports and relevant NATA accredited laboratory certificates.

8.5 Audit Findings

RAP

The consultant's nominated Phase A remediation objectives as reported in GHD 2015c were appropriate and consistent with the proposed site landuse.

The consultant (GHD 2015b and 2015c) considered a range of remediation options and adopted excavation to remove secondary source (contaminated soil); physical or hydraulic containment; and MPVE as suitable approaches for application at the site as the preferred remediation approach for the site. With consideration to the nature and extent of the identified contamination, the auditor accepts the preferred/adopted approach to be appropriate and consistent with relevant NSW EPA guidance.

The adopted remediation approach was checked by the auditor and found to be:

- Technically feasible.
- Environmentally justifiable given the nature and extent of the identified contamination.
- Consistent with relevant laws, policies and guidelines, since the works are proposed to be undertaken in a manner which is unlikely to result in any relevant regulatory measures being breached.

Extent of Remediation Works

The consultant (GHD 2016b) reported works were generally conducted in accordance with the RAP (GHD 2015c) prepared for the site.

The site plans provided by the consultant (GHD 2016b) were to scale and adequately identified the sampling locations relevant to the main site features such as boundaries and street frontage. The consultant (GHD 2016b) additionally provided survey plans showing the extent of the excavations and site levels post remediation works.

The remediation works described by the consultant were also consistent with observations made by the and site audit assistant during audit inspections undertaken during Phase A remediation works (as outlined in **Section 1.5**).

Validation Works

The validation consultant (GHD 2016b) provided tables which adequately summarised the laboratory results. The concentrations of contaminants reported by the consultant (GHD 2016b) for the Phase A remediation areas were checked against, and found to be consistent with, those reported by the laboratory.

The laboratory procedures were appropriate for the identified contaminants of concern and the adopted site assessment criteria against which the results were compared.

The Phase A validation sampling undertaken by the consultant was generally consistent with the requirements of the RAP. All soil validation locations collected as part of the works reported concentrations of contaminants below the adopted site criteria.

The consultant (GHD 2016b) validated all excavations with collected wall and base samples reported below site validation criteria, with the exception of VS01_0.9 collected from Tank Farm 2, where no further excavation was possible due to proximity to Moorebank Avenue and underground services. As such, the auditor considers all remedial excavations to be validated to the extent practicable.

Appendix D

Airsafe Inspection Reports (Asbestos Removal Works)

TP4 / TP5 AREA

AIRSAFE

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ABN 85 143 863 486

INSPECTION REPORT

January 23, 2013

J.A. Bradshaw Civil Contracting Pty Ltd
P.O. Box 224
SEVEN HILLS NSW 1730

Your Reference: DLTP Moorebank – Anzac Road, Moorebank
Job Number: 18491

Attention: s22

Dear Paul,

In accordance with your instructions, Airsafe carried out a visual inspection of an asbestos work area prior to the resumption of normal work in the area by unprotected personnel to confirm that the asbestos removal work has been completed.

The inspection was carried out on the date indicated.
Date of Inspection: 23/01/13

The inspection details are contained in the following pages of this report.

Should you have any queries regarding this report please contact the undersigned.

Yours faithfully
AIRSAFE OHC PTY LIMITED

s22

s22
Consultant

AIRSAFE

PROJECT: **DLTP Moorebank – Anzac Road, Moorebank** **JOB NO:** **18491**

Scope:

The scope of work involved the removal of soil contaminated with asbestos cement sheet debris from the proposed main entrance to site.

Inspection:

A detailed inspection of the above area revealed the asbestos material specified has been removed in accordance with the Code of Practice: How to Safely Remove Asbestos [Safe Work Australia, 2011] and that no visual evidence of asbestos remains on the ground surface.

Limitations:

Although the surface has been found to be free of visible asbestos debris, sub-surface pieces or 'pockets' of asbestos material may be encountered during further excavation. Should asbestos materials be encountered during future works, appropriate action should be taken in accordance with WorkCover regulations.

This inspection report covers the surface of the area stated above. Airsafe takes no responsibility for any asbestos or other contamination found within demolition debris, the soil, inaccessible areas, the sub-surface or other areas of the property not stated above.

AIRSAFE

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ABN 85 143 863 496

TEST REPORT

January 23, 2013

J.A. Bradshaw Civil Contracting Pty Ltd
P.O. Box 224
SEVEN HILLS NSW 1730

Your Reference: DLTP Moorebank – Anzac Road, Moorebank
Job Number: 18491

Attention: s22

Dear Paul,

In accordance with your instructions, Airsafe conducted air monitoring for airborne asbestos fibres at the above site.

The following samples were processed on the dates indicated.

Samples:	4 Filters
Date of Sampling:	23/01/12
Date of Analysis:	23/01/12
Date of Preliminary Report Sent:	Not Issued

The results and associated quality control are contained in the following pages of this report.

Should you have any queries regarding this report please contact the undersigned.

Yours faithfully
AIRSAFE OHC PTY LIMITED

s22

s22
Approved Counter and Signatory

AIRSAFE

PROJECT: DLTP Moorebank – Anzac Road, Moorebank **JOB NO:** 18491

Sample No	Location/Reference	Time		Fields	Fibres	Concentration (Fibres/mL)
		On	Off			
18491-1	Decon. /Clean Change Unit	0909	1445	100	0	<0.01
18491-2	Temporary perimeter fence – south-west of work area	0910	1446	100	0	<0.01
18491-3	Temporary perimeter fence – north of work area	0911	1447	100	0	<0.01
18491-4	Temporary perimeter fence – south-east of work area	0912	1448	100	0	<0.01

Method: AS101 – Membrane Filter Method for Estimating Airborne Asbestos Fibres.

Sampling: All samples have been taken by Airsafe personnel in accordance with the sampling plan detailed in Method AS101.

Quality Control: A field blank is taken and analysed for each batch of samples.

Note: The results relate only to the samples tested.

Environmental Conditions: Air monitoring during the removal of soil contaminated with asbestos located in the proposed main entrance to the site.

Comment: These calculated concentrations are less than the reporting limit of 0.01 fibres/mL for control and exposure monitoring as stated in the Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres [NOHSC: 3003 (2005)].

Appendix H

Laboratory Analytical Reports

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES1413246**	Page	: 1 of 6
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: s22	Contact	: Client Services
Address	: LEVEL 11, 44 MARKET STREET SYDNEY NSW 1230	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: s22 @aecom.com	E-mail	: sydney@alsglobal.com
Telephone	: 02 8264 5100	Telephone	: +61-2-8784 8555
Facsimile	: 02 8264 5111	Facsimile	: +61-2-8784 8500
Project	: 60221935 TASK 1 82 MOOREBANK	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: 60221935 TASK 1.82		
C-O-C number	: ----	Date Samples Received	: 17-JUN-2014
Sampler	: s22	Issue Date	: 23-JUN-2014
Site	: ----		
		No. of samples received	: 15
Quote number	: EN/004/14	No. of samples analysed	: 15

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
		Sydney Inorganics
s22	Senior Organic Chemist	Sydney Organics
s22	Metals Coordinator	Sydney Inorganics

General Comments

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

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

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

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

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

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 he American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Compound	CAS Number	LOR	Unit	Client sample ID	EXCAV4-N	EXCAV4-S	EXCAV4-E	EXCAV4-W	EXCAV4-B
				Client sampling date / time	16-JUN-2014 15:00	16-JUN-2014 15:00	16-JUN-2014 15:00	16-JUN-2014 15 00	16-JUN-2014 15:00
					ES1413246-001	ES1413246-002	ES1413246-003	ES1413246-004	ES1413246-005
EA055: Moisture Content									
Moisture Content (dried @ 103°C)	----	1.0	%		16.5	18.6	12.7	14.2	18.8
EG005T: Total Metals by ICP-AES									
Lead	7439-92-1	5	mg/kg		7	27	<5	6	12
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg		<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg		<50	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013									
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	>C10_C16	50	mg/kg		<50	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		<50	<50	<50	<50	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		<50	<50	<50	<50	<50
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	1330-20-7	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
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.1	%		93.8	95.1	107	96.0	93.0
Toluene-D8	2037-26-5	0.1	%		93.9	94.5	101	96.8	83.7
4-Bromofluorobenzene	460-00-4	0.1	%		95.2	92.4	105	96.2	88.2

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Compound	CAS Number	LOR	Unit	Client sample ID	EXCAV4-VS1	EXCAV4-VS2	EXCAV5-N	EXCAV5-S	EXCAV5-E
				Client sampling date / time	16-JUN-2014 15:00	16-JUN-2014 15:00	16-JUN-2014 15:00	16-JUN-2014 15 00	16-JUN-2014 15:00
					ES1413246-006	ES1413246-007	ES1413246-008	ES1413246-009	ES1413246-010
EA055: Moisture Content									
Moisture Content (dried @ 103°C)	----	1.0	%		17.8	14.1	16.8	17.6	8.5
EG005T: Total Metals by ICP-AES									
Lead	7439-92-1	5	mg/kg		29	12	20	10	7
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg		130	<50	60	<50	<50
C15 - C28 Fraction	----	100	mg/kg		720	<100	380	<100	<100
C29 - C36 Fraction	----	100	mg/kg		800	<100	190	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg		1650	<50	630	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013									
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	>C10_C16	50	mg/kg		200	<50	140	<50	<50
>C16 - C34 Fraction	----	100	mg/kg		1240	<100	440	<100	<100
>C34 - C40 Fraction	----	100	mg/kg		490	<100	120	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		1930	<50	700	<50	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		200	<50	140	<50	<50
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	1330-20-7	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
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.1	%		94.8	89.0	96.5	102	96.2
Toluene-D8	2037-26-5	0.1	%		99.8	79.0	97.6	89.6	84.0
4-Bromofluorobenzene	460-00-4	0.1	%		94.7	84.0	95.8	88.4	81.5

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Compound	CAS Number	LOR	Unit	Client sample ID	EXCAV5-W	EXCAV5-B	EXCAV5-VS1	EXCAV5-VS2	QC01
				Client sampling date / time	16-JUN-2014 15:00	16-JUN-2014 15:00	16-JUN-2014 15:00	16-JUN-2014 15 00	16-JUN-2014 15:00
					ES1413246-011	ES1413246-012	ES1413246-013	ES1413246-014	ES1413246-015
EA055: Moisture Content									
Moisture Content (dried @ 103°C)	----	1.0	%		12.8	11.5	12.5	25.4	13.6
EG005T: Total Metals by ICP-AES									
Lead	7439-92-1	5	mg/kg		10	12	125	14	26
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg		<50	<50	440	<50	60
C15 - C28 Fraction	----	100	mg/kg		<100	140	2440	220	380
C29 - C36 Fraction	----	100	mg/kg		<100	<100	1590	150	260
^ C10 - C36 Fraction (sum)	----	50	mg/kg		<50	140	4470	370	700
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	<10	26	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		<10	<10	26	<10	<10
>C10 - C16 Fraction	>C10_C16	50	mg/kg		<50	60	900	90	130
>C16 - C34 Fraction	----	100	mg/kg		<100	160	3130	290	500
>C34 - C40 Fraction	----	100	mg/kg		<100	<100	1040	<100	170
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		<50	220	5070	380	800
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		<50	60	900	90	130
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	1330-20-7	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
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.1	%		91.0	99.3	99.6	90.6	90.9
Toluene-D8	2037-26-5	0.1	%		81.0	83.6	85.8	95.3	96.7
4-Bromofluorobenzene	460-00-4	0.1	%		78.9	82.2	84.1	91.7	97.4

Surrogate Control Limits

Sub-Matrix: **SOIL**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	72.8	133.2
Toluene-D8	2037-26-5	73.9	132.1
4-Bromofluorobenzene	460-00-4	71.6	130.0

13/6/14

CHAIN OF CUSTODY

ALS Laboratory: please tick →

ALS Sydney, 277 Woodpark Rd, Smithfield NSW 2176 Ph 02 8784 8555 E samples.sydney@alsenviro.com
ALS Newcastle: 5 Rosegum Rd, Waratah NSW 2298 Ph 02 4968 9433 E samples.newcastle@alsenviro.com
ALS Brisbane 32 Shand St, Stafford QLD 4053 Ph 07 3243 7222 E samples.brisbane@alsenviro.com
ALS Townsville: 14-15 Desma Ct, Bohle QLD 4818 Ph 07 4796 0600 E townsville.environmental@alsenviro.com
ALS Melbourne 24 Westall Rd, Springvale VIC 3171 Ph 03 8549 9600 E samples.melbourne@alsenviro.com
ALS Adelaide: 2-1 Burma Rd, Pooraka SA 5095 Ph 08 8359 0890 E adelaide@alsenviro.com
ALS Perth: 10 Hod Way, Malaga WA 6090 Ph 08 9209 7655 E samples.perth@alsenviro.com
ALS Launceston: 27 Wellington St, Launceston TAS 7250 Ph 03 6331 2158 E launceston@alsenviro.com

CLIENT: AECOM AUSTRALIA PTY LTD	TURNAROUND REQUIREMENTS: (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)	☑ Standard TAT (List due date):	FOR LABORATORY USE ONLY (Circle)
OFFICE: SYDNEY		☐ Non Standard or urgent TAT (List due date):	Custody Seal Intact? Yes / No / N/A
PROJECT: MOORE BANK	ALS QUOTE NO.:	COC SEQUENCE NUMBER (Circle)	Free Ice / Frozen Ice packs present upon receipt? Yes / No / N/A
ORDER NUMBER: 60221935		COC: 1 2 3 4 5 6 7	Random Sample Temperature on Receipt: °C
PROJECT MANAGER: s22	CONTACT PH:	OF: 1 2 3 4 5 6 7	Other comments:

SAMPLER s22	SAMPLER MOBILE s22	RELINQUISHED BY: s22	RECEIVED BY: s22	RELINQUISHED BY:
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default):			
Email Reports to (will default to PM if no other addresses are listed): s22	@aecom.com	DATE/TIME:	DATE/TIME: 5/6/14 1345	DATE/TIME:
Email Invoice to (will default to PM if no other addresses are listed):				

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE ONLY	SAMPLE DETAILS MATRIX: Solid(S) Water(W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	TPH/BTEX	lead	VOCs						Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
1	EXCAV3-VS1	5/6/14	SOIL	125ml jar	1	X	X	X						
2	EXCAV3-VS2													
3	EXCAV3-N													
4	EXCAV3-S													
5	EXCAV3-E													
6	EXCAV3-W													
7	EXCAV3-B1													
8	EXCAV3-B2													
					TOTAL									

Environmental Division
Sydney
Work Order
ES1412488

Telephone : +61-2-8784 8555

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

ALS Environmental

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **ES1412488**	Page	: 1 of 7
Client	: AECOM Australia Pty Ltd	Laboratory	: Environmental Division Sydney
Contact	: s22	Contact	: Client Services
Address	: Level 21, 420 George Street, Sydney, NSW 2000 PO Box Q410, QVB Post Office Sydney NSW, AUSTRALIA 1230	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: s22 @aecom.com	E-mail	: sydney@alsglobal.com
Telephone	: +61 02 8934 0000	Telephone	: +61-2-8784 8555
Facsimile	: +61 02 8934 0001	Facsimile	: +61-2-8784 8500
Project	: MOOREBANK 60221935	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 05-JUN-2014
Sampler	: s22	Issue Date	: 13-JUN-2014
Order number	: 60221935 TASK 1.82		
		No. of samples received	: 8
Quote number	: EN/004/14	No. of samples analysed	: 8

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

This Interpretive Quality Control Report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Parameter Frequency Compliance
- Brief Method Summaries
- Summary of Outliers

Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with recommended holding times (USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilu ions 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 ime breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content							
Soil Glass Jar - Unpreserved (EA055-103)							
EXCAV3-VS1, EXCAV3-VS2, EXCAV3-N, EXCAV3-S, EXCAV3-E, EXCAV3-W, EXCAV3-B1, EXCAV3-B2	**05-JUN-2014**	**----**	----	----	**06-JUN-2014**	19-JUN-2014	✓
EG005T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved (EG005T)							
EXCAV3-VS1, EXCAV3-VS2, EXCAV3-N, EXCAV3-S, EXCAV3-E, EXCAV3-W, EXCAV3-B1, EXCAV3-B2	**05-JUN-2014**	**10-JUN-2014**	02-DEC-2014	✓	**11-JUN-2014**	02-DEC-2014	✓
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP071)							
EXCAV3-VS1, EXCAV3-VS2, EXCAV3-N, EXCAV3-S, EXCAV3-E, EXCAV3-W, EXCAV3-B1, EXCAV3-B2	**05-JUN-2014**	**11-JUN-2014**	19-JUN-2014	✓	**11-JUN-2014**	21-JUL-2014	✓
EP074D: Fumigants							
Soil Glass Jar - Unpreserved (EP074)							
EXCAV3-VS1, EXCAV3-VS2, EXCAV3-N, EXCAV3-S, EXCAV3-E, EXCAV3-W, EXCAV3-B1, EXCAV3-B2	**05-JUN-2014**	**10-JUN-2014**	12-JUN-2014	✓	**11-JUN-2014**	12-JUN-2014	✓
EP074E: Halogenated Aliphatic Compounds							
Soil Glass Jar - Unpreserved (EP074)							
EXCAV3-VS1, EXCAV3-VS2, EXCAV3-N, EXCAV3-S, EXCAV3-E, EXCAV3-W, EXCAV3-B1, EXCAV3-B2	**05-JUN-2014**	**10-JUN-2014**	12-JUN-2014	✓	**11-JUN-2014**	12-JUN-2014	✓

Matrix: **SOIL**

Evaluation: × = Holding ime 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
EP074F: Halogenated Aromatic Compounds								
Soil Glass Jar - Unpreserved (EP074)								
EXCAV3-VS1,	EXCAV3-VS2,	**05-JUN-2014**	**10-JUN-2014**	12-JUN-2014	✓	**11-JUN-2014**	12-JUN-2014	✓
EXCAV3-N,	EXCAV3-S,							
EXCAV3-E,	EXCAV3-W,							
EXCAV3-B1,	EXCAV3-B2							
EP074A: Monocyclic Aromatic Hydrocarbons								
Soil Glass Jar - Unpreserved (EP074)								
EXCAV3-VS1,	EXCAV3-VS2,	**05-JUN-2014**	**10-JUN-2014**	12-JUN-2014	✓	**11-JUN-2014**	12-JUN-2014	✓
EXCAV3-N,	EXCAV3-S,							
EXCAV3-E,	EXCAV3-W,							
EXCAV3-B1,	EXCAV3-B2							
EP074H: Naphthalene								
Soil Glass Jar - Unpreserved (EP074)								
EXCAV3-VS1,	EXCAV3-VS2,	**05-JUN-2014**	**10-JUN-2014**	12-JUN-2014	✓	**11-JUN-2014**	12-JUN-2014	✓
EXCAV3-N,	EXCAV3-S,							
EXCAV3-E,	EXCAV3-W,							
EXCAV3-B1,	EXCAV3-B2							
EP074B: Oxygenated Compounds								
Soil Glass Jar - Unpreserved (EP074)								
EXCAV3-VS1,	EXCAV3-VS2,	**05-JUN-2014**	**10-JUN-2014**	12-JUN-2014	✓	**11-JUN-2014**	12-JUN-2014	✓
EXCAV3-N,	EXCAV3-S,							
EXCAV3-E,	EXCAV3-W,							
EXCAV3-B1,	EXCAV3-B2							
EP074C: Sulfonated Compounds								
Soil Glass Jar - Unpreserved (EP074)								
EXCAV3-VS1,	EXCAV3-VS2,	**05-JUN-2014**	**10-JUN-2014**	12-JUN-2014	✓	**11-JUN-2014**	12-JUN-2014	✓
EXCAV3-N,	EXCAV3-S,							
EXCAV3-E,	EXCAV3-W,							
EXCAV3-B1,	EXCAV3-B2							
EP074G: Trihalomethanes								
Soil Glass Jar - Unpreserved (EP074)								
EXCAV3-VS1,	EXCAV3-VS2,	**05-JUN-2014**	**10-JUN-2014**	12-JUN-2014	✓	**11-JUN-2014**	12-JUN-2014	✓
EXCAV3-N,	EXCAV3-S,							
EXCAV3-E,	EXCAV3-W,							
EXCAV3-B1,	EXCAV3-B2							
EP080: BTEXN								
Soil Glass Jar - Unpreserved (EP080)								
EXCAV3-VS1,	EXCAV3-VS2,	**05-JUN-2014**	**10-JUN-2014**	19-JUN-2014	✓	**11-JUN-2014**	19-JUN-2014	✓
EXCAV3-N,	EXCAV3-S,							
EXCAV3-E,	EXCAV3-W,							
EXCAV3-B1,	EXCAV3-B2							

Matrix: **SOIL**

Evaluation: × = Holding ime breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013							
Soil Glass Jar - Unpreserved (EP080)							
EXCAV3-VS1, EXCAV3-VS2, EXCAV3-N, EXCAV3-S, EXCAV3-E, EXCAV3-W, EXCAV3-B1, EXCAV3-B2	**05-JUN-2014**	**10-JUN-2014**	19-JUN-2014	✓	**11-JUN-2014**	19-JUN-2014	✓

Quality Control Parameter Frequency Compliance

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

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055-103	2	20	**10.0**	**10.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	4	40	**10.0**	**10.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	16	**12.5**	**10.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	20	**10.0**	**10.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	9	**11.1**	**10.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
Total Metals by ICP-AES	EG005T	2	40	**5.0**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	16	**6.3**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	20	**5.0**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	9	**11.1**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Total Metals by ICP-AES	EG005T	2	40	**5.0**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	16	**6.3**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	20	**5.0**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	9	**11.1**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
Total Metals by ICP-AES	EG005T	2	40	**5.0**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	16	**6.3**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	20	**5.0**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	9	**11.1**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement

Brief Method Summaries

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

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055-103	SOIL	A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Total Metals by ICP-AES	EG005T	SOIL	(APHA 21st ed., 3120; USEPA SW 846 - 6010) (ICPAES) Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (2013) Schedule B(3)
TPH - Semivolatile Fraction	EP071	SOIL	(USEPA SW 846 - 8015A) Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C36. This method is compliant with the QC requirements of NEPM (2013) Schedule B(3).
Volatile Organic Compounds	EP074	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 501)
TPH Volatiles/BTEX	EP080	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with the QC requirements of NEPM (2013) Schedule B(3)

Preparation Methods	Method	Matrix	Method Descriptions
Methanolic Extraction of Soils for Purge and Trap	* ORG16	SOIL	(USEPA SW 846 - 5030A) 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids (Option B - Non-concentrating)	ORG17B	SOIL	In-house, Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 20mL 1:1 DCM/Acetone by end over end tumble. The solvent is transferred directly to a GC vial for analysis.

Summary of Outliers

Outliers : Quality Control Samples

The following report highlights outliers flagged in the Quality Control (QC) Report. Surrogate recovery limits are static and based on USEPA SW 846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). This report displays QC Outliers (breaches) only.

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample D	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
EG005T: Total Metals by ICP-AES	ES1412149-001	Anonymous	**Lead**	7439-92-1	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

- **For all matrices, no Method Blank value outliers occur.**
- **For all matrices, no Duplicate outliers occur.**
- **For all matrices, no Laboratory Control outliers occur.**

Regular Sample Surrogates

- **For all regular sample matrices, no surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

This report displays Holding Time breaches only. Only the respective Extraction / Preparation and/or Analysis component is/are displayed.

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

Outliers : Frequency of Quality Control Samples

The following report highlights breaches in the Frequency of Quality Control Samples.

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

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **ES1412488**	Page	: 1 of 10
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: s22	Contact	: Client Services
Address	: Level 21, 420 George Street, Sydney, NSW 2000 PO Box Q410, QVB Post Office Sydney NSW, AUSTRALIA 1230	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: s22 @aecom.com	E-mail	: sydney@alsglobal.com
Telephone	: +61 02 8934 0000	Telephone	: +61-2-8784 8555
Facsimile	: +61 02 8934 0001	Facsimile	: +61-2-8784 8500
Project	: MOOREBANK 60221935	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 05-JUN-2014
Sampler	: s22	Issue Date	: 13-JUN-2014
Order number	: 60221935 TASK 1.82		
		No. of samples received	: 8
Quote number	: EN/004/14	No. of samples analysed	: 8

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

This Quality Control Report contains the following information:

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

NATA WORLD RECOGNISED ACCREDITATION

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
		Sydney Inorganics
s22	Organic Chemist	Sydney Organics
s22	Senior Spectroscopist	Sydney Inorganics
s22	Senior Organic Chemist	Sydney Organics

General Comments

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

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

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

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

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EA055: Moisture Content (QC Lot: 3478152)									
ES1412487-003	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	13.0	13.9	6.6	0% - 50%
ES1412488-004	EXCAV3-S	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	20.1	16.8	18.2	0% - 20%
EG005T: Total Metals by ICP-AES (QC Lot: 3482242)									
ES1412149-001	Anonymous	EG005T: Lead	7439-92-1	5	mg/kg	31400	34300	8.9	0% - 20%
ES1412454-008	Anonymous	EG005T: Lead	7439-92-1	5	mg/kg	105	119	12.3	0% - 20%
EG005T: Total Metals by ICP-AES (QC Lot: 3482244)									
ES1412488-002	EXCAV3-VS2	EG005T: Lead	7439-92-1	5	mg/kg	12	11	0.0	No Limit
ES1412508-001	Anonymous	EG005T: Lead	7439-92-1	5	mg/kg	26	32	20.3	No Limit
EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 3480768)									
ES1412488-001	EXCAV3-VS1	EP074: Styrene	100-42-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.3.5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2.4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP074B: Oxygenated Compounds (QC Lot: 3480768)									
ES1412488-001	EXCAV3-VS1	EP074: Vinyl Acetate	108-05-4	5	mg/kg	<5	<5	0.0	No Limit
		EP074: 2-Butanone (MEK)	78-93-3	5	mg/kg	<5	<5	0.0	No Limit
		EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	<5	<5	0.0	No Limit
		EP074: 2-Hexanone (MBK)	591-78-6	5	mg/kg	<5	<5	0.0	No Limit
EP074C: Sulfonated Compounds (QC Lot: 3480768)									
ES1412488-001	EXCAV3-VS1	EP074: Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP074D: Fumigants (QC Lot: 3480768)									
ES1412488-001	EXCAV3-VS1	EP074: 2.2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: cis-1.3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: trans-1.3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP074E: Halogenated Aliphatic Compounds (QC Lot: 3480768)									
ES1412488-001	EXCAV3-VS1	EP074: 1.1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Iodomethane	74-88-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: trans-1.2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	<0.5	0.0	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 (%)*
EP074E: Halogenated Aliphatic Compounds (QC Lot: 3480768) - continued									
ES1412488-001	EXCAV3-VS1	EP074: 1.1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: cis-1.2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.1.1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Trichloroethene	79-01-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Dibromomethane	74-95-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.1.2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.1.1.2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: trans-1.4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: cis-1.4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2.3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Chloromethane	74-87-3	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Vinyl chloride	75-01-4	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Bromomethane	74-83-9	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Chloroethane	75-00-3	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Trichlorofluoromethane	75-69-4	5	mg/kg	<5	<5	0.0	No Limit
EP074F: Halogenated Aromatic Compounds (QC Lot: 3480768)									
ES1412488-001	EXCAV3-VS1	EP074: Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Bromobenzene	108-86-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2.4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2.3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP074G: Trihalomethanes (QC Lot: 3480768)									
ES1412488-001	EXCAV3-VS1	EP074: Chloroform	67-66-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Bromoform	75-25-2	0.5	mg/kg	<0.5	<0.5	0.0	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 (%)*
EP074H: Naphthalene (QC Lot: 3480768)									
ES1412488-001	EXCAV3-VS1	EP074: Naphthalene	91-20-3	5	mg/kg	<5	<5	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3480767)									
ES1412402-008	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
ES1412488-001	EXCAV3-VS1	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3480963)									
ES1412406-001	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	10600	10800	1.6	0% - 20%
		EP071: C29 - C36 Fraction	----	100	mg/kg	5770	5290	8.7	0% - 20%
		EP071: C10 - C14 Fraction	----	50	mg/kg	980	1000	2.5	0% - 20%
ES1412488-003	EXCAV3-N	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3480767)									
ES1412402-008	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
ES1412488-001	EXCAV3-VS1	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3480963)									
ES1412406-001	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	13200	13200	0.2	0% - 20%
		EP071: >C34 - C40 Fraction	----	100	mg/kg	2860	2500	13.8	0% - 20%
		EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	2610	2580	1.0	0% - 20%
ES1412488-003	EXCAV3-N	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	0.0	No Limit
EP080: BTEXN (QC Lot: 3480767)									
ES1412402-008	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit
ES1412488-001	EXCAV3-VS1	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit

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	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EG005T: Total Metals by ICP-AES (QCLot: 3482242)								
EG005T: Lead	7439-92-1	5	mg/kg	<5	40.0 mg/kg	98.4	86	124
EG005T: Total Metals by ICP-AES (QCLot: 3482244)								
EG005T: Lead	7439-92-1	5	mg/kg	<5	40.0 mg/kg	107	86	124
EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 3480768)								
EP074: Styrene	100-42-5	0.5	mg/kg	<0.5	1 mg/kg	79.1	64	126
EP074: Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	1 mg/kg	83.1	66	128
EP074: n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	1 mg/kg	83.2	63	129
EP074: 1.3.5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	1 mg/kg	80.3	63	129
EP074: sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	1 mg/kg	80.9	64	130
EP074: 1 2.4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	1 mg/kg	77.6	63	129
EP074: tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	1 mg/kg	81.7	63	129
EP074: p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	1 mg/kg	84.0	62	130
EP074: n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	1 mg/kg	82.0	61	131
EP074B: Oxygenated Compounds (QCLot: 3480768)								
EP074: Vinyl Acetate	108-05-4	1	mg/kg	<5	10 mg/kg	45.2	29.6	156
EP074: 2-Butanone (MEK)	78-93-3	1	mg/kg	<5	10 mg/kg	77.7	58	136
EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	1	mg/kg	<5	10 mg/kg	75.9	54	138
EP074: 2-Hexanone (MBK)	591-78-6	1	mg/kg	<5	10 mg/kg	60.7	54	136
EP074C: Sulfonated Compounds (QCLot: 3480768)								
EP074: Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	1 mg/kg	72.6	54	126
EP074D: Fumigants (QCLot: 3480768)								
EP074: 2.2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	1 mg/kg	77.4	55	133
EP074: 1.2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	1 mg/kg	79.6	69	127
EP074: cis-1.3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	1 mg/kg	69.3	54	124
EP074: trans-1.3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	1 mg/kg	66.5	51	125
EP074: 1 2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	1 mg/kg	77.6	66	126
EP074E: Halogenated Aliphatic Compounds (QCLot: 3480768)								
EP074: Dichlorodifluoromethane	75-71-8	1	mg/kg	<5	10 mg/kg	56.9	30	148
EP074: Chloromethane	74-87-3	1	mg/kg	<5	10 mg/kg	78.0	41	141
EP074: Vinyl chloride	75-01-4	1	mg/kg	<5	10 mg/kg	72.6	43	147
EP074: Bromomethane	74-83-9	1	mg/kg	<5	10 mg/kg	80.1	47	141
EP074: Chloroethane	75-00-3	1	mg/kg	<5	10 mg/kg	87.9	49	143
EP074: Trichlorofluoromethane	75-69-4	1	mg/kg	<5	10 mg/kg	82.8	49	135
EP074: 1.1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	1 mg/kg	82.8	54	126

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report		
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP074E: Halogenated Aliphatic Compounds (QCLot: 3480768) - continued								
EP074: Iodomethane	74-88-4	0.5	mg/kg	<0.5	1 mg/kg	77.7	43	129
EP074: trans-1.2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	1 mg/kg	77.0	62	130
EP074: 1.1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	1 mg/kg	81.1	66	132
EP074: cis-1.2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	1 mg/kg	82.7	66	132
EP074: 1.1.1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	1 mg/kg	73.9	62	126
EP074: 1.1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	1 mg/kg	76.8	64	128
EP074: Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	1 mg/kg	68.7	59	125
EP074: 1 2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	1 mg/kg	75.8	65	123
EP074: Trichloroethene	79-01-6	0.5	mg/kg	<0.5	1 mg/kg	80.7	64	120
EP074: Dibromomethane	74-95-3	0.5	mg/kg	<0.5	1 mg/kg	76.0	65	127
EP074: 1.1.2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	1 mg/kg	83.6	70	130
EP074: 1.3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	1 mg/kg	76.6	72	128
EP074: Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	1 mg/kg	97.4	67	143
EP074: 1.1.1.2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	1 mg/kg	74.9	62	122
EP074: trans-1.4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	1 mg/kg	62.0	54	128
EP074: cis-1.4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	1 mg/kg	74.7	55	129
EP074: 1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	1 mg/kg	79.0	56	132
EP074: 1.2.3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	1 mg/kg	77.8	65	135
EP074: Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	1 mg/kg	56.7	19.8	134
EP074: 1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	1 mg/kg	74.2	53	129
EP074: Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	1 mg/kg	82.8	48	136
EP074F: Halogenated Aromatic Compounds (QCLot: 3480768)								
EP074: Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	1 mg/kg	80.2	70	128
EP074: Bromobenzene	108-86-1	0.5	mg/kg	<0.5	1 mg/kg	81.5	67	127
EP074: 2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	1 mg/kg	83.4	64	130
EP074: 4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	1 mg/kg	82.0	62	130
EP074: 1 3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	1 mg/kg	80.4	63	129
EP074: 1.4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	1 mg/kg	81.4	63	129
EP074: 1.2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	1 mg/kg	78.9	66	128
EP074: 1.2.4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	1 mg/kg	81.2	54	134
EP074: 1.2.3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	1 mg/kg	77.0	60	132
EP074G: Trihalomethanes (QCLot: 3480768)								
EP074: Chloroform	67-66-3	0.5	mg/kg	<0.5	1 mg/kg	78.4	62	120
EP074: Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	1 mg/kg	70.7	61	121
EP074: Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	1 mg/kg	68.7	63	121
EP074: Bromoform	75-25-2	0.5	mg/kg	<0.5	1 mg/kg	72.4	60	126
EP074H: Naphthalene (QCLot: 3480768)								
EP074: Naphthalene	91-20-3	0.5	mg/kg	<5	1 mg/kg	76.7	63	133

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	LCS Recovery (%)	Recovery Limits (%): Low	Recovery Limits (%): High
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3480767)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	106	68.4	128
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3480963)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	200 mg/kg	114	71	131
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	300 mg/kg	105	74	138
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	200 mg/kg	88.0	64	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3480767)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	106	68.4	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3480963)								
EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	250 mg/kg	106	70	130
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	350 mg/kg	100	74	138
EP071: >C34 - C40 Fraction	----	50	mg/kg	<100	150 mg/kg	74.2	63	131
EP080: BTEXN (QCLot: 3480767)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	94.9	62	116
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	93.1	62	128
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	94.3	58	118
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	92.3	60	120
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	98.9	60	120
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	88.4	62	138

Matrix Spike (MS) Report

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

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%) MS	Recovery Limits (%): Low	Recovery Limits (%): High
EG005T: Total Metals by ICP-AES (QCLot: 3482242)							
ES1412149-001	Anonymous	EG005T: Lead	7439-92-1	125 mg/kg	# Not Determined	70	130
EG005T: Total Metals by ICP-AES (QCLot: 3482244)							
ES1412508-001	Anonymous	EG005T: Lead	7439-92-1	125 mg/kg	106	70	130
EP074E: Halogenated Aliphatic Compounds (QCLot: 3480768)							
ES1412488-001	EXCAV3-VS1	EP074: 1.1-Dichloroethene	75-35-4	2.5 mg/kg	76.7	70	130
		EP074: Trichloroethene	79-01-6	2.5 mg/kg	85.8	70	130
EP074F: Halogenated Aromatic Compounds (QCLot: 3480768)							
ES1412488-001	EXCAV3-VS1	EP074: Chlorobenzene	108-90-7	2.5 mg/kg	76.0	70	130

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Recovery Limits (%): Low	Recovery Limits (%): High
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3480767)							
ES1412488-001	EXCAV3-VS1	EP080: C6 - C9 Fraction	----	32.5 mg/kg	122	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3480963)							
ES1412406-001	Anonymous	EP071: C10 - C14 Fraction	----	640 mg/kg	98.8	73	137
		EP071: C15 - C28 Fraction	----	3140 mg/kg	62.0	53	131
		EP071: C29 - C36 Fraction	----	2860 mg/kg	106	52	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3480767)							
ES1412488-001	EXCAV3-VS1	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	114	70	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3480963)							
ES1412406-001	Anonymous	EP071: >C10 - C16 Fraction	>C10_C16	850 mg/kg	104	73	137
		EP071: >C16 - C34 Fraction	----	4800 mg/kg	104	53	131
		EP071: >C34 - C40 Fraction	----	2400 mg/kg	80.9	52	132
EP080: BTEXN (QCLot: 3480767)							
ES1412488-001	EXCAV3-VS1	EP080: Benzene	71-43-2	2.5 mg/kg	97.9	70	130
		EP080: Toluene	108-88-3	2.5 mg/kg	102	70	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	100	70	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	102	70	130
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	102	70	130
		EP080: Naphthalene	91-20-3	2.5 mg/kg	78.6	70	130

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

The quality control term Matrix Spike (MS) and Matrix Spike Duplicate (MSD) refers to intralaboratory split samples spiked with a representa ive set of target analytes. The purpose of these QC parameters are to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration	Spike Recovery (%): MS	Spike Recovery (%): MSD	Recovery Limits (%): Low	Recovery Limits (%): High	RPDs (%): Value	RPDs (%): Control Limit
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3480767)										
ES1412488-001	EXCAV3-VS1	EP080: C6 - C9 Fraction	----	32.5 mg/kg	122	----	70	130	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3480767)										
ES1412488-001	EXCAV3-VS1	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	114	----	70	130	----	----
EP080: BTEXN (QCLot: 3480767)										
ES1412488-001	EXCAV3-VS1	EP080: Benzene	71-43-2	2.5 mg/kg	97.9	----	70	130	----	----
		EP080: Toluene	108-88-3	2.5 mg/kg	102	----	70	130	----	----
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	100	----	70	130	----	----
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	102	----	70	130	----	----

Sub-Matrix: **SOIL**

				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	MSD	Low	High	Value	Control Limit
EP080: BTEXN (QCLot: 3480767) - continued										
ES1412488-001	EXCAV3-VS1	EP080: ortho-Xylene	95-47-6	2.5 mg/kg	102	----	70	130	----	----
		EP080: Naphthalene	91-20-3	2.5 mg/kg	78.6	----	70	130	----	----
EP074E: Halogenated Aliphatic Compounds (QCLot: 3480768)										
ES1412488-001	EXCAV3-VS1	EP074: 1.1-Dichloroethene	75-35-4	2.5 mg/kg	76.7	----	70	130	----	----
		EP074: Trichloroethene	79-01-6	2.5 mg/kg	85.8	----	70	130	----	----
EP074F: Halogenated Aromatic Compounds (QCLot: 3480768)										
ES1412488-001	EXCAV3-VS1	EP074: Chlorobenzene	108-90-7	2.5 mg/kg	76.0	----	70	130	----	----
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3480963)										
ES1412406-001	Anonymous	EP071: C10 - C14 Fraction	----	640 mg/kg	98.8	----	73	137	----	----
		EP071: C15 - C28 Fraction	----	3140 mg/kg	62.0	----	53	131	----	----
		EP071: C29 - C36 Fraction	----	2860 mg/kg	106	----	52	132	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3480963)										
ES1412406-001	Anonymous	EP071: >C10 - C16 Fraction	>C10_C16	850 mg/kg	104	----	73	137	----	----
		EP071: >C16 - C34 Fraction	----	4800 mg/kg	104	----	53	131	----	----
		EP071: >C34 - C40 Fraction	----	2400 mg/kg	80.9	----	52	132	----	----
EG005T: Total Metals by ICP-AES (QCLot: 3482242)										
ES1412149-001	Anonymous	EG005T: Lead	7439-92-1	125 mg/kg	# Not Determined	----	70	130	----	----
EG005T: Total Metals by ICP-AES (QCLot: 3482244)										
ES1412508-001	Anonymous	EG005T: Lead	7439-92-1	125 mg/kg	106	----	70	130	----	----

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES1412488**	Page	: 1 of 11
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: s22	Contact	: Client Services
Address	: Level 21, 420 George Street, Sydney, NSW 2000 PO Box Q410, QVB Post Office Sydney NSW, AUSTRALIA 1230	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: s22 @aecom.com	E-mail	: sydney@alsglobal.com
Telephone	: +61 02 8934 0000	Telephone	: +61-2-8784 8555
Facsimile	: +61 02 8934 0001	Facsimile	: +61-2-8784 8500
Project	: MOOREBANK 60221935	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: 60221935 TASK 1.82		
C-O-C number	: ----	Date Samples Received	: 05-JUN-2014
Sampler	: s22	Issue Date	: 13-JUN-2014
Site	: ----		
		No. of samples received	: 8
Quote number	: EN/004/14	No. of samples analysed	: 8

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
		Sydney Inorganics
s22	Organic Chemist	Sydney Organics
s22	Senior Spectroscopist	Sydney Inorganics
s22	Senior Organic Chemist	Sydney Organics

General Comments

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

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

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

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

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

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

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of he American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Compound	CAS Number	LOR	Unit	Client sample ID	EXCAV3-VS1	EXCAV3-VS2	EXCAV3-N	EXCAV3-S	EXCAV3-E
				Client sampling date / time	[05-JUN-2014]	[05-JUN-2014]	[05-JUN-2014]	[05-JUN-2014]	[05-JUN-2014]
					ES1412488-001	ES1412488-002	ES1412488-003	ES1412488-004	ES1412488-005
EA055: Moisture Content									
Moisture Content (dried @ 103°C)	----	1.0	%		8.9	9.2	18.4	20.1	14.7
EG005T: Total Metals by ICP-AES									
Lead	7439-92-1	5	mg/kg		14	12	22	10	10
EP074A: Monocyclic Aromatic Hydrocarbons									
Styrene	100-42-5	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Isopropylbenzene	98-82-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
n-Propylbenzene	103-65-1	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
1.3.5-Trimethylbenzene	108-67-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
sec-Butylbenzene	135-98-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
1.2.4-Trimethylbenzene	95-63-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
tert-Butylbenzene	98-06-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
p-Isopropyltoluene	99-87-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
n-Butylbenzene	104-51-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
EP074B: Oxygenated Compounds									
Vinyl Acetate	108-05-4	5	mg/kg		<5	<5	<5	<5	<5
2-Butanone (MEK)	78-93-3	5	mg/kg		<5	<5	<5	<5	<5
4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg		<5	<5	<5	<5	<5
2-Hexanone (MBK)	591-78-6	5	mg/kg		<5	<5	<5	<5	<5
EP074C: Sulfonated Compounds									
Carbon disulfide	75-15-0	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
EP074D: Fumigants									
2.2-Dichloropropane	594-20-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
1.2-Dichloropropane	78-87-5	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
cis-1.3-Dichloropropylene	10061-01-5	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
trans-1.3-Dichloropropylene	10061-02-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
1.2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
EP074E: Halogenated Aliphatic Compounds									
Dichlorodifluoromethane	75-71-8	5	mg/kg		<5	<5	<5	<5	<5
Chloromethane	74-87-3	5	mg/kg		<5	<5	<5	<5	<5
Vinyl chloride	75-01-4	5	mg/kg		<5	<5	<5	<5	<5
Bromomethane	74-83-9	5	mg/kg		<5	<5	<5	<5	<5
Chloroethane	75-00-3	5	mg/kg		<5	<5	<5	<5	<5
Trichlorofluoromethane	75-69-4	5	mg/kg		<5	<5	<5	<5	<5

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Compound	CAS Number	LOR	Unit	Client sample ID	EXCAV3-VS1	EXCAV3-VS2	EXCAV3-N	EXCAV3-S	EXCAV3-E
				Client sampling date / time	[05-JUN-2014]	[05-JUN-2014]	[05-JUN-2014]	[05-JUN-2014]	[05-JUN-2014]
					ES1412488-001	ES1412488-002	ES1412488-003	ES1412488-004	ES1412488-005
EP074E: Halogenated Aliphatic Compounds - Continued									
1.1-Dichloroethene	75-35-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Iodomethane	74-88-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
trans-1.2-Dichloroethene	156-60-5	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
1.1-Dichloroethane	75-34-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
cis-1.2-Dichloroethene	156-59-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
1.1.1-Trichloroethane	71-55-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
1.1-Dichloropropylene	563-58-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Carbon Tetrachloride	56-23-5	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
1.2-Dichloroethane	107-06-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Trichloroethene	79-01-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Dibromomethane	74-95-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
1.1.2-Trichloroethane	79-00-5	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
1.3-Dichloropropane	142-28-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Tetrachloroethene	127-18-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
1.1.1.2-Tetrachloroethane	630-20-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
trans-1.4-Dichloro-2-butene	110-57-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
cis-1.4-Dichloro-2-butene	1476-11-5	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
1.2.3-Trichloropropane	96-18-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Pentachloroethane	76-01-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Hexachlorobutadiene	87-68-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
EP074F: Halogenated Aromatic Compounds									
Chlorobenzene	108-90-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Bromobenzene	108-86-1	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2-Chlorotoluene	95-49-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
4-Chlorotoluene	106-43-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
1.3-Dichlorobenzene	541-73-1	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
1.4-Dichlorobenzene	106-46-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
1.2-Dichlorobenzene	95-50-1	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
1.2.4-Trichlorobenzene	120-82-1	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
1.2.3-Trichlorobenzene	87-61-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
EP074G: Trihalomethanes									
Chloroform	67-66-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Compound	CAS Number	LOR	Unit	Client sample ID	EXCAV3-VS1	EXCAV3-VS2	EXCAV3-N	EXCAV3-S	EXCAV3-E
				Client sampling date / time	[05-JUN-2014]	[05-JUN-2014]	[05-JUN-2014]	[05-JUN-2014]	[05-JUN-2014]
					ES1412488-001	ES1412488-002	ES1412488-003	ES1412488-004	ES1412488-005
EP074G: Trihalomethanes - Continued									
Bromodichloromethane	75-27-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Dibromochloromethane	124-48-1	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Bromoform	75-25-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
EP074H: Naphthalene									
Naphthalene	91-20-3	5	mg/kg		<5	<5	<5	<5	<5
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg		<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg		<100	340	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg		130	300	<100	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg		130	640	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013									
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	>C10_C16	50	mg/kg		<50	90	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg		160	490	<100	<100	<100
>C34 - C40 Fraction	----	100	mg/kg		<100	240	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		160	820	<50	<50	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		<50	90	<50	<50	<50
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	1330-20-7	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
EP074S: VOC Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.1	%		104	79.4	79.9	78.5	81.4
Toluene-D8	2037-26-5	0.1	%		116	95.8	91.1	89.5	92.4
4-Bromofluorobenzene	460-00-4	0.1	%		103	92.9	92.4	90.1	92.1

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	EXCAV3-VS1	EXCAV3-VS2	EXCAV3-N	EXCAV3-S	EXCAV3-E
			Client sampling date / time	[05-JUN-2014]	[05-JUN-2014]	[05-JUN-2014]	[05-JUN-2014]	[05-JUN-2014]
Compound	CAS Number	LOR	Unit	ES1412488-001	ES1412488-002	ES1412488-003	ES1412488-004	ES1412488-005
EP074S: VOC Surrogates - Continued								
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	105	74.7	75.3	73.9	76.9
Toluene-D8	2037-26-5	0.1	%	115	102	95.9	94.8	97.6
4-Bromofluorobenzene	460-00-4	0.1	%	104	91.5	92.8	90.8	90.4

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	EXCAV3-W	EXCAV3-B1	EXCAV3-B2	---	---
			Client sampling date / time	[05-JUN-2014]	[05-JUN-2014]	[05-JUN-2014]	---	---
Compound	CAS Number	LOR	Unit	ES1412488-006	ES1412488-007	ES1412488-008	---	---
EA055: Moisture Content								
Moisture Content (dried @ 103°C)	----	1.0	%	14.4	19.6	15.4	---	---
EG005T: Total Metals by ICP-AES								
Lead	7439-92-1	5	mg/kg	25	18	36	---	---
EP074A: Monocyclic Aromatic Hydrocarbons								
Styrene	100-42-5	0.5	mg/kg	<0.5	<0.5	<0.5	---	---
Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	<0.5	<0.5	---	---
n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	<0.5	<0.5	---	---
1.3.5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	<0.5	<0.5	---	---
sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	<0.5	<0.5	---	---
1.2.4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	<0.5	<0.5	---	---
tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	<0.5	<0.5	---	---
p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	<0.5	<0.5	---	---
n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	<0.5	<0.5	---	---
EP074B: Oxygenated Compounds								
Vinyl Acetate	108-05-4	5	mg/kg	<5	<5	<5	---	---
2-Butanone (MEK)	78-93-3	5	mg/kg	<5	<5	<5	---	---
4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	<5	<5	<5	---	---
2-Hexanone (MBK)	591-78-6	5	mg/kg	<5	<5	<5	---	---
EP074C: Sulfonated Compounds								
Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	<0.5	<0.5	---	---
EP074D: Fumigants								
2.2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	<0.5	<0.5	---	---
1.2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	<0.5	<0.5	---	---
cis-1.3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	<0.5	<0.5	---	---
trans-1.3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	<0.5	<0.5	---	---
1.2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	<0.5	<0.5	---	---
EP074E: Halogenated Aliphatic Compounds								
Dichlorodifluoromethane	75-71-8	5	mg/kg	<5	<5	<5	---	---
Chloromethane	74-87-3	5	mg/kg	<5	<5	<5	---	---
Vinyl chloride	75-01-4	5	mg/kg	<5	<5	<5	---	---
Bromomethane	74-83-9	5	mg/kg	<5	<5	<5	---	---
Chloroethane	75-00-3	5	mg/kg	<5	<5	<5	---	---
Trichlorofluoromethane	75-69-4	5	mg/kg	<5	<5	<5	---	---

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Compound	CAS Number	LOR	Unit	Client sample ID: EXCAV3-W	EXCAV3-B1	EXCAV3-B2	---	---
				Client sampling date / time: [05-JUN-2014]	[05-JUN-2014]	[05-JUN-2014]	---	---
				ES1412488-006	ES1412488-007	ES1412488-008	---	---
EP074E: Halogenated Aliphatic Compounds - Continued								
1.1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	<0.5	<0.5	---	---
Iodomethane	74-88-4	0.5	mg/kg	<0.5	<0.5	<0.5	---	---
trans-1.2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	<0.5	<0.5	---	---
1.1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	<0.5	<0.5	---	---
cis-1.2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	<0.5	<0.5	---	---
1.1.1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	<0.5	<0.5	---	---
1.1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	<0.5	<0.5	---	---
Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	<0.5	<0.5	---	---
1.2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	<0.5	<0.5	---	---
Trichloroethene	79-01-6	0.5	mg/kg	<0.5	<0.5	<0.5	---	---
Dibromomethane	74-95-3	0.5	mg/kg	<0.5	<0.5	<0.5	---	---
1.1.2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	<0.5	<0.5	---	---
1.3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	<0.5	<0.5	---	---
Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	<0.5	<0.5	---	---
1.1.1.2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	<0.5	<0.5	---	---
trans-1.4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	<0.5	<0.5	---	---
cis-1.4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	<0.5	<0.5	---	---
1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	<0.5	<0.5	---	---
1.2.3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	<0.5	<0.5	---	---
Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	<0.5	<0.5	---	---
1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	<0.5	<0.5	---	---
Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	<0.5	<0.5	---	---
EP074F: Halogenated Aromatic Compounds								
Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	<0.5	<0.5	---	---
Bromobenzene	108-86-1	0.5	mg/kg	<0.5	<0.5	<0.5	---	---
2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	<0.5	<0.5	---	---
4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	<0.5	<0.5	---	---
1.3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	<0.5	<0.5	---	---
1.4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	<0.5	<0.5	---	---
1.2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	<0.5	<0.5	---	---
1.2.4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	<0.5	<0.5	---	---
1.2.3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	<0.5	<0.5	---	---
EP074G: Trihalomethanes								
Chloroform	67-66-3	0.5	mg/kg	<0.5	<0.5	<0.5	---	---

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Compound	CAS Number	LOR	Unit	Client sample ID: EXCAV3-W	EXCAV3-B1	EXCAV3-B2	----	----
				Client sampling date / time: [05-JUN-2014]	[05-JUN-2014]	[05-JUN-2014]	----	----
				ES1412488-006	ES1412488-007	ES1412488-008	----	----
EP074G: Trihalomethanes - Continued								
Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Bromoform	75-25-2	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
EP074H: Naphthalene								
Naphthalene	91-20-3	5	mg/kg	<5	<5	<5	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	----	----
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	----	----
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<100	----	----
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	----	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	<50	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	<10	----	----
>C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	<50	----	----
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	<100	----	----
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	<100	----	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	<50	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	<50	<50	----	----
EP080: BTEXN								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	----	----
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	----	----
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	----	----
EP074S: VOC Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	81.2	79.4	80.5	----	----
Toluene-D8	2037-26-5	0.1	%	94.9	92.0	91.6	----	----
4-Bromofluorobenzene	460-00-4	0.1	%	95.2	91.0	91.0	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	EXCAV3-W	EXCAV3-B1	EXCAV3-B2	----	----
			Client sampling date / time	[05-JUN-2014]	[05-JUN-2014]	[05-JUN-2014]	----	----
Compound	CAS Number	LOR	Unit	ES1412488-006	ES1412488-007	ES1412488-008	----	----
EP074S: VOC Surrogates - Continued								
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	**76.8**	**75.0**	**76.0**	----	----
Toluene-D8	2037-26-5	0.1	%	**100**	**97.2**	**96.2**	----	----
4-Bromofluorobenzene	460-00-4	0.1	%	**95.0**	**93.9**	**91.3**	----	----

Surrogate Control Limits

Sub-Matrix: **SOIL**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP074S: VOC Surrogates			
1.2-Dichloroethane-D4	17060-07-0	64	130
Toluene-D8	2037-26-5	66	136
4-Bromofluorobenzene	460-00-4	60	122
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	72.8	133.2
Toluene-D8	2037-26-5	73.9	132.1
4-Bromofluorobenzene	460-00-4	71.6	130.0

1/2

AECOM

Chain of Custody

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Laboratory Details
Lab Name: Envirolab Services
Address: 12 Ashley St
Chatswood NSW 2067
02 9910 6200
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Lab Quote No:

ALS

Sampled By s22
AECOM Project No: ~~60221737~~ 60221935
Project Name: ~~SITEP~~ Morebank

Specifications
Turnaround time required: 5 day
Special storage requirements?
Report Format: Email: s22 @aecom.com s22 @aecom.com

Lab. ID	Sample ID	Sampling Date	Matrix: soil	Matrix: water	Matrix: other	Preservation: filtered	Preservation: acid	Preservation: ice	Container	Analysis: Asbestos (WA guidelines)	Analysis: TPH/BTEX/PAH	Analysis: lead.
1	EXCAV1-N	21/5/14	X					X	jar		X	X
2	EXCAV1-S											
3	EXCAV1-E											
4	EXCAV1-W											
5	EXCAV1-B											
6	EXCAV1-VS1	28/5/14										
7	EXCAV1-VS2											
8	EXCAV2-1											
9	EXCAV2-2											
10	EXCAV2-3											
11	EXCAV2-4											
12	EXCAV2-5											
13	EXCAV2-6											
14	EXCAV2-7											
15	EXCAV2-8											
16	EXCAV2-9											

Environmental Division
Sydney
Work Order
ES1411803
Telephone : +61-2-8784 8555

Comments:

Relinquished by: L.Atkinson s22
Signed:
Date/Time: 28/5/14
Received by: s22
Signed: 28/5/14 1200
Date/Time:

212

AECOM

Chain of Custody

AECOM Australia Pty Ltd
Level 21, 420 George Street
Sydney, NSW, 2000
PO Box Q410, QVB PO, Sydney, NSW, 1230
T +61 2 8934 0000
F +61 2 8934 0001

Laboratory Details
Lab. Name: Envirolab Services
Address: 12 Ashley St
Chatswood NSW 2067
ALS
02 9910 6200
Fax: 02 9910 6201
Lab Quote No:

Sampled By: s22
AECOM Project No: ~~60287287~~
Project Name: ~~QICEEP~~ Moorebank

Specifications
Turnaround time required: 5 day
Special storage requirements?
Report Format: Email: s22 @aecom.com /s22 @aecom.com s22 Daecom.com

Lab. ID	Sample ID	Sampling Date	Matrix: soil	Matrix: water	Matrix: other	Preservation: filtered	Preservation: acid	Preservation: ice	Container	Analysis: Asbestos (WA guidelines/NEPM)	Analysis: TPH/BTEX/PAH	Analysis: lead
17	EXCAV2-10	28/5/14	X					X	jar	/	X	X
18	EXCAV2-11	"	"					"	"		"	"
19	EXCAV2-VS1	"	"					"	"		"	"
20	EXCAV2-VS2	"	"					"	"		"	"

Comments:

Relinquished by: L.Atkinson s22
Signed:
Date/Time: 28/5/14
Recieved by: s22
Signed:
Date/Time: 28/5/14 1200

Environmental Division

SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive Report

Work Order : **ES1411803**

Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: s22	Contact	: Client Services
Address	: LEVEL 11, 44 MARKET STREET SYDNEY NSW 1230	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: s22 @aecom.com	E-mail	: sydney@alsglobal.com
Telephone	: 02 8264 5100	Telephone	: +61-2-8784 8555
Facsimile	: 02 8264 5111	Facsimile	: +61-2-8784 8500
Project	: 60221935 MOOREBANK	Page	: 1 of 3
Order number	: ----		
C-O-C number	: ----	Quote number	: ES2014HLAENV0523 (EN/004/14)
Site	: ----		
Sampler	: s22	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement

Dates

Date Samples Received	: 28-MAY-2014	Issue Date	: 28-MAY-2014 16:37
Client Requested Due Date	: 03-JUN-2014	Scheduled Reporting Date	: **03-JUN-2014**

Delivery Details

Mode of Delivery	: Client Drop off	Temperature	: 3.5'C - Ice present
No. of coolers/boxes	: 1 HARD	No. of samples received	: 20
Security Seal	: Intact.	No. of samples analysed	: 20

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
- **Samples received in appropriately pretreated and preserved containers.**
- **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 (14 days), Solid (60 days) from date of completion of work order.

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 neccessary 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 to 15:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory for processing purposes and will be shown bracketed without a time component.

Matrix: **SOIL**

Laboratory sample ID	*Client sampling date / time*	*Client sample ID*	SOIL - S-21 TRH/BTEXN/PAH + Pb
ES1411803-001	21-MAY-2014 15:00	EXCAV1-N	✓
ES1411803-002	21-MAY-2014 15:00	EXCAV1-S	✓
ES1411803-003	21-MAY-2014 15:00	EXCAV1-E	✓
ES1411803-004	21-MAY-2014 15:00	EXCAV1-W	✓
ES1411803-005	21-MAY-2014 15:00	EXCAV1-B	✓
ES1411803-006	28-MAY-2014 15:00	EXCAV1-VS1	✓
ES1411803-007	28-MAY-2014 15:00	EXCAV1-VS2	✓
ES1411803-008	28-MAY-2014 15:00	EXCAV2-1	✓
ES1411803-009	28-MAY-2014 15:00	EXCAV2-2	✓
ES1411803-010	28-MAY-2014 15:00	EXCAV2-3	✓
ES1411803-011	28-MAY-2014 15:00	EXCAV2-4	✓
ES1411803-012	28-MAY-2014 15:00	EXCAV2-5	✓
ES1411803-013	28-MAY-2014 15:00	EXCAV2-6	✓
ES1411803-014	28-MAY-2014 15:00	EXCAV2-7	✓
ES1411803-015	28-MAY-2014 15:00	EXCAV2-8	✓
ES1411803-016	28-MAY-2014 15:00	EXCAV2-9	✓
ES1411803-017	28-MAY-2014 15:00	EXCAV2-10	✓
ES1411803-018	28-MAY-2014 15:00	EXCAV2-11	✓
ES1411803-019	28-MAY-2014 15:00	EXCAV2-VS1	✓
ES1411803-020	28-MAY-2014 15:00	EXCAV2-VS2	✓

Proactive Holding Time Report

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

Requested Deliverables

ACCOUNTS PAYABLE

- A4 - AU Tax Invoice (INV)	Email	ap_customerservice.anz@aecom.com

s22

- *AU Certificate of Analysis - NATA	Email	s22 @aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep)	Email	@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA	Email	@aecom.com
- A4 - AU Sample Receipt Notification - Environmental HT	Email	@aecom.com
- A4 - AU Tax Invoice	Email	@aecom.com
- Chain of Custody (CoC)	Email	@aecom.com
- EDI Format - ENMRG	Email	@aecom.com
- EDI Format - ESDAT	Email	@aecom.com
- EDI Format - HLAPro	Email	@aecom.com
- EDI Format - XTab	Email	@aecom.com

s22

- *AU Certificate of Analysis - NATA (COA)	Email	s22 @aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	@aecom.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	@aecom.com
- A4 - AU Tax Invoice (INV)	Email	@aecom.com
- Chain of Custody (CoC) (COC)	Email	@aecom.com
- EDI Format - ENMRG (ENMRG)	Email	@aecom.com
- EDI Format - ESDAT (ESDAT)	Email	@aecom.com
- EDI Format - HLAPro (HLAPro)	Email	@aecom.com
- EDI Format - XTab (XTAB)	Email	@aecom.com

ALS Environmental

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **ES1411803**	Page	: 1 of 7
Client	: AECOM Australia Pty Ltd	Laboratory	: Environmental Division Sydney
Contact	: s22	Contact	: Client Services
Address	: LEVEL 11, 44 MARKET STREET SYDNEY NSW 1230	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: s22 @aecom.com	E-mail	: sydney@alsglobal.com
Telephone	: 02 8264 5100	Telephone	: +61-2-8784 8555
Facsimile	: 02 8264 5111	Facsimile	: +61-2-8784 8500
Project	: 60221935 MOOREBANK	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 28-MAY-2014
Sampler	: s22	Issue Date	: 03-JUN-2014
Order number	: ----		
		No. of samples received	: 20
Quote number	: EN/004/14	No. of samples analysed	: 20

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

This Interpretive Quality Control Report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Parameter Frequency Compliance
- Brief Method Summaries
- Summary of Outliers

Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with recommended holding times (USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilu ions 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 ime breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content							
Soil Glass Jar - Unpreserved (EA055-103)							
EXCAV1-N, EXCAV1-S, EXCAV1-E, EXCAV1-W, EXCAV1-B	**21-MAY-2014**	**----**	----	----	**28-MAY-2014**	04-JUN-2014	✓
Soil Glass Jar - Unpreserved (EA055-103)							
EXCAV1-VS1, EXCAV1-VS2, EXCAV2-1, EXCAV2-2, EXCAV2-3, EXCAV2-4, EXCAV2-5, EXCAV2-6, EXCAV2-7, EXCAV2-8, EXCAV2-9, EXCAV2-10, EXCAV2-11, EXCAV2-VS1, EXCAV2-VS2	**28-MAY-2014**	**----**	----	----	**28-MAY-2014**	11-JUN-2014	✓
EG005T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved (EG005T)							
EXCAV1-N, EXCAV1-S, EXCAV1-E, EXCAV1-W, EXCAV1-B	**21-MAY-2014**	**29-MAY-2014**	17-NOV-2014	✓	**30-MAY-2014**	17-NOV-2014	✓
Soil Glass Jar - Unpreserved (EG005T)							
EXCAV1-VS1, EXCAV1-VS2, EXCAV2-1, EXCAV2-2, EXCAV2-3	**28-MAY-2014**	**29-MAY-2014**	24-NOV-2014	✓	**30-MAY-2014**	24-NOV-2014	✓
Soil Glass Jar - Unpreserved (EG005T)							
EXCAV2-4, EXCAV2-5, EXCAV2-6, EXCAV2-7, EXCAV2-8, EXCAV2-9, EXCAV2-10, EXCAV2-11, EXCAV2-VS1, EXCAV2-VS2	**28-MAY-2014**	**30-MAY-2014**	24-NOV-2014	✓	**31-MAY-2014**	24-NOV-2014	✓

Matrix: **SOIL**

Evaluation: × = Holding ime breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP071)							
EXCAV1-N, EXCAV1-S, EXCAV1-E, EXCAV1-W, EXCAV1-B	**21-MAY-2014**	**28-MAY-2014**	04-JUN-2014	✓	**29-MAY-2014**	07-JUL-2014	✓
Soil Glass Jar - Unpreserved (EP071)							
EXCAV1-VS1, EXCAV1-VS2, EXCAV2-1, EXCAV2-2, EXCAV2-3, EXCAV2-4, EXCAV2-5, EXCAV2-6, EXCAV2-7, EXCAV2-8, EXCAV2-9, EXCAV2-10, EXCAV2-11, EXCAV2-VS1, EXCAV2-VS2	**28-MAY-2014**	**28-MAY-2014**	11-JUN-2014	✓	**29-MAY-2014**	07-JUL-2014	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved (EP075(SIM))							
EXCAV1-N, EXCAV1-S, EXCAV1-E, EXCAV1-W, EXCAV1-B	**21-MAY-2014**	**28-MAY-2014**	04-JUN-2014	✓	**29-MAY-2014**	07-JUL-2014	✓
Soil Glass Jar - Unpreserved (EP075(SIM))							
EXCAV1-VS1, EXCAV1-VS2, EXCAV2-1, EXCAV2-2, EXCAV2-3, EXCAV2-4, EXCAV2-5, EXCAV2-6, EXCAV2-7, EXCAV2-8, EXCAV2-9, EXCAV2-10, EXCAV2-11, EXCAV2-VS1, EXCAV2-VS2	**28-MAY-2014**	**28-MAY-2014**	11-JUN-2014	✓	**29-MAY-2014**	07-JUL-2014	✓
EP080: BTEXN							
Soil Glass Jar - Unpreserved (EP080)							
EXCAV1-N, EXCAV1-S, EXCAV1-E, EXCAV1-W, EXCAV1-B	**21-MAY-2014**	**28-MAY-2014**	04-JUN-2014	✓	**30-MAY-2014**	04-JUN-2014	✓
Soil Glass Jar - Unpreserved (EP080)							
EXCAV1-VS1, EXCAV1-VS2, EXCAV2-1, EXCAV2-2, EXCAV2-3, EXCAV2-4, EXCAV2-5, EXCAV2-6, EXCAV2-7, EXCAV2-8, EXCAV2-9, EXCAV2-10, EXCAV2-11, EXCAV2-VS1, EXCAV2-VS2	**28-MAY-2014**	**28-MAY-2014**	11-JUN-2014	✓	**30-MAY-2014**	11-JUN-2014	✓

Matrix: **SOIL**

Evaluation: × = Holding ime breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP080)							
EXCAV1-N, EXCAV1-S, EXCAV1-E, EXCAV1-W, EXCAV1-B	**21-MAY-2014**	**28-MAY-2014**	04-JUN-2014	✓	**30-MAY-2014**	04-JUN-2014	✓
Soil Glass Jar - Unpreserved (EP080)							
EXCAV1-VS1, EXCAV1-VS2, EXCAV2-1, EXCAV2-2, EXCAV2-3, EXCAV2-4, EXCAV2-5, EXCAV2-6, EXCAV2-7, EXCAV2-8, EXCAV2-9, EXCAV2-10, EXCAV2-11, EXCAV2-VS1, EXCAV2-VS2	**28-MAY-2014**	**28-MAY-2014**	11-JUN-2014	✓	**30-MAY-2014**	11-JUN-2014	✓

Quality Control Parameter Frequency Compliance

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

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055-103	3	24	**12.5**	**10.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	2	20	**10.0**	**10.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	4	37	**10.8**	**10.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	20	**10.0**	**10.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	20	**10.0**	**10.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)	EP075(SIM)	1	20	**5.0**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	37	**5.4**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	20	**5.0**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	20	**5.0**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
PAH/Phenols (SIM)	EP075(SIM)	1	20	**5.0**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	37	**5.4**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	20	**5.0**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	20	**5.0**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	1	20	**5.0**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	37	**5.4**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	20	**5.0**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	20	**5.0**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement

Brief Method Summaries

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

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055-103	SOIL	A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Total Metals by ICP-AES	EG005T	SOIL	(APHA 21st ed., 3120; USEPA SW 846 - 6010) (ICPAES) Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (2013) Schedule B(3)
TPH - Semivolatile Fraction	EP071	SOIL	(USEPA SW 846 - 8015A) Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C36. This method is compliant with the QC requirements of NEPM (2013) Schedule B(3).
PAH/Phenols (SIM)	EP075(SIM)	SOIL	(USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 502 and 507)
TPH Volatiles/BTEX	EP080	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with the QC requirements of NEPM (2013) Schedule B(3)

Preparation Methods	Method	Matrix	Method Descriptions
Methanolic Extraction of Soils for Purge and Trap	* ORG16	SOIL	(USEPA SW 846 - 5030A) 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids (Option B - Non-concentrating)	ORG17B	SOIL	In-house, Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 20mL 1:1 DCM/Acetone by end over end tumble. The solvent is transferred directly to a GC vial for analysis.

Summary of Outliers

Outliers : Quality Control Samples

The following report highlights outliers flagged in the Quality Control (QC) Report. Surrogate recovery limits are static and based on USEPA SW 846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). This report displays QC Outliers (breaches) only.

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

- **For all matrices, no Method Blank value outliers occur.**
- **For all matrices, no Duplicate outliers occur.**
- **For all matrices, no Laboratory Control outliers occur.**
- **For all matrices, no Matrix Spike outliers occur.**

Regular Sample Surrogates

- **For all regular sample matrices, no surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

This report displays Holding Time breaches only. Only the respective Extraction / Preparation and/or Analysis component is/are displayed.

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

Outliers : Frequency of Quality Control Samples

The following report highlights breaches in the Frequency of Quality Control Samples.

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

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **ES1411803**	Page	: 1 of 9
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: s22	Contact	: Client Services
Address	: LEVEL 11, 44 MARKET STREET SYDNEY NSW 1230	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: s22 @aecom.com	E-mail	: sydney@alsglobal.com
Telephone	: 02 8264 5100	Telephone	: +61-2-8784 8555
Facsimile	: 02 8264 5111	Facsimile	: +61-2-8784 8500
Project	: 60221935 MOOREBANK	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 28-MAY-2014
Sampler	: s22	Issue Date	: 03-JUN-2014
Order number	: ----		
		No. of samples received	: 20
Quote number	: EN/004/14	No. of samples analysed	: 20

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

This Quality Control Report contains the following information:

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

NATA WORLD RECOGNISED ACCREDITATION

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
s22	Senior Spectroscopist	Sydney Inorganics
s22	Senior Organic Chemist	Sydney Inorganics
s22	Senior Organic Chemist	Sydney Organics
s22	Metals Coordinator	Sydney Inorganics

General Comments

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

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

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

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

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EA055: Moisture Content (QC Lot: 3462283)									
ES1411794-022	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	12.6	12.0	5.0	0% - 50%
ES1411803-010	EXCAV2-3	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	12.6	12.9	1.8	0% - 50%
EA055: Moisture Content (QC Lot: 3462284)									
ES1411803-019	EXCAV2-VS1	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	6.6	7.6	14.9	No Limit
EG005T: Total Metals by ICP-AES (QC Lot: 3463716)									
ES1411835-029	Anonymous	EG005T: Lead	7439-92-1	5	mg/kg	28	21	29.9	No Limit
ES1411923-004	Anonymous	EG005T: Lead	7439-92-1	5	mg/kg	22	26	16.7	No Limit
EG005T: Total Metals by ICP-AES (QC Lot: 3465681)									
ES1411766-022	Anonymous	EG005T: Lead	7439-92-1	5	mg/kg	9	7	30.2	No Limit
ES1411803-016	EXCAV2-9	EG005T: Lead	7439-92-1	5	mg/kg	<5	<5	0.0	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3462070)									
ES1411803-001	EXCAV1-N	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Sum of polycyclic aroma ic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
ES1411803-011	EXCAV2-4	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3462070) - continued									
ES1411803-011	EXCAV2-4	EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Sum of polycyclic aroma ic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3462062)									
ES1411803-001	EXCAV1-N	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
ES1411803-011	EXCAV2-4	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3462069)									
ES1411803-001	EXCAV1-N	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
ES1411803-011	EXCAV2-4	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3462062)									
ES1411803-001	EXCAV1-N	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
ES1411803-011	EXCAV2-4	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3462069)									
ES1411803-001	EXCAV1-N	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	0.0	No Limit
ES1411803-011	EXCAV2-4	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	0.0	No Limit
EP080: BTEXN (QC Lot: 3462062)									
ES1411803-001	EXCAV1-N	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP080: BTEXN (QC Lot: 3462062) - continued									
ES1411803-001	EXCAV1-N	EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit
ES1411803-011	EXCAV2-4	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit

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	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EG005T: Total Metals by ICP-AES (QCLot: 3463716)								
EG005T: Lead	7439-92-1	5	mg/kg	<5	40.0 mg/kg	114	86	124
EG005T: Total Metals by ICP-AES (QCLot: 3465681)								
EG005T: Lead	7439-92-1	5	mg/kg	<5	40.0 mg/kg	99.9	86	124
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3462070)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	4 mg/kg	93.2	80	124
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	4 mg/kg	86.2	77	123
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	4 mg/kg	84.0	79	123
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	4 mg/kg	84.7	77	123
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	4 mg/kg	96.1	79	123
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	4 mg/kg	94.3	79	123
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	4 mg/kg	91.7	79	123
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	4 mg/kg	92.9	79	125
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	4 mg/kg	84.7	73	121
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	4 mg/kg	94.8	81	123
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2	0.5	mg/kg	<0.5	4 mg/kg	79.9	70	118
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	4 mg/kg	95.1	77	123
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	4 mg/kg	79.8	76	122
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	4 mg/kg	76.0	71	113
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	4 mg/kg	82.2	71.7	113
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	4 mg/kg	77.7	72.4	114
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3462062)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	109	68.4	128
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3462069)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	200 mg/kg	125	71	131
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	300 mg/kg	120	74	138
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	200 mg/kg	91.8	64	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3462062)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	112	68.4	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3462069)								
EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	250 mg/kg	119	70	130
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	350 mg/kg	112	74	138
EP071: >C34 - C40 Fraction	----	50	mg/kg	<100	150 mg/kg	70.6	63	131
EP080: BTEXN (QCLot: 3462062)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	94.4	62	116

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	LCS Recovery (%)	Recovery Limits (%): Low	Recovery Limits (%): High
EP080: BTEXN (QCLot: 3462062) - continued								
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	93.5	62	128
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	92.7	58	118
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	92.2	60	120
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	95.6	60	120
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	87.4	62	138

Matrix Spike (MS) Report

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

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Recovery Limits (%): Low	Recovery Limits (%): High
EG005T: Total Metals by ICP-AES (QCLot: 3463716)							
ES1411923-004	Anonymous	EG005T: Lead	7439-92-1	125 mg/kg	114	70	130
EG005T: Total Metals by ICP-AES (QCLot: 3465681)							
ES1411766-022	Anonymous	EG005T: Lead	7439-92-1	125 mg/kg	99.6	70	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3462070)							
ES1411803-001	EXCAV1-N	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	90.8	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	101	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3462062)							
ES1411803-001	EXCAV1-N	EP080: C6 - C9 Fraction	----	32.5 mg/kg	102	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3462069)							
ES1411803-001	EXCAV1-N	EP071: C10 - C14 Fraction	----	640 mg/kg	92.3	73	137
		EP071: C15 - C28 Fraction	----	3140 mg/kg	88.7	53	131
		EP071: C29 - C36 Fraction	----	2860 mg/kg	78.2	52	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3462062)							
ES1411803-001	EXCAV1-N	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	100	70	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3462069)							
ES1411803-001	EXCAV1-N	EP071: >C10 - C16 Fraction	>C10_C16	850 mg/kg	114	73	137
		EP071: >C16 - C34 Fraction	----	4800 mg/kg	81.3	53	131
		EP071: >C34 - C40 Fraction	----	2400 mg/kg	60.6	52	132
EP080: BTEXN (QCLot: 3462062)							
ES1411803-001	EXCAV1-N	EP080: Benzene	71-43-2	2.5 mg/kg	83.5	70	130
		EP080: Toluene	108-88-3	2.5 mg/kg	82.7	70	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	78.4	70	130

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	Matrix Spike (MS) Report: SpikeRecovery(%) MS	Matrix Spike (MS) Report: Recovery Limits (%) Low	Matrix Spike (MS) Report: Recovery Limits (%) High
EP080: BTEXN (QCLot: 3462062) - continued							
ES1411803-001	EXCAV1-N	EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	79.2	70	130
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	83.6	70	130
		EP080: Naphthalene	91-20-3	2.5 mg/kg	82.0	70	130

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

The quality control term Matrix Spike (MS) and Matrix Spike Duplicate (MSD) refers to intralaboratory split samples spiked with a representa ive set of target analytes. The purpose of these QC parameters are to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration	Spike Recovery (%) MS	Spike Recovery (%) MSD	Recovery Limits (%) Low	Recovery Limits (%) High	RPDs (%) Value	RPDs (%) Control Limit
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3462062)										
ES1411803-001	EXCAV1-N	EP080: C6 - C9 Fraction	----	32.5 mg/kg	102	----	70	130	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3462062)										
ES1411803-001	EXCAV1-N	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	100	----	70	130	----	----
EP080: BTEXN (QCLot: 3462062)										
ES1411803-001	EXCAV1-N	EP080: Benzene	71-43-2	2.5 mg/kg	83.5	----	70	130	----	----
		EP080: Toluene	108-88-3	2.5 mg/kg	82.7	----	70	130	----	----
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	78.4	----	70	130	----	----
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	79.2	----	70	130	----	----
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	83.6	----	70	130	----	----
		EP080: Naphthalene	91-20-3	2.5 mg/kg	82.0	----	70	130	----	----
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3462069)										
ES1411803-001	EXCAV1-N	EP071: C10 - C14 Fraction	----	640 mg/kg	92.3	----	73	137	----	----
		EP071: C15 - C28 Fraction	----	3140 mg/kg	88.7	----	53	131	----	----
		EP071: C29 - C36 Fraction	----	2860 mg/kg	78.2	----	52	132	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3462069)										
ES1411803-001	EXCAV1-N	EP071: >C10 - C16 Fraction	>C10_C16	850 mg/kg	114	----	73	137	----	----
		EP071: >C16 - C34 Fraction	----	4800 mg/kg	81.3	----	53	131	----	----
		EP071: >C34 - C40 Fraction	----	2400 mg/kg	60.6	----	52	132	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3462070)										
ES1411803-001	EXCAV1-N	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	90.8	----	70	130	----	----
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	101	----	70	130	----	----
EG005T: Total Metals by ICP-AES (QCLot: 3463716)										
ES1411923-004	Anonymous	EG005T: Lead	7439-92-1	125 mg/kg	114	----	70	130	----	----
EG005T: Total Metals by ICP-AES (QCLot: 3465681)										

Sub-Matrix: **SOIL**

				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	MSD	Low	High	Value	Control Limit
EG005T: Total Metals by ICP-AES (QCLot: 3465681) - continued										
ES1411766-022	Anonymous	EG005T: Lead	7439-92-1	125 mg/kg	99.6	----	70	130	----	----

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES1411803**	Page	: 1 of 11
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: s22	Contact	: Client Services
Address	: LEVEL 11, 44 MARKET STREET SYDNEY NSW 1230	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
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Project	: 60221935 MOOREBANK	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: ----		
C-O-C number	: ----	Date Samples Received	: 28-MAY-2014
Sampler	: s22	Issue Date	: 03-JUN-2014
Site	: ----		
		No. of samples received	: 20
Quote number	: EN/004/14	No. of samples analysed	: 20

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

WORLD RECOGNISED ACCREDITATION

Signatories

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

Signatories	*Position*	*Accreditation Category*
s22	Senior Spectroscopist	Sydney Inorganics
s22	Senior Organic Chemist	Sydney Inorganics
s22	Senior Organic Chemist	Sydney Organics
s22	Metals Coordinator	Sydney Inorganics

General Comments

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

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

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

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

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

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

- **Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) 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.**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Compound	CAS Number	LOR	Unit	Client sample ID	EXCAV1-N	EXCAV1-S	EXCAV1-E	EXCAV1-W	EXCAV1-B
				Client sampling date / time	21-MAY-2014 15:00	21-MAY-2014 15:00	21-MAY-2014 15:00	21-MAY-2014 15:00	21-MAY-2014 15:00
					ES1411803-001	ES1411803-002	ES1411803-003	ES1411803-004	ES1411803-005
EA055: Moisture Content									
Moisture Content (dried @ 103°C)	---	1.0	%		15.1	17.2	14.6	12.9	18.1
EG005T: Total Metals by ICP-AES									
Lead	7439-92-1	5	mg/kg		22	24	14	41	26
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b+j)fluoranthene	205-99-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	---	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	---	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	---	0.5	mg/kg		0.6	0.6	0.6	0.6	0.6
^ Benzo(a)pyrene TEQ (LOR)	---	0.5	mg/kg		1.2	1.2	1.2	1.2	1.2
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	---	10	mg/kg		<10	<10	<10	<10	<10
C10 - C14 Fraction	---	50	mg/kg		<50	<50	<50	<50	70
C15 - C28 Fraction	---	100	mg/kg		<100	<100	210	<100	550
C29 - C36 Fraction	---	100	mg/kg		<100	<100	280	120	470
^ C10 - C36 Fraction (sum)	---	50	mg/kg		<50	<50	490	120	1090
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013									
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

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Compound	CAS Number	LOR	Unit	Client sample ID	EXCAV1-N	EXCAV1-S	EXCAV1-E	EXCAV1-W	EXCAV1-B
				Client sampling date / time	21-MAY-2014 15:00	21-MAY-2014 15:00	21-MAY-2014 15:00	21-MAY-2014 15:00	21-MAY-2014 15:00
					ES1411803-001	ES1411803-002	ES1411803-003	ES1411803-004	ES1411803-005
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 - Continued									
>C10 - C16 Fraction	>C10_C16	50	mg/kg		<50	<50	<50	<50	180
>C16 - C34 Fraction	---	100	mg/kg		<100	<100	390	160	750
>C34 - C40 Fraction	---	100	mg/kg		<100	<100	180	<100	320
^ >C10 - C40 Fraction (sum)	---	50	mg/kg		<50	<50	570	160	1250
^ >C10 - C16 Fraction minus Naphthalene (F2)	---	50	mg/kg		<50	<50	<50	<50	180
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	---	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	1330-20-7	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
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.1	%		91.7	94.4	84.3	85.1	90.8
2-Chlorophenol-D4	93951-73-6	0.1	%		91.6	94.5	85.0	89.7	92.2
2.4.6-Tribromophenol	118-79-6	0.1	%		65.5	70.0	60.5	77.2	83.6
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.1	%		87.6	90.0	77.3	85.1	87.0
Anthracene-d10	1719-06-8	0.1	%		95.0	100	88.8	97.0	96.5
4-Terphenyl-d14	1718-51-0	0.1	%		103	103	88.0	99.3	99.5
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.1	%		101	107	105	102	106
Toluene-D8	2037-26-5	0.1	%		93.7	106	95.8	104	116
4-Bromofluorobenzene	460-00-4	0.1	%		92.6	94.7	92.6	95.4	107

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Compound	CAS Number	LOR	Unit	Client sample ID	EXCAV1-VS1	EXCAV1-VS2	EXCAV2-1	EXCAV2-2	EXCAV2-3
				Client sampling date / time	28-MAY-2014 15:00	28-MAY-2014 15:00	28-MAY-2014 15:00	28-MAY-2014 15:00	28-MAY-2014 15:00
					ES1411803-006	ES1411803-007	ES1411803-008	ES1411803-009	ES1411803-010
EA055: Moisture Content									
Moisture Content (dried @ 103°C)	---	1.0	%		18.8	16.6	13.0	10.8	12.6
EG005T: Total Metals by ICP-AES									
Lead	7439-92-1	5	mg/kg		33	23	10	7	9
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b+j)fluoranthene	205-99-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	---	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	---	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	---	0.5	mg/kg		0.6	0.6	0.6	0.6	0.6
^ Benzo(a)pyrene TEQ (LOR)	---	0.5	mg/kg		1.2	1.2	1.2	1.2	1.2
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	---	10	mg/kg		<10	<10	<10	<10	<10
C10 - C14 Fraction	---	50	mg/kg		<50	70	<50	<50	<50
C15 - C28 Fraction	---	100	mg/kg		490	800	<100	<100	<100
C29 - C36 Fraction	---	100	mg/kg		440	860	<100	<100	<100
^ C10 - C36 Fraction (sum)	---	50	mg/kg		930	1730	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013									
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

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Compound	CAS Number	LOR	Unit	Client sample ID	EXCAV1-VS1	EXCAV1-VS2	EXCAV2-1	EXCAV2-2	EXCAV2-3
				Client sampling date / time	28-MAY-2014 15:00	28-MAY-2014 15:00	28-MAY-2014 15:00	28-MAY-2014 15:00	28-MAY-2014 15:00
					ES1411803-006	ES1411803-007	ES1411803-008	ES1411803-009	ES1411803-010
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 - Continued									
>C10 - C16 Fraction	>C10_C16	50	mg/kg		110	160	<50	<50	<50
>C16 - C34 Fraction	---	100	mg/kg		720	1250	<100	<100	<100
>C34 - C40 Fraction	---	100	mg/kg		340	660	<100	<100	<100
^ >C10 - C40 Fraction (sum)	---	50	mg/kg		1170	2070	<50	<50	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	---	50	mg/kg		110	160	<50	<50	<50
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	---	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	1330-20-7	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
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.1	%		94.3	94.7	86.7	87.2	88.7
2-Chlorophenol-D4	93951-73-6	0.1	%		96.2	96.0	95.4	91.5	91.4
2.4.6-Tribromophenol	118-79-6	0.1	%		92.0	89.8	83.2	83.2	77.7
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.1	%		89.3	87.1	90.1	87.6	84.6
Anthracene-d10	1719-06-8	0.1	%		101	99.6	104	99.3	96.6
4-Terphenyl-d14	1718-51-0	0.1	%		102	101	104	98.8	96.5
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.1	%		96.6	97.0	91.9	100	97.7
Toluene-D8	2037-26-5	0.1	%		101	109	89.4	97.5	94.4
4-Bromofluorobenzene	460-00-4	0.1	%		94.7	106	90.8	99.0	92.4

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Compound	CAS Number	LOR	Unit	Client sample ID	EXCAV2-4	EXCAV2-5	EXCAV2-6	EXCAV2-7	EXCAV2-8
				Client sampling date / time	28-MAY-2014 15:00	28-MAY-2014 15:00	28-MAY-2014 15:00	28-MAY-2014 15:00	28-MAY-2014 15:00
					ES1411803-011	ES1411803-012	ES1411803-013	ES1411803-014	ES1411803-015
EA055: Moisture Content									
Moisture Content (dried @ 103°C)	---	1.0	%		11.5	17.9	5.1	9.4	11.2
EG005T: Total Metals by ICP-AES									
Lead	7439-92-1	5	mg/kg		6	15	<5	6	6
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b+j)fluoranthene	205-99-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	---	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	---	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	---	0.5	mg/kg		0.6	0.6	0.6	0.6	0.6
^ Benzo(a)pyrene TEQ (LOR)	---	0.5	mg/kg		1.2	1.2	1.2	1.2	1.2
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	---	10	mg/kg		<10	<10	<10	<10	<10
C10 - C14 Fraction	---	50	mg/kg		<50	<50	<50	<50	<50
C15 - C28 Fraction	---	100	mg/kg		<100	<100	<100	<100	<100
C29 - C36 Fraction	---	100	mg/kg		<100	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	---	50	mg/kg		<50	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013									
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

Analytical Results

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

Compound	CAS Number	LOR	Unit	Client sample ID	EXCAV2-4	EXCAV2-5	EXCAV2-6	EXCAV2-7	EXCAV2-8
				Client sampling date / time	28-MAY-2014 15:00	28-MAY-2014 15:00	28-MAY-2014 15:00	28-MAY-2014 15:00	28-MAY-2014 15:00
					ES1411803-011	ES1411803-012	ES1411803-013	ES1411803-014	ES1411803-015
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 - Continued									
>C10 - C16 Fraction	>C10_C16	50	mg/kg		<50	<50	<50	<50	<50
>C16 - C34 Fraction	---	100	mg/kg		<100	<100	<100	<100	<100
>C34 - C40 Fraction	---	100	mg/kg		<100	<100	<100	<100	<100
^ **>C10 - C40 Fraction (sum)**	---	50	mg/kg		<50	<50	<50	<50	<50
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	---	50	mg/kg		<50	<50	<50	<50	<50
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ **Sum of BTEX**	---	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ **Total Xylenes**	1330-20-7	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
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.1	%		**85.1**	**89.3**	**89.9**	**89.5**	**89.4**
2-Chlorophenol-D4	93951-73-6	0.1	%		**89.2**	**90.9**	**91.1**	**91.4**	**92.9**
2.4.6-Tribromophenol	118-79-6	0.1	%		**77.0**	**71.2**	**69.9**	**67.0**	**60.0**
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.1	%		**85.4**	**85.5**	**86.6**	**86.3**	**89.4**
Anthracene-d10	1719-06-8	0.1	%		**98.2**	**97.5**	**101**	**98.6**	**99.8**
4-Terphenyl-d14	1718-51-0	0.1	%		**97.9**	**98.5**	**102**	**98.6**	**106**
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.1	%		**96.7**	**98.7**	**117**	**103**	**99.3**
Toluene-D8	2037-26-5	0.1	%		**99.6**	**96.1**	**111**	**99.0**	**95.1**
4-Bromofluorobenzene	460-00-4	0.1	%		**97.1**	**91.9**	**107**	**94.8**	**88.0**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Compound	CAS Number	LOR	Unit	Client sample ID	EXCAV2-9	EXCAV2-10	EXCAV2-11	EXCAV2-VS1	EXCAV2-VS2
				Client sampling date / time	28-MAY-2014 15:00	28-MAY-2014 15:00	28-MAY-2014 15:00	28-MAY-2014 15:00	28-MAY-2014 15:00
					ES1411803-016	ES1411803-017	ES1411803-018	ES1411803-019	ES1411803-020
EA055: Moisture Content									
Moisture Content (dried @ 103°C)	---	1.0	%		8.0	8.4	13.5	6.6	8.7
EG005T: Total Metals by ICP-AES									
Lead	7439-92-1	5	mg/kg		<5	<5	7	<5	21
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b+j)fluoranthene	205-99-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	---	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	---	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	---	0.5	mg/kg		0.6	0.6	0.6	0.6	0.6
^ Benzo(a)pyrene TEQ (LOR)	---	0.5	mg/kg		1.2	1.2	1.2	1.2	1.2
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	---	10	mg/kg		<10	<10	<10	<10	<10
C10 - C14 Fraction	---	50	mg/kg		<50	<50	<50	<50	<50
C15 - C28 Fraction	---	100	mg/kg		<100	<100	<100	<100	<100
C29 - C36 Fraction	---	100	mg/kg		<100	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	---	50	mg/kg		<50	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013									
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

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Compound	CAS Number	LOR	Unit	Client sample ID	EXCAV2-9	EXCAV2-10	EXCAV2-11	EXCAV2-VS1	EXCAV2-VS2
				Client sampling date / time	28-MAY-2014 15:00	28-MAY-2014 15:00	28-MAY-2014 15:00	28-MAY-2014 15:00	28-MAY-2014 15:00
					ES1411803-016	ES1411803-017	ES1411803-018	ES1411803-019	ES1411803-020
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 - Continued									
>C10 - C16 Fraction	>C10_C16	50	mg/kg		<50	<50	<50	<50	<50
>C16 - C34 Fraction	---	100	mg/kg		<100	<100	<100	<100	<100
>C34 - C40 Fraction	---	100	mg/kg		<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	---	50	mg/kg		<50	<50	<50	<50	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	---	50	mg/kg		<50	<50	<50	<50	<50
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	---	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	1330-20-7	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
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.1	%		**83.8**	**89.8**	**92.6**	**94.9**	**83.1**
2-Chlorophenol-D4	93951-73-6	0.1	%		**92.6**	**90.8**	**90.9**	**95.1**	**88.7**
2.4.6-Tribromophenol	118-79-6	0.1	%		**63.0**	**57.8**	**58.5**	**64.3**	**63.8**
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.1	%		**86.0**	**87.0**	**86.7**	**92.3**	**85.9**
Anthracene-d10	1719-06-8	0.1	%		**96.3**	**95.9**	**98.0**	**104**	**95.6**
4-Terphenyl-d14	1718-51-0	0.1	%		**100**	**100**	**101**	**109**	**98.5**
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.1	%		**101**	**94.9**	**96.4**	**113**	**105**
Toluene-D8	2037-26-5	0.1	%		**99.5**	**88.9**	**92.8**	**103**	**89.5**
4-Bromofluorobenzene	460-00-4	0.1	%		**93.4**	**87.8**	**90.4**	**96.2**	**91.6**

Surrogate Control Limits

Sub-Matrix: **SOIL**

Compound	CAS Number	Recovery Limits (%) Low	Recovery Limits (%) High
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	63	123
2-Chlorophenol-D4	93951-73-6	66	122
2.4.6-Tribromophenol	118-79-6	40	138
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	70	122
Anthracene-d10	1719-06-8	66	128
4-Terphenyl-d14	1718-51-0	65	129
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	72.8	133.2
Toluene-D8	2037-26-5	73.9	132.1
4-Bromofluorobenzene	460-00-4	71.6	130.0

AECOM

Chain of Custody

AECOM Australia Pty Ltd
Level 21, 420 George Street
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F +61 2 8934 0001

Laboratory Details
Lab. Name: ALS
Address: SMITHFIELD
Fax:
Lab Quote No:

Sampled By: s22
AECOM Project No: 60224935
Project Name: Moorebank

Specifications
Turnaround time required: 5 day
Special storage requirements?
Report Format: Email: s22 @aecom.com

Lab. ID	Sample ID	Sampling Date	Matrix: soil	Matrix: water	Matrix: other	Preservation: filtered	Preservation: acid	Preservation: ice	Container	Analysis: TPH/PAH/BTEX	Analysis: 8 Metals
1	SP103-4	6/5/13	X					X	250 ml Jar	X	
2	SP103-5									X	
3	SP103-6									X	
4	SP103-7									X	
5	SP103-8									X	X
6	SP104-1									X	X
7	SP104-2										

Environmental Division
Sydney
Work Order
ES1310252

Telephone : +61-2-8784 8555

Comments:

Relinquished by: s22 Signed: s22 Date/Time: 6/5/13

Recieved by: s22 Signed: s22 Date/Time: 6/5/13 9:30

Environmental Division

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **ES1310252**	Page	: 1 of 6
Client	: AECOM Australia Pty Ltd	Laboratory	: Environmental Division Sydney
Contact	: s22	Contact	: s22
Address	: LEVEL 11, 44 MARKET STREET SYDNEY NSW 1230	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: s22 @aecom.com	E-mail	: s22 @alsglobal.com
Telephone	: 02 8264 5100	Telephone	: +61 2 8784 8555
Facsimile	: 02 8264 5111	Facsimile	: +61 2 8784 8555
Project	: 60221935 MOOREBANK	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 06-MAY-2013
Sampler	: s22	Issue Date	: 13-MAY-2013
Order number	: ----		
		No. of samples received	: 7
Quote number	: EN/004/12	No. of samples analysed	: 6

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

This Interpretive Quality Control Report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Parameter Frequency Compliance
- Brief Method Summaries
- Summary of Outliers

Analysis Holding Time Compliance

The following report summarises extraction / preparation and analysis times and compares with recommended holding times. Dates reported represent first date of extraction or analysis and precludes subsequent dilutions and reruns. Information is also provided re the sample container (preservative) from which the analysis aliquot was taken. Elapsed period to analysis represents number of days from sampling where no extraction / digestion is involved or period from extraction / digestion where this is present. For composite samples, sampling date is assumed to be that of the oldest sample contributing to the composite. Sample date for laboratory produced leachates is assumed as the completion date of the leaching process. Outliers for holding time are based on USEPA SW 846, APHA, AS and NEPM (1999). A listing of breaches is provided in the Summary of Outliers.

Holding times for leachate methods (excluding elutriates) vary according to the analytes being determined on the resulting solution. For non-volatile analytes, the holding time compliance assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These soil holding times are: Organics (14 days); Mercury (28 days) & other metals (180 days). A recorded breach therefore does not guarantee a breach for all non-volatile parameters.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content							
Soil Glass Jar - Unpreserved (EA055-103)							
SP103-5, SP103-6, SP103-7, SP103-8, SP104-1, SP103_9	**06-MAY-2013**	**----**	----	----	**09-MAY-2013**	20-MAY-2013	✓
EG005T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved (EG005T)							
SP103-8, SP104-1, SP103_9	**06-MAY-2013**	**10-MAY-2013**	02-NOV-2013	✓	**11-MAY-2013**	02-NOV-2013	✓
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved (EG035T)							
SP103-8, SP104-1, SP103_9	**06-MAY-2013**	**10-MAY-2013**	03-JUN-2013	✓	**13-MAY-2013**	03-JUN-2013	✓
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP071)							
SP103_9	**06-MAY-2013**	**08-MAY-2013**	20-MAY-2013	✓	**08-MAY-2013**	17-JUN-2013	✓
Soil Glass Jar - Unpreserved (EP071)							
SP103-5, SP103-6, SP103-7, SP103-8, SP104-1	**06-MAY-2013**	**08-MAY-2013**	20-MAY-2013	✓	**09-MAY-2013**	17-JUN-2013	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved (EP075(SIM))							
SP103_9	**06-MAY-2013**	**08-MAY-2013**	20-MAY-2013	✓	**08-MAY-2013**	17-JUN-2013	✓
Soil Glass Jar - Unpreserved (EP075(SIM))							
SP103-5, SP103-6, SP103-7, SP103-8, SP104-1	**06-MAY-2013**	**08-MAY-2013**	20-MAY-2013	✓	**09-MAY-2013**	17-JUN-2013	✓

Matrix: **SOIL**

Evaluation: × = Holding ime breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080: BTEX							
Soil Glass Jar - Unpreserved (EP080) SP103-5, SP103-6, SP103-7, SP103-8, SP104-1	**06-MAY-2013**	**07-MAY-2013**	20-MAY-2013	✓	**08-MAY-2013**	20-MAY-2013	✓
Soil Glass Jar - Unpreserved (EP080) SP103_9	**06-MAY-2013**	**08-MAY-2013**	20-MAY-2013	✓	**09-MAY-2013**	20-MAY-2013	✓
EP080: BTEXN							
Soil Glass Jar - Unpreserved (EP080) SP103-5, SP103-6, SP103-7, SP103-8, SP104-1	**06-MAY-2013**	**07-MAY-2013**	20-MAY-2013	✓	**08-MAY-2013**	20-MAY-2013	✓
Soil Glass Jar - Unpreserved (EP080) SP103_9	**06-MAY-2013**	**08-MAY-2013**	20-MAY-2013	✓	**09-MAY-2013**	20-MAY-2013	✓
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP080) SP103-5, SP103-6, SP103-7, SP103-8, SP104-1	**06-MAY-2013**	**07-MAY-2013**	20-MAY-2013	✓	**08-MAY-2013**	20-MAY-2013	✓
Soil Glass Jar - Unpreserved (EP080) SP103_9	**06-MAY-2013**	**08-MAY-2013**	20-MAY-2013	✓	**09-MAY-2013**	20-MAY-2013	✓

Quality Control Parameter Frequency Compliance

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

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055-103	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	3	29	**10.3**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	3	29	**10.3**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	4	39	**10.3**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)	EP075(SIM)	2	29	**6.9**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	29	**6.9**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	39	**5.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
PAH/Phenols (SIM)	EP075(SIM)	2	29	**6.9**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	29	**6.9**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	39	**5.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	2	29	**6.9**	**5.0**	✓	ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	20	**5.0**	**5.0**	✓	ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	20	**5.0**	**5.0**	✓	ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	29	**6.9**	**5.0**	✓	ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	39	**5.1**	**5.0**	✓	ALS QCS3 requirement

Brief Method Summaries

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

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055-103	SOIL	A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (2010 Draft) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Total Metals by ICP-AES	EG005T	SOIL	(APHA 21st ed., 3120; USEPA SW 846 - 6010) (ICPAES) Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (1999) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	AS 3550, APHA 21st ed., 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a cal bration curve. This method is compliant with NEPM (1999) Schedule B(3)
TPH - Semivolatile Fraction	EP071	SOIL	(USEPA SW 846 - 8015A) Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C36. This method is compliant with NEPM (1999) Schedule B(3) (Method 506.1)
PAH/Phenols (SIM)	EP075(SIM)	SOIL	(USEPA SW 846 - 8270B) 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 (1999) Schedule B(3) (Method 502 and 507)
TPH Volatiles/BTEX	EP080	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Method 501)

Preparation Methods	Method	Matrix	Method Descriptions
Methanolic Extraction of Soils for Purge and Trap	* ORG16	SOIL	(USEPA SW 846 - 5030A) 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids (Option B - Non-concentrating)	ORG17B	SOIL	In-house, Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 20mL 1:1 DCM/Acetone by end over end tumble. The solvent is transferred directly to a GC vial for analysis.

Summary of Outliers

Outliers : Quality Control Samples

The following report highlights outliers flagged in the Quality Control (QC) Report. Surrogate recovery limits are static and based on USEPA SW 846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). This report displays QC Outliers (breaches) only.

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

- **For all matrices, no Method Blank value outliers occur.**
- **For all matrices, no Duplicate outliers occur.**
- **For all matrices, no Laboratory Control outliers occur.**
- **For all matrices, no Matrix Spike outliers occur.**

Regular Sample Surrogates

- **For all regular sample matrices, no surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

This report displays Holding Time breaches only. Only the respective Extraction / Preparation and/or Analysis component is/are displayed.

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

Outliers : Frequency of Quality Control Samples

The following report highlights breaches in the Frequency of Quality Control Samples.

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

Environmental Division

QUALITY CONTROL REPORT

Work Order	: **ES1310252**	Page	: 1 of 12
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: s22	Contact	: s22
Address	: LEVEL 11, 44 MARKET STREET SYDNEY NSW 1230	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: s22 @aecom.com	E-mail	: s22 @alsglobal.com
Telephone	: 02 8264 5100	Telephone	: +61 2 8784 8555
Facsimile	: 02 8264 5111	Facsimile	: +61 2 8784 8555
Project	: 60221935 MOOREBANK	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 06-MAY-2013
Sampler	: s22	Issue Date	: 13-MAY-2013
Order number	: ----		
		No. of samples received	: 7
Quote number	: EN/004/12	No. of samples analysed	: 6

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

This Quality Control Report contains the following information:

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

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
s22	Inorganic Chemist	Sydney Inorganics
s22	Senior Organic Chemist	Sydney Organics
s22	Senior Organic Chemist	Sydney Organics
s22	Instrument Chemist	Sydney Inorganics

General Comments

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

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

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

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

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EA055: Moisture Content (QC Lot: 2858547)									
ES1310251-002	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	20.6	20.4	1.1	0% - 20%
ES1310414-001	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	23.4	23.1	1.0	0% - 20%
EG005T: Total Metals by ICP-AES (QC Lot: 2861367)									
ES1310245-014	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	12	12	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	12	12	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	17	24	31.4	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	41	40	3.2	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	104	109	5.4	0% - 20%
		EG005T: Zinc	7440-66-6	5	mg/kg	89	63	33.7	0% - 50%
ES1310276-001	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	<2	<2	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	<2	<2	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	<5	<5	0.0	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 2861368)									
ES1310245-014	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
ES1310276-001	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 2854078)									
ES1310251-002	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 2854078) - continued									
ES1310251-002	Anonymous	EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Sum of polycyclic aroma ic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (WHO)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 2855819)									
ES1310140-002	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Sum of polycyclic aroma ic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (WHO)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
ES1310250-019	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 2855819) - continued									
ES1310250-019	Anonymous	EP075(SIM): Sum of polycyclic aroma ic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (WHO)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 2854077)									
ES1310251-002	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 2854652)									
ES1310096-001	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
ES1310096-017	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 2855818)									
ES1310140-002	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
ES1310250-019	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 2856430)									
ES1310250-019	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
ES1310251-003	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QC Lot: 2854077)									
ES1310251-002	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QC Lot: 2854652)									
ES1310096-001	Anonymous	EP080: C6 - C10 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
ES1310096-017	Anonymous	EP080: C6 - C10 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QC Lot: 2855818)									
ES1310140-002	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
ES1310250-019	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QC Lot: 2856430)									
ES1310250-019	Anonymous	EP080: C6 - C10 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
ES1310251-003	Anonymous	EP080: C6 - C10 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080: BTEXN (QC Lot: 2854652)									
ES1310096-001	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP080: BTEXN (QC Lot: 2854652) - continued									
ES1310096-001	Anonymous	EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit
ES1310096-017	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit
EP080: BTEXN (QC Lot: 2856430)									
ES1310250-019	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit
ES1310251-003	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit

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

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

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EG005T: Total Metals by ICP-AES (QCLot: 2861367)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	105	84	128
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	99.3	79	119
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	102	70	130
EG005T: Copper	7440-50-8	5	mg/kg	<5	32.0 mg/kg	99.9	83	127
EG005T: Lead	7439-92-1	5	mg/kg	<5	40.0 mg/kg	97.2	81	117
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55.0 mg/kg	106	79	127
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	94.0	78	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 2861368)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	88.4	72	114
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2854078)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	4 mg/kg	103	81.9	113
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	4 mg/kg	101	79.6	113
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	4 mg/kg	102	81.5	112
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	4 mg/kg	106	79.9	112
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	4 mg/kg	106	79.4	114
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	4 mg/kg	103	81.1	112
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	4 mg/kg	109	78.8	113
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	4 mg/kg	110	78.9	113
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	4 mg/kg	107	77.2	112
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	4 mg/kg	101	79.8	114
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	4 mg/kg	107	71.8	118
EP075(SIM): Benzo(k)fluoran hene	207-08-9	0.5	mg/kg	<0.5	4 mg/kg	94.1	74.2	117
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	4 mg/kg	106	76.4	113
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	4 mg/kg	95.7	71	113
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	4 mg/kg	94.5	71.7	113
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	4 mg/kg	90.0	72.4	114
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2855819)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	4 mg/kg	100	81.9	113
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	4 mg/kg	99.8	79.6	113
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	4 mg/kg	100	81.5	112
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	4 mg/kg	103	79.9	112
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	4 mg/kg	105	79.4	114
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	4 mg/kg	105	81.1	112
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	4 mg/kg	108	78.8	113

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2855819) - continued								
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	4 mg/kg	110	78.9	113
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	4 mg/kg	96.5	77.2	112
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	4 mg/kg	100	79.8	114
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	4 mg/kg	89.5	71.8	118
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	4 mg/kg	102	74.2	117
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	4 mg/kg	99.7	76.4	113
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	4 mg/kg	80.5	71	113
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	4 mg/kg	79.0	71.7	113
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	4 mg/kg	81.0	72.4	114
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2854077)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	200 mg/kg	108	59	131
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	300 mg/kg	105	74	138
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	200 mg/kg	104	63	131
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2854652)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	98.2	68.4	128
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2855818)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	200 mg/kg	107	59	131
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	300 mg/kg	112	74	138
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	200 mg/kg	105	63	131
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2856430)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	99.6	68.4	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 2854077)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	250 mg/kg	97.6	59	131
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	350 mg/kg	99.4	74	138
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	----	----	----	----
		50	mg/kg	----	150 mg/kg	101	63	131
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 2854652)								
EP080: C6 - C10 Fraction	----	10	mg/kg	<10	31 mg/kg	95.0	68.4	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 2855818)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	250 mg/kg	106	59	131
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	350 mg/kg	110	74	138
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	----	----	----	----
		50	mg/kg	----	150 mg/kg	101	63	131
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 2856430)								
EP080: C6 - C10 Fraction	----	10	mg/kg	<10	31 mg/kg	96.9	68.4	128
EP080: BTEXN (QCLot: 2854652)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	82.3	62	120
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	77.2	62	128

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EP080: BTEXN (QCLot: 2854652) - continued								
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	77.3	58	118
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	80.2	60	120
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	81.2	60	120
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	78.0	62	138
EP080: BTEXN (QCLot: 2856430)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	81.7	62	120
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	119	62	128
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	83.8	58	118
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	89.5	60	120
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	87.9	60	120
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	83.9	62	138

Matrix Spike (MS) Report

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

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Recovery Limits (%): Low	Recovery Limits (%): High
EG005T: Total Metals by ICP-AES (QCLot: 2861367)							
ES1310245-014	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	119	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	100	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	117	70	130
		EG005T: Copper	7440-50-8	250 mg/kg	104	70	130
		EG005T: Lead	7439-92-1	250 mg/kg	95.6	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	97.4	70	130
		EG005T: Zinc	7440-66-6	250 mg/kg	82.1	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 2861368)							
ES1310245-014	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	96.6	70	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2854078)							
ES1310251-002	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	105	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	111	70	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2855819)							
ES1310140-002	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	94.1	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	106	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2854077)							

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
				Concentration	MS	Low	High
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2854077) - continued							
ES1310251-002	Anonymous	EP071: C10 - C14 Fraction	----	640 mg/kg	102	73	137
		EP071: C15 - C28 Fraction	----	3140 mg/kg	122	53	131
		EP071: C29 - C36 Fraction	----	2860 mg/kg	90.0	52	132
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2854652)							
ES1310096-001	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	110	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2855818)							
ES1310140-002	Anonymous	EP071: C10 - C14 Fraction	----	640 mg/kg	107	73	137
		EP071: C15 - C28 Fraction	----	3140 mg/kg	120	53	131
		EP071: C29 - C36 Fraction	----	2860 mg/kg	86.5	52	132
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2856430)							
ES1310250-019	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	109	70	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 2854077)							
ES1310251-002	Anonymous	EP071: >C10 - C16 Fraction	----	850 mg/kg	127	73	137
		EP071: >C16 - C34 Fraction	----	4800 mg/kg	106	53	131
		EP071: >C34 - C40 Fraction	----	2400 mg/kg	59.8	52	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 2854652)							
ES1310096-001	Anonymous	EP080: C6 - C10 Fraction	----	37.5 mg/kg	107	70	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 2855818)							
ES1310140-002	Anonymous	EP071: >C10 - C16 Fraction	----	850 mg/kg	99.1	73	137
		EP071: >C16 - C34 Fraction	----	4800 mg/kg	81.6	53	131
		EP071: >C34 - C40 Fraction	----	2400 mg/kg	58.7	52	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 2856430)							
ES1310250-019	Anonymous	EP080: C6 - C10 Fraction	----	37.5 mg/kg	106	70	130
EP080: BTEXN (QCLot: 2854652)							
ES1310096-001	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	74.4	70	130
		EP080: Toluene	108-88-3	2.5 mg/kg	78.5	70	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	77.2	70	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	77.4	70	130
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	81.0	70	130
		EP080: Naphthalene	91-20-3	2.5 mg/kg	79.1	70	130
EP080: BTEXN (QCLot: 2856430)							
ES1310250-019	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	78.6	70	130
		EP080: Toluene	108-88-3	2.5 mg/kg	89.8	70	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	86.8	70	130

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	Matrix Spike (MS) Report: SpikeRecovery(%) MS	Matrix Spike (MS) Report: Recovery Limits (%) Low	Matrix Spike (MS) Report: Recovery Limits (%) High
EP080: BTEXN (QCLot: 2856430) - continued							
ES1310250-019	Anonymous	EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	87.5	70	130
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	87.7	70	130
		EP080: Naphthalene	91-20-3	2.5 mg/kg	77.9	70	130

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

The quality control term Matrix Spike (MS) and Matrix Spike Duplicate (MSD) refers to intralaboratory split samples spiked with a representa ive set of target analytes. The purpose of these QC parameters are to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration	Spike Recovery (%) MS	Spike Recovery (%) MSD	Recovery Limits (%) Low	Recovery Limits (%) High	RPDs (%) Value	RPDs (%) Control Limit
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2854077)										
ES1310251-002	Anonymous	EP071: C10 - C14 Fraction	----	640 mg/kg	102	----	73	137	----	----
		EP071: C15 - C28 Fraction	----	3140 mg/kg	122	----	53	131	----	----
		EP071: C29 - C36 Fraction	----	2860 mg/kg	90.0	----	52	132	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 2854077)										
ES1310251-002	Anonymous	EP071: >C10 - C16 Fraction	----	850 mg/kg	127	----	73	137	----	----
		EP071: >C16 - C34 Fraction	----	4800 mg/kg	106	----	53	131	----	----
		EP071: >C34 - C40 Fraction	----	2400 mg/kg	59.8	----	52	132	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2854078)										
ES1310251-002	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	105	----	70	130	----	----
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	111	----	70	130	----	----
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2854652)										
ES1310096-001	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	110	----	70	130	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 2854652)										
ES1310096-001	Anonymous	EP080: C6 - C10 Fraction	----	37.5 mg/kg	107	----	70	130	----	----
EP080: BTEXN (QCLot: 2854652)										
ES1310096-001	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	74.4	----	70	130	----	----
		EP080: Toluene	108-88-3	2.5 mg/kg	78.5	----	70	130	----	----
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	77.2	----	70	130	----	----
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	77.4	----	70	130	----	----
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	81.0	----	70	130	----	----
		EP080: Naphthalene	91-20-3	2.5 mg/kg	79.1	----	70	130	----	----
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2855818)										
ES1310140-002	Anonymous	EP071: C10 - C14 Fraction	----	640 mg/kg	107	----	73	137	----	----
		EP071: C15 - C28 Fraction	----	3140 mg/kg	120	----	53	131	----	----

Sub-Matrix: **SOIL**

				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	MSD	Low	High	Value	Control Limit
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2855818) - continued										
ES1310140-002	Anonymous	EP071: C29 - C36 Fraction	----	2860 mg/kg	86.5	----	52	132	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 2855818)										
ES1310140-002	Anonymous	EP071: >C10 - C16 Fraction	----	850 mg/kg	99.1	----	73	137	----	----
		EP071: >C16 - C34 Fraction	----	4800 mg/kg	81.6	----	53	131	----	----
		EP071: >C34 - C40 Fraction	----	2400 mg/kg	58.7	----	52	132	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2855819)										
ES1310140-002	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	94.1	----	70	130	----	----
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	106	----	70	130	----	----
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2856430)										
ES1310250-019	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	109	----	70	130	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 2856430)										
ES1310250-019	Anonymous	EP080: C6 - C10 Fraction	----	37.5 mg/kg	106	----	70	130	----	----
EP080: BTEXN (QCLot: 2856430)										
ES1310250-019	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	78.6	----	70	130	----	----
		EP080: Toluene	108-88-3	2.5 mg/kg	89.8	----	70	130	----	----
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	86.8	----	70	130	----	----
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	87.5	----	70	130	----	----
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	87.7	----	70	130	----	----
		EP080: Naphthalene	91-20-3	2.5 mg/kg	77.9	----	70	130	----	----
EG005T: Total Metals by ICP-AES (QCLot: 2861367)										
ES1310245-014	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	119	----	70	130	----	----
		EG005T: Cadmium	7440-43-9	50 mg/kg	100	----	70	130	----	----
		EG005T: Chromium	7440-47-3	50 mg/kg	117	----	70	130	----	----
		EG005T: Copper	7440-50-8	250 mg/kg	104	----	70	130	----	----
		EG005T: Lead	7439-92-1	250 mg/kg	95.6	----	70	130	----	----
		EG005T: Nickel	7440-02-0	50 mg/kg	97.4	----	70	130	----	----
		EG005T: Zinc	7440-66-6	250 mg/kg	82.1	----	70	130	----	----
EG035T: Total Recoverable Mercury by FIMS (QCLot: 2861368)										
ES1310245-014	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	96.6	----	70	130	----	----

Environmental Division

CERTIFICATE OF ANALYSIS

Work Order	: **ES1310252**	Page	: 1 of 7
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: s22	Contact	: s22
Address	: LEVEL 11, 44 MARKET STREET SYDNEY NSW 1230	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: s22 @aecom.com	E-mail	: s22 @alsglobal.com
Telephone	: 02 8264 5100	Telephone	: +61 2 8784 8555
Facsimile	: 02 8264 5111	Facsimile	: +61 2 8784 8555
Project	: 60221935 MOOREBANK	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: ----		
C-O-C number	: ----	Date Samples Received	: 06-MAY-2013
Sampler	: s22	Issue Date	: 13-MAY-2013
Site	: ----		
		No. of samples received	: 7
Quote number	: EN/004/12	No. of samples analysed	: 6

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
s22	Inorganic Chemist	Sydney Inorganics
s22	Senior Organic Chemist	Sydney Organics
s22	Senior Organic Chemist	Sydney Organics
s22	Instrument Chemist	Sydney Inorganics

General Comments

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

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

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

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

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

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of he American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Compound	CAS Number	LOR	Unit	Client sample ID	SP103-5	SP103-6	SP103-7	SP103-8	SP104-1
				Client sampling date / time	06-MAY-2013 14:00	06-MAY-2013 14:00	06-MAY-2013 14:00	06-MAY-2013 14:00	06-MAY-2013 14:00
					ES1310252-002	ES1310252-003	ES1310252-004	ES1310252-005	ES1310252-006
EA055: Moisture Content									
Moisture Content (dried @ 103°C)	----	1.0	%		8.7	14.7	8.8	9.3	7.3
EG005T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		----	----	----	9	8
Cadmium	7440-43-9	1	mg/kg		----	----	----	<1	<1
Chromium	7440-47-3	2	mg/kg		----	----	----	21	25
Copper	7440-50-8	5	mg/kg		----	----	----	36	44
Lead	7439-92-1	5	mg/kg		----	----	----	128	103
Nickel	7440-02-0	2	mg/kg		----	----	----	17	40
Zinc	7440-66-6	5	mg/kg		----	----	----	78	119
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		----	----	----	<0.1	<0.1
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ (WHO)	----	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg		70	<50	<50	60	<50

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Compound	CAS Number	LOR	Unit	Client sample ID	SP103-5	SP103-6	SP103-7	SP103-8	SP104-1
				Client sampling date / time	06-MAY-2013 14:00	06-MAY-2013 14:00	06-MAY-2013 14:00	06-MAY-2013 14:00	06-MAY-2013 14:00
					ES1310252-002	ES1310252-003	ES1310252-004	ES1310252-005	ES1310252-006
EP080/071: Total Petroleum Hydrocarbons - Continued									
C15 - C28 Fraction	----	100	mg/kg		690	<100	670	960	160
C29 - C36 Fraction	----	100	mg/kg		470	<100	550	580	130
^ C10 - C36 Fraction (sum)	----	50	mg/kg		1230	<50	1220	1600	290
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft									
C6 - C10 Fraction	----	10	mg/kg		11	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	----	10	mg/kg		11	<10	<10	<10	<10
>C10 - C16 Fraction	----	50	mg/kg		90	<50	<50	80	<50
>C16 - C34 Fraction	----	100	mg/kg		950	<100	1020	1290	230
>C34 - C40 Fraction	----	100	mg/kg		300	<100	320	350	100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		1340	<50	1340	1720	330
EP080: BTEX									
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
EP080: BTEXN									
^ Sum of BTEX	----	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	1330-20-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg		<1	<1	<1	<1	<1
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.1	%		97.8	94.3	94.7	95.3	94.3
2-Chlorophenol-D4	93951-73-6	0.1	%		96.1	92.3	92.3	91.4	92.2
2.4.6-Tribromophenol	118-79-6	0.1	%		85.0	91.3	96.0	87.8	91.0
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.1	%		96.0	95.6	95.4	93.5	94.6
Anthracene-d10	1719-06-8	0.1	%		89.2	87.6	91.6	87.6	89.0
4-Terphenyl-d14	1718-51-0	0.1	%		88.9	88.2	90.0	87.5	87.9
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.1	%		106	89.2	82.5	87.4	78.3
Toluene-D8	2037-26-5	0.1	%		126	105	94.6	113	105
4-Bromofluorobenzene	460-00-4	0.1	%		106	87.2	81.6	96.0	83.5

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	SP103_9	----	----	----	----
			Client sampling date / time	06-MAY-2013 14:00	----	----	----	----
Compound	CAS Number	LOR	Unit	ES1310252-008	----	----	----	----
EA055: Moisture Content								
Moisture Content (dried @ 103°C)	----	1.0	%	10.0	----	----	----	----
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	----	----	----	----
Cadmium	7440-43-9	1	mg/kg	<1	----	----	----	----
Chromium	7440-47-3	2	mg/kg	7	----	----	----	----
Copper	7440-50-8	5	mg/kg	24	----	----	----	----
Lead	7439-92-1	5	mg/kg	40	----	----	----	----
Nickel	7440-02-0	2	mg/kg	7	----	----	----	----
Zinc	7440-66-6	5	mg/kg	26	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
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	----	----	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	----	----	----	----
Chrysene	218-01-9	0.5	mg/kg	<0.5	----	----	----	----
Benzo(b)fluoranthene	205-99-2	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 (WHO)	----	0.5	mg/kg	<0.5	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	----	----	----	----
C10 - C14 Fraction	----	50	mg/kg	<50	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SP103_9	----	----	----	----
				Client sampling date / time	06-MAY-2013 14:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES1310252-008	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons - Continued									
C15 - C28 Fraction	----	100	mg/kg		**140**	----	----	----	----
C29 - C36 Fraction	----	100	mg/kg		<100	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg		**140**	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft									
C6 - C10 Fraction	----	10	mg/kg		<10	----	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	----	10	mg/kg		<10	----	----	----	----
>C10 - C16 Fraction	----	50	mg/kg		<50	----	----	----	----
>C16 - C34 Fraction	----	100	mg/kg		**190**	----	----	----	----
>C34 - C40 Fraction	----	100	mg/kg		<100	----	----	----	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		**190**	----	----	----	----
EP080: BTEX									
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	----	----	----	----
EP080: BTEXN									
^ Sum of BTEX	----	0.2	mg/kg		<0.2	----	----	----	----
^ Total Xylenes	1330-20-7	0.5	mg/kg		<0.5	----	----	----	----
Naphthalene	91-20-3	1	mg/kg		<1	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.1	%		**82.6**	----	----	----	----
2-Chlorophenol-D4	93951-73-6	0.1	%		**86.6**	----	----	----	----
2.4.6-Tribromophenol	118-79-6	0.1	%		**68.2**	----	----	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.1	%		**93.2**	----	----	----	----
Anthracene-d10	1719-06-8	0.1	%		**91.7**	----	----	----	----
4-Terphenyl-d14	1718-51-0	0.1	%		**89.0**	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.1	%		**98.8**	----	----	----	----
Toluene-D8	2037-26-5	0.1	%		**114**	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.1	%		**102**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **SOIL**

Compound	CAS Number	Recovery Limits (%) Low	High
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	63	127
2-Chlorophenol-D4	93951-73-6	64	126
2.4.6-Tribromophenol	118-79-6	36	136
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	64	130
Anthracene-d10	1719-06-8	69	135
4-Terphenyl-d14	1718-51-0	64	136
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	72.8	133.2
Toluene-D8	2037-26-5	73.9	132.1
4-Bromofluorobenzene	460-00-4	71.6	130.0

AECOM

Chain of Custody

AECOM Australia Pty Ltd
Level 21, 420 George Street
Sydney, NSW, 2000
PO Box Q410, QVB PO, Sydney, NSW, 1230
T +61 2 8934 0000
F +61 2 8934 0001

Laboratory Details
Lab. Name: ALS
Address: SMITHFIELD
Fax:
Lab Quote No:

Sampled By: s22

AECOM Project No: 60220935

Project Name: Moorebank

Specifications

Turnaround time required: 5 day

Special storage requirements?

Report Format: Email: s22 @aecom.com

Lab. ID	Sample ID	Sampling Date	Matrix: soil	Matrix: water	Matrix: other	Preservation: filtered	Preservation: acid	Preservation: ice	Container	Analysis: TPH/BTEX	Analysis: PAH	Analysis: 8 Metals
1	VS104-1	2/5/13	X					X	250ml Jar	X	X	X
2	VS104-2	↓	↓					↓	↓	↓	↓	↓
3	VS104-3											
4	VS104-4											
5	VS104-5											
6	QC23											

Environmental Division
Sydney
Work Order
ES1310251

Telephone : +61-2-8784 8555

Comments:

Relinquished by:	Signed:	Date/Time:	Recieved by:	Signed:	Date/Time:
s22	s22	2/5/13	s22	s22	6/5/13 9:30

Environmental Division

SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive Report

Work Order	: **ES1310251**		
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: s22	Contact	: s22
Address	: LEVEL 11, 44 MARKET STREET SYDNEY NSW 1230	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: s22 @aecom.com	E-mail	: s22 @alsglobal.com
Telephone	: 02 8264 5100	Telephone	: +61 2 8784 8555
Facsimile	: 02 8264 5111	Facsimile	: +61 2 8784 8555
Project	: 60221935 MOOREBANK	Page	: 1 of 2
Order number	: ----		
C-O-C number	: ----	Quote number	: ES2012HLAENV0454 (EN/004/12)
Site	: ----		
Sampler	: s22	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement

Dates

Date Samples Received	: 06-MAY-2013	Issue Date	: 06-MAY-2013 15:29
Client Requested Due Date	: 13-MAY-2013	Scheduled Reporting Date	: **13-MAY-2013**

Delivery Details

Mode of Delivery	: Client Drop off	Temperature	: 3.6'C - Ice present
No. of coolers/boxes	: 2 HARD	No. of samples received	: 5
Security Seal	: Intact.	No. of samples analysed	: 5

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
- **Samples received in appropriately pretreated and preserved containers.**
- **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).**
- **Sample VS104-1 not received by ALS Sydney.**
- 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 (14 days), Solid (60 days) from date of completion of work order.

Sample Container(s)/Preservation Non-Compliances

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

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

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process neccessary 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 to 15:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory for processing purposes and will be shown bracketed without a time component.

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	SOIL - S-26 8 metals/TPH/BTEX/PAH
ES1310251-002	02-MAY-2013 15:00	VS104-2	✓
ES1310251-003	02-MAY-2013 15:00	VS104-3	✓
ES1310251-004	02-MAY-2013 15:00	VS104-4	✓
ES1310251-005	02-MAY-2013 15:00	VS104-5	✓
ES1310251-006	02-MAY-2013 15:00	QC23	✓

Proactive Holding Time Report

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

Requested Deliverables

s22

- *AU Certificate of Analysis - NATA (COA)	Email	s22	@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email		@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email		@aecom.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email		@aecom.com
- A4 - AU Tax Invoice (INV)	Email		@aecom.com
- Chain of Custody (CoC) (COC)	Email		@aecom.com
- EDI Format - ENMRG (ENMRG)	Email		@aecom.com
- EDI Format - ESDAT (ESDAT)	Email		@aecom.com
- EDI Format - HLAPro (HLAPro)	Email		@aecom.com
- EDI Format - XTab (XTAB)	Email		@aecom.com

Environmental Division

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **ES1310251**	Page	: 1 of 6
Client	: AECOM Australia Pty Ltd	Laboratory	: Environmental Division Sydney
Contact	: s22	Contact	s22
Address	: LEVEL 11, 44 MARKET STREET SYDNEY NSW 1230	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: s22 @aecom.com	E-mail	: s22 @alsglobal.com
Telephone	: 02 8264 5100	Telephone	: +61 2 8784 8555
Facsimile	: 02 8264 5111	Facsimile	: +61 2 8784 8555
Project	: 60221935 MOOREBANK	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ---		
C-O-C number	: ---	Date Samples Received	: 06-MAY-2013
Sampler	: s22	Issue Date	: 10-MAY-2013
Order number	: ---		
		No. of samples received	: 5
Quote number	: EN/004/12	No. of samples analysed	: 5

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

This Interpretive Quality Control Report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Parameter Frequency Compliance
- Brief Method Summaries
- Summary of Outliers

Analysis Holding Time Compliance

The following report summarises extraction / preparation and analysis times and compares with recommended holding times. Dates reported represent first date of extraction or analysis and precludes subsequent dilutions and reruns. Information is also provided re the sample container (preservative) from which the analysis aliquot was taken. Elapsed period to analysis represents number of days from sampling where no extraction / digestion is involved or period from extraction / digestion where this is present. For composite samples, sampling date is assumed to be that of the oldest sample contributing to the composite. Sample date for laboratory produced leachates is assumed as the completion date of the leaching process. Outliers for holding time are based on USEPA SW 846, APHA, AS and NEPM (1999). A listing of breaches is provided in the Summary of Outliers.

Holding times for leachate methods (excluding elutriates) vary according to the analytes being determined on the resulting solution. For non-volatile analytes, the holding time compliance assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These soil holding times are: Organics (14 days); Mercury (28 days) & other metals (180 days). A recorded breach therefore does not guarantee a breach for all non-volatile parameters.

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content							
Soil Glass Jar - Unpreserved (EA055-103)							
VS104-2, VS104-3, VS104-4, VS104-5, QC23	**02-MAY-2013**	**----**	----	----	**09-MAY-2013**	16-MAY-2013	✓
EG005T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved (EG005T)							
VS104-2, VS104-3, VS104-4, VS104-5, QC23	**02-MAY-2013**	**09-MAY-2013**	29-OCT-2013	✓	**09-MAY-2013**	29-OCT-2013	✓
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved (EG035T)							
VS104-2, VS104-3, VS104-4, VS104-5, QC23	**02-MAY-2013**	**09-MAY-2013**	30-MAY-2013	✓	**09-MAY-2013**	30-MAY-2013	✓
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP071)							
VS104-2, VS104-3, VS104-4, VS104-5, QC23	**02-MAY-2013**	**08-MAY-2013**	16-MAY-2013	✓	**09-MAY-2013**	17-JUN-2013	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved (EP075(SIM))							
VS104-2, VS104-3, VS104-4, VS104-5, QC23	**02-MAY-2013**	**08-MAY-2013**	16-MAY-2013	✓	**09-MAY-2013**	17-JUN-2013	✓
EP080: BTEX							
Soil Glass Jar - Unpreserved (EP080)							
VS104-2, VS104-3, VS104-4, VS104-5, QC23	**02-MAY-2013**	**08-MAY-2013**	16-MAY-2013	✓	**09-MAY-2013**	16-MAY-2013	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080: BTEXN							
Soil Glass Jar - Unpreserved (EP080)							
VS104-2, VS104-3, VS104-4, VS104-5, QC23	**02-MAY-2013**	**08-MAY-2013**	16-MAY-2013	✓	**09-MAY-2013**	16-MAY-2013	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft							
Soil Glass Jar - Unpreserved (EP080)							
VS104-2, VS104-3, VS104-4, VS104-5, QC23	**02-MAY-2013**	**08-MAY-2013**	16-MAY-2013	✓	**09-MAY-2013**	16-MAY-2013	✓

Quality Control Parameter Frequency Compliance

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

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055-103	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	1	10	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	5	**20.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	5	**20.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	10	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)	EP075(SIM)	1	10	**10.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	5	**20.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	5	**20.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	10	**10.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
PAH/Phenols (SIM)	EP075(SIM)	1	10	**10.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	5	**20.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	5	**20.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	10	**10.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	1	10	**10.0**	**5.0**	✓	ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	5	**20.0**	**5.0**	✓	ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	5	**20.0**	**5.0**	✓	ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	10	**10.0**	**5.0**	✓	ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	20	**5.0**	**5.0**	✓	ALS QCS3 requirement

Brief Method Summaries

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

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055-103	SOIL	A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (2010 Draft) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Total Metals by ICP-AES	EG005T	SOIL	(APHA 21st ed., 3120; USEPA SW 846 - 6010) (ICPAES) Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (1999) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	AS 3550, APHA 21st ed., 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (1999) Schedule B(3)
TPH - Semivolatile Fraction	EP071	SOIL	(USEPA SW 846 - 8015A) Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C36. This method is compliant with NEPM (1999) Schedule B(3) (Method 506.1)
PAH/Phenols (SIM)	EP075(SIM)	SOIL	(USEPA SW 846 - 8270B) 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 (1999) Schedule B(3) (Method 502 and 507)
TPH Volatiles/BTEX	EP080	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Method 501)

Preparation Methods	Method	Matrix	Method Descriptions
Methanolic Extraction of Soils for Purge and Trap	* ORG16	SOIL	(USEPA SW 846 - 5030A) 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids (Option B - Non-concentrating)	ORG17B	SOIL	In-house, Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 20mL 1:1 DCM/Acetone by end over end tumble. The solvent is transferred directly to a GC vial for analysis.

Summary of Outliers

Outliers : Quality Control Samples

The following report highlights outliers flagged in the Quality Control (QC) Report. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). This report displays QC Outliers (breaches) only.

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

- **For all matrices, no Method Blank value outliers occur.**
- **For all matrices, no Duplicate outliers occur.**
- **For all matrices, no Laboratory Control outliers occur.**
- **For all matrices, no Matrix Spike outliers occur.**

Regular Sample Surrogates

- **For all regular sample matrices, no surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

This report displays Holding Time breaches only. Only the respective Extraction / Preparation and/or Analysis component is/are displayed.

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

Outliers : Frequency of Quality Control Samples

The following report highlights breaches in the Frequency of Quality Control Samples.

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

Environmental Division

QUALITY CONTROL REPORT

Work Order	: **ES1310251**	Page	: 1 of 8
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: s22	Contact	: s22
Address	: LEVEL 11, 44 MARKET STREET SYDNEY NSW 1230	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: s22 @aecom.com	E-mail	: s22 @alsglobal.com
Telephone	: 02 8264 5100	Telephone	: +61 2 8784 8555
Facsimile	: 02 8264 5111	Facsimile	: +61 2 8784 8555
Project	: 60221935 MOOREBANK	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ---		
C-O-C number	: ---	Date Samples Received	: 06-MAY-2013
Sampler	: s22	Issue Date	: 10-MAY-2013
Order number	: ---		
		No. of samples received	: 5
Quote number	: EN/004/12	No. of samples analysed	: 5

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

This Quality Control Report contains the following information:

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

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
s22	Organic Chemist	Sydney Organics
s22	Organic Chemist	Sydney Organics
s22	Senior Spectroscopist	Sydney Inorganics
s22	Inorganic Chemist	Sydney Inorganics
s22	Senior Inorganic Chemist	Sydney Inorganics

General Comments

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

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

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

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

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EA055: Moisture Content (QC Lot: 2858547)									
ES1310251-002	VS104-2	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	20.6	20.4	1.1	0% - 20%
ES1310414-001	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	23.4	23.1	1.0	0% - 20%
EG005T: Total Metals by ICP-AES (QC Lot: 2859093)									
ES1310251-002	VS104-2	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	17	20	14.7	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	<2	<2	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	6	7	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	14	16	12.8	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	10	12	16.9	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	9	9	0.0	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 2859094)									
ES1310251-002	VS104-2	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 2854078)									
ES1310251-002	VS104-2	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (WHO)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 2854077)									
ES1310251-002	VS104-2	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 2854077) - continued									
ES1310251-002	VS104-2	EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 2856430)									
ES1310250-019	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
ES1310251-003	VS104-3	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QC Lot: 2854077)									
ES1310251-002	VS104-2	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QC Lot: 2856430)									
ES1310250-019	Anonymous	EP080: C6 - C10 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
ES1310251-003	VS104-3	EP080: C6 - C10 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080: BTEXN (QC Lot: 2856430)									
ES1310250-019	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit
ES1310251-003	VS104-3	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit

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

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

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EG005T: Total Metals by ICP-AES (QCLot: 2859093)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	106	84	128
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	104	79	119
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	100	70	130
EG005T: Copper	7440-50-8	5	mg/kg	<5	32.0 mg/kg	106	83	127
EG005T: Lead	7439-92-1	5	mg/kg	<5	40.0 mg/kg	99.9	81	117
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55.0 mg/kg	110	79	127
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	107	78	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 2859094)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	94.8	72	114
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2854078)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	4 mg/kg	103	81.9	113
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	4 mg/kg	101	79.6	113
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	4 mg/kg	102	81.5	112
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	4 mg/kg	106	79.9	112
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	4 mg/kg	106	79.4	114
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	4 mg/kg	103	81.1	112
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	4 mg/kg	109	78.8	113
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	4 mg/kg	110	78.9	113
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	4 mg/kg	107	77.2	112
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	4 mg/kg	101	79.8	114
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	4 mg/kg	107	71.8	118
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	4 mg/kg	94.1	74.2	117
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	4 mg/kg	106	76.4	113
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	4 mg/kg	95.7	71	113
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	4 mg/kg	94.5	71.7	113
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	4 mg/kg	90.0	72.4	114
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2854077)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	200 mg/kg	108	59	131
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	300 mg/kg	105	74	138
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	200 mg/kg	104	63	131
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2856430)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	99.6	68.4	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 2854077)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	250 mg/kg	97.6	59	131

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 2854077) - continued								
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	350 mg/kg	99.4	74	138
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	----	----	----	----
		50	mg/kg	----	150 mg/kg	101	63	131
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 2856430)								
EP080: C6 - C10 Fraction	----	10	mg/kg	<10	31 mg/kg	96.9	68.4	128
EP080: BTEXN (QCLot: 2856430)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	81.7	62	120
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	119	62	128
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	83.8	58	118
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	89.5	60	120
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	87.9	60	120
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	83.9	62	138

Matrix Spike (MS) Report

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

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Recovery Limits (%): Low	Recovery Limits (%): High
EG005T: Total Metals by ICP-AES (QCLot: 2859093)							
ES1310251-002	VS104-2	EG005T: Arsenic	7440-38-2	50 mg/kg	93.7	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	102	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	102	70	130
		EG005T: Copper	7440-50-8	250 mg/kg	105	70	130
		EG005T: Lead	7439-92-1	250 mg/kg	100	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	103	70	130
		EG005T: Zinc	7440-66-6	250 mg/kg	100	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 2859094)							
ES1310251-002	VS104-2	EG035T: Mercury	7439-97-6	5 mg/kg	102	70	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2854078)							
ES1310251-002	VS104-2	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	105	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	111	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2854077)							
ES1310251-002	VS104-2	EP071: C10 - C14 Fraction	----	640 mg/kg	102	73	137
		EP071: C15 - C28 Fraction	----	3140 mg/kg	122	53	131
		EP071: C29 - C36 Fraction	----	2860 mg/kg	90.0	52	132

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	Matrix Spike (MS) Report: SpikeRecovery(%) MS	Matrix Spike (MS) Report: Recovery Limits (%) Low	Matrix Spike (MS) Report: Recovery Limits (%) High
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2856430)							
ES1310250-019	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	109	70	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 2854077)							
ES1310251-002	VS104-2	EP071: >C10 - C16 Fraction	----	850 mg/kg	127	73	137
		EP071: >C16 - C34 Fraction	----	4800 mg/kg	106	53	131
		EP071: >C34 - C40 Fraction	----	2400 mg/kg	59.8	52	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 2856430)							
ES1310250-019	Anonymous	EP080: C6 - C10 Fraction	----	37.5 mg/kg	106	70	130
EP080: BTEXN (QCLot: 2856430)							
ES1310250-019	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	78.6	70	130
		EP080: Toluene	108-88-3	2.5 mg/kg	89.8	70	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	86.8	70	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	87.5	70	130
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	87.7	70	130
		EP080: Naphthalene	91-20-3	2.5 mg/kg	77.9	70	130

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

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

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration	Spike Recovery (%) MS	Spike Recovery (%) MSD	Recovery Limits (%) Low	Recovery Limits (%) High	RPDs (%) Value	RPDs (%) Control Limit
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2854077)										
ES1310251-002	VS104-2	EP071: C10 - C14 Fraction	----	640 mg/kg	102	----	73	137	----	----
		EP071: C15 - C28 Fraction	----	3140 mg/kg	122	----	53	131	----	----
		EP071: C29 - C36 Fraction	----	2860 mg/kg	90.0	----	52	132	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 2854077)										
ES1310251-002	VS104-2	EP071: >C10 - C16 Fraction	----	850 mg/kg	127	----	73	137	----	----
		EP071: >C16 - C34 Fraction	----	4800 mg/kg	106	----	53	131	----	----
		EP071: >C34 - C40 Fraction	----	2400 mg/kg	59.8	----	52	132	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2854078)										
ES1310251-002	VS104-2	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	105	----	70	130	----	----
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	111	----	70	130	----	----
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2856430)										
ES1310250-019	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	109	----	70	130	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 2856430)										

Sub-Matrix: **SOIL**

				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	MSD	Low	High	Value	Control Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 2856430) - continued										
ES1310250-019	Anonymous	EP080: C6 - C10 Fraction	----	37.5 mg/kg	106	----	70	130	----	----
EP080: BTEXN (QCLot: 2856430)										
ES1310250-019	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	78.6	----	70	130	----	----
		EP080: Toluene	108-88-3	2.5 mg/kg	89.8	----	70	130	----	----
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	86.8	----	70	130	----	----
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	87.5	----	70	130	----	----
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	87.7	----	70	130	----	----
		EP080: Naphthalene	91-20-3	2.5 mg/kg	77.9	----	70	130	----	----
EG005T: Total Metals by ICP-AES (QCLot: 2859093)										
ES1310251-002	VS104-2	EG005T: Arsenic	7440-38-2	50 mg/kg	93.7	----	70	130	----	----
		EG005T: Cadmium	7440-43-9	50 mg/kg	102	----	70	130	----	----
		EG005T: Chromium	7440-47-3	50 mg/kg	102	----	70	130	----	----
		EG005T: Copper	7440-50-8	250 mg/kg	105	----	70	130	----	----
		EG005T: Lead	7439-92-1	250 mg/kg	100	----	70	130	----	----
		EG005T: Nickel	7440-02-0	50 mg/kg	103	----	70	130	----	----
		EG005T: Zinc	7440-66-6	250 mg/kg	100	----	70	130	----	----
EG035T: Total Recoverable Mercury by FIMS (QCLot: 2859094)										
ES1310251-002	VS104-2	EG035T: Mercury	7439-97-6	5 mg/kg	102	----	70	130	----	----

Environmental Division

CERTIFICATE OF ANALYSIS

Work Order	: **ES1310251**	Page	: 1 of 5
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: s22	Contact	: s22
Address	: LEVEL 11, 44 MARKET STREET SYDNEY NSW 1230	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: s22 @aecom.com	E-mail	: s22 @alsglobal.com
Telephone	: 02 8264 5100	Telephone	: +61 2 8784 8555
Facsimile	: 02 8264 5111	Facsimile	: +61 2 8784 8555
Project	: 60221935 MOOREBANK	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: ---		
C-O-C number	: ---	Date Samples Received	: 06-MAY-2013
Sampler	: s22	Issue Date	: 10-MAY-2013
Site	: ---		
		No. of samples received	: 5
Quote number	: EN/004/12	No. of samples analysed	: 5

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
s22	Organic Chemist	Sydney Organics
s22	Organic Chemist	Sydney Organics
s22	Senior Spectroscopist	Sydney Inorganics
s22	Inorganic Chemist	Sydney Inorganics
s22	Senior Inorganic Chemist	Sydney Inorganics

General Comments

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

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

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

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

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

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Compound	CAS Number	LOR	Unit	Client sample ID	VS104-2	VS104-3	VS104-4	VS104-5	QC23
				Client sampling date / time	02-MAY-2013 15:00	02-MAY-2013 15:00	02-MAY-2013 15:00	02-MAY-2013 15:00	02-MAY-2013 15:00
					ES1310251-002	ES1310251-003	ES1310251-004	ES1310251-005	ES1310251-006
EA055: Moisture Content									
Moisture Content (dried @ 103°C)	---	1.0	%		20.6	18.5	19.6	20.4	18.9
EG005T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		6	7	8	10	8
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg		17	20	27	30	22
Copper	7440-50-8	5	mg/kg		14	19	25	18	19
Lead	7439-92-1	5	mg/kg		10	23	32	19	22
Nickel	7440-02-0	2	mg/kg		<2	<2	<2	<2	<2
Zinc	7440-66-6	5	mg/kg		9	15	13	10	11
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	<0.1
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	---	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ (WHO)	---	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	---	10	mg/kg		<10	<10	<10	<10	<10
C10 - C14 Fraction	---	50	mg/kg		<50	<50	<50	<50	<50

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Compound	CAS Number	LOR	Unit	Client sample ID	VS104-2	VS104-3	VS104-4	VS104-5	QC23
				Client sampling date / time	02-MAY-2013 15:00	02-MAY-2013 15:00	02-MAY-2013 15:00	02-MAY-2013 15:00	02-MAY-2013 15:00
					ES1310251-002	ES1310251-003	ES1310251-004	ES1310251-005	ES1310251-006
EP080/071: Total Petroleum Hydrocarbons - Continued									
C15 - C28 Fraction	---	100	mg/kg		<100	<100	<100	<100	<100
C29 - C36 Fraction	---	100	mg/kg		<100	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	---	50	mg/kg		<50	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft									
C6 - C10 Fraction	---	10	mg/kg		<10	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	---	10	mg/kg		<10	<10	<10	<10	<10
>C10 - C16 Fraction	---	50	mg/kg		<50	<50	<50	<50	<50
>C16 - C34 Fraction	---	100	mg/kg		<100	<100	<100	<100	<100
>C34 - C40 Fraction	---	100	mg/kg		<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	---	50	mg/kg		<50	<50	<50	<50	<50
EP080: BTEX									
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
EP080: BTEXN									
^ Sum of BTEX	---	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	1330-20-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg		<1	<1	<1	<1	<1
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.1	%		97.0	97.8	93.7	90.3	98.0
2-Chlorophenol-D4	93951-73-6	0.1	%		96.6	97.1	91.2	89.4	96.6
2.4.6-Tribromophenol	118-79-6	0.1	%		88.2	89.4	94.5	88.8	96.7
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.1	%		97.8	98.3	98.4	94.4	102
Anthracene-d10	1719-06-8	0.1	%		90.5	91.1	92.7	88.0	95.3
4-Terphenyl-d14	1718-51-0	0.1	%		90.2	91.2	92.1	87.0	95.8
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.1	%		86.3	102	92.2	101	90.9
Toluene-D8	2037-26-5	0.1	%		96.8	114	99.6	105	102
4-Bromofluorobenzene	460-00-4	0.1	%		92.6	107	93.1	97.3	75.5

Surrogate Control Limits

Sub-Matrix: **SOIL**

Compound	CAS Number	Recovery Limits (%) Low	Recovery Limits (%) High
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	63	127
2-Chlorophenol-D4	93951-73-6	64	126
2.4.6-Tribromophenol	118-79-6	36	136
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	64	130
Anthracene-d10	1719-06-8	69	135
4-Terphenyl-d14	1718-51-0	64	136
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	72.8	133.2
Toluene-D8	2037-26-5	73.9	132.1
4-Bromofluorobenzene	460-00-4	71.6	130.0

AECOM

Chain of Custody

AECOM Australia Pty Ltd
Level 21, 420 George Street
Sydney, NSW, 2000
PO Box Q410, QVB PO, Sydney, NSW, 1230
T +61 2 8934 0000
F +61 2 8934 0001

Laboratory Details
Lab. Name: ALS
Address: Smithfield
Fax:
Lab Quote No:

Sampled By: s22
AECOM Project No: 60221935
Project Name: Moorebank

Specifications
Turnaround time required: 5 day
Special storage requirements?
Report Format: Email: s22 @aecom.com

Lab. ID	Sample ID	Sampling Date	Matrix: soil	Matrix: water	Matrix: other	Preservation: filtered	Preservation: acid	Preservation: ice	Container	Analysis: TRH/BTEX
1	VS103-1	2/5/13	X					X	250ml Jar	X
2	VS103-2									X
3	VS103-3									X
4	VS103-4									X
5	VS103-5									X
6	VS103-6									X
7	VS103-7									X
8	VS103-8									X
9	VS103-9									X
10	VS103-10									X
11	VS103-11									X
12	VS103-12									X
13	VS103-13									X
14	VS103-14									X
15	VS103-15									X
16	VS103-16									X
17	QC21									X

Comments: QC22

Environmental Division
Sydney
Work Order
ES1310250
Telephone : +61-2-8784 8555

Relinquished by: s22 Signed: s22 Date/Time: 3/5/13
Recieved by: s22 Signed: s22 Date/Time: 6/5/13 9:30

Environmental Division

SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive Report

Work Order : **ES1310250**

Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: s22	Contact	: s22
Address	: LEVEL 11, 44 MARKET STREET SYDNEY NSW 1230	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: s22 @aecom.com	E-mail	: s22 @alsglobal.com
Telephone	: 02 8264 5100	Telephone	: +61 2 8784 8555
Facsimile	: 02 8264 5111	Facsimile	: +61 2 8784 8555
Project	: 60221935 MOOREBANK	Page	: 1 of 3
Order number	: ----		
C-O-C number	: ----	Quote number	: ES2012HLAENV0454 (EN/004/12)
Site	: ----		
Sampler	: s22	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement

Dates

Date Samples Received	: 06-MAY-2013	Issue Date	: 07-MAY-2013 12:06
Client Requested Due Date	: 13-MAY-2013	Scheduled Reporting Date	: **13-MAY-2013**

Delivery Details

Mode of Delivery	: Client Drop off	Temperature	: 3.6'C - Ice present
No. of coolers/boxes	: 2 HARD	No. of samples received	: 26
Security Seal	: Intact.	No. of samples analysed	: 26

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
- **Samples received in appropriately pretreated and preserved containers.**
- **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 (14 days), Solid (60 days) from date of completion of work order.

Sample Container(s)/Preservation Non-Compliances

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

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

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process neccessary 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 to 15:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory for processing purposes and will be shown bracketed without a time component.

Matrix: **SOIL**

Laboratory sample ID	*Client sampling date / time*	*Client sample ID*	SOIL - S-07 TPH/BTEX/PAH (SIM)
ES1310250-001	02-MAY-2013 15:00	VS103-1	✓
ES1310250-002	02-MAY-2013 15:00	VS103-2	✓
ES1310250-003	02-MAY-2013 15:00	VS103-3	✓
ES1310250-004	02-MAY-2013 15:00	VS103-4	✓
ES1310250-005	02-MAY-2013 15:00	VS103-5	✓
ES1310250-006	02-MAY-2013 15:00	VS103-6	✓
ES1310250-007	02-MAY-2013 15:00	VS103-7	✓
ES1310250-008	02-MAY-2013 15:00	VS103-8	✓
ES1310250-009	02-MAY-2013 15:00	VS103-9	✓
ES1310250-010	02-MAY-2013 15:00	VS103-10	✓
ES1310250-011	02-MAY-2013 15:00	VS103-11	✓
ES1310250-012	02-MAY-2013 15:00	VS103-12	✓
ES1310250-013	02-MAY-2013 15:00	VS103-13	✓
ES1310250-014	02-MAY-2013 15:00	VS103-14	✓
ES1310250-015	02-MAY-2013 15:00	VS103-15	✓
ES1310250-016	02-MAY-2013 15:00	VS103-16	✓
ES1310250-017	02-MAY-2013 15:00	QC21	✓
ES1310250-018	02-MAY-2013 15:00	QC22	✓
ES1310250-019	02-MAY-2013 15:00	VS103-17	✓
ES1310250-020	02-MAY-2013 15:00	VS103-18	✓
ES1310250-021	02-MAY-2013 15:00	VS103-19	✓
ES1310250-022	02-MAY-2013 15:00	VS103-20	✓
ES1310250-023	02-MAY-2013 15:00	VS103-21	✓
ES1310250-024	02-MAY-2013 15:00	VS103-22	✓
ES1310250-025	02-MAY-2013 15:00	VS103-23	✓
ES1310250-026	02-MAY-2013 15:00	VS103-24	✓

Proactive Holding Time Report

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

Requested Deliverables

s22

- *AU Certificate of Analysis - NATA (COA)	Email	s22	@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email		@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email		@aecom.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email		@aecom.com
- A4 - AU Tax Invoice (INV)	Email		@aecom.com
- Chain of Custody (CoC) (COC)	Email		@aecom.com
- EDI Format - ENMRG (ENMRG)	Email		@aecom.com
- EDI Format - ESDAT (ESDAT)	Email		@aecom.com
- EDI Format - HLAPro (HLAPro)	Email		@aecom.com
- EDI Format - XTab (XTAB)	Email		@aecom.com

Environmental Division

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **ES1310250**	Page	: 1 of 7
Client	: AECOM Australia Pty Ltd	Laboratory	: Environmental Division Sydney
Contact	: s22	Contact	: s22
Address	: LEVEL 11, 44 MARKET STREET SYDNEY NSW 1230	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: s22 @aecom.com	E-mail	: s22 @alsglobal.com
Telephone	: 02 8264 5100	Telephone	: +61 2 8784 8555
Facsimile	: 02 8264 5111	Facsimile	: +61 2 8784 8555
Project	: 60221935 MOOREBANK	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 06-MAY-2013
Sampler	: s22	Issue Date	: 10-MAY-2013
Order number	: ----		
		No. of samples received	: 26
Quote number	: EN/004/12	No. of samples analysed	: 26

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

This Interpretive Quality Control Report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Parameter Frequency Compliance
- Brief Method Summaries
- Summary of Outliers

Analysis Holding Time Compliance

The following report summarises extraction / preparation and analysis times and compares with recommended holding times. Dates reported represent first date of extraction or analysis and precludes subsequent dilutions and reruns. Information is also provided re the sample container (preservative) from which the analysis aliquot was taken. Elapsed period to analysis represents number of days from sampling where no extraction / digestion is involved or period from extraction / digestion where this is present. For composite samples, sampling date is assumed to be that of the oldest sample contributing to the composite. Sample date for laboratory produced leachates is assumed as the completion date of the leaching process. Outliers for holding time are based on USEPA SW 846, APHA, AS and NEPM (1999). A listing of breaches is provided in the Summary of Outliers.

Holding times for leachate methods (excluding elutriates) vary according to the analytes being determined on the resulting solution. For non-volatile analytes, the holding time compliance assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These soil holding times are: Organics (14 days); Mercury (28 days) & other metals (180 days). A recorded breach therefore does not guarantee a breach for all non-volatile parameters.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content								
Soil Glass Jar - Unpreserved (EA055-103)								
VS103-1,	VS103-2,	**02-MAY-2013**	**----**	----	----	**08-MAY-2013**	16-MAY-2013	✓
VS103-3,	VS103-4,							
VS103-5,	VS103-6,							
VS103-7,	VS103-8,							
VS103-9,	VS103-10,							
VS103-11,	VS103-12,							
VS103-13,	VS103-14,							
VS103-15,	VS103-16,							
QC21,	QC22,							
VS103-17,	VS103-18,							
VS103-19,	VS103-20,							
VS103-21,	VS103-22,							
VS103-23,	VS103-24							
EP080/071: Total Petroleum Hydrocarbons								
Soil Glass Jar - Unpreserved (EP071)								
VS103-17,	VS103-18,	**02-MAY-2013**	**08-MAY-2013**	16-MAY-2013	✓	**08-MAY-2013**	17-JUN-2013	✓
VS103-19,	VS103-20,							
VS103-21,	VS103-22,							
VS103-23,	VS103-24							
Soil Glass Jar - Unpreserved (EP071)								
VS103-1,	VS103-2,	**02-MAY-2013**	**08-MAY-2013**	16-MAY-2013	✓	**09-MAY-2013**	17-JUN-2013	✓
VS103-3,	VS103-4,							
VS103-5,	VS103-6,							
VS103-7,	VS103-8,							
VS103-9,	VS103-10,							
VS103-11,	VS103-12,							
VS103-13,	VS103-14,							
VS103-15,	VS103-16,							
QC21,	QC22							

Matrix: **SOIL**

Evaluation: × = Holding ime 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
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Soil Glass Jar - Unpreserved (EP075(SIM))								
VS103-17,	VS103-18,	**02-MAY-2013**	**08-MAY-2013**	16-MAY-2013	✓	**08-MAY-2013**	17-JUN-2013	✓
VS103-19,	VS103-20,							
VS103-21,	VS103-22,							
VS103-23,	VS103-24							
Soil Glass Jar - Unpreserved (EP075(SIM))								
VS103-1,	VS103-2,	**02-MAY-2013**	**08-MAY-2013**	16-MAY-2013	✓	**09-MAY-2013**	17-JUN-2013	✓
VS103-3,	VS103-4,							
VS103-5,	VS103-6,							
VS103-7,	VS103-8,							
VS103-9,	VS103-10,							
VS103-11,	VS103-12,							
VS103-13,	VS103-14,							
VS103-15,	VS103-16,							
QC21,	QC22							
EP080: BTEX								
Soil Glass Jar - Unpreserved (EP080)								
VS103-1,	VS103-2,	**02-MAY-2013**	**07-MAY-2013**	16-MAY-2013	✓	**09-MAY-2013**	16-MAY-2013	✓
VS103-3,	VS103-4,							
VS103-5,	VS103-6,							
VS103-7,	VS103-8,							
VS103-9,	VS103-10,							
VS103-11,	VS103-12,							
VS103-13,	VS103-14,							
VS103-15,	VS103-16,							
QC21,	QC22							
Soil Glass Jar - Unpreserved (EP080)								
VS103-17,	VS103-18,	**02-MAY-2013**	**08-MAY-2013**	16-MAY-2013	✓	**09-MAY-2013**	16-MAY-2013	✓
VS103-19,	VS103-20,							
VS103-21,	VS103-22,							
VS103-23,	VS103-24							

Matrix: **SOIL**

Evaluation: × = Holding ime breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080: BTEXN								
Soil Glass Jar - Unpreserved (EP080)								
VS103-1,	VS103-2,	**02-MAY-2013**	**07-MAY-2013**	16-MAY-2013	✓	**09-MAY-2013**	16-MAY-2013	✓
VS103-3,	VS103-4,							
VS103-5,	VS103-6,							
VS103-7,	VS103-8,							
VS103-9,	VS103-10,							
VS103-11,	VS103-12,							
VS103-13,	VS103-14,							
VS103-15,	VS103-16,							
QC21,	QC22							
Soil Glass Jar - Unpreserved (EP080)								
VS103-17,	VS103-18,	**02-MAY-2013**	**08-MAY-2013**	16-MAY-2013	✓	**09-MAY-2013**	16-MAY-2013	✓
VS103-19,	VS103-20,							
VS103-21,	VS103-22,							
VS103-23,	VS103-24							
EP080/071: Total Petroleum Hydrocarbons								
Soil Glass Jar - Unpreserved (EP080)								
VS103-1,	VS103-2,	**02-MAY-2013**	**07-MAY-2013**	16-MAY-2013	✓	**09-MAY-2013**	16-MAY-2013	✓
VS103-3,	VS103-4,							
VS103-5,	VS103-6,							
VS103-7,	VS103-8,							
VS103-9,	VS103-10,							
VS103-11,	VS103-12,							
VS103-13,	VS103-14,							
VS103-15,	VS103-16,							
QC21,	QC22							
Soil Glass Jar - Unpreserved (EP080)								
VS103-17,	VS103-18,	**02-MAY-2013**	**08-MAY-2013**	16-MAY-2013	✓	**09-MAY-2013**	16-MAY-2013	✓
VS103-19,	VS103-20,							
VS103-21,	VS103-22,							
VS103-23,	VS103-24							

Quality Control Parameter Frequency Compliance

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

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055-103	3	26	**11.5**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	4	37	**10.8**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	4	37	**10.8**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	4	38	**10.5**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)	EP075(SIM)	2	37	**5.4**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	37	**5.4**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	38	**5.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
PAH/Phenols (SIM)	EP075(SIM)	2	37	**5.4**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	37	**5.4**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	38	**5.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	2	37	**5.4**	**5.0**	✓	ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	37	**5.4**	**5.0**	✓	ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	38	**5.3**	**5.0**	✓	ALS QCS3 requirement

Brief Method Summaries

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

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055-103	SOIL	A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (2010 Draft) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
TPH - Semivolatile Fraction	EP071	SOIL	(USEPA SW 846 - 8015A) Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C36. This method is compliant with NEPM (1999) Schedule B(3) (Method 506.1)
PAH/Phenols (SIM)	EP075(SIM)	SOIL	(USEPA SW 846 - 8270B) 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 (1999) Schedule B(3) (Method 502 and 507)
TPH Volatiles/BTEX	EP080	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Method 501)

Preparation Methods	Method	Matrix	Method Descriptions
Methanolic Extraction of Soils for Purge and Trap	* ORG16	SOIL	(USEPA SW 846 - 5030A) 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids (Option B - Non-concentrating)	ORG17B	SOIL	In-house, Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 20mL 1:1 DCM/Acetone by end over end tumble. The solvent is transferred directly to a GC vial for analysis.

Summary of Outliers

Outliers : Quality Control Samples

The following report highlights outliers flagged in the Quality Control (QC) Report. Surrogate recovery limits are static and based on USEPA SW 846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). This report displays QC Outliers (breaches) only.

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Laboratory Control Spike (LCS) Recoveries							
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	3389608-007	----	**Fluorene**	86-73-7	112 %	79.9-112%	**Recovery greater than upper control limit**

- **For all matrices, no Method Blank value outliers occur.**
- **For all matrices, no Duplicate outliers occur.**
- **For all matrices, no Matrix Spike outliers occur.**

Regular Sample Surrogates

- **For all regular sample matrices, no surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

This report displays Holding Time breaches only. Only the respective Extraction / Preparation and/or Analysis component is/are displayed.

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

Outliers : Frequency of Quality Control Samples

The following report highlights breaches in the Frequency of Quality Control Samples.

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

Environmental Division

QUALITY CONTROL REPORT

Work Order	: **ES1310250**	Page	: 1 of 11
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: s22	Contact	: s22
Address	: LEVEL 11, 44 MARKET STREET SYDNEY NSW 1230	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: s22 @aecom.com	E-mail	: s22 @alsglobal.com
Telephone	: 02 8264 5100	Telephone	: +61 2 8784 8555
Facsimile	: 02 8264 5111	Facsimile	: +61 2 8784 8555
Project	: 60221935 MOOREBANK	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 06-MAY-2013
Sampler	: s22	Issue Date	: 10-MAY-2013
Order number	: ----		
		No. of samples received	: 26
Quote number	: EN/004/12	No. of samples analysed	: 26

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

This Quality Control Report contains the following information:

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

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
s22	Organic Chemist	Sydney Organics
s22	Organic Chemist	Sydney Organics
s22	Inorganic Chemist	Sydney Inorganics

General Comments

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

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

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

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

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EA055: Moisture Content (QC Lot: 2856740)									
ES1310250-003	VS103-3	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	12.2	14.3	16.1	0% - 50%
ES1310250-014	VS103-14	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	7.2	7.9	8.3	No Limit
EA055: Moisture Content (QC Lot: 2856741)									
ES1310250-023	VS103-21	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	12.0	12.0	0.0	0% - 50%
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 2853403)									
ES1310250-001	VS103-1	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Sum of polycyclic aroma ic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (WHO)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
ES1310250-011	VS103-11	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 2853403) - continued									
ES1310250-011	VS103-11	EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Sum of polycyclic aroma ic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (WHO)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 2855819)									
ES1310140-002	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Sum of polycyclic aroma ic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (WHO)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
ES1310250-019	VS103-17	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 2855819) - continued									
ES1310250-019	VS103-17	EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Sum of polycyclic aroma ic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (WHO)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 2853402)									
ES1310250-001	VS103-1	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
ES1310250-011	VS103-11	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 2854651)									
ES1310250-001	VS103-1	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
ES1310250-011	VS103-11	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 2855818)									
ES1310140-002	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
ES1310250-019	VS103-17	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 2856430)									
ES1310250-019	VS103-17	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
ES1310251-003	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QC Lot: 2853402)									
ES1310250-001	VS103-1	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
ES1310250-011	VS103-11	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QC Lot: 2854651)									
ES1310250-001	VS103-1	EP080: C6 - C10 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
ES1310250-011	VS103-11	EP080: C6 - C10 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QC Lot: 2855818)									
ES1310140-002	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QC Lot: 2855818) - continued									
ES1310140-002	Anonymous	EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
ES1310250-019	VS103-17	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QC Lot: 2856430)									
ES1310250-019	VS103-17	EP080: C6 - C10 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
ES1310251-003	Anonymous	EP080: C6 - C10 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080: BTEXN (QC Lot: 2854651)									
ES1310250-001	VS103-1	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit
ES1310250-011	VS103-11	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit
EP080: BTEXN (QC Lot: 2856430)									
ES1310250-019	VS103-17	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit
ES1310251-003	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit

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

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

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2853403)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	4 mg/kg	110	81.9	113
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	4 mg/kg	112	79.6	113
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	4 mg/kg	111	81.5	112
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	4 mg/kg	# 112	79.9	112
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	4 mg/kg	100	79.4	114
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	4 mg/kg	100	81.1	112
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	4 mg/kg	102	78.8	113
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	4 mg/kg	104	78.9	113
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	4 mg/kg	110	77.2	112
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	4 mg/kg	111	79.8	114
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	4 mg/kg	105	71.8	118
EP075(SIM): Benzo(k)fluoran hene	207-08-9	0.5	mg/kg	<0.5	4 mg/kg	110	74.2	117
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	4 mg/kg	112	76.4	113
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	4 mg/kg	108	71	113
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	4 mg/kg	108	71.7	113
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	4 mg/kg	107	72.4	114
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2855819)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	4 mg/kg	100	81.9	113
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	4 mg/kg	99.8	79.6	113
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	4 mg/kg	100	81.5	112
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	4 mg/kg	103	79.9	112
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	4 mg/kg	105	79.4	114
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	4 mg/kg	105	81.1	112
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	4 mg/kg	108	78.8	113
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	4 mg/kg	110	78.9	113
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	4 mg/kg	96.5	77.2	112
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	4 mg/kg	100	79.8	114
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	4 mg/kg	89.5	71.8	118
EP075(SIM): Benzo(k)fluoran hene	207-08-9	0.5	mg/kg	<0.5	4 mg/kg	102	74.2	117
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	4 mg/kg	99.7	76.4	113
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	4 mg/kg	80.5	71	113
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	4 mg/kg	79.0	71.7	113
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	4 mg/kg	81.0	72.4	114
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2853402)								

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2853402) - continued								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	200 mg/kg	97.0	59	131
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	300 mg/kg	103	74	138
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	200 mg/kg	93.0	63	131
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2854651)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	76.6	68.4	128
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2855818)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	200 mg/kg	107	59	131
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	300 mg/kg	112	74	138
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	200 mg/kg	105	63	131
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2856430)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	99.6	68.4	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 2853402)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	250 mg/kg	93.6	59	131
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	350 mg/kg	101	74	138
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	----	----	----	----
		50	mg/kg	----	150 mg/kg	97.3	63	131
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 2854651)								
EP080: C6 - C10 Fraction	----	10	mg/kg	<10	31 mg/kg	77.6	68.4	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 2855818)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	250 mg/kg	106	59	131
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	350 mg/kg	110	74	138
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	----	----	----	----
		50	mg/kg	----	150 mg/kg	101	63	131
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 2856430)								
EP080: C6 - C10 Fraction	----	10	mg/kg	<10	31 mg/kg	96.9	68.4	128
EP080: BTEXN (QCLot: 2854651)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	86.4	62	120
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	84.3	62	128
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	77.7	58	118
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	78.2	60	120
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	77.8	60	120
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	73.2	62	138
EP080: BTEXN (QCLot: 2856430)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	81.7	62	120
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	119	62	128
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	83.8	58	118

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EP080: BTEXN (QCLot: 2856430) - continued								
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	89.5	60	120
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	87.9	60	120
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	83.9	62	138

Matrix Spike (MS) Report

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

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Recovery Limits (%): Low	Recovery Limits (%): High
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2853403)							
ES1310250-001	VS103-1	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	95.7	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	106	70	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2855819)							
ES1310140-002	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	94.1	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	106	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2853402)							
ES1310250-001	VS103-1	EP071: C10 - C14 Fraction	----	640 mg/kg	110	73	137
		EP071: C15 - C28 Fraction	----	3140 mg/kg	124	53	131
		EP071: C29 - C36 Fraction	----	2860 mg/kg	99.3	52	132
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2854651)							
ES1310250-001	VS103-1	EP080: C6 - C9 Fraction	----	32.5 mg/kg	88.7	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2855818)							
ES1310140-002	Anonymous	EP071: C10 - C14 Fraction	----	640 mg/kg	107	73	137
		EP071: C15 - C28 Fraction	----	3140 mg/kg	120	53	131
		EP071: C29 - C36 Fraction	----	2860 mg/kg	86.5	52	132
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2856430)							
ES1310250-019	VS103-17	EP080: C6 - C9 Fraction	----	32.5 mg/kg	109	70	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 2853402)							
ES1310250-001	VS103-1	EP071: >C10 - C16 Fraction	----	850 mg/kg	113	73	137
		EP071: >C16 - C34 Fraction	----	4800 mg/kg	87.1	53	131
		EP071: >C34 - C40 Fraction	----	2400 mg/kg	62.2	52	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 2854651)							
ES1310250-001	VS103-1	EP080: C6 - C10 Fraction	----	37.5 mg/kg	89.8	70	130

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Recovery Limits (%): Low	Recovery Limits (%): High
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 2855818)							
ES1310140-002	Anonymous	EP071: >C10 - C16 Fraction	----	850 mg/kg	99.1	73	137
		EP071: >C16 - C34 Fraction	----	4800 mg/kg	81.6	53	131
		EP071: >C34 - C40 Fraction	----	2400 mg/kg	58.7	52	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 2856430)							
ES1310250-019	VS103-17	EP080: C6 - C10 Fraction	----	37.5 mg/kg	106	70	130
EP080: BTEXN (QCLot: 2854651)							
ES1310250-001	VS103-1	EP080: Benzene	71-43-2	2.5 mg/kg	79.7	70	130
		EP080: Toluene	108-88-3	2.5 mg/kg	78.6	70	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	73.2	70	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	78.4	70	130
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	79.6	70	130
		EP080: Naphthalene	91-20-3	2.5 mg/kg	72.7	70	130
EP080: BTEXN (QCLot: 2856430)							
ES1310250-019	VS103-17	EP080: Benzene	71-43-2	2.5 mg/kg	78.6	70	130
		EP080: Toluene	108-88-3	2.5 mg/kg	89.8	70	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	86.8	70	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	87.5	70	130
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	87.7	70	130
		EP080: Naphthalene	91-20-3	2.5 mg/kg	77.9	70	130

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

The quality control term Matrix Spike (MS) and Matrix Spike Duplicate (MSD) refers to intralaboratory split samples spiked with a representa ive set of target analytes. The purpose of these QC parameters are to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration	Spike Recovery (%): MS	Spike Recovery (%): MSD	Recovery Limits (%): Low	Recovery Limits (%): High	RPDs (%): Value	RPDs (%): Control Limit
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2853402)										
ES1310250-001	VS103-1	EP071: C10 - C14 Fraction	----	640 mg/kg	110	----	73	137	----	----
		EP071: C15 - C28 Fraction	----	3140 mg/kg	124	----	53	131	----	----
		EP071: C29 - C36 Fraction	----	2860 mg/kg	99.3	----	52	132	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 2853402)										
ES1310250-001	VS103-1	EP071: >C10 - C16 Fraction	----	850 mg/kg	113	----	73	137	----	----
		EP071: >C16 - C34 Fraction	----	4800 mg/kg	87.1	----	53	131	----	----
		EP071: >C34 - C40 Fraction	----	2400 mg/kg	62.2	----	52	132	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2853403)										

Sub-Matrix: **SOIL**

				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	MSD	Low	High	Value	Control Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2853403) - continued										
ES1310250-001	VS103-1	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	95.7	----	70	130	----	----
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	106	----	70	130	----	----
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2854651)										
ES1310250-001	VS103-1	EP080: C6 - C9 Fraction	----	32.5 mg/kg	88.7	----	70	130	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 2854651)										
ES1310250-001	VS103-1	EP080: C6 - C10 Fraction	----	37.5 mg/kg	89.8	----	70	130	----	----
EP080: BTEXN (QCLot: 2854651)										
ES1310250-001	VS103-1	EP080: Benzene	71-43-2	2.5 mg/kg	79.7	----	70	130	----	----
		EP080: Toluene	108-88-3	2.5 mg/kg	78.6	----	70	130	----	----
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	73.2	----	70	130	----	----
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	78.4	----	70	130	----	----
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	79.6	----	70	130	----	----
		EP080: Naphthalene	91-20-3	2.5 mg/kg	72.7	----	70	130	----	----
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2855818)										
ES1310140-002	Anonymous	EP071: C10 - C14 Fraction	----	640 mg/kg	107	----	73	137	----	----
		EP071: C15 - C28 Fraction	----	3140 mg/kg	120	----	53	131	----	----
		EP071: C29 - C36 Fraction	----	2860 mg/kg	86.5	----	52	132	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 2855818)										
ES1310140-002	Anonymous	EP071: >C10 - C16 Fraction	----	850 mg/kg	99.1	----	73	137	----	----
		EP071: >C16 - C34 Fraction	----	4800 mg/kg	81.6	----	53	131	----	----
		EP071: >C34 - C40 Fraction	----	2400 mg/kg	58.7	----	52	132	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2855819)										
ES1310140-002	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	94.1	----	70	130	----	----
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	106	----	70	130	----	----
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2856430)										
ES1310250-019	VS103-17	EP080: C6 - C9 Fraction	----	32.5 mg/kg	109	----	70	130	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 2856430)										
ES1310250-019	VS103-17	EP080: C6 - C10 Fraction	----	37.5 mg/kg	106	----	70	130	----	----
EP080: BTEXN (QCLot: 2856430)										
ES1310250-019	VS103-17	EP080: Benzene	71-43-2	2.5 mg/kg	78.6	----	70	130	----	----
		EP080: Toluene	108-88-3	2.5 mg/kg	89.8	----	70	130	----	----
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	86.8	----	70	130	----	----
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	87.5	----	70	130	----	----
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	87.7	----	70	130	----	----
		EP080: Naphthalene	91-20-3	2.5 mg/kg	77.9	----	70	130	----	----

ALS Group

Environmental Division

CERTIFICATE OF ANALYSIS

Work Order	: **ES1310250**	Page	: 1 of 15
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	s22	Contact	:s22
Address	: LEVEL 11, 44 MARKET STREET SYDNEY NSW 1230	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	:s22 @aecom.com	E-mail	s22 @alsglobal.com
Telephone	: 02 8264 5100	Telephone	: +61 2 8784 8555
Facsimile	: 02 8264 5111	Facsimile	: +61 2 8784 8555
Project	: 60221935 MOOREBANK	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: ---		
C-O-C number	: ---	Date Samples Received	: 06-MAY-2013
Sampler	:s22	Issue Date	: 10-MAY-2013
Site	: ---		
		No. of samples received	: 26
Quote number	: EN/004/12	No. of samples analysed	: 26

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

NATA

WORLD RECOGNISED ACCREDITATION

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
s22	Organic Chemist	Sydney Organics
s22	Organic Chemist	Sydney Organics
s22	Inorganic Chemist	Sydney Inorganics

General Comments

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

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

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

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

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

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting

- **EP080:Results of VS103-22 have been confirmed by re-analysis.**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Compound	CAS Number	LOR	Unit	Client sample ID: VS103-1	VS103-2	VS103-3	VS103-4	VS103-5
				Client sampling date / time: 02-MAY-2013 15:00	02-MAY-2013 15:00	02-MAY-2013 15:00	02-MAY-2013 15:00	02-MAY-2013 15:00
				ES1310250-001	ES1310250-002	ES1310250-003	ES1310250-004	ES1310250-005
EA055: Moisture Content								
Moisture Content (dried @ 103°C)	---	1.0	%	9.0	9.0	12.2	9.2	11.3
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	---	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ (WHO)	---	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	---	10	mg/kg	<10	<10	<10	<10	<10
C10 - C14 Fraction	---	50	mg/kg	<50	<50	<50	<50	<50
C15 - C28 Fraction	---	100	mg/kg	<100	930	<100	<100	<100
C29 - C36 Fraction	---	100	mg/kg	<100	640	<100	<100	<100
^ C10 - C36 Fraction (sum)	---	50	mg/kg	<50	1570	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft								
C6 - C10 Fraction	---	10	mg/kg	<10	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	---	10	mg/kg	<10	<10	<10	<10	<10
>C10 - C16 Fraction	---	50	mg/kg	<50	<50	<50	<50	<50
>C16 - C34 Fraction	---	100	mg/kg	<100	1290	<100	<100	<100
>C34 - C40 Fraction	---	100	mg/kg	<100	480	<100	<100	<100
^ >C10 - C40 Fraction (sum)	---	50	mg/kg	<50	1770	<50	<50	<50

Analytical Results

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

Compound	CAS Number	LOR	Unit	Client sample ID: VS103-1	VS103-2	VS103-3	VS103-4	VS103-5
				Client sampling date / time: 02-MAY-2013 15:00	02-MAY-2013 15:00	02-MAY-2013 15:00	02-MAY-2013 15:00	02-MAY-2013 15:00
				ES1310250-001	ES1310250-002	ES1310250-003	ES1310250-004	ES1310250-005
EP080: BTEX								
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
EP080: BTEXN								
^ **Sum of BTEX**	---	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
^ **Total Xylenes**	1330-20-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	<1
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	**88.4**	**92.4**	**82.7**	**90.9**	**92.6**
2-Chlorophenol-D4	93951-73-6	0.1	%	**90.5**	**95.1**	**86.8**	**95.4**	**97.5**
2.4.6-Tribromophenol	118-79-6	0.1	%	**82.6**	**89.3**	**78.6**	**85.2**	**83.6**
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**97.0**	**101**	**93.4**	**102**	**103**
Anthracene-d10	1719-06-8	0.1	%	**93.3**	**97.9**	**90.9**	**96.7**	**98.3**
4-Terphenyl-d14	1718-51-0	0.1	%	**90.4**	**93.6**	**88.6**	**94.2**	**94.3**
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	**95.3**	**114**	**118**	**110**	**105**
Toluene-D8	2037-26-5	0.1	%	**114**	**119**	**117**	**111**	**104**
4-Bromofluorobenzene	460-00-4	0.1	%	**96.5**	**111**	**116**	**103**	**110**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Compound	CAS Number	LOR	Unit	Client sample ID	VS103-6	VS103-7	VS103-8	VS103-9	VS103-10
				Client sampling date / time	02-MAY-2013 15:00	02-MAY-2013 15:00	02-MAY-2013 15:00	02-MAY-2013 15:00	02-MAY-2013 15:00
					ES1310250-006	ES1310250-007	ES1310250-008	ES1310250-009	ES1310250-010
EA055: Moisture Content									
Moisture Content (dried @ 103°C)	---	1.0	%		17.3	9.6	8.3	9.1	8.2
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	---	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ (WHO)	---	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	---	10	mg/kg		<10	<10	<10	<10	<10
C10 - C14 Fraction	---	50	mg/kg		<50	<50	<50	<50	<50
C15 - C28 Fraction	---	100	mg/kg		<100	<100	<100	<100	<100
C29 - C36 Fraction	---	100	mg/kg		<100	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	---	50	mg/kg		<50	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft									
C6 - C10 Fraction	---	10	mg/kg		<10	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	---	10	mg/kg		<10	<10	<10	<10	<10
>C10 - C16 Fraction	---	50	mg/kg		<50	<50	<50	<50	<50
>C16 - C34 Fraction	---	100	mg/kg		<100	<100	<100	<100	<100
>C34 - C40 Fraction	---	100	mg/kg		<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	---	50	mg/kg		<50	<50	<50	<50	<50

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Compound	CAS Number	LOR	Unit	Client sample ID: VS103-6	VS103-7	VS103-8	VS103-9	VS103-10
				Client sampling date / time: 02-MAY-2013 15:00	02-MAY-2013 15:00	02-MAY-2013 15:00	02-MAY-2013 15:00	02-MAY-2013 15:00
				ES1310250-006	ES1310250-007	ES1310250-008	ES1310250-009	ES1310250-010
EP080: BTEX								
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
EP080: BTEXN								
^ **Sum of BTEX**	---	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
^ **Total Xylenes**	1330-20-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	<1
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	**82.2**	**84.6**	**89.7**	**92.3**	**84.8**
2-Chlorophenol-D4	93951-73-6	0.1	%	**86.5**	**87.0**	**93.3**	**95.9**	**88.2**
2.4.6-Tribromophenol	118-79-6	0.1	%	**74.3**	**81.8**	**77.4**	**73.6**	**70.3**
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**93.8**	**94.5**	**98.5**	**98.0**	**93.1**
Anthracene-d10	1719-06-8	0.1	%	**89.3**	**81.6**	**93.9**	**94.1**	**90.0**
4-Terphenyl-d14	1718-51-0	0.1	%	**86.9**	**86.0**	**91.6**	**92.0**	**88.5**
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	**111**	**96.1**	**99.1**	**102**	**102**
Toluene-D8	2037-26-5	0.1	%	**95.8**	**113**	**115**	**101**	**98.0**
4-Bromofluorobenzene	460-00-4	0.1	%	**105**	**95.8**	**99.1**	**93.1**	**101**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Compound	CAS Number	LOR	Unit	Client sample ID	VS103-11	VS103-12	VS103-13	VS103-14	VS103-15
				Client sampling date / time	02-MAY-2013 15:00	02-MAY-2013 15:00	02-MAY-2013 15:00	02-MAY-2013 15:00	02-MAY-2013 15:00
					ES1310250-011	ES1310250-012	ES1310250-013	ES1310250-014	ES1310250-015
EA055: Moisture Content									
Moisture Content (dried @ 103°C)	---	1.0	%		8.5	9.0	8.3	7.2	6.5
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	---	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ (WHO)	---	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	---	10	mg/kg		<10	<10	<10	<10	<10
C10 - C14 Fraction	---	50	mg/kg		<50	<50	<50	<50	<50
C15 - C28 Fraction	---	100	mg/kg		<100	<100	<100	<100	<100
C29 - C36 Fraction	---	100	mg/kg		<100	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	---	50	mg/kg		<50	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft									
C6 - C10 Fraction	---	10	mg/kg		<10	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	---	10	mg/kg		<10	<10	<10	<10	<10
>C10 - C16 Fraction	---	50	mg/kg		<50	<50	<50	<50	<50
>C16 - C34 Fraction	---	100	mg/kg		<100	<100	<100	<100	<100
>C34 - C40 Fraction	---	100	mg/kg		<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	---	50	mg/kg		<50	<50	<50	<50	<50

Analytical Results

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

Compound	CAS Number	LOR	Unit	Client sample ID: VS103-11	VS103-12	VS103-13	VS103-14	VS103-15
				Client sampling date / time: 02-MAY-2013 15:00	02-MAY-2013 15:00	02-MAY-2013 15:00	02-MAY-2013 15:00	02-MAY-2013 15:00
				ES1310250-011	ES1310250-012	ES1310250-013	ES1310250-014	ES1310250-015
EP080: BTEX								
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
EP080: BTEXN								
^ **Sum of BTEX**	---	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
^ **Total Xylenes**	1330-20-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	<1
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	**87.2**	**86.6**	**90.8**	**90.5**	**91.3**
2-Chlorophenol-D4	93951-73-6	0.1	%	**92.5**	**90.4**	**94.9**	**94.2**	**95.2**
2.4.6-Tribromophenol	118-79-6	0.1	%	**76.4**	**75.1**	**76.5**	**74.8**	**74.7**
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**98.9**	**98.3**	**101**	**101**	**101**
Anthracene-d10	1719-06-8	0.1	%	**94.8**	**94.4**	**97.1**	**97.2**	**97.0**
4-Terphenyl-d14	1718-51-0	0.1	%	**92.5**	**92.3**	**94.8**	**95.2**	**95.8**
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	**115**	**102**	**109**	**124**	**110**
Toluene-D8	2037-26-5	0.1	%	**121**	**110**	**110**	**114**	**101**
4-Bromofluorobenzene	460-00-4	0.1	%	**120**	**96.5**	**109**	**118**	**108**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Compound	CAS Number	LOR	Unit	Client sample ID	VS103-16	QC21	QC22	VS103-17	VS103-18
				Client sampling date / time	02-MAY-2013 15:00	02-MAY-2013 15:00	02-MAY-2013 15:00	02-MAY-2013 15:00	02-MAY-2013 15:00
					ES1310250-016	ES1310250-017	ES1310250-018	ES1310250-019	ES1310250-020
EA055: Moisture Content									
Moisture Content (dried @ 103°C)	---	1.0	%		8.8	10.7	10.9	10.8	15.5
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	---	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ (WHO)	---	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	---	10	mg/kg		<10	<10	<10	<10	<10
C10 - C14 Fraction	---	50	mg/kg		<50	<50	<50	<50	<50
C15 - C28 Fraction	---	100	mg/kg		<100	<100	<100	<100	<100
C29 - C36 Fraction	---	100	mg/kg		<100	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	---	50	mg/kg		<50	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft									
C6 - C10 Fraction	---	10	mg/kg		<10	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	---	10	mg/kg		<10	<10	<10	<10	<10
>C10 - C16 Fraction	---	50	mg/kg		<50	<50	<50	<50	<50
>C16 - C34 Fraction	---	100	mg/kg		<100	<100	<100	<100	<100
>C34 - C40 Fraction	---	100	mg/kg		<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	---	50	mg/kg		<50	<50	<50	<50	<50

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Compound	CAS Number	LOR	Unit	Client sample ID: VS103-16	QC21	QC22	VS103-17	VS103-18
				Client sampling date / time: 02-MAY-2013 15:00	02-MAY-2013 15:00	02-MAY-2013 15:00	02-MAY-2013 15:00	02-MAY-2013 15:00
				ES1310250-016	ES1310250-017	ES1310250-018	ES1310250-019	ES1310250-020
EP080: BTEX								
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
EP080: BTEXN								
^ **Sum of BTEX**	---	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
^ **Total Xylenes**	1330-20-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	<1
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	**98.4**	**86.4**	**86.4**	**83.0**	**78.2**
2-Chlorophenol-D4	93951-73-6	0.1	%	**102**	**91.8**	**89.8**	**86.9**	**81.5**
2.4.6-Tribromophenol	118-79-6	0.1	%	**79.9**	**72.5**	**70.5**	**67.4**	**64.8**
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**109**	**98.2**	**96.5**	**91.9**	**88.3**
Anthracene-d10	1719-06-8	0.1	%	**105**	**95.4**	**94.0**	**90.3**	**89.3**
4-Terphenyl-d14	1718-51-0	0.1	%	**102**	**93.0**	**92.2**	**87.1**	**86.6**
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	**111**	**110**	**114**	**106**	**102**
Toluene-D8	2037-26-5	0.1	%	**114**	**112**	**104**	**77.2**	**101**
4-Bromofluorobenzene	460-00-4	0.1	%	**113**	**114**	**110**	**109**	**97.5**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Compound	CAS Number	LOR	Unit	Client sample ID	VS103-19	VS103-20	VS103-21	VS103-22	VS103-23
				Client sampling date / time	02-MAY-2013 15:00	02-MAY-2013 15:00	02-MAY-2013 15:00	02-MAY-2013 15:00	02-MAY-2013 15:00
					ES1310250-021	ES1310250-022	ES1310250-023	ES1310250-024	ES1310250-025
EA055: Moisture Content									
Moisture Content (dried @ 103°C)	---	1.0	%		15.8	7.2	12.0	10.0	10.6
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	---	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ (WHO)	---	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	---	10	mg/kg		<10	<10	<10	18	<10
C10 - C14 Fraction	---	50	mg/kg		<50	<50	<50	<50	<50
C15 - C28 Fraction	---	100	mg/kg		<100	<100	<100	<100	<100
C29 - C36 Fraction	---	100	mg/kg		<100	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	---	50	mg/kg		<50	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft									
C6 - C10 Fraction	---	10	mg/kg		<10	<10	<10	51	<10
^ C6 - C10 Fraction minus BTEX (F1)	---	10	mg/kg		<10	<10	<10	51	<10
>C10 - C16 Fraction	---	50	mg/kg		<50	<50	<50	<50	<50
>C16 - C34 Fraction	---	100	mg/kg		<100	<100	<100	<100	<100
>C34 - C40 Fraction	---	100	mg/kg		<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	---	50	mg/kg		<50	<50	<50	<50	<50

Analytical Results

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

Compound	CAS Number	LOR	Unit	Client sample ID: VS103-19	VS103-20	VS103-21	VS103-22	VS103-23
				Client sampling date / time: 02-MAY-2013 15:00	02-MAY-2013 15:00	02-MAY-2013 15:00	02-MAY-2013 15:00	02-MAY-2013 15:00
				ES1310250-021	ES1310250-022	ES1310250-023	ES1310250-024	ES1310250-025
EP080: BTEX								
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
EP080: BTEXN								
^ **Sum of BTEX**	---	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
^ **Total Xylenes**	1330-20-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	<1
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	**80.6**	**83.8**	**84.1**	**81.1**	**83.4**
2-Chlorophenol-D4	93951-73-6	0.1	%	**82.8**	**88.5**	**89.0**	**85.0**	**88.4**
2.4.6-Tribromophenol	118-79-6	0.1	%	**64.3**	**66.4**	**67.9**	**65.9**	**66.2**
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**90.2**	**94.9**	**96.2**	**91.2**	**94.5**
Anthracene-d10	1719-06-8	0.1	%	**89.3**	**92.1**	**93.5**	**90.6**	**91.4**
4-Terphenyl-d14	1718-51-0	0.1	%	**86.8**	**89.9**	**91.2**	**88.2**	**89.1**
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	**100**	**99.2**	**99.7**	**97.6**	**102**
Toluene-D8	2037-26-5	0.1	%	**100**	**100**	**108**	**119**	**107**
4-Bromofluorobenzene	460-00-4	0.1	%	**95.2**	**97.0**	**102**	**113**	**93.8**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	VS103-24	---	---	---	---
			Client sampling date / time	02-MAY-2013 15:00	----	----	----	----
Compound	CAS Number	LOR	Unit	ES1310250-026	----	----	---	---
EA055: Moisture Content								
Moisture Content (dried @ 103°C)	---	1.0	%	6.2	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
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	----	----	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	----	----	----	----
Chrysene	218-01-9	0.5	mg/kg	<0.5	----	----	----	----
Benzo(b)fluoranthene	205-99-2	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 (WHO)	---	0.5	mg/kg	<0.5	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	---	10	mg/kg	<10	----	----	----	----
C10 - C14 Fraction	---	50	mg/kg	<50	----	----	----	----
C15 - C28 Fraction	---	100	mg/kg	<100	----	----	----	----
C29 - C36 Fraction	---	100	mg/kg	<100	----	----	----	----
^ C10 - C36 Fraction (sum)	---	50	mg/kg	<50	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft								
C6 - C10 Fraction	---	10	mg/kg	<10	----	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	---	10	mg/kg	<10	----	----	----	----
>C10 - C16 Fraction	---	50	mg/kg	<50	----	----	----	----
>C16 - C34 Fraction	---	100	mg/kg	<100	----	----	----	----
>C34 - C40 Fraction	---	100	mg/kg	<100	----	----	----	----
^ >C10 - C40 Fraction (sum)	---	50	mg/kg	<50	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	VS103-24	---	---	---	---
				Client sampling date / time	02-MAY-2013 15:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES1310250-026	----	----	---	---
EP080: BTEX									
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	----	----	----	----
EP080: BTEXN									
^ Sum of BTEX	---	0.2	mg/kg		<0.2	----	----	----	----
^ Total Xylenes	1330-20-7	0.5	mg/kg		<0.5	----	----	----	----
Naphthalene	91-20-3	1	mg/kg		<1	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.1	%		80.6	----	----	----	----
2-Chlorophenol-D4	93951-73-6	0.1	%		85.2	----	----	----	----
2.4.6-Tribromophenol	118-79-6	0.1	%		67.3	----	----	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.1	%		91.7	----	----	----	----
Anthracene-d10	1719-06-8	0.1	%		92.6	----	----	----	----
4-Terphenyl-d14	1718-51-0	0.1	%		90.4	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.1	%		93.5	----	----	----	----
Toluene-D8	2037-26-5	0.1	%		100	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.1	%		95.4	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **SOIL**

Compound	CAS Number	Recovery Limits (%) Low	High
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	63	127
2-Chlorophenol-D4	93951-73-6	64	126
2.4.6-Tribromophenol	118-79-6	36	136
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	64	130
Anthracene-d10	1719-06-8	69	135
4-Terphenyl-d14	1718-51-0	64	136
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	72.8	133.2
Toluene-D8	2037-26-5	73.9	132.1
4-Bromofluorobenzene	460-00-4	71.6	130.0

Form:

AECOM

Chain of Custody & Analysis Request Form

AECOM - Sydney
Level 21, 420 George Street
Sydney, NSW 2000
Tel: 02 8934 0000
Fax: 02 8934 0001
Email: s22 @aecom.com

Laboratory Details
Lab. Name:
Lab. Address: ALS - Sydney
Contact Name:
Lab. Ref:
Tel:
Fax:
Preliminary Report by:
Final Report by:
Lab Quote No: EN/004/12

Project Name: Moorebank **Project Number:** 60221935_1.82

Purchase Order Number:

Sample collected by s22 22 **Sample Results to be returned to:** s22 @aecom.com / s22 @aec

Analysis Reques

Environmental Division
Sydney
Work Order
ES1309731
Telephone : +61-2-8784 8555

Specifications:	(Tick)		
1. Urgent TAT required? (please circle: 24hr / 48hr ____days) STANDARD	☐ Yes	☐ No	☐ N/A
2. Fast TAT Guarantee Required?	☐ Yes	☐ No	☐ N/A
3. Is any sediment layer present in waters to be excluded from extractions?	☐ Yes	☐ No	☐ N/A
4. Special storage requirements?	☐ Yes	☐ No	☐ N/A
5. Preservation requirements?	☐ Yes	☐ No	☐ N/A
6. Other requirements? ☐ Fax ☐ Hard copy ☑ Email	☐ Yes	☐ No	☐ N/A

7. Report Format: 8. Project Manager: Jonathan Ho tel: 02 8394 0000

Lab. ID	Sample ID	Sampling Date	Sampling Time	Matrix: soil	water	other	Preservation: filtered	acid	Ice	other	Container (No. & type)	ASBESTOS IN WATER	ASBESTOS IN SOIL	TPH C6-C36	PAHs	*7 METALS	TPH C6-C9	BTEX	TPH C6-C36	8 METALS	HOL	
1	SP103-1	29/4/13	11:30	X					X		250ml Jar			X	X			X				*7 metals: As, Cd, Cr, Cu,
2	SP103-2	↓	↓	X					X		↓			X	X			X				Fe, Pb, Zn
3	SP103-3			X					X					X	X			X				
4	SP103-4			X					X					X	X			X				
									X													
									X													
									X													
									X													
									X													
									X													

Relinquished By: s22 s22 Date: 29/4/13 Time: of: AECOM

Received by: s22 Name: s22 Date: 29/4/13 Time: 1:20pm of: AU

Relinquished By: Name: Date: Time: of:

Received by: Name: Date: Time: of:

Received in good condition?	Yes/No/NA	Method of Shipment	☐ Courier ☐ Postal ☐ By Hand
Samples received chilled?	Yes/No/NA	Consignment Note No.	
	Yes/No/NA	Transport Co:	
Received in good condition?	Yes/No/NA	Method of Shipment	☐ Courier ☐ Postal ☐ By Hand
Samples received chilled?	Yes/No/NA	Consignment Note No.	
	Yes/No/NA	Transport Co:	

Environmental Division

SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive Report

Work Order	: **ES1309731**		
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: s22	Contact	: Client Services
Address	: LEVEL 11, 44 MARKET STREET SYDNEY NSW 1230	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: s22 @aecom.com	E-mail	: sydney@alsglobal.com
Telephone	: 02 8295 3600	Telephone	: +61-2-8784 8555
Facsimile	: 03 9262 5060	Facsimile	: +61-2-8784 8500
Project	: 60221935_1 82 MOOREBANK	Page	: 1 of 2
Order number	: ----		
C-O-C number	: ----	Quote number	: EP2013HLAENV0468 (EN/004/12)
Site	: ----		
Sampler	: s22	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement

Dates

Date Samples Received	: 29-APR-2013	Issue Date	: 29-APR-2013 15:12
Client Requested Due Date	: 30-APR-2013	Scheduled Reporting Date	: **30-APR-2013**

Delivery Details

Mode of Delivery	: Carrier	Temperature	: 7.3' C - Ice present
No. of coolers/boxes	: 1 HARD	No. of samples received	: 4
Security Seal	: Not intact.	No. of samples analysed	: 4

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
- **Samples received in appropriately pretreated and preserved containers.**
- **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 (14 days), Solid (60 days) from date of completion of work order.

Sample Container(s)/Preservation Non-Compliances

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

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

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process neccessary 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 to 15:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory for processing purposes and will be shown bracketed without a time component.

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	SOIL - S-07 TPH/BTEX/PAH (SIM)
ES1309731-001	29-APR-2013 11:30	SP103-1	✓
ES1309731-002	29-APR-2013 11:30	SP103-2	✓
ES1309731-003	29-APR-2013 11:30	SP103-3	✓
ES1309731-004	29-APR-2013 11:30	SP103-4	✓

Proactive Holding Time Report

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

Requested Deliverables

s22

- *AU Certificate of Analysis - NATA (COA) Email s22 @aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email @aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email @aecom.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN Email @aecom.com
- A4 - AU Tax Invoice (INV) Email @aecom.com
- Chain of Custody (CoC) (COC) Email @aecom.com
- EDI Format - ENMRG (ENMRG) Email @aecom.com
- EDI Format - ESDAT (ESDAT) Email @aecom.com
- EDI Format - HLAPro (HLAPro) Email @aecom.com
- EDI Format - XTab (XTAB) Email @aecom.com

s22

- *AU Certificate of Analysis - NATA (COA) Email s22 @aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email @aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email @aecom.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email @aecom.com
- A4 - AU Tax Invoice (INV) Email @aecom.com
- Chain of Custody (CoC) (COC) Email @aecom.com
- EDI Format - ENMRG (ENMRG) Email @aecom.com
- EDI Format - ESDAT (ESDAT) Email @aecom.com
- EDI Format - HLAPro (HLAPro) Email @aecom.com
- EDI Format - XTab (XTAB) Email @aecom.com

s22

- *AU Certificate of Analysis - NATA (COA) Email s22 @aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email @aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email @aecom.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN Email @aecom.com
- A4 - AU Tax Invoice (INV) Email @aecom.com
- Chain of Custody (CoC) (COC) Email @aecom.com
- EDI Format - ENMRG (ENMRG) Email @aecom.com
- EDI Format - ESDAT (ESDAT) Email @aecom.com
- EDI Format - HLAPro (HLAPro) Email @aecom.com
- EDI Format - XTab (XTAB) Email @aecom.com

Environmental Division

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **ES1309731**	Page	: 1 of 5
Client	: AECOM Australia Pty Ltd	Laboratory	: Environmental Division Sydney
Contact	: s22	Contact	: Client Services
Address	: LEVEL 11, 44 MARKET STREET SYDNEY NSW 1230	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: s22 @aecom.com	E-mail	: sydney@alsglobal.com
Telephone	: 02 8295 3600	Telephone	: +61-2-8784 8555
Facsimile	: 03 9262 5060	Facsimile	: +61-2-8784 8500
Project	: 60221935_1 82 MOOREBANK	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ---		
C-O-C number	: ---	Date Samples Received	: 29-APR-2013
Sampler	: s22	Issue Date	: 30-APR-2013
Order number	: ---		
		No. of samples received	: 4
Quote number	: EN/004/12	No. of samples analysed	: 4

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

This Interpretive Quality Control Report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Parameter Frequency Compliance
- Brief Method Summaries
- Summary of Outliers

Analysis Holding Time Compliance

The following report summarises extraction / preparation and analysis times and compares with recommended holding times. Dates reported represent first date of extraction or analysis and precludes subsequent dilutions and reruns. Information is also provided re the sample container (preservative) from which the analysis aliquot was taken. Elapsed period to analysis represents number of days from sampling where no extraction / digestion is involved or period from extraction / digestion where this is present. For composite samples, sampling date is assumed to be that of the oldest sample contributing to the composite. Sample date for laboratory produced leachates is assumed as the completion date of the leaching process. Outliers for holding time are based on USEPA SW 846, APHA, AS and NEPM (1999). A listing of breaches is provided in the Summary of Outliers.

Holding times for leachate methods (excluding elutriates) vary according to the analytes being determined on the resulting solution. For non-volatile analytes, the holding time compliance assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These soil holding times are: Organics (14 days); Mercury (28 days) & other metals (180 days). A recorded breach therefore does not guarantee a breach for all non-volatile parameters.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content							
Soil Glass Jar - Unpreserved (EA055-103)							
SP103-1, SP103-2, SP103-3, SP103-4	**29-APR-2013**	**----**	----	----	**29-APR-2013**	13-MAY-2013	✓
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP071)							
SP103-1, SP103-2, SP103-3, SP103-4	**29-APR-2013**	**29-APR-2013**	13-MAY-2013	✓	**29-APR-2013**	08-JUN-2013	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved (EP075(SIM))							
SP103-1, SP103-2, SP103-3, SP103-4	**29-APR-2013**	**29-APR-2013**	13-MAY-2013	✓	**29-APR-2013**	08-JUN-2013	✓
EP080: BTEX							
Soil Glass Jar - Unpreserved (EP080)							
SP103-1, SP103-2, SP103-3, SP103-4	**29-APR-2013**	**29-APR-2013**	13-MAY-2013	✓	**29-APR-2013**	13-MAY-2013	✓
EP080: BTEXN							
Soil Glass Jar - Unpreserved (EP080)							
SP103-1, SP103-2, SP103-3, SP103-4	**29-APR-2013**	**29-APR-2013**	13-MAY-2013	✓	**29-APR-2013**	13-MAY-2013	✓
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP080)							
SP103-1, SP103-2, SP103-3, SP103-4	**29-APR-2013**	**29-APR-2013**	13-MAY-2013	✓	**29-APR-2013**	13-MAY-2013	✓

Quality Control Parameter Frequency Compliance

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

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055-103	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	1	5	**20.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	5	**20.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	5	**20.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)	EP075(SIM)	1	5	**20.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	5	**20.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	5	**20.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
PAH/Phenols (SIM)	EP075(SIM)	1	5	**20.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	5	**20.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	5	**20.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	1	5	**20.0**	**5.0**	✓	ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	5	**20.0**	**5.0**	✓	ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	5	**20.0**	**5.0**	✓	ALS QCS3 requirement

Brief Method Summaries

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

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055-103	SOIL	A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (2010 Draft) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
TPH - Semivolatile Fraction	EP071	SOIL	(USEPA SW 846 - 8015A) Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C36. This method is compliant with NEPM (1999) Schedule B(3) (Method 506.1)
PAH/Phenols (SIM)	EP075(SIM)	SOIL	(USEPA SW 846 - 8270B) 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 (1999) Schedule B(3) (Method 502 and 507)
TPH Volatiles/BTEX	EP080	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Method 501)

Preparation Methods	Method	Matrix	Method Descriptions
Methanolic Extraction of Soils for Purge and Trap	* ORG16	SOIL	(USEPA SW 846 - 5030A) 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids (Option B - Non-concentrating)	ORG17B	SOIL	In-house, Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 20mL 1:1 DCM/Acetone by end over end tumble. The solvent is transferred directly to a GC vial for analysis.

Summary of Outliers

Outliers : Quality Control Samples

The following report highlights outliers flagged in the Quality Control (QC) Report. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). This report displays QC Outliers (breaches) only.

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

- **For all matrices, no Method Blank value outliers occur.**
- **For all matrices, no Duplicate outliers occur.**
- **For all matrices, no Laboratory Control outliers occur.**
- **For all matrices, no Matrix Spike outliers occur.**

Regular Sample Surrogates

- **For all regular sample matrices, no surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

This report displays Holding Time breaches only. Only the respective Extraction / Preparation and/or Analysis component is/are displayed.

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

Outliers : Frequency of Quality Control Samples

The following report highlights breaches in the Frequency of Quality Control Samples.

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

Environmental Division

QUALITY CONTROL REPORT

Work Order	: **ES1302531**	Page	: 1 of 7
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: s22	Contact	: Client Services
Address	: LEVEL 11, 44 MARKET STREET SYDNEY NSW 1230	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: s22 @aecom.com	E-mail	: sydney@alsglobal.com
Telephone	: 02 8295 3600	Telephone	: +61-2-8784 8555
Facsimile	: 03 9262 5060	Facsimile	: +61-2-8784 8500
Project	: 60221935_1 82 MOOREBANK	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 29-APR-2013
Sampler	: s22	Issue Date	: 30-APR-2013
Order number	: ----		
		No. of samples received	: 4
Quote number	: EN/004/12	No. of samples analysed	: 4

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

This Quality Control Report contains the following information:

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

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
s22	Senior Inorganic Chemist	Sydney Inorganics
s22	Laboratory Manager - Organics	Sydney Organics
s22	Laboratory Manager - Organics	Sydney Organics
s22	Inorganics Coordinator	Sydney Inorganics

General Comments

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

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

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

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

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EA0FF: Moisture Content)QC Lot: 87487FFB									
ES1309674-005	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	14.9	14.9	0.0	0% - 50%
ES1309731-004	SP103-4	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	18.4	21.1	13.8	0% - 20%
EP05F)SIMb: Polynu(lear Aromati(Hydro(ar9ons)QC Lot: 87482FFB									
ES1309731-004	SP103-4	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Sum of polycyclic aroma ic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (WHO)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP070/051: Total Petroleum Hydro(ar9ons)QC Lot: 8748234B									
ES1309731-003	SP103-3	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP070/051: Total Petroleum Hydro(ar9ons)QC Lot: 87482F4B									
ES1309731-004	SP103-4	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP070/051: Total Re(overa9le Hydro(ar9ons - NEPM 8010 Draft)QC Lot: 8748234B									
ES1309731-003	SP103-3	EP080: C6 - C10 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP070/051: Total Re(overa9le Hydro(ar9ons - NEPM 8010 Draft)QC Lot: 87482F4B									
ES1309731-004	SP103-4	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP070: bTEXN)QC Lot: 8748234B									

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 (%)*
EP070: bTEXN)QC Lot: 8748234B - (ontinued									
ES1309731-003	SP103-3	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit

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

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

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP05F)SIMb : Polynu(lear Aromati(Hydro(ar9ons)QCLot: 87482FFB								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	4 mg/kg	110	81.9	113
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	4 mg/kg	98.5	79.6	113
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	4 mg/kg	93.4	81.5	112
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	4 mg/kg	92.8	79.9	112
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	4 mg/kg	101	79.4	114
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	4 mg/kg	103	81.1	112
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	4 mg/kg	103	78.8	113
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	4 mg/kg	104	78.9	113
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	4 mg/kg	103	77.2	112
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	4 mg/kg	102	79.8	114
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	4 mg/kg	106	71.8	118
EP075(SIM): Benzo(k)fluoran hene	207-08-9	0.5	mg/kg	<0.5	4 mg/kg	101	74.2	117
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	4 mg/kg	94.7	76.4	113
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	4 mg/kg	89.8	71	113
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	4 mg/kg	84.2	71.7	113
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	4 mg/kg	109	72.4	114
EP070/051: Total Petroleum Hydro(ar9ons)QCLot: 8748234B								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	118	68.4	128
EP070/051: Total Petroleum Hydro(ar9ons)QCLot: 87482F4B								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	200 mg/kg	112	59	131
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	300 mg/kg	116	74	138
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	200 mg/kg	98.9	63	131
EP070/051: Total Re(overa9le Hydro(ar9ons - NEPM 8010 Draft)QCLot: 8748234B								
EP080: C6 - C10 Fraction	----	10	mg/kg	<10	31 mg/kg	110	68.4	128
EP070/051: Total Re(overa9le Hydro(ar9ons - NEPM 8010 Draft)QCLot: 87482F4B								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	250 mg/kg	108	59	131
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	350 mg/kg	114	74	138
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	----	----	----	----
		50	mg/kg	----	150 mg/kg	65.2	63	131
EP070: bTEXN)QCLot: 8748234B								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	110	62	120
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	98.1	62	128
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	86.6	58	118

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EP070: bTEXN)QCLot: 8748234B - (ontinued								
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	81.7	60	120
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	85.9	60	120
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	73.6	62	138

Matrix Spike (MS) Report

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

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Recovery Limits (%): Low	Recovery Limits (%): High
EP05F)SIMb : Polynu(lear Aromati(Hydro(ar9ons)QCLot: 87482FFB							
ES1309731-004	SP103-4	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	93.9	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	97.6	70	130
EP070/051: Total Petroleum Hydro(ar9ons)QCLot: 8748234B							
ES1309731-003	SP103-3	EP080: C6 - C9 Fraction	----	32.5 mg/kg	126	70	130
EP070/051: Total Petroleum Hydro(ar9ons)QCLot: 87482F4B							
ES1309731-004	SP103-4	EP071: C10 - C14 Fraction	----	640 mg/kg	99.0	73	137
		EP071: C15 - C28 Fraction	----	3140 mg/kg	120	53	131
		EP071: C29 - C36 Fraction	----	2860 mg/kg	97.2	52	132
EP070/051: Total Re(overa9le Hydro(ar9ons - NEPM 8010 Draft)QCLot: 8748234B							
ES1309731-003	SP103-3	EP080: C6 - C10 Fraction	----	37.5 mg/kg	122	70	130
EP070/051: Total Re(overa9le Hydro(ar9ons - NEPM 8010 Draft)QCLot: 87482F4B							
ES1309731-004	SP103-4	EP071: >C10 - C16 Fraction	----	850 mg/kg	122	73	137
		EP071: >C16 - C34 Fraction	----	4800 mg/kg	124	53	131
		EP071: >C34 - C40 Fraction	----	2400 mg/kg	56.3	52	132
EP070: bTEXN)QCLot: 8748234B							
ES1309731-003	SP103-3	EP080: Benzene	71-43-2	2.5 mg/kg	92.2	70	130
		EP080: Toluene	108-88-3	2.5 mg/kg	110	70	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	103	70	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	101	70	130
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	101	70	130
		EP080: Naphthalene	91-20-3	2.5 mg/kg	82.9	70	130

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

The quality control term Matrix Spike (MS) and Matrix Spike Duplicate (MSD) refers to intralaboratory split samples spiked with a representa ive set of target analytes. The purpose of these QC parameters are to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	MSD	Low	High	Value	Control Limit
EP070/051: Total Petroleum Hydro(ar9ons)QCLot: 8748234B										
ES1309731-003	SP103-3	EP080: C6 - C9 Fraction	----	32.5 mg/kg	126	----	70	130	----	----
EP070/051: Total Re(overa9le Hydro(ar9ons - NEPM 8010 Draft)QCLot: 8748234B										
ES1309731-003	SP103-3	EP080: C6 - C10 Fraction	----	37.5 mg/kg	122	----	70	130	----	----
EP070: bTEXN)QCLot: 8748234B										
ES1309731-003	SP103-3	EP080: Benzene	71-43-2	2.5 mg/kg	92.2	----	70	130	----	----
		EP080: Toluene	108-88-3	2.5 mg/kg	110	----	70	130	----	----
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	103	----	70	130	----	----
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	101	----	70	130	----	----
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	101	----	70	130	----	----
		EP080: Naphthalene	91-20-3	2.5 mg/kg	82.9	----	70	130	----	----
EP070/051: Total Petroleum Hydro(ar9ons)QCLot: 87482F4B										
ES1309731-004	SP103-4	EP071: C10 - C14 Fraction	----	640 mg/kg	99.0	----	73	137	----	----
		EP071: C15 - C28 Fraction	----	3140 mg/kg	120	----	53	131	----	----
		EP071: C29 - C36 Fraction	----	2860 mg/kg	97.2	----	52	132	----	----
EP070/051: Total Re(overa9le Hydro(ar9ons - NEPM 8010 Draft)QCLot: 87482F4B										
ES1309731-004	SP103-4	EP071: >C10 - C16 Fraction	----	850 mg/kg	122	----	73	137	----	----
		EP071: >C16 - C34 Fraction	----	4800 mg/kg	124	----	53	131	----	----
		EP071: >C34 - C40 Fraction	----	2400 mg/kg	56.3	----	52	132	----	----
EP05F)SIMb: Polynu(lear Aromati(Hydro(ar9ons)QCLot: 87482FFB										
ES1309731-004	SP103-4	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	93.9	----	70	130	----	----
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	97.6	----	70	130	----	----

Environmental Division

CERTIFICATE OF ANALYSIS

Work Order	: **ES1302531**	Page	: 1 of 5
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: s22	Contact	: Client Services
Address	: LEVEL 11, 44 MARKET STREET SYDNEY NSW 1230	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: s22 @aecom.com	E-mail	: sydney@alsglobal.com
Telephone	: 02 8295 3600	Telephone	: +61-2-8784 8555
Facsimile	: 03 9262 5060	Facsimile	: +61-2-8784 8500
Project	: 60221935_1 82 MOOREBANK	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: ----		
C-O-C number	: ----	Date Samples Received	: 29-APR-2013
Sampler	: s22	Issue Date	: 30-APR-2013
Site	: ----		
		No. of samples received	: 4
Quote number	: EN/004/12	No. of samples analysed	: 4

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
s22	Senior Inorganic Chemist	Sydney Inorganics
s22	Laboratory Manager - Organics	Sydney Organics
s22	Laboratory Manager - Organics	Sydney Organics
s22	Inorganics Coordinator	Sydney Inorganics

General Comments

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

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

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

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

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

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of he American Chemical Society.
LOR = Limit of reporting
f = This result is computed from individual analyte detections at or above the level of reporting

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	SP103-1	SP103-2	SP103-3	SP103-4	----
			Client sampling date / time	29-APR-2013 11:30	29-APR-2013 11:30	29-APR-2013 11:30	29-APR-2013 11:30	----
Compound	CAS Number	LOR	Unit	ES1309731-001	ES1309731-002	ES1309731-003	ES1309731-004	---
EA055: Moisture Content								
Moisture Content (dried @ 103°C)	---	1.0	%	27.7	47.3	15.7	18.4	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<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	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<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	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<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	----
^ Sum of polycyclic aromatic hydrocarbons	---	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Benzo(a)pyrene TEQ (WHO)	---	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	---	10	mg/kg	<10	<10	<10	<10	----
C10 - C14 Fraction	---	50	mg/kg	200	<50	<50	<50	----
C15 - C28 Fraction	---	100	mg/kg	2770	11100	860	<100	----
C29 - C36 Fraction	---	100	mg/kg	2310	8160	740	<100	----
^ C10 - C36 Fraction (sum)	---	50	mg/kg	5280	19300	1600	<50	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft								
C6 - C10 Fraction	---	10	mg/kg	12	<10	<10	<10	----
^ C6 - C10 Fraction minus BTEX (F1)	---	10	mg/kg	12	<10	<10	<10	----
>C10 - C16 Fraction	---	50	mg/kg	300	210	<50	<50	----
>C16 - C34 Fraction	---	100	mg/kg	4430	17700	1450	<100	----
>C34 - C40 Fraction	---	100	mg/kg	1600	4060	410	<100	----
^ >C10 - C40 Fraction (sum)	---	50	mg/kg	6330	22000	1860	<50	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	SP103-1	SP103-2	SP103-3	SP103-4	----
			Client sampling date / time	29-APR-2013 11:30	29-APR-2013 11:30	29-APR-2013 11:30	29-APR-2013 11:30	----
Compound	CAS Number	LOR	Unit	ES1309731-001	ES1309731-002	ES1309731-003	ES1309731-004	---
EP080: BTEX								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	----
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Ethylbenzene	100-41-4	0.5	mg/kg	<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	----
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
EP080: BTEXN								
^ Sum of BTEX	---	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	----
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	83.7	83.7	80.3	83.7	----
2-Chlorophenol-D4	93951-73-6	0.1	%	80.2	87.3	83.1	87.5	----
2.4.6-Tribromophenol	118-79-6	0.1	%	103	90.0	101	102	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	99.2	103	98.8	102	----
Anthracene-d10	1719-06-8	0.1	%	89.3	91.6	89.7	93.3	----
4-Terphenyl-d14	1718-51-0	0.1	%	94.2	102	92.3	96.2	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	84.6	74.7	94.4	90.0	----
Toluene-D8	2037-26-5	0.1	%	93.8	76.8	115	104	----
4-Bromofluorobenzene	460-00-4	0.1	%	85.8	77.7	104	94.9	----

Surrogate Control Limits

Sub-Matrix: **SOIL**

Compound	CAS Number	Recovery Limits (%) Low	Recovery Limits (%) High
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	63	127
2-Chlorophenol-D4	93951-73-6	64	126
2.4.6-Tribromophenol	118-79-6	36	136
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	64	130
Anthracene-d10	1719-06-8	69	135
4-Terphenyl-d14	1718-51-0	64	136
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	72.8	133.2
Toluene-D8	2037-26-5	73.9	132.1
4-Bromofluorobenzene	460-00-4	71.6	130.0

AECOM

Chain of Custody

AECOM Australia Pty Ltd
Level 21, 420 George Street
Sydney, NSW, 2000
PO Box Q410, QVB PO, Sydney, NSW, 1230
T +61 2 8934 0000
F +61 2 8934 0001

Laboratory Details
Lab. Name: ALS Environmental
Address: 277-289 Woodpark
Smithfield, NSW, 2164
61 2 8784 8555
Fax: 61 2 8784 8500
Lab Quote No: EN-004-12

Sampled By: s22
AECOM Project No: 60221935
Project Name: Moorebank

Specifications
Turnaround time required: 24 hr
Special storage requirements?
Report Format: Email s22 @aecom.com, s22 @aecom.com

Lab. ID	Sample ID	Sampling Date	Matrix: soil	Matrix: water	Matrix: other	Preservation: filtered	Preservation: acid	Preservation: ice	Container	Analysis: PAH	Analysis: PAH (TCLP)
1	SP102-1	16/04/13	X					X	Jar	X	
2	SP102-2	16/04/13	X					X		X	
3	SP102-3	16/04/13	X					X		X	
4	SP102-4	16/04/13	X					X		X	
5	SP102-5	16/04/13	X					X		X	
6	SP102-6	16/04/13	X					X		X	
7	SP102-7	16/04/13	X					X		X	

TAT

Environmental Division
Sydney
Work Order
ES1308793
Telephone : +61-2-8784 8555

Comments:

Relinquished by: s22 (AECOM) s22 Signed: Date/Time: 16/04/2013

Recieved by: s22 ALS s22 Signed: Date/Time: 16-4-13 1520

Environmental Division

SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive Report

Work Order	: **ES1308793**		
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: s22	Contact	: s22
Address	: LEVEL 11, 44 MARKET STREET SYDNEY NSW 1230	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: s22 @aecom.com	E-mail	: s22 @alsglobal.com
Telephone	: 02 8264 5100	Telephone	: +61 2 8784 8555
Facsimile	: 02 8264 5111	Facsimile	: +61 2 8784 8555
Project	: 60221935 MOOREBANK	Page	: 1 of 2
Order number	: ----		
C-O-C number	: ----	Quote number	: ES2012HLAENV0454 (EN/004/12)
Site	: ----		
Sampler	: s22	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement

Dates

Date Samples Received	: 16-APR-2013	Issue Date	: 17-APR-2013 13:05
Client Requested Due Date	: 17-APR-2013	Scheduled Reporting Date	: **17-APR-2013**

Delivery Details

Mode of Delivery	: Carrier	Temperature	: 20.1'C
No. of coolers/boxes	: 1 HARD	No. of samples received	: 7
Security Seal	: Intact.	No. of samples analysed	: 7

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
- **Samples received in appropriately pretreated and preserved containers.**
- **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 QC20 sent to Envirolab as requested**
- 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 (14 days), Solid (60 days) from date of completion of work order.

Sample Container(s)/Preservation Non-Compliances

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

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

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process neccessary 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 to 15:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory for processing purposes and will be shown bracketed without a time component.

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	SOIL - EA055-103 Moisture Content	SOIL - EP075 SIM PAH only SIM - PAH only
ES1308793-001	16-APR-2013 15:00	SP102-1	✓	✓
ES1308793-002	16-APR-2013 15:00	SP102-2	✓	✓
ES1308793-003	16-APR-2013 15:00	SP102-3	✓	✓
ES1308793-004	16-APR-2013 15:00	SP102-4	✓	✓
ES1308793-005	16-APR-2013 15:00	SP102-5	✓	✓
ES1308793-006	16-APR-2013 15:00	SP102-6	✓	✓
ES1308793-007	16-APR-2013 15:00	SP102-7	✓	✓

Proactive Holding Time Report

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

Requested Deliverables

s22

- *AU Certificate of Analysis - NATA	Email	s22	@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep)	Email		@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA	Email		@aecom.com
- A4 - AU Sample Receipt Notification - Environmental HT	Email		@aecom.com
- A4 - AU Tax Invoice	Email		@aecom.com
- Chain of Custody (CoC)	Email		@aecom.com
- EDI Format - ENMRG	Email		@aecom.com
- EDI Format - ESDAT	Email		@aecom.com
- EDI Format - HLAPro	Email		@aecom.com
- EDI Format - XTab	Email		@aecom.com

s22

- *AU Certificate of Analysis - NATA (COA)	Email	s22	@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email		@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email		@aecom.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email		@aecom.com
- A4 - AU Tax Invoice (INV)	Email		@aecom.com
- Chain of Custody (CoC) (COC)	Email		@aecom.com
- EDI Format - ENMRG (ENMRG)	Email		@aecom.com
- EDI Format - ESDAT (ESDAT)	Email		@aecom.com
- EDI Format - HLAPro (HLAPro)	Email		@aecom.com
- EDI Format - XTab (XTAB)	Email		@aecom.com

Environmental Division

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **ES1308793**	Page	: 1 of 5
Client	: AECOM Australia Pty Ltd	Laboratory	: Environmental Division Sydney
Contact	: s22	Contact	: s22
Address	: LEVEL 11, 44 MARKET STREET SYDNEY NSW 1230	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: s22 @aecom.com	E-mail	: s22 @alsglobal.com
Telephone	: 02 8264 5100	Telephone	: +61 2 8784 8555
Facsimile	: 02 8264 5111	Facsimile	: +61 2 8784 8555
Project	: 60221935 MOOREBANK	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 16-APR-2013
Sampler	: s22	Issue Date	: 17-APR-2013
Order number	: ----		
		No. of samples received	: 7
Quote number	: EN/004/12	No. of samples analysed	: 7

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

This Interpretive Quality Control Report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Parameter Frequency Compliance
- Brief Method Summaries
- Summary of Outliers

Analysis Holding Time Compliance

The following report summarises extraction / preparation and analysis times and compares with recommended holding times. Dates reported represent first date of extraction or analysis and precludes subsequent dilutions and reruns. Information is also provided re the sample container (preservative) from which the analysis aliquot was taken. Elapsed period to analysis represents number of days from sampling where no extraction / digestion is involved or period from extraction / digestion where this is present. For composite samples, sampling date is assumed to be that of the oldest sample contributing to the composite. Sample date for laboratory produced leachates is assumed as the completion date of the leaching process. Outliers for holding time are based on USEPA SW 846, APHA, AS and NEPM (1999). A listing of breaches is provided in the Summary of Outliers.

Holding times for leachate methods (excluding elutriates) vary according to the analytes being determined on the resulting solution. For non-volatile analytes, the holding time compliance assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These soil holding times are: Organics (14 days); Mercury (28 days) & other metals (180 days). A recorded breach therefore does not guarantee a breach for all non-volatile parameters.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content							
Soil Glass Jar - Unpreserved (EA055-103)							
SP102-1, SP102-2, SP102-3, SP102-4, SP102-5, SP102-6, SP102-7	**16-APR-2013**	**----**	----	----	**16-APR-2013**	30-APR-2013	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved (EP075(SIM))							
SP102-1, SP102-2, SP102-3, SP102-4, SP102-5, SP102-6, SP102-7	**16-APR-2013**	**16-APR-2013**	30-APR-2013	✓	**16-APR-2013**	26-MAY-2013	✓

Quality Control Parameter Frequency Compliance

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

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055-103	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	1	7	**14.3**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)	EP075(SIM)	1	7	**14.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
PAH/Phenols (SIM)	EP075(SIM)	1	7	**14.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	1	7	**14.3**	**5.0**	✓	ALS QCS3 requirement

Brief Method Summaries

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

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055-103	SOIL	A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (2010 Draft) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
PAH/Phenols (SIM)	EP075(SIM)	SOIL	(USEPA SW 846 - 8270B) 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 (1999) Schedule B(3) (Method 502 and 507)

Preparation Methods	Method	Matrix	Method Descriptions
Tumbler Extraction of Solids (Option B - Non-concentrating)	ORG17B	SOIL	In-house, Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 20mL 1:1 DCM/Acetone by end over end tumble. The solvent is transferred directly to a GC vial for analysis.

Summary of Outliers

Outliers : Quality Control Samples

The following report highlights outliers flagged in the Quality Control (QC) Report. Surrogate recovery limits are static and based on USEPA SW 846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). This report displays QC Outliers (breaches) only.

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

- **For all matrices, no Method Blank value outliers occur.**
- **For all matrices, no Duplicate outliers occur.**
- **For all matrices, no Laboratory Control outliers occur.**
- **For all matrices, no Matrix Spike outliers occur.**

Regular Sample Surrogates

- **For all regular sample matrices, no surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

This report displays Holding Time breaches only. Only the respective Extraction / Preparation and/or Analysis component is/are displayed.

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

Outliers : Frequency of Quality Control Samples

The following report highlights breaches in the Frequency of Quality Control Samples.

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

Environmental Division

QUALITY CONTROL REPORT

Work Order	: **ES1308793**	Page	: 1 of 5
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: s22	Contact	: s22
Address	: LEVEL 11, 44 MARKET STREET SYDNEY NSW 1230	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: s22 @aecom.com	E-mail	: s22 @alsglobal.com
Telephone	: 02 8264 5100	Telephone	: +61 2 8784 8555
Facsimile	: 02 8264 5111	Facsimile	: +61 2 8784 8555
Project	: 60221935 MOOREBANK	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 16-APR-2013
Sampler	: s22	Issue Date	: 17-APR-2013
Order number	: ----		
		No. of samples received	: 7
Quote number	: EN/004/12	No. of samples analysed	: 7

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

This Quality Control Report contains the following information:

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

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
s22	Organic Coordinator	Sydney Inorganics
s22	Organic Coordinator	Sydney Organics

General Comments

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

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

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

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

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EA055: Moisture Content (QC Lot: 2823927)									
ES1308338-001	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	7.7	7.1	7.8	No Limit
ES1308793-007	SP102-7	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	13.8	14.0	1.8	0% - 50%
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 2823574)									
ES1308793-001	SP102-1	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	1.4	1.2	8.2	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	3.2	3.7	14.5	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	2.9	2.7	4.6	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	1.1	1.3	18.8	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	0.9	1.0	12.3	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	1.3	1.5	9.2	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	0.5	0.6	19.6	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	1.1	1.3	13.9	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	0.6	0.7	0.0	No Limit
		EP075(SIM): Sum of polycyclic aroma ic hydrocarbons	----	0.5	mg/kg	13.5	14.5	7.1	0% - 20%
		EP075(SIM): Benzo(a)pyrene TEQ (WHO)	----	0.5	mg/kg	1.4	1.6	13.0	No Limit

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

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

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2823574)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	4 mg/kg	84.2	81.9	113
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	4 mg/kg	85.9	79.6	113
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	4 mg/kg	84.9	81.5	112
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	4 mg/kg	82.6	79.9	112
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	4 mg/kg	88.8	79.4	114
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	4 mg/kg	90.3	81.1	112
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	4 mg/kg	88.5	78.8	113
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	4 mg/kg	88.6	78.9	113
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	4 mg/kg	93.4	77.2	112
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	4 mg/kg	96.4	79.8	114
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	4 mg/kg	85.4	71.8	118
EP075(SIM): Benzo(k)fluoran hene	207-08-9	0.5	mg/kg	<0.5	4 mg/kg	91.2	74.2	117
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	4 mg/kg	92.9	76.4	113
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	4 mg/kg	90.5	71	113
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	4 mg/kg	97.0	71.7	113
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	4 mg/kg	93.4	72.4	114

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
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2823574)							
ES1308793-001	SP102-1	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	91.6	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	79.1	70	130

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

The quality control term Matrix Spike (MS) and Matrix Spike Duplicate (MSD) refers to intralaboratory split samples spiked with a representa ive set of target analytes. The purpose of these QC parameters are to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	MSD	Low	High	Value	Control Limit

Sub-Matrix: **SOIL**

				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	MSD	Low	High	Value	Control Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2823574)										
ES1308793-001	SP102-1	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	91.6	----	70	130	----	----
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	79.1	----	70	130	----	----

Environmental Division

CERTIFICATE OF ANALYSIS

Work Order	: **ES1308793**	Page	: 1 of 5
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: s22	Contact	: s22
Address	: LEVEL 11, 44 MARKET STREET SYDNEY NSW 1230	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: s22 @aecom.com	E-mail	s22 @alsglobal.com
Telephone	: 02 8264 5100	Telephone	: +61 2 8784 8555
Facsimile	: 02 8264 5111	Facsimile	: +61 2 8784 8555
Project	: 60221935 MOOREBANK	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: ---		
C-O-C number	: ---	Date Samples Received	: 16-APR-2013
Sampler	: s22	Issue Date	: 17-APR-2013
Site	: ---		
		No. of samples received	: 7
Quote number	: EN/004/12	No. of samples analysed	: 7

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
s22	Organic Coordinator	Sydney Inorganics
s22	Organic Coordinator	Sydney Organics

General Comments

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

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

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

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

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

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	SP102-1	SP102-2	SP102-3	SP102-4	SP102-5
			Client sampling date / time	16-APR-2013 15:00	16-APR-2013 15:00	16-APR-2013 15:00	16-APR-2013 15:00	16-APR-2013 15:00
Compound	CAS Number	LOR	Unit	ES1308793-001	ES1308793-002	ES1308793-003	ES1308793-004	ES1308793-005
EA055: Moisture Content								
Moisture Content (dried @ 103°C)	---	1.0	%	19.1	15.0	16.5	10.5	10.0
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	2.0	0.5
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	1.0	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	0.7	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	1.4	2.2	2.6	17.6	4.7
Anthracene	120-12-7	0.5	mg/kg	<0.5	0.7	0.8	5.4	1.5
Fluoranthene	206-44-0	0.5	mg/kg	3.2	5.5	6.5	42.8	11.2
Pyrene	129-00-0	0.5	mg/kg	2.9	5.0	6.8	38.3	9.7
Benz(a)anthracene	56-55-3	0.5	mg/kg	1.1	1.9	2.5	15.9	3.7
Chrysene	218-01-9	0.5	mg/kg	0.9	1.5	2.0	12.7	3.1
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	1.3	2.5	3.0	20.2	4.2
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	0.5	1.1	1.4	7.3	1.9
Benzo(a)pyrene	50-32-8	0.5	mg/kg	1.1	1.8	2.6	15.8	3.6
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	0.5	0.7	1.0	6.9	1.6
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	1.4	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	0.6	0.8	1.2	8.2	1.8
^ Sum of polycyclic aromatic hydrocarbons	---	0.5	mg/kg	13.5	23.7	30.4	196	47.5
Benzo(a)pyrene TEQ (WHO)	---	0.5	mg/kg	1.4	2.4	3.4	22.4	4.8
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	94.0	80.1	84.4	82.9	81.0
2-Chlorophenol-D4	93951-73-6	0.1	%	84.6	82.6	84.4	85.3	81.8
2.4.6-Tribromophenol	118-79-6	0.1	%	105	98.5	105	112	113
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	88.2	88.4	93.0	90.6	93.6
Anthracene-d10	1719-06-8	0.1	%	86.0	82.2	86.6	84.5	83.0
4-Terphenyl-d14	1718-51-0	0.1	%	95.6	101	92.9	93.8	94.6

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	SP102-6	SP102-7	----	----	----
			Client sampling date / time	16-APR-2013 15:00	16-APR-2013 15:00	----	----	----
Compound	CAS Number	LOR	Unit	ES1308793-006	ES1308793-007	----	----	----
EA055: Moisture Content								
Moisture Content (dried @ 103°C)	----	1.0	%	14.0	13.8	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	----	----	----
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	0.6	----	----	----
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	----	----	----
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg	3.2	3.7	----	----	----
Anthracene	120-12-7	0.5	mg/kg	1.1	1.4	----	----	----
Fluoranthene	206-44-0	0.5	mg/kg	7.4	10.1	----	----	----
Pyrene	129-00-0	0.5	mg/kg	6.6	9.3	----	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	2.6	3.8	----	----	----
Chrysene	218-01-9	0.5	mg/kg	2.1	3.1	----	----	----
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	3.3	5.4	----	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	1.3	2.0	----	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	2.7	4.6	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	1.2	2.0	----	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	----	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	1.4	2.4	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	32.9	48.4	----	----	----
Benzo(a)pyrene TEQ (WHO)	----	0.5	mg/kg	3.6	6.0	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	85.0	86.8	----	----	----
2-Chlorophenol-D4	93951-73-6	0.1	%	92.7	92.7	----	----	----
2.4.6-Tribromophenol	118-79-6	0.1	%	115	112	----	----	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	92.9	87.0	----	----	----
Anthracene-d10	1719-06-8	0.1	%	86.3	80.1	----	----	----
4-Terphenyl-d14	1718-51-0	0.1	%	94.0	86.7	----	----	----

Surrogate Control Limits

Sub-Matrix: **SOIL**

Compound	CAS Number	Recovery Limits (%) Low	Recovery Limits (%) High
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	63	127
2-Chlorophenol-D4	93951-73-6	64	126
2.4.6-Tribromophenol	118-79-6	36	136
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	64	130
Anthracene-d10	1719-06-8	69	135
4-Terphenyl-d14	1718-51-0	64	136

Form: 1 of 1 * 48 TAT *

AECOM

Chain of Custody & Analysis Request Form

AECOM - Sydney
Level 21, 420 George Street
Sydney, NSW 2000
Tel: 02 8934 0000
Fax: 02 8934 0001
Email: s22 @aecom.com, s22 @aecom.com

Laboratory Details
Lab. Name:
Lab. Address: ALS - Sydney
Contact Name:
Lab. Ref:
Tel:
Fax:
Preliminary Report by:
Final Report by:
Lab Quote No: EN/004/12

Project Name: Moorebank **Project Number:** 60221935_1.82 **Purchase Order Number:**

Sample collected by: s22 **Sample Results to be returned to:**

Specifications:

	(Tick)		
1. Urgent TAT required? (please circle: 24hr (48hr) ____days) STANDARD	☐ Yes	☐ No	☐ N/A
2. Fast TAT Guarantee Required?	☐ Yes	☐ No	☐ N/A
3. Is any sediment layer present in waters to be excluded from extractions?	☐ Yes	☐ No	☐ N/A
4. Special storage requirements?	☐ Yes	☐ No	☐ N/A
5. Preservation requirements?	☐ Yes	☐ No	☐ N/A
6. Other requirements? ☐ Fax ☐ Hard copy ☑ Email	☐ Yes	☐ No	☐ N/A

7. Report Format: 8. Project Manager: Jonathan Ho tel: 02 8394 0000

Analysis Request — TAT

Lab. ID	Sample ID	Sampling Date	Sampling Time	Matrix: soil	Matrix: water	Matrix: other	Preservation: fit'ed	Preservation: acid	Preservation: ice	Preservation: other	Container (No. & type)	ASBESTOS IN SOIL	TPH C10-C36	PAHs	8 METALS	OCPs	TPH C6-C36	BTEX	OLD	Remarks & comments
1	VSI9-0.7-0.8	26.03.13		X					X		1 x soil jar			X						
2	SP102	26.03.13		X					X		↓			X						
3	QC01	26.03.13		X					X		↓			X						
4	VSI6-0.2-0.3	26.03.13		X					X		1 x bag	X								

Environmental Division
Sydney
Work Order
ES1307104
Telephone : +61-2-8784 8555

Relinquished By: s22
of: AECOM
Date: 26.03.13
Time: AM

Received by: s22
of: ALS
Date: 26-3-13
Time: 1530

Received in good condition?	Yes/No/NA	Method of Shipment	☐ Courier ☐ Postal ☐ By Hand
Samples received chilled?	Yes/No/NA	Consignment Note No.	
	Yes/No/NA	Transport Co:	

Relinquished By:
Name: Date:
of: Time:

Received by:
Name: Date:
of: Time:

Received in good condition?	Yes/No/NA	Method of Shipment	☐ Courier ☐ Postal ☐ By Hand
Samples received chilled?	Yes/No/NA	Consignment Note No.	
	Yes/No/NA	Transport Co:	

ALS Group

Environmental Division

SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive Report

Work Order : **ES1307104**

Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: s22	Contact	: s22
Address	: LEVEL 11, 44 MARKET STREET SYDNEY NSW 1230	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: s22 @aecom.com	E-mail	: s22 @alsglobal.com
Telephone	: 02 8295 3600	Telephone	: +61 2 8784 8555
Facsimile	: 03 9262 5060	Facsimile	: +61 2 8784 8555
Project	: 60221935_1 82 MOOREBANK	Page	: 1 of 2
Order number	: ---		
C-O-C number	: ---	Quote number	: ES2012HLAENV0454 (EN/004/12)
Site	: ---		
Sampler	: s22	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement

Dates

Date Samples Received	: 26-MAR-2013	Issue Date	: 28-MAR-2013 16:28
Client Requested Due Date	: 28-MAR-2013	Scheduled Reporting Date	: **28-MAR-2013**

Delivery Details

Mode of Delivery	: Carrier	Temperature	: 2.2'C - Ice present
No. of coolers/boxes	: 1 HARD	No. of samples received	: 4
Security Seal	: Intact.	No. of samples analysed	: 3

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
- Samples received in appropriately pretreated and preserved containers.
- Asbestos analysis will be subcontracted to ASET.
- **Samples received in appropriately pretreated and preserved containers.**
- **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.**
- 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 (14 days), Solid (60 days) from date of completion of work order.

Sample Container(s)/Preservation Non-Compliances

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

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

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process neccessary 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 to 15:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory for processing purposes and will be shown bracketed without a time component.

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	SOIL - ASB-SOL (Subcontracted) Asbestos - Count (Solid)	SOIL - EA055-103 Moisture Content	SOIL - EP075 SIM PAH only SIM - PAH only
ES1307104-001	26-MAR-2013 15:00	VS19_0.7-0.8		✓	✓
ES1307104-002	26-MAR-2013 15:00	SP102		✓	✓
ES1307104-003	26-MAR-2013 15:00	QC01		✓	✓
ES1307104-004	26-MAR-2013 15:00	VS16_0.2-0.3	✓		

Proactive Holding Time Report

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

Requested Deliverables

s22

- *AU Certificate of Analysis - NATA	Email	s22	@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep)	Email		@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA	Email		@aecom.com
- A4 - AU Sample Receipt Notification - Environmental HT	Email		@aecom.com
- Attachment - Report (SUBCO)	Email		@aecom.com
- Chain of Custody (CoC)	Email		@aecom.com
- EDI Format - ENMRG	Email		@aecom.com
- EDI Format - ESDAT	Email		@aecom.com
- EDI Format - HLAPro	Email		@aecom.com
- EDI Format - XTab	Email		@aecom.com

s22

- *AU Certificate of Analysis - NATA (COA)	Email	s22	@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email		@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email		@aecom.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email		@aecom.com
- A4 - AU Tax Invoice (INV)	Email		@aecom.com
- Attachment - Report (SUBCO)	Email		@aecom.com
- Chain of Custody (CoC) (COC)	Email		@aecom.com
- EDI Format - ENMRG (ENMRG)	Email		@aecom.com
- EDI Format - ESDAT (ESDAT)	Email		@aecom.com
- EDI Format - HLAPro (HLAPro)	Email		@aecom.com
- EDI Format - XTab (XTAB)	Email		@aecom.com

Environmental Division

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **ES1307104**	Page	: 1 of 5
Client	: AECOM Australia Pty Ltd	Laboratory	: Environmental Division Sydney
Contact	: s22	Contact	: s22
Address	: LEVEL 11, 44 MARKET STREET SYDNEY NSW 1230	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: s22 @aecom.com	E-mail	: s22 @alsglobal.com
Telephone	: 02 8295 3600	Telephone	: +61 2 8784 8555
Facsimile	: 03 9262 5060	Facsimile	: +61 2 8784 8555
Project	: 60221935_1 82 MOOREBANK	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 26-MAR-2013
Sampler	: s22	Issue Date	: 27-MAR-2013
Order number	: ----		
		No. of samples received	: 4
Quote number	: EN/004/12	No. of samples analysed	: 3

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

This Interpretive Quality Control Report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Parameter Frequency Compliance
- Brief Method Summaries
- Summary of Outliers

Analysis Holding Time Compliance

The following report summarises extraction / preparation and analysis times and compares with recommended holding times. Dates reported represent first date of extraction or analysis and precludes subsequent dilutions and reruns. Information is also provided re the sample container (preservative) from which the analysis aliquot was taken. Elapsed period to analysis represents number of days from sampling where no extraction / digestion is involved or period from extraction / digestion where this is present. For composite samples, sampling date is assumed to be that of the oldest sample contributing to the composite. Sample date for laboratory produced leachates is assumed as the completion date of the leaching process. Outliers for holding time are based on USEPA SW 846, APHA, AS and NEPM (1999). A listing of breaches is provided in the Summary of Outliers.

Holding times for leachate methods (excluding elutriates) vary according to the analytes being determined on the resulting solution. For non-volatile analytes, the holding time compliance assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These soil holding times are: Organics (14 days); Mercury (28 days) & other metals (180 days). A recorded breach therefore does not guarantee a breach for all non-volatile parameters.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content								
Soil Glass Jar - Unpreserved (EA055-103)								
VS19_0.7-0.8, QC01	SP102,	**26-MAR-2013**	**----**	----	----	**26-MAR-2013**	09-APR-2013	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Soil Glass Jar - Unpreserved (EP075(SIM))								
VS19_0.7-0.8, QC01	SP102,	**26-MAR-2013**	**26-MAR-2013**	09-APR-2013	✓	**26-MAR-2013**	05-MAY-2013	✓

Quality Control Parameter Frequency Compliance

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

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055-103	1	12	**8.3**	**10.0**	×	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	1	4	**25.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)	EP075(SIM)	1	4	**25.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
PAH/Phenols (SIM)	EP075(SIM)	1	4	**25.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	1	4	**25.0**	**5.0**	✓	ALS QCS3 requirement

Brief Method Summaries

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

Analytical Methods	Method	Matrix	Method Descriptions
Asbestos - Count (Solid)	ASB-SOL	SOIL	Asbestos Count on solid matrices using PLM conducted by Subcontracting Laboratory
Moisture Content	EA055-103	SOIL	A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (2010 Draft) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
PAH/Phenols (SIM)	EP075(SIM)	SOIL	(USEPA SW 846 - 8270B) 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 (1999) Schedule B(3) (Method 502 and 507)

Preparation Methods	Method	Matrix	Method Descriptions
Tumbler Extraction of Solids (Option B - Non-concentrating)	ORG17B	SOIL	In-house, Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 20mL 1:1 DCM/Acetone by end over end tumble. The solvent is transferred directly to a GC vial for analysis.

Summary of Outliers

Outliers : Quality Control Samples

The following report highlights outliers flagged in the Quality Control (QC) Report. Surrogate recovery limits are static and based on USEPA SW 846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). This report displays QC Outliers (breaches) only.

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

- **For all matrices, no Method Blank value outliers occur.**
- **For all matrices, no Duplicate outliers occur.**
- **For all matrices, no Laboratory Control outliers occur.**
- **For all matrices, no Matrix Spike outliers occur.**

Regular Sample Surrogates

- **For all regular sample matrices, no surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

This report displays Holding Time breaches only. Only the respective Extraction / Preparation and/or Analysis component is/are displayed.

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

Outliers : Frequency of Quality Control Samples

The following report highlights breaches in the Frequency of Quality Control Samples.

Matrix: **SOIL**

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
Method	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
Moisture Content	1	12	8.3	10.0	NEPM 1999 Schedule B(3) and ALS QCS3 requirement

Environmental Division

QUALITY CONTROL REPORT

Work Order	: **ES1308107**	Page	: 1 of 5
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: s22	Contact	: s22
Address	: LEVEL 11, 44 MARKET STREET SYDNEY NSW 1230	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: s22 @aecom.com	E-mail	: s22 @alsglobal.com
Telephone	: 02 8295 3600	Telephone	: +61 2 8784 8555
Facsimile	: 03 9262 5060	Facsimile	: +61 2 8784 8555
Project	: 60221935_1 82 MOOREBANK	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 26-MAR-2013
Sampler	: s22	Issue Date	: 27-MAR-2013
Order number	: ----		
		No. of samples received	: 4
Quote number	: EN/004/12	No. of samples analysed	: 3

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

This Quality Control Report contains the following information:

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

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
s22	Senior Organic Chemist	Sydney Inorganics
s22	Senior Organic Chemist	Sydney Organics

General Comments

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

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

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

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

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EA044: 9 oistMre Content cQC Lot: - 8(322( )									
ES1305941-003	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	10.7	12.1	12.0	0% - 50%
EP084cSI9)B: PolunMFlear AromatiF | udroFarbons cQC Lot: - 8(3201)									
ES1307145-001	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	0.8	0.8	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	1.8	1.6	9.5	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	1.7	1.6	7.8	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	1.0	0.9	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	0.9	0.8	11.6	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	1.1	1.0	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	0.7	0.6	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Sum of polycyclic aroma ic hydrocarbons	----	0.5	mg/kg	8.0	7.3	9.2	0% - 50%
		EP075(SIM): Benzo(a)pyrene TEQ (WHO)	----	0.5	mg/kg	0.9	0.8	14.1	No Limit

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

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

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP084cSl9)B: PolunMFlear AromatiF | udroFarbons cQCLot: - 8(3201)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	4 mg/kg	91.0	81.9	113
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	4 mg/kg	88.9	79.6	113
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	4 mg/kg	91.9	81.5	112
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	4 mg/kg	91.3	79.9	112
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	4 mg/kg	92.2	79.4	114
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	4 mg/kg	92.4	81.1	112
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	4 mg/kg	91.6	78.8	113
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	4 mg/kg	91.3	78.9	113
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	4 mg/kg	98.8	77.2	112
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	4 mg/kg	100	79.8	114
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	4 mg/kg	84.5	71.8	118
EP075(SIM): Benzo(k)fluoran hene	207-08-9	0.5	mg/kg	<0.5	4 mg/kg	88.6	74.2	117
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	4 mg/kg	99.4	76.4	113
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	4 mg/kg	89.0	71	113
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	4 mg/kg	97.7	71.7	113
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	4 mg/kg	89.8	72.4	114

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
EP084cSl9)B: PolunMFlear AromatiF | udroFarbons cQCLot: - 8(3201)							
ES1307145-001	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	89.2	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	94.1	70	130

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

The quality control term Matrix Spike (MS) and Matrix Spike Duplicate (MSD) refers to intralaboratory split samples spiked with a representa ive set of target analytes. The purpose of these QC parameters are to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	MSD	Low	High	Value	Control Limit

Sub-Matrix: **SOIL**

				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	MSD	Low	High	Value	Control Limit
EP084cSI9)B: PolunMFlear AromatiF | udroFarbons cQCLot: - 8(3201)										
ES1307145-001	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	89.2	----	70	130	----	----
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	94.1	----	70	130	----	----

Environmental Division

CERTIFICATE OF ANALYSIS

Work Order	: **ES1307104**	Page	: 1 of 4
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: s22	Contact	: s22
Address	: LEVEL 11, 44 MARKET STREET SYDNEY NSW 1230	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: s22 @aecom.com	E-mail	: s22 @alsglobal.com
Telephone	: 02 8295 3600	Telephone	: +61 2 8784 8555
Facsimile	: 03 9262 5060	Facsimile	: +61 2 8784 8555
Project	: 60221935_1 82 MOOREBANK	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: ----		
C-O-C number	: ----	Date Samples Received	: 26-MAR-2013
Sampler	: s22	Issue Date	: 27-MAR-2013
Site	: ----		
		No. of samples received	: 4
Quote number	: EN/004/12	No. of samples analysed	: 3

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
s22	Senior Organic Chemist	Sydney Inorganics
s22	Senior Organic Chemist	Sydney Organics

General Comments

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

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

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

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

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

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	VS19_0.7-0.8	SP102	QC01	----	----
			Client sampling date / time	26-MAR-2013 15:00	26-MAR-2013 15:00	26-MAR-2013 15:00	----	----
Compound	CAS Number	LOR	Unit	ES1307104-001	ES1307104-002	ES1307104-003	---	---
EA055: Moisture Content								
Moisture Content (dried @ 103°C)	----	1.0	%	12.3	11.0	11.5	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Acenaphthylene	208-96-8	0.5	mg/kg	2.6	0.9	1.2	----	----
Acenaphthene	83-32-9	0.5	mg/kg	1.5	0.8	1.0	----	----
Fluorene	86-73-7	0.5	mg/kg	1.2	0.6	0.7	----	----
Phenanthrene	85-01-8	0.5	mg/kg	19.7	10.3	11.8	----	----
Anthracene	120-12-7	0.5	mg/kg	6.8	3.1	3.8	----	----
Fluoranthene	206-44-0	0.5	mg/kg	46.7	19.9	26.8	----	----
Pyrene	129-00-0	0.5	mg/kg	41.5	17.3	23.8	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	16.5	6.8	9.3	----	----
Chrysene	218-01-9	0.5	mg/kg	14.1	6.0	8.2	----	----
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	17.1	6.8	9.4	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	7.1	3.0	3.8	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	16.2	6.6	9.1	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	6.1	2.6	3.2	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	1.4	0.6	0.7	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	7.1	3.0	3.8	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	206	88.3	117	----	----
Benzo(a)pyrene TEQ (WHO)	----	0.5	mg/kg	22.5	9.2	12.5	----	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	90.3	98.3	92.3	----	----
2-Chlorophenol-D4	93951-73-6	0.1	%	98.1	110	97.2	----	----
2.4.6-Tribromophenol	118-79-6	0.1	%	88.0	102	95.4	----	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	84.7	96.2	88.9	----	----
Anthracene-d10	1719-06-8	0.1	%	86.0	94.7	88.3	----	----
4-Terphenyl-d14	1718-51-0	0.1	%	99.8	111	102	----	----

Surrogate Control Limits

Sub-Matrix: **SOIL**

Compound	CAS Number	Recovery Limits (%) Low	High
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	63	127
2-Chlorophenol-D4	93951-73-6	64	126
2.4.6-Tribromophenol	118-79-6	36	136
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	64	130
Anthracene-d10	1719-06-8	69	135
4-Terphenyl-d14	1718-51-0	64	136

AECOM

Chain of Custody

AECOM Australia Pty Ltd
Level 21, 420 George Street
Sydney, NSW, 2000
PO Box Q410, QVB PO, Sydney, NSW, 1230
T +61 2 8934 0000
F +61 2 8934 0001

Laboratory Details
Lab. Name: Australian Laboratory Serices
Address: Smithfield
02 9910 6200
Fax: 02 9910 6201
Lab Quote No:

Sampled By: s22
AECOM Project No: 60221935
Project Name: Moorebank

Specifications
Turnaround time required: standard
Special storage requirements?
Report Format: Email: s22 @aecom.com / s22 @aecom.com

Lab. ID	Sample ID	Sampling Date	Matrix: soil	Matrix: water	Matrix: other	Preservation: filtered	Preservation: acid	Preservation: ice	Container	Analysis: TPH/BTEX	Analysis: lead
1	EXCAV6-N	18/06/14	x						125 ml jar	x	x
2	EXCAV6-S	18/06/14	x							x	x
3	EXCAV6-E	18/06/14	x							x	x
4	EXCAV6-W	18/06/14	x							x	x
5	EXCAV6-B	18/06/14	x							x	x
6	EXCAV6-VS1	18/06/14	x							x	x
7	EXCAV6-VS2	18/06/14	x							x	x

Environmental Division
Sydney
Work Order
ES1413712

Telephone : +61-2-8784 8555

Comments:

Relinquished by s22 Signed: Date/Time: 19/06/14

Recieved by: s22 Signed: s22 Date/Time: 23/6/14 1130

ALS Environmental

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **ES1413712**	Page	: 1 of 5
Client	: AECOM Australia Pty Ltd	Laboratory	: Environmental Division Sydney
Contact	s22	Contact	: Client Services
Address	: LEVEL 11, 44 MARKET STREET SYDNEY NSW 1230	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	s22 @aecom.com	E-mail	: sydney@alsglobal.com
Telephone	: 02 8264 5100	Telephone	: +61-2-8784 8555
Facsimile	: 02 8264 5111	Facsimile	: +61-2-8784 8500
Project	: 60221935 MOOREBANK	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: ---		
C-O-C number	: ---	Date Samples Received	: 23-JUN-2014
Sampler	s22	Issue Date	: 26-JUN-2014
Order number	: 60221935 TASK 1.82		
		No. of samples received	: 7
Quote number	: EN/004/14	No. of samples analysed	: 7

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

This Interpretive Quality Control Report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Parameter Frequency Compliance
- Brief Method Summaries
- Summary of Outliers

Analysis Holding Time Compliance

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

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

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

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content							
Soil Glass Jar - Unpreserved (EA055-103)							
EXCAV6-N, EXCAV6-S, EXCAV6-E, EXCAV6-W, EXCAV6-B, EXCAV6-VS1, EXCAV6-VS2	**18-JUN-2014**	**----**	----	----	**25-JUN-2014**	02-JUL-2014	✓
EG005T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved (EG005T)							
EXCAV6-N, EXCAV6-S, EXCAV6-E, EXCAV6-W, EXCAV6-B, EXCAV6-VS1, EXCAV6-VS2	**18-JUN-2014**	**25-JUN-2014**	15-DEC-2014	✓	**26-JUN-2014**	15-DEC-2014	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013							
Soil Glass Jar - Unpreserved (EP071)							
EXCAV6-N, EXCAV6-S, EXCAV6-E, EXCAV6-W, EXCAV6-B, EXCAV6-VS1, EXCAV6-VS2	**18-JUN-2014**	**25-JUN-2014**	02-JUL-2014	✓	**25-JUN-2014**	04-AUG-2014	✓
EP080: BTEXN							
Soil Glass Jar - Unpreserved (EP080)							
EXCAV6-N, EXCAV6-S, EXCAV6-E, EXCAV6-W, EXCAV6-B, EXCAV6-VS1, EXCAV6-VS2	**18-JUN-2014**	**25-JUN-2014**	02-JUL-2014	✓	**25-JUN-2014**	02-JUL-2014	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013							
Soil Glass Jar - Unpreserved (EP080)							
EXCAV6-N, EXCAV6-S, EXCAV6-E, EXCAV6-W, EXCAV6-B, EXCAV6-VS1, EXCAV6-VS2	**18-JUN-2014**	**25-JUN-2014**	02-JUL-2014	✓	**25-JUN-2014**	02-JUL-2014	✓

Quality Control Parameter Frequency Compliance

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

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055-103	2	20	**10.0**	**10.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	10	**10.0**	**10.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	9	**11.1**	**10.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	19	**10.5**	**10.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
Total Metals by ICP-AES	EG005T	1	10	**10.0**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	9	**11.1**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	19	**5.3**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Total Metals by ICP-AES	EG005T	1	10	**10.0**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	9	**11.1**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	19	**5.3**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
Total Metals by ICP-AES	EG005T	1	10	**10.0**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	9	**11.1**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	19	**5.3**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement

Brief Method Summaries

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

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055-103	SOIL	A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Total Metals by ICP-AES	EG005T	SOIL	(APHA 21st ed., 3120; USEPA SW 846 - 6010) (ICPAES) Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (2013) Schedule B(3)
TPH - Semivolatile Fraction	EP071	SOIL	(USEPA SW 846 - 8015A) Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C36. This method is compliant with the QC requirements of NEPM (2013) Schedule B(3).
TPH Volatiles/BTEX	EP080	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with the QC requirements of NEPM (2013) Schedule B(3)

Preparation Methods	Method	Matrix	Method Descriptions
Methanolic Extraction of Soils for Purge and Trap	* ORG16	SOIL	(USEPA SW 846 - 5030A) 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids (Option B - Non-concentrating)	ORG17B	SOIL	In-house, Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 20mL 1:1 DCM/Acetone by end over end tumble. The solvent is transferred directly to a GC vial for analysis.

Summary of Outliers

Outliers : Quality Control Samples

The following report highlights outliers flagged in the Quality Control (QC) Report. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). This report displays QC Outliers (breaches) only.

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

- **For all matrices, no Method Blank value outliers occur.**
- **For all matrices, no Duplicate outliers occur.**
- **For all matrices, no Laboratory Control outliers occur.**
- **For all matrices, no Matrix Spike outliers occur.**

Regular Sample Surrogates

- **For all regular sample matrices, no surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

This report displays Holding Time breaches only. Only the respective Extraction / Preparation and/or Analysis component is/are displayed.

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

Outliers : Frequency of Quality Control Samples

The following report highlights breaches in the Frequency of Quality Control Samples.

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

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **ES1413712**	Page	: 1 of 6
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: s22	Contact	: Client Services
Address	: LEVEL 11, 44 MARKET STREET SYDNEY NSW 1230	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: s22 @aecom.com	E-mail	: sydney@alsglobal.com
Telephone	: 02 8264 5100	Telephone	: +61-2-8784 8555
Facsimile	: 02 8264 5111	Facsimile	: +61-2-8784 8500
Project	: 60221935 MOOREBANK	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: ---		
C-O-C number	: ---	Date Samples Received	: 23-JUN-2014
Sampler	: s22	Issue Date	: 26-JUN-2014
Order number	: 60221935 TASK 1.82		
		No. of samples received	: 7
Quote number	: EN/004/14	No. of samples analysed	: 7

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

This Quality Control Report contains the following information:

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

NATA WORLD RECOGNISED ACCREDITATION

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
		Sydney Inorganics
s22	Senior Spectroscopist	Sydney Inorganics
s22	Senior Organic Chemist	Sydney Organics

General Comments

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

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

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

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

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EA055: Moisture Content (QC Lot: 3509122)									
ES1413618-010	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	26.0	25.4	2.2	0% - 20%
ES1413712-007	EXCAV6-VS2	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	10.9	10.8	0.0	0% - 50%
EG005T: Total Metals by ICP-AES (QC Lot: 3509563)									
ES1413586-002	Anonymous	EG005T: Lead	7439-92-1	5	mg/kg	14	14	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3507177)									
ES1413712-001	EXCAV6-N	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3507188)									
ES1413712-001	EXCAV6-N	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
ES1413726-021	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3507177)									
ES1413712-001	EXCAV6-N	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3507188)									
ES1413712-001	EXCAV6-N	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
ES1413726-021	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
EP080: BTEXN (QC Lot: 3507188)									
ES1413712-001	EXCAV6-N	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit
ES1413726-021	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit

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	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EG005T: Total Metals by ICP-AES (QCLot: 3509563)								
EG005T: Lead	7439-92-1	5	mg/kg	<5	40.0 mg/kg	103	86	124
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3507177)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	200 mg/kg	103	71	131
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	300 mg/kg	90.7	74	138
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	200 mg/kg	90.0	64	128
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3507188)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	94.8	68.4	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3507177)								
EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	250 mg/kg	96.2	70	130
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	350 mg/kg	101	74	138
EP071: >C34 - C40 Fraction	----	50	mg/kg	<100	150 mg/kg	76.0	63	131
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3507188)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	94.3	68.4	128
EP080: BTEXN (QCLot: 3507188)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	88.4	62	116
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	98.4	62	128
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	97.7	58	118
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	98.9	60	120
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	97.6	60	120
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	91.6	62	138

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
EG005T: Total Metals by ICP-AES (QCLot: 3509563)							
ES1413586-002	Anonymous	EG005T: Lead	7439-92-1	250 mg/kg	106	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3507177)							
ES1413712-001	EXCAV6-N	EP071: C10 - C14 Fraction	----	640 mg/kg	86.1	73	137

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	Matrix Spike (MS) Report: SpikeRecovery(%) MS	Matrix Spike (MS) Report: Recovery Limits (%) Low	Matrix Spike (MS) Report: Recovery Limits (%) High
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3507177) - continued							
ES1413712-001	EXCAV6-N	EP071: C15 - C28 Fraction	----	3140 mg/kg	81.4	53	131
		EP071: C29 - C36 Fraction	----	2860 mg/kg	70.2	52	132
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3507188)							
ES1413712-001	EXCAV6-N	EP080: C6 - C9 Fraction	----	32.5 mg/kg	103	70	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3507177)							
ES1413712-001	EXCAV6-N	EP071: >C10 - C16 Fraction	>C10_C16	850 mg/kg	108	73	137
		EP071: >C16 - C34 Fraction	----	4800 mg/kg	73.6	53	131
		EP071: >C34 - C40 Fraction	----	2400 mg/kg	55.0	52	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3507188)							
ES1413712-001	EXCAV6-N	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	98.9	70	130
EP080: BTEXN (QCLot: 3507188)							
ES1413712-001	EXCAV6-N	EP080: Benzene	71-43-2	2.5 mg/kg	77.8	70	130
		EP080: Toluene	108-88-3	2.5 mg/kg	89.8	70	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	90.5	70	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	91.4	70	130
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	91.0	70	130
		EP080: Naphthalene	91-20-3	2.5 mg/kg	83.0	70	130

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

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

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration	Spike Recovery (%) MS	Spike Recovery (%) MSD	Recovery Limits (%) Low	Recovery Limits (%) High	RPDs (%) Value	RPDs (%) Control Limit
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3507177)										
ES1413712-001	EXCAV6-N	EP071: C10 - C14 Fraction	----	640 mg/kg	86.1	----	73	137	----	----
		EP071: C15 - C28 Fraction	----	3140 mg/kg	81.4	----	53	131	----	----
		EP071: C29 - C36 Fraction	----	2860 mg/kg	70.2	----	52	132	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3507177)										
ES1413712-001	EXCAV6-N	EP071: >C10 - C16 Fraction	>C10_C16	850 mg/kg	108	----	73	137	----	----
		EP071: >C16 - C34 Fraction	----	4800 mg/kg	73.6	----	53	131	----	----
		EP071: >C34 - C40 Fraction	----	2400 mg/kg	55.0	----	52	132	----	----
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3507188)										
ES1413712-001	EXCAV6-N	EP080: C6 - C9 Fraction	----	32.5 mg/kg	103	----	70	130	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3507188)										

Sub-Matrix: **SOIL**

				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	MSD	Low	High	Value	Control Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3507188) - continued										
ES1413712-001	EXCAV6-N	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	98.9	----	70	130	----	----
EP080: BTEXN (QCLot: 3507188)										
ES1413712-001	EXCAV6-N	EP080: Benzene	71-43-2	2.5 mg/kg	77.8	----	70	130	----	----
		EP080: Toluene	108-88-3	2.5 mg/kg	89.8	----	70	130	----	----
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	90.5	----	70	130	----	----
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	91.4	----	70	130	----	----
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	91.0	----	70	130	----	----
		EP080: Naphthalene	91-20-3	2.5 mg/kg	83.0	----	70	130	----	----
EG005T: Total Metals by ICP-AES (QCLot: 3509563)										
ES1413586-002	Anonymous	EG005T: Lead	7439-92-1	250 mg/kg	106	----	70	130	----	----

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES1413712**	Page	: 1 of 5
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: s22	Contact	: Client Services
Address	: LEVEL 11, 44 MARKET STREET SYDNEY NSW 1230	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: s22 @aecom.com	E-mail	: sydney@alsglobal.com
Telephone	: 02 8264 5100	Telephone	: +61-2-8784 8555
Facsimile	: 02 8264 5111	Facsimile	: +61-2-8784 8500
Project	: 60221935 MOOREBANK	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: 60221935 TASK 1.82		
C-O-C number	: ---	Date Samples Received	: 23-JUN-2014
Sampler	: s22	Issue Date	: 26-JUN-2014
Site	: ---		
		No. of samples received	: 7
Quote number	: EN/004/14	No. of samples analysed	: 7

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

WORLD RECOGNISED ACCREDITATION

Signatories

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

Signatories	*Position*	*Accreditation Category*
		Sydney Inorganics
s22	Senior Spectroscopist	Sydney Inorganics
s22	Senior Organic Chemist	Sydney Organics

General Comments

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

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

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

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

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

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

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Compound	CAS Number	LOR	Unit	Client sample ID	EXCAV6-N	EXCAV6-S	EXCAV6-E	EXCAV6-W	EXCAV6-B
				Client sampling date / time	18-JUN-2014 15:00	18-JUN-2014 15:00	18-JUN-2014 15:00	18-JUN-2014 15:00	18-JUN-2014 15:00
					ES1413712-001	ES1413712-002	ES1413712-003	ES1413712-004	ES1413712-005
EA055: Moisture Content									
Moisture Content (dried @ 103°C)	---	1.0	%		18.9	19.3	19.8	19.8	19.4
EG005T: Total Metals by ICP-AES									
Lead	7439-92-1	5	mg/kg		9	10	16	9	15
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	---	10	mg/kg		<10	<10	<10	<10	<10
C10 - C14 Fraction	---	50	mg/kg		<50	<50	<50	<50	<50
C15 - C28 Fraction	---	100	mg/kg		<100	<100	<100	<100	<100
C29 - C36 Fraction	---	100	mg/kg		<100	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	---	50	mg/kg		<50	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013									
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	>C10_C16	50	mg/kg		<50	<50	<50	<50	<50
>C16 - C34 Fraction	---	100	mg/kg		<100	<100	<100	<100	<100
>C34 - C40 Fraction	---	100	mg/kg		<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	---	50	mg/kg		<50	<50	<50	<50	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	---	50	mg/kg		<50	<50	<50	<50	<50
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	---	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	1330-20-7	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
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.1	%		76.4	81.2	75.7	95.3	78.2
Toluene-D8	2037-26-5	0.1	%		101	110	99.9	112	108
4-Bromofluorobenzene	460-00-4	0.1	%		119	124	115	118	121

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	EXCAV6-VS1	EXCAV6-VS2	----	----	----
			Client sampling date / time	18-JUN-2014 15:00	18-JUN-2014 15:00	----	----	----
Compound	CAS Number	LOR	Unit	ES1413712-006	ES1413712-007	----	----	----
EA055: Moisture Content								
Moisture Content (dried @ 103°C)	----	1.0	%	10.0	10.9	----	----	----
EG005T: Total Metals by ICP-AES								
Lead	7439-92-1	5	mg/kg	8	7	----	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	----	----	----
C10 - C14 Fraction	----	50	mg/kg	<50	<50	----	----	----
C15 - C28 Fraction	----	100	mg/kg	<100	<100	----	----	----
C29 - C36 Fraction	----	100	mg/kg	<100	<100	----	----	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	----	----	----
>C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	----	----	----
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	----	----	----
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	----	----	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	<50	----	----	----
EP080: BTEXN								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	----	----	----
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	----	----	----
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	----	----	----
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	----	----	----
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	----	----	----
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	<0.5	----	----	----
Naphthalene	91-20-3	1	mg/kg	<1	<1	----	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	76.2	76.4	----	----	----
Toluene-D8	2037-26-5	0.1	%	106	103	----	----	----
4-Bromofluorobenzene	460-00-4	0.1	%	115	116	----	----	----

Surrogate Control Limits

Sub-Matrix: **SOIL**

Compound	CAS Number	Recovery Limits (%) Low	Recovery Limits (%) High
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	72.8	133.2
Toluene-D8	2037-26-5	73.9	132.1
4-Bromofluorobenzene	460-00-4	71.6	130.0

AECOM

Chain of Custody

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Sydney, NSW, 2000
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T +61 2 8934 0000
F +61 2 8934 0001

Laboratory Details
Lab. Name: Australian Laboratory Serices
Address: Smithfield
02 9910 6200
Fax: 02 9910 6201
Lab Quote No:

Sampled By: s22
AECOM Project No: 60221935
Project Name: Moorebank

Specifications
Turnaround time required: standard
Special storage requirements?
Report Format: Email: s22 @aecom.com ;s22 @aecom.com

Lab. ID	Sample ID	Sampling Date	Matrix: soil	Matrix: water	Matrix: other	Preservation: filtered	Preservation: acid	Preservation: ice	Container	Analysis: TPH/BTEX	Analysis: lead
1	EXCAV4-N	16/06/14	x						125ml jar	x	x
2	EXCAV4-S	16/06/14	x							x	x
3	EXCAV4-E	16/06/14	x							x	x
4	EXCAV4-W	16/06/14	x							x	x
5	EXCAV4-B	16/06/14	x							x	x
6	EXCAV4-VS1	16/06/14	x							x	x
7	EXCAV4-VS2	16/06/14	x							x	x
8	EXCAV5-N	16/06/14	x							x	x
9	EXCAV5-S	16/06/14	x							x	x
10	EXCAV5-E	16/06/14	x							x	x
11	EXCAV5-W	16/06/14	x							x	x
12	EXCAV5-B	16/06/14	x							x	x
13	EXCAV5-VS1	16/06/14	x							x	x
14	EXCAV5-VS2	16/06/14	x							x	x
15	QC01	16/06/14	x							x	x
~~16~~											

Comments:

Relinquished by s22 Signed: Date/Time: 17/06/14

Received by: s22 Signed: s22 Date/Time: 17/6/14 1300

Environmental Division
Sydney
Work Order
ES1413246

Telephone : +61-2-8784 8555

ALS Environmental

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **ES1413246**	Page	: 1 of 6
Client	: AECOM Australia Pty Ltd	Laboratory	: Environmental Division Sydney
Contact	: s22	Contact	: Client Services
Address	: LEVEL 11, 44 MARKET STREET SYDNEY NSW 1230	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: s22 @aecom.com	E-mail	: sydney@alsglobal.com
Telephone	: 02 8264 5100	Telephone	: +61-2-8784 8555
Facsimile	: 02 8264 5111	Facsimile	: +61-2-8784 8500
Project	: 60221935 TASK 1 82 MOOREBANK	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: ---		
C-O-C number	: ---	Date Samples Received	: 17-JUN-2014
Sampler	: s22	Issue Date	: 23-JUN-2014
Order number	: 60221935 TASK 1.82		
		No. of samples received	: 15
Quote number	: EN/004/14	No. of samples analysed	: 15

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

This Interpretive Quality Control Report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Parameter Frequency Compliance
- Brief Method Summaries
- Summary of Outliers

Analysis Holding Time Compliance

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

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

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

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content							
Soil Glass Jar - Unpreserved (EA055-103)							
EXCAV4-N, EXCAV4-S, EXCAV4-E, EXCAV4-W, EXCAV4-B, EXCAV4-VS1, EXCAV4-VS2, EXCAV5-N, EXCAV5-S, EXCAV5-E, EXCAV5-W, EXCAV5-B, EXCAV5-VS1, EXCAV5-VS2, QC01	**16-JUN-2014**	**----**	----	----	**18-JUN-2014**	30-JUN-2014	✓
EG005T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved (EG005T)							
EXCAV4-N, EXCAV4-S, EXCAV4-E, EXCAV4-W, EXCAV4-B, EXCAV4-VS1, EXCAV4-VS2, EXCAV5-N, EXCAV5-S, EXCAV5-E, EXCAV5-W, EXCAV5-B, EXCAV5-VS1, EXCAV5-VS2, QC01	**16-JUN-2014**	**19-JUN-2014**	13-DEC-2014	✓	**19-JUN-2014**	13-DEC-2014	✓
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP071)							
EXCAV4-N, EXCAV4-S, EXCAV4-E, EXCAV4-W, EXCAV4-B, EXCAV4-VS1, EXCAV4-VS2, EXCAV5-N, EXCAV5-S, EXCAV5-E, EXCAV5-W, EXCAV5-B, EXCAV5-VS1, EXCAV5-VS2, QC01	**16-JUN-2014**	**19-JUN-2014**	30-JUN-2014	✓	**19-JUN-2014**	29-JUL-2014	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080: BTEXN							
Soil Glass Jar - Unpreserved (EP080)							
EXCAV4-N, EXCAV4-S, EXCAV4-E, EXCAV4-W, EXCAV4-B, EXCAV4-VS1, EXCAV4-VS2, EXCAV5-N, EXCAV5-S, EXCAV5-E, EXCAV5-W, EXCAV5-B, EXCAV5-VS1, EXCAV5-VS2, QC01	**16-JUN-2014**	**18-JUN-2014**	30-JUN-2014	✓	**19-JUN-2014**	30-JUN-2014	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013							
Soil Glass Jar - Unpreserved (EP080)							
EXCAV4-N, EXCAV4-S, EXCAV4-E, EXCAV4-W, EXCAV4-B, EXCAV4-VS1, EXCAV4-VS2, EXCAV5-N, EXCAV5-S, EXCAV5-E, EXCAV5-W, EXCAV5-B, EXCAV5-VS1, EXCAV5-VS2, QC01	**16-JUN-2014**	**18-JUN-2014**	30-JUN-2014	✓	**19-JUN-2014**	30-JUN-2014	✓

Quality Control Parameter Frequency Compliance

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

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055-103	2	20	**10.0**	**10.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	4	33	**12.1**	**10.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	16	**12.5**	**10.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	20	**10.0**	**10.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
Total Metals by ICP-AES	EG005T	2	33	**6.1**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	16	**6.3**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	20	**5.0**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Total Metals by ICP-AES	EG005T	2	33	**6.1**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	16	**6.3**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	20	**5.0**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
Total Metals by ICP-AES	EG005T	2	33	**6.1**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	16	**6.3**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	20	**5.0**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement

Brief Method Summaries

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

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055-103	SOIL	A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Total Metals by ICP-AES	EG005T	SOIL	(APHA 21st ed., 3120; USEPA SW 846 - 6010) (ICPAES) Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (2013) Schedule B(3)
TPH - Semivolatile Fraction	EP071	SOIL	(USEPA SW 846 - 8015A) Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C36. This method is compliant with the QC requirements of NEPM (2013) Schedule B(3).
TPH Volatiles/BTEX	EP080	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with the QC requirements of NEPM (2013) Schedule B(3)

Preparation Methods	Method	Matrix	Method Descriptions
Methanolic Extraction of Soils for Purge and Trap	* ORG16	SOIL	(USEPA SW 846 - 5030A) 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids (Option B - Non-concentrating)	ORG17B	SOIL	In-house, Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 20mL 1:1 DCM/Acetone by end over end tumble. The solvent is transferred directly to a GC vial for analysis.

Summary of Outliers

Outliers : Quality Control Samples

The following report highlights outliers flagged in the Quality Control (QC) Report. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). This report displays QC Outliers (breaches) only.

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

- **For all matrices, no Method Blank value outliers occur.**
- **For all matrices, no Duplicate outliers occur.**
- **For all matrices, no Laboratory Control outliers occur.**
- **For all matrices, no Matrix Spike outliers occur.**

Regular Sample Surrogates

- **For all regular sample matrices, no surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

This report displays Holding Time breaches only. Only the respective Extraction / Preparation and/or Analysis component is/are displayed.

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

Outliers : Frequency of Quality Control Samples

The following report highlights breaches in the Frequency of Quality Control Samples.

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

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **ES1413246**	Page	: 1 of 7
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: s22	Contact	: Client Services
Address	: LEVEL 11, 44 MARKET STREET SYDNEY NSW 1230	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: s22 @aecom.com	E-mail	: sydney@alsglobal.com
Telephone	: 02 8264 5100	Telephone	: +61-2-8784 8555
Facsimile	: 02 8264 5111	Facsimile	: +61-2-8784 8500
Project	: 60221935 TASK 1 82 MOOREBANK	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 17-JUN-2014
Sampler	: s22	Issue Date	: 23-JUN-2014
Order number	: 60221935 TASK 1.82		
		No. of samples received	: 15
Quote number	: EN/004/14	No. of samples analysed	: 15

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

This Quality Control Report contains the following information:

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

NATA WORLD RECOGNISED ACCREDITATION

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
		Sydney Inorganics
s22	Senior Organic Chemist	Sydney Organics
s22	Metals Coordinator	Sydney Inorganics

General Comments

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

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

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

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

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EA055: Moisture Content (QC Lot: 3496251)									
ES1413243-003	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	87.0	89.2	2.4	0% - 20%
ES1413246-011	EXCAV5-W	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	12.8	12.5	2.8	0% - 50%
EG005T: Total Metals by ICP-AES (QC Lot: 3498517)									
ES1413119-001	Anonymous	EG005T: Lead	7439-92-1	5	mg/kg	<5	<5	0.0	No Limit
ES1413246-001	EXCAV4-N	EG005T: Lead	7439-92-1	5	mg/kg	7	7	0.0	No Limit
EG005T: Total Metals by ICP-AES (QC Lot: 3499123)									
ES1413198-001	Anonymous	EG005T: Lead	7439-92-1	5	mg/kg	9	8	0.0	No Limit
ES1413198-011	Anonymous	EG005T: Lead	7439-92-1	5	mg/kg	20	19	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3496235)									
ES1413198-001	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
ES1413246-006	EXCAV4-VS1	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3496475)									
ES1413246-001	EXCAV4-N	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
ES1413246-011	EXCAV5-W	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3496235)									
ES1413198-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
ES1413246-006	EXCAV4-VS1	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3496475)									
ES1413246-001	EXCAV4-N	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	0.0	No Limit
ES1413246-011	EXCAV5-W	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	0.0	No Limit
EP080: BTEXN (QC Lot: 3496235)									
ES1413198-001	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP080: BTEXN (QC Lot: 3496235) - continued									
ES1413198-001	Anonymous	EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit
ES1413246-006	EXCAV4-VS1	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit

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	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EG005T: Total Metals by ICP-AES (QCLot: 3498517)								
EG005T: Lead	7439-92-1	5	mg/kg	<5	40.0 mg/kg	108	86	124
EG005T: Total Metals by ICP-AES (QCLot: 3499123)								
EG005T: Lead	7439-92-1	5	mg/kg	<5	40.0 mg/kg	98.6	86	124
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3496235)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	96.4	68.4	128
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3496475)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	200 mg/kg	113	71	131
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	300 mg/kg	107	74	138
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	200 mg/kg	101	64	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3496235)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	97.3	68.4	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3496475)								
EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	250 mg/kg	105	70	130
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	350 mg/kg	98.4	74	138
EP071: >C34 - C40 Fraction	----	50	mg/kg	<100	150 mg/kg	70.9	63	131
EP080: BTEXN (QCLot: 3496235)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	101	62	116
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	94.6	62	128
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	91.4	58	118
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	90.1	60	120
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	94.3	60	120
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	94.3	62	138

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
EG005T: Total Metals by ICP-AES (QCLot: 3498517)							
ES1413119-001	Anonymous	EG005T: Lead	7439-92-1	250 mg/kg	110	70	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
EG005T: Total Metals by ICP-AES (QCLot: 3499123)							
ES1413198-001	Anonymous	EG005T: Lead	7439-92-1	250 mg/kg	108	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3496235)							
ES1413198-001	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	130	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3496475)							
ES1413246-001	EXCAV4-N	EP071: C10 - C14 Fraction	----	790 mg/kg	74.3	73	137
		EP071: C15 - C28 Fraction	----	3490 mg/kg	96.4	53	131
		EP071: C29 - C36 Fraction	----	2400 mg/kg	114	52	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3496235)							
ES1413198-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	128	70	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3496475)							
ES1413246-001	EXCAV4-N	EP071: >C10 - C16 Fraction	>C10_C16	987 mg/kg	105	73	137
		EP071: >C16 - C34 Fraction	----	5235 mg/kg	94.3	53	131
		EP071: >C34 - C40 Fraction	----	1600 mg/kg	106	52	132
EP080: BTEXN (QCLot: 3496235)							
ES1413198-001	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	99.9	70	130
		EP080: Toluene	108-88-3	2.5 mg/kg	99.1	70	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	96.0	70	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	102	70	130
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	96.6	70	130
		EP080: Naphthalene	91-20-3	2.5 mg/kg	85.3	70	130

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

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

Sub-Matrix: **SOIL**

				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	MSD	Low	High	Value	Control Limit
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3496235)										
ES1413198-001	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	130	----	70	130	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3496235)										
ES1413198-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	128	----	70	130	----	----
EP080: BTEXN (QCLot: 3496235)										
ES1413198-001	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	99.9	----	70	130	----	----
		EP080: Toluene	108-88-3	2.5 mg/kg	99.1	----	70	130	----	----
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	96.0	----	70	130	----	----

Sub-Matrix: **SOIL**

				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	MSD	Low	High	Value	Control Limit
EP080: BTEXN (QCLot: 3496235) - continued										
ES1413198-001	Anonymous	EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	102	----	70	130	----	----
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	96.6	----	70	130	----	----
		EP080: Naphthalene	91-20-3	2.5 mg/kg	85.3	----	70	130	----	----
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3496475)										
ES1413246-001	EXCAV4-N	EP071: C10 - C14 Fraction	----	790 mg/kg	74.3	----	73	137	----	----
		EP071: C15 - C28 Fraction	----	3490 mg/kg	96.4	----	53	131	----	----
		EP071: C29 - C36 Fraction	----	2400 mg/kg	114	----	52	132	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3496475)										
ES1413246-001	EXCAV4-N	EP071: >C10 - C16 Fraction	>C10_C16	987 mg/kg	105	----	73	137	----	----
		EP071: >C16 - C34 Fraction	----	5235 mg/kg	94.3	----	53	131	----	----
		EP071: >C34 - C40 Fraction	----	1600 mg/kg	106	----	52	132	----	----
EG005T: Total Metals by ICP-AES (QCLot: 3498517)										
ES1413119-001	Anonymous	EG005T: Lead	7439-92-1	250 mg/kg	110	----	70	130	----	----
EG005T: Total Metals by ICP-AES (QCLot: 3499123)										
ES1413198-001	Anonymous	EG005T: Lead	7439-92-1	250 mg/kg	108	----	70	130	----	----