

1-6		
Requ	mation ıired	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 - 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 Phenanthrene (33%) 512566: Laboratory RPD acceptance criteria exceeded for Anthracene (51%), Phenanthrene (35%) and Pyrene (38%) 512668: Laboratory RPD acceptance criteria exceeded for Anthracene (51%), Phenanthrene (35%) and Pyrene (38%) 512668: Laboratory RPD acceptance criteria exceeded for Anthracene (51%), Phenanthrene (35%) and Pyrene (38%) 512668: 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

Defence FOI 235/19/20



93 Beattie Street Balmain NSW 2041 Australia T. 02 9555 9034 | F. 02 9555 9035 info@airsafe.net.au | www.airsafe.net.au 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: \$22

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





PROJECT: DNSDC Refueling Depot - Moorebank

JOB NO: 32121

Comple No.	Location/Reference	Time		Fields	Fibres	Concentration
Sample No		On	Off	Fields	Fibres	(Fibres/mL)
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)].



Defence FOI 235/19/20



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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: \$22

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





PROJECT: DNSDC Refueling Depot - Moorebank

JOB NO: 32121

Comple No.	Location/Reference	Time		Fields	Fibres	Concentration
Sample No		On	Off	Fields	Fibres	(Fibres/mL)
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)].



Defence FOI 235/19/20



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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: \$22

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





PROJECT: DNSDC Refueling Depot - Moorebank

JOB NO: 32121

Sample No	Lass firm /Defensions	Time		Fields	P=-1	Concentration
	Location/Reference	On	Off	Fields	Fibres	(Fibres/mL)
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. All samples have been taken by Airsafe personnel in accordance with the sampling 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)].



Defence FOI 235/19/20



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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: \$22

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





PROJECT: DNSDC Refueling Depot - Moorebank

JOB NO: 32121

O-mula Na	Time		Pielele.	P =1	Concentration	
Sample No Location/Ref	Location/Reference	On	Off	Fields	Fibres	(Fibres/mL)
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. All samples have been taken by Airsafe personnel in accordance with the sampling 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)].



Defence FOI 235/19/20



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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: \$22

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





PROJECT: DNSDC Refueling Depot - Moorebank

JOB NO: 32121

		Ti	Time		e-1	Concentration
Sample No Location/Re	Location/Reference	On	Off	Fields	Fibres	(Fibres/mL)
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. All samples have been taken by Airsafe personnel in accordance with the sampling 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 μ g/L in eight wells sampled, with the highest concentration of 16,000 μ g/L in GW121 and GW129.
- Xylene (o) concentrations were exceeding the criteria of 350 μ g/L in four wells sampled, with the highest concentration of 1900 μ g/L in GW121.
- TRH C₆-C₁₀ (F1) concentrations were exceeding the criteria of 6000 μ g/L in nine wells sampled, with the highest concentration of 47,000 μ g/L in GW118.
- Naphthalene concentrations were exceeding the criteria of 16 μ g/L in 18 wells sampled, with the highest concentration of 350 μ g/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

<u>RAP</u>

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.

Contamination and Stockpile Validation Works Validation Report

Appendix D

Airsafe Inspection Reports (Asbestos Removal Works)



93 Beattie Street Balmain NSW 2041 Australia T. 02 9555 9034 | F. 02 9555 9035 info@airsafe.net.au | www.airsafe.net.au ABN 85 143 863 496

Defence FOI 235/19/20 TP4 / TP5 AREA

INSPECTION REPORT

January 23, 2013

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

DLTP Moorebank – Anzac Road, Moorebank 18491

Attention:

Job Number:

Your Reference:

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

	Defence FOI 235/19/20	
	AIRSAFE	
PROJECT:	DI TR Maansharka a	
TROOLOT.	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.	

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93 Beattie Street Balmain NSW 2041 Australia T. 02 9555 9034 | F. 02 9555 9035 info@airsafe.net.au | www.airsafe.net.au ABN 85 143 863 498

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:

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.

s22

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





18491

JOB NO:

PROJECT: DLTP Moorebank – Anzac Road, Moorebank

Time

Sample No	Location/Reference	Reference		Fields	Fibres	Concentration	
		On	Off	rieius	FIDIes	(Fibres/mL)	
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)].



Contamination and Stockpile Validation Works Validation Report

Appendix H

Laboratory Analytical Reports



Page 1	CERT	IFICATE 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	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
	SYDNEY NSW 1230		
E-mail	s22 @aecom.com	E-mail	: sydney@alsglobal.com
elephone	: 02 8264 5100	Telephone	: +61-2-8784 8555
acsimile	: 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		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 carried out in compliance with procedures s		indicated below. Electronic signing has been		
	Signatories	Position Accreditation Category				
WORLD RECOGNISED		s22 s22	Senior Organic Chemist Metals Coordinator	Sydney Inorganics Sydney Organics Sydney Inorganics		

Address 277-289 Woodpark Road Smithfield NSW Australia 2164 PHONE +61-2-8784 8555 Facsimile +61-2-8784 8500 Environmental Division Sydney ABN 84 009 936 029 Part of the ALS Group An ALS Limited Company



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Page	: 2 of 6
Work Order	: ES1413246
Client	: AECOM Australia Pty Ltd
Project	: 60221935 TASK 1 82 MOOREBANK



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

 Page
 : 3 of 6

 Work Order
 : ES1413246

 Client
 : AECOM Australia Pty Ltd

 Project
 : 60221935 TASK 1 82 MOOREBANK



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)		Clie	ent sample ID	EXCAV4-N	EXCAV4-S	EXCAV4-E	EXCAV4-W	EXCAV4-B
	Cl	ient sampli	ng 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
Compound	CAS Number	LOR	Unit	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 Hydrocarl	bons							
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 Hydroc	arbons - NEPM 201	3						
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)		Clie	ent sample ID	EXCAV4-VS1	EXCAV4-VS2	EXCAV5-N	EXCAV5-S	EXCAV5-E
	Cl	ient sampli	ng 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
Compound	CAS Number	LOR	Unit	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 Hydrocar	bons							
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 Hydroc	arbons - NEPM 201	3						
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		50	mg/kg	200	<50	140	<50	<50
(F2)								
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

 Page
 : 5 of 6

 Work Order
 : ES1413246

 Client
 : AECOM Australia Pty Ltd

 Project
 : 60221935 TASK 1 82 MOOREBANK



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)		Clie	ent sample ID	EXCAV5-W	EXCAV5-B	EXCAV5-VS1	EXCAV5-VS2	QC01
	Cl	ient sampli	ng 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
Compound	CAS Number	LOR	Unit	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 Hydrocar	bons							
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 Hydroc	arbons - NEPM 201	3						
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		50	mg/kg	<50	60	900	90	130
(F2)								
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

Page: 6 of 6Work Order: ES1413246Client: AECOM Australia Pty LtdProject: 60221935 TASK 1 82 MOOREBANK

Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)			
Compound	CAS Number	r Low Hig			
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		



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	ExCAV 3-VS1	5/6/14	SOIL	125ml jar	1	×	\times	×						
7	EXCAN 3-VS2	1		U	1		1	1		1				
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6	EXCAV3-W										2			2488
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	1. 				TOTAL									



Provide states	INTERPRETIVE	UALITY CONTROL I	REPORT
Work Order	: ES1412488	Page	: 1 of 7
Client	: AECOM Australia Pty Ltd	Laboratory	: Environmental Division Sydney
Contact	_s22	Contact	: Client Services
Address	E 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

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Page	: 2 of 7
Work Order	: ES1412488
Client	: AECOM Australia Pty Ltd
Project	: MOOREBANK 60221935

Matrix: SOIL



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

Evaluation: \star = Holding ime breach ; \checkmark = Within holding time.

			Evaluation: * = Holding Time breach; * = Within holding						
Method		Sample Date	Ex	traction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluatio	
EA055: Moisture Content									
Soil Glass Jar - Unpreserved (EA055-103)									
EXCAV3-VS1,	EXCAV3-VS2,	05-JUN-2014				06-JUN-2014	19-JUN-2014	✓	
EXCAV3-N,	EXCAV3-S,								
EXCAV3-E,	EXCAV3-W,								
EXCAV3-B1,	EXCAV3-B2								
EG005T: Total Metals by ICP-AES									
Soil Glass Jar - Unpreserved (EG005T)									
EXCAV3-VS1,	EXCAV3-VS2,	05-JUN-2014	10-JUN-2014	02-DEC-2014	1	11-JUN-2014	02-DEC-2014	✓	
EXCAV3-N,	EXCAV3-S,								
EXCAV3-E,	EXCAV3-W,								
EXCAV3-B1,	EXCAV3-B2								
EP080/071: Total Petroleum Hydrocarbons									
Soil Glass Jar - Unpreserved (EP071)									
EXCAV3-VS1,	EXCAV3-VS2,	05-JUN-2014	11-JUN-2014	19-JUN-2014	~	11-JUN-2014	21-JUL-2014	\checkmark	
EXCAV3-N,	EXCAV3-S,								
EXCAV3-E,	EXCAV3-W,								
EXCAV3-B1,	EXCAV3-B2								
EP074D: Fumigants									
Soil Glass Jar - Unpreserved (EP074)									
EXCAV3-VS1,	EXCAV3-VS2,	05-JUN-2014	10-JUN-2014	12-JUN-2014	1	11-JUN-2014	12-JUN-2014	\checkmark	
EXCAV3-N,	EXCAV3-S,								
EXCAV3-E,	EXCAV3-W,								
EXCAV3-B1,	EXCAV3-B2								
EP074E: Halogenated Aliphatic Compounds									
Soil Glass Jar - Unpreserved (EP074)									
EXCAV3-VS1,	EXCAV3-VS2,	05-JUN-2014	10-JUN-2014	12-JUN-2014	1	11-JUN-2014	12-JUN-2014	✓	
EXCAV3-N,	EXCAV3-S,								
EXCAV3-E,	EXCAV3-W,								
EXCAV3-B1,	EXCAV3-B2								

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Work Order	: ES1412488
Client	: AECOM Australia Pty Ltd
Project	MOOREBANK 60221935



Matrix: SOIL					Evaluation	: × = Holding ime	breach ; ✓ = Within	n holding time	
Method		Sample Date	Ex	traction / Preparation			Analysis	Analysis	
Container / Client Sample ID(s)			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 Hydrocarbon	IS								
Soil Glass Jar - Unpreserved (EP074)				40.0014			40.0014		
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	1	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	1	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	1	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	1	11-JUN-2014	19-JUN-2014	✓	
EXCAV3-N,	EXCAV3-S,								
EXCAV3-E,	EXCAV3-W,								
EXCAV3-B1,	EXCAV3-B2								

Defence FOI 235/19/20

Page	: 4 of 7
Work Order	: ES1412488
Client	: AECOM Australia Pty Ltd
Project	: MOOREBANK 60221935

Matrix: SOIL



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

Method			Ex	traction / Preparation		Analysis			
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013									
Soil Glass Jar - Unpreserved (EP080)									
EXCAV3-VS1,	EXCAV3-VS2,	05-JUN-2014	10-JUN-2014	19-JUN-2014	1	11-JUN-2014	19-JUN-2014	\checkmark	
EXCAV3-N,	EXCAV3-S,								
EXCAV3-E,	EXCAV3-W,								
EXCAV3-B1,	EXCAV3-B2								

Page	5 of 7
Work Order	: ES1412488
Client	: AECOM Australia Pty Ltd
Project	: MOOREBANK 60221935



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 Co	ntrol frequency r	not within specification ; \checkmark = Quality Control frequency within specification.
Quality Control Sample Type		С	ount		Rate (%)		Quality Control Specification
Analytical Methods	Method	QC	Reaular	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	1	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

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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.

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Summary of Outliers

Outliers : Quality Control Samples

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

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: SOIL

Compound Group Name	Laboratory Sample ID	Client Sample 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		MS recovery not determined,
					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.



QUALITY CONTROL REPORT

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

Laboratory 825	This docume	nt has	been	electronically	signed	by	the	authorized	signatories	indicated	below.	Electronic	signing	has	been	carried	out	ir
,	This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out compliance with procedures specified in 21 CFR Part 11.																	

	Accredited for	Signatories	Position	Accreditation Category		
	compliance with ISO/IEC 17025.	s22	Organic Chemist	Sydney Inorganics Sydney Organics		
D N		s22	Senior Spectroscopist	Sydney Inorganics		
		s22	Senior Organic Chemist	Sydney Organics		

Address 277-289 Woodpark Road Smithfield NSW Australia 2164 PHONE +61-2-8784 8555 Facsimile +61-2-8784 8500 Environmental Division Sydney ABN 84 009 936 029 Part of the ALS Group An ALS Limited Company



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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

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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 (%)		
A055: Moisture Co	ontent (QC Lot: 347815	2)									
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%		
G005T: Total Meta	Is 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 Meta	Is 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		
P074A: Monocycli	c Aromatic Hydrocarbo	ons (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-lsopropyltoluene	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: Oxygenate	ed Compounds (QC Lo	t: 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		
S1412488-002 S1412508-001 P074A: Monocyclic / S1412488-001 P074B: Oxygenated S1412488-001 P074C: Sulfonated C S1412488-001 P074D: Fumigants (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: Halogenate	ed Aliphatic Compound										
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		

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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: Halogena	ted Aliphatic Compoun	ds (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: Halogena	ted Aromatic Compoun	ds (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: Tribalom	ethanes (QC Lot: 34807				33				
ES1412488-001	EXCAV3-VS1		67-66-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
L01412400-001		EP074: Chloroform	75-27-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Bromodichloromethane	124-48-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Dibromochloromethane		0.5		<0.5	<0.5	0.0	No Limit
		EP074: Bromoform	75-25-2	0.5	mg/kg	<u.5< td=""><td>SU.5</td><td>0.0</td><td></td></u.5<>	SU.5	0.0	

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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: Naphthale	ne (QC Lot: 3480768)									
ES1412488-001	EXCAV3-VS1	EP074: Naphthalene	91-20-3	5	mg/kg	<5	<5	0.0	No Limit	
EP080/071: Total Pe	etroleum Hydrocarbon	s (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 Pe	etroleum Hydrocarbon	s (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 Re	ecoverable Hydrocarbo	ons - 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 Re	ecoverable Hydrocarbo	ons - 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	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
			106-42-3							
		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	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
			106-42-3							
		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	

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 : MOOREBANK 60221935



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)	Laboratory Control Spike (LCS) Report				
				Report	Spike	Spike Recovery (%)	Recovery	Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High	
EG005T: Total Metals by ICP-AES (QCLot: 3482	242)								
EG005T: Lead	7439-92-1	5	mg/kg	<5	40.0 mg/kg	98.4	86	124	
EG005T: Total Metals by ICP-AES (QCLot: 3482	244)								
EG005T: Lead	7439-92-1	5	mg/kg	<5	40.0 mg/kg	107	86	124	
EP074A: Monocyclic Aromatic Hydrocarbons(C	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: 3480	0768)								
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: 34807	768)								
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(Q	CLot: 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	

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Sub-Matrix: SOIL			Method Bla			S) Report		
				Report	Spike	Spike Recovery (%)	Recovery	Limits (%)
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP074E: Halogenated Aliphatic Compounds (QCLo	t: 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 (QCLo	ot: 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

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Sub-Matrix: SOIL				Method Blank (MB)	Laboratory Control Spike (LCS) Report				
				Report	Spike	Spike Recovery (%)	Recovery	Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	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 Hydrocarbon	is - NEPM 2013 (QCLot: 3480767	7)							
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	106	68.4	128	
EP080/071: Total Recoverable Hydrocarbon	is - NEPM 2013 (QCLot: 3480963	3)							
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	0.5	mg/kg	<0.5	2 mg/kg	92.3	60	120	
	106-42-3								
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		Matrix: SOIL				Matrix Spike (MS) Report		
				Spike	SpikeRecovery(%)	Recovery I	Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High	
EG005T: Total Me	tals by ICP-AES (QCLot: 3482242)							
ES1412149-001	Anonymous	EG005T: Lead	7439-92-1	125 mg/kg	# Not	70	130	
					Determined			
EG005T: Total Me	tals by ICP-AES (QCLot: 3482244)							
ES1412508-001	Anonymous	EG005T: Lead	7439-92-1	125 mg/kg	106	70	130	
EP074E: Halogen	ated 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: Halogen	ated Aromatic Compounds (QCLot: 3480768)							
ES1412488-001	EXCAV3-VS1	EP074: Chlorobenzene	108-90-7	2.5 mg/kg	76.0	70	130	

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ub-Matrix: SOIL				Matrix Spike (MS) Report			
					SpikeRecovery(%)	Recovery I	Limits (%)
aboratory sample ID	Client sample ID	Method: Compound	Method: Compound CAS Number		MS	Low	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	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(Q0	CLot: 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(Q0	CLot: 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 (O	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	2.5 mg/kg	102	70	130
			106-42-3				
		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 representaive 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 Re	covery (%)	Recovery	Limits (%)	RP	Ds (%)
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	MSD	Low	High	Value	Control Limit
EP080/071: Total P	etroleum Hydrocarbons (Q	CLot: 3480767)								
ES1412488-001	EXCAV3-VS1	EP080: C6 - C9 Fraction		32.5 mg/kg	122		70	130		
EP080/071: Total F	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 (Q	CLot: 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	2.5 mg/kg	102		70	130		
			106-42-3							

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Sub-Matrix: SOIL					Matrix Spike (N	IS) and Matrix S	pike Duplicate	(MSD) Report	t	
				Spike	Spike Red	overy (%)	Recovery	Limits (%)	RP	Ds (%)
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	MSD	Low	High	Value	Control Limit
EP080: BTEXN (Q	CLot: 3480767) - continue	d								
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: Halogena	ted 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: Halogena	ted Aromatic Compounds	(QCLot: 3480768)								
ES1412488-001	EXCAV3-VS1	EP074: Chlorobenzene	108-90-7	2.5 mg/kg	76.0		70	130		
EP080/071: Total F	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 F	Recoverable Hydrocarbons	s - 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 Met	als by ICP-AES (QCLot: 3	482242)								
ES1412149-001	Anonymous	EG005T: Lead	7439-92-1	125 mg/kg	# Not		70	130		
					Determined					
EG005T: Total Met	als by ICP-AES (QCLot: 3	482244)								
ES1412508-001	Anonymous	EG005T: Lead	7439-92-1	125 mg/kg	106		70	130		



1999	CERTIFICATE OF ANALYSIS									
Work Order	ES1412488	Page	: 1 of 11							
Client Contact	AECOM Australia Pty Ltd s22	Laboratory Contact	: Environmental Division Sydney : Client Services							
Address	ELEVEL 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	NATA Accredited Laboratory 825 Accredited for compliance with	<i>Signatories</i> This document has been electronicall carried out in compliance with procedures s		indicated below. Electronic signing has been
NATA	ISO/IEC 17025.	Signatories	Position	Accreditation Category
				Sydney Inorganics
WORLD RECOGNISED		s22	Organic Chemist	Sydney Organics
ACCREDITATION		s22	Senior Spectroscopist	Sydney Inorganics
		s22	Senior Organic Chemist	Sydney Organics

Address 277-289 Woodpark Road Smithfield NSW Australia 2164 PHONE +61-2-8784 8555 Facsimile +61-2-8784 8500 Environmental Division Sydney ABN 84 009 936 029 Part of the ALS Group An ALS Limited Company





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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



Sub-Matrix: SOIL (Matrix: SOIL)		Clie	ent sample ID	EXCAV3-VS1	EXCAV3-VS2	EXCAV3-N	EXCAV3-S	EXCAV3-E
	Cli	ent samplir	ng 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
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 Hydro	carbons							
Styrene	100-42-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
lsopropylbenzene	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-lsopropyltoluene	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 Com	pounds							
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



Sub-Matrix: SOIL (Matrix: SOIL)		Clie	nt sample ID	EXCAV3-VS1	EXCAV3-VS2	EXCAV3-N	EXCAV3-S	EXCAV3-E
	Clie	ent samplin	g 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
EP074E: Halogenated Aliphatic Com	pounds - Continued							
1.1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
lodomethane	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 Com	pounds							
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



Sub-Matrix: SOIL (Matrix: SOIL)		Cli	ent sample ID	EXCAV3-VS1	EXCAV3-VS2	EXCAV3-N	EXCAV3-S	EXCAV3-E
	Cli	ent sampli	ing 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
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 Hydrocar	rbons							
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 Hydrod	arbons - NEPM 201	3						
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

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Work Order	: ES1412488
Client	: AECOM Australia Pty Ltd
Project	MOOREBANK 60221935



Sub-Matrix: SOIL (Matrix: SOIL)		Clie	ent sample ID	EXCAV3-VS1	EXCAV3-VS2	EXCAV3-N	EXCAV3-S	EXCAV3-E
	Cl	lient sampli	ng 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



Sub-Matrix: SOIL (Matrix: SOIL)		Clie	ent sample ID	EXCAV3-W	EXCAV3-B1	EXCAV3-B2	
	Clie	ent sampli	ng 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 Hydroc	arbons						
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-lsopropyltoluene	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 Compo	ounds						
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	



Sub-Matrix: SOIL (Matrix: SOIL)		Clie	ent sample ID	EXCAV3-W	EXCAV3-B1	EXCAV3-B2	
	Cli	ent samplii	ng date / time	[05-JUN-2014]	[05-JUN-2014]	[05-JUN-2014]	
Compound	CAS Number	LOR	Unit	ES1412488-006	ES1412488-007	ES1412488-008	
EP074E: Halogenated Aliphatic Compo	ounds - Continued						
1.1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	<0.5	<0.5	
lodomethane	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 Compo	ounds						
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	



Sub-Matrix: SOIL (Matrix: SOIL)		Clie	ent sample ID	EXCAV3-W	EXCAV3-B1	EXCAV3-B2	
	Cli	ient sampli	ng date / time	[05-JUN-2014]	[05-JUN-2014]	[05-JUN-2014]	
Compound	CAS Number	LOR	Unit	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 Hydrocarl	bons						
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 Hydroc	arbons - NEPM 201	3					
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	

Page	: 10 of 11
Work Order	: ES1412488
Client	: AECOM Australia Pty Ltd
Project	: MOOREBANK 60221935



	Cli	ent sample ID	EXCAV3-W	EXCAV3-B1	EXCAV3-B2		
Cl	ient sampli	ing date / time	[05-JUN-2014]	[05-JUN-2014]	[05-JUN-2014]		
CAS Number	LOR	Unit	ES1412488-006	ES1412488-007	ES1412488-008		
							-
17060-07-0	0.1	%	76.8	75.0	76.0		
2037-26-5	0.1	%	100	97.2	96.2		
460-00-4	0.1	%	95.0	93.9	91.3		
	CAS Number 17060-07-0 2037-26-5	Client sampli CAS Number LOR 17060-07-0 0.1 2037-26-5 0.1	17060-07-0 0.1 % 2037-26-5 0.1 %	Client sampling date / time [05-JUN-2014] CAS Number LOR Unit ES1412488-006 17060-07-0 0.1 % 76.8 2037-26-5 0.1 % 100	Client sampling date / time [05-JUN-2014] [05-JUN-2014] CAS Number LOR Unit ES1412488-006 ES1412488-007 17060-07-0 0.1 % 76.8 75.0 2037-26-5 0.1 % 100 97.2	Client sampling date / time [05-JUN-2014] [05-JUN-2014] [05-JUN-2014] CAS Number LOR Unit ES1412488-006 ES1412488-007 ES1412488-008 CAS Number LOR Unit Final Control of the second se	Client sampling date / time [05-JUN-2014] [05-JUN-2014] [05-JUN-2014] [05-JUN-2014] CAS Number LOR Unit ES1412488-006 ES1412488-007 ES1412488-008 17060-07-0 0.1 % 76.8 75.0 76.0 2037-26-5 0.1 % 100 97.2 96.2

Page	: 11 of 11
Work Order	: ES1412488
Client	: AECOM Australia Pty Ltd
Project	: MOOREBANK 60221935

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

Defence FOI 235/19/20



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SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive Report

Work Order	: ES1411803

Client Contact Address	: s22 : LEVE	M Australia Pty Ltd L 11, 44 MARKET STREET IEY NSW 1230	Laboratory Contact Address	 Environmental Division Sydney Client Services 277-289 Woodpark Road Smithfield NSW Australia 2164 				
E-mail : s22 @aecom.com Telephone : 02 8264 5100 Facsimile : 02 8264 5111			E-mail Telephone Facsimile	 sydney@alsglobal.com +61-2-8784 8555 +61-2-8784 8500 				
Project : 60221935 MOOREBANK			Page	: 1 of 3				
Order number C-O-C number	-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 Rece	eived	: 28-MAY-2014	Issue Date	: 28-MAY-2014 16:37				
Client Requested D	ue Date	: 03-JUN-2014	Scheduled Reporting	ng Date 03-JUN-2014				
Delivery Deta	ails							
Mode of Delivery		: Client Drop off	Temperature	: 3.5'C - Ice present				
No. of coolers/boxe	s	1 HARD	No. of samples rec	•				
Security Seal		: Intact.	No. of samples and	alysed : 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.

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Issue Date	: 28-MAY-2014 16:37
Page	: 2 of 3
Work Order	: ES1411803
Client	: AECOM Australia Pty Ltd

Sample Container(s)/Preservation Non-Compliances

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

KN/PAH + Pb

• 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/btex
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	1
ES1411803-008	28-MAY-2014 15:00	EXCAV2-1	✓
ES1411803-009	28-MAY-2014 15:00	EXCAV2-2	1
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	1
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.



Issue Date	: 28-MAY-2014 16:37
Page	: 3 of 3
Work Order	: ES1411803
Client	: AECOM Australia Ptv Ltd

Requested Deliverables

ACCOUNTS PAYABLE



- A4 - AU Tax Invoice (INV)	Email	ap_cust m	tomerservice.anz@aecom.co
s22		- 00	
 *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



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

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Work Order	: ES1411803
Client	: AECOM Australia Pty Ltd
Project	: 60221935 MOOREBANK

Matrix: SOIL



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

Evaluation: \mathbf{x} = Holding ime breach ; \mathbf{v} = Within holding time.

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

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Work Order	: ES1411803
Client	: AECOM Australia Pty Ltd
Project	· 60221935 MOOREBANK



Matrix: SOIL					Evaluation	: × = Holding ime	breach ; ✓ = Withir	n holding time
Method		Sample Date	Ex	traction / Preparation		Analysis		
Container / Client Sample ID(s)			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,	21-MAY-2014	28-MAY-2014	04-JUN-2014	1	29-MAY-2014	07-JUL-2014	✓
EXCAV1-E,	EXCAV1-W,							
EXCAV1-B								
Soil Glass Jar - Unpreserved (EP071)								
EXCAV1-VS1,	EXCAV1-VS2,	28-MAY-2014	28-MAY-2014	11-JUN-2014	1	29-MAY-2014	07-JUL-2014	✓
EXCAV2-1,	EXCAV2-2,							
EXCAV2-3,	EXCAV2-4,							
EXCAV2-5,	EXCAV2-6,							
EXCAV2-7,	EXCAV2-8,							
EXCAV2-9,	EXCAV2-10,							
EXCAV2-3, EXCAV2-11,	EXCAV2-10, EXCAV2-VS1,							
EXCAV2-11, EXCAV2-VS2	EXCAV2-V31,							
EP075(SIM)B: Polynuclear Aromatic Hydrocarbo	ns		1				1	
Soil Glass Jar - Unpreserved (EP075(SIM))	5/201/4/2	04 MAY 0044	00 10 10 10 10 10	04 1111 2014		29-MAY-2014	07 11 11 0044	
EXCAV1-N,	EXCAV1-S,	21-MAY-2014	28-MAY-2014	04-JUN-2014	~	29-WA 1-2014	07-JUL-2014	 ✓
EXCAV1-E,	EXCAV1-W,							
EXCAV1-B								
Soil Glass Jar - Unpreserved (EP075(SIM))	EV.0.0.1/1.1/00	00 MAX 0044	00 10 10 10 10 10	44 1111 0044		00 1447 0044	07 11 11 0044	
EXCAV1-VS1,	EXCAV1-VS2,	28-MAY-2014	28-MAY-2014	11-JUN-2014	~	29-MAY-2014	07-JUL-2014	✓
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								
EP080: BTEXN								
Soil Glass Jar - Unpreserved (EP080)								
EXCAV1-N,	EXCAV1-S,	21-MAY-2014	28-MAY-2014	04-JUN-2014	1	30-MAY-2014	04-JUN-2014	 ✓
EXCAV1-E,	EXCAV1-W,							
EXCAV1-B								
Soil Glass Jar - Unpreserved (EP080)								
EXCAV1-VS1,	EXCAV1-VS2,	28-MAY-2014	28-MAY-2014	11-JUN-2014	1	30-MAY-2014	11-JUN-2014	 ✓
EXCAV2-1,	EXCAV2-2,							
EXCAV2-3,	EXCAV2-4,							
EXCAV2-5,	EXCAV2-6,							
EXCAV2-7,	EXCAV2-8,							
EXCAV2-9,	EXCAV2-10,							
EXCAV2-3, EXCAV2-11,	EXCAV2-10, EXCAV2-VS1,							
								1

Defence FOI 235/19/20

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Evaluation: \star = Holding ime breach ; \checkmark = Within holding time.

Matrix: SOIL					Evaluation:	: × = Holding ime	breach ; ✓ = Withir	n holding time.
Method		Sample Date	Ex	Extraction / Preparation			Analysis	
Container / Client Sample ID(s)			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,	21-MAY-2014	28-MAY-2014	04-JUN-2014	1	30-MAY-2014	04-JUN-2014	✓
EXCAV1-E,	EXCAV1-W,							
EXCAV1-B								
Soil Glass Jar - Unpreserved (EP080)								
EXCAV1-VS1,	EXCAV1-VS2,	28-MAY-2014	28-MAY-2014	11-JUN-2014	1	30-MAY-2014	11-JUN-2014	✓
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								

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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 Cor	ntrol frequency n	not within specification ; \checkmark = Quality Control frequency within specification.
Quality Control Sample Type		С	ount	Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Reaular	Actual Expected Evaluation		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	1	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

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

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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.



QUALITY CONTROL REPORT

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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			
acsimile	: 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 Accredited Signatories

Laboratory 825 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.

Accredited for	Signatories	Position	Accreditation Category
compliance with ISO/IEC 17025.	s22	Senior Spectroscopist	Sydney Inorganics
130/IEC 17025.	s22	Senior Organic Chemist	Sydney Inorganics
	s22	Senior Organic Chemist	Sydney Organics
	s22	Metals Coordinator	Sydney Inorganics

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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

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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 (%		
A055: Moisture Co	ntent (QC Lot: 3462283	3)									
ES1411794-022	Anonymous	EA055-103: Moisture Content (dried @ 103°C)		1.0	%	12.6	12.0	5.0	0% - 50%		
S1411803-010	EXCAV2-3	EA055-103: Moisture Content (dried @ 103°C)		1.0	%	12.6	12.9	1.8	0% - 50%		
A055: Moisture Co	ntent (QC Lot: 3462284	4)									
ES1411803-019	EXCAV2-VS1	EA055-103: Moisture Content (dried @ 103°C)		1.0	%	6.6	7.6	14.9	No Limit		
G005T: Total Metal	Is by ICP-AES (QC Lot:	: 3463716)									
S1411835-029	Anonymous	EG005T: Lead	7439-92-1	5	mg/kg	28	21	29.9	No Limit		
S1411923-004	Anonymous	EG005T: Lead	7439-92-1	5	mg/kg	22	26	16.7	No Limit		
G005T: Total Metal	s by ICP-AES (QC Lot										
S1411766-022	Anonymous	EG005T: Lead	7439-92-1	5	mg/kg	9	7	30.2	No Limit		
S1411803-016	EXCAV2-9	EG005T: Lead	7439-92-1	5	mg/kg	<5	<5	0.0	No Limit		
		carbons (QC Lot: 3462070)									
S1411803-001	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		
S1411803-011	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		

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Sub-Matrix: SOIL			Γ						
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP075(SIM)B: Poly	nuclear Aromatic Hy	drocarbons (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		0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		hydrocarbons							
		EP075(SIM): Benzo(a)pyrene TEQ (zero)		0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP080/071: Total P	etroleum Hydrocarbo	ons (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 P	etroleum Hydrocarbo	ons (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 R	ecoverable Hydrocar	bons - 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
		bons - NEPM 2013 (QC Lot: 3462069)			3 5				
ES1411803-001	EXCAV1-N	EP071: >C16 - C34 Fraction		100	mg/kg	<100	<100	0.0	No Limit
201411000-001		EP071: >C10 - C34 Fraction 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			100	mg/kg	<100	<100	0.0	No Limit
231411003-011		EP071: >C16 - C34 Fraction		100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction EP071: >C10 - C16 Fraction	 >C10 C16	50	mg/kg	<50	<50	0.0	No Limit
	L at: 2462062)			00	119/119	-00	-00	0.0	
EP080: BTEXN (QC			74.40.0	0.0		-0.0	10.0	0.0	N In I insid
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	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
			106-42-3						

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Sub-Matrix: SOIL						Laboratory L	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	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
			106-42-3						
		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

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 : 60221935 MOOREBANK



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)		S) Report	Report		
				Report	Spike	Spike Recovery (%)	Recovery	Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High	
EG005T: Total Metals by ICP-AES(QCLot: 3463	3716)								
EG005T: Lead	7439-92-1	5	mg/kg	<5	40.0 mg/kg	114	86	124	
EG005T: Total Metals by ICP-AES (QCLot: 3465	5681)								
EG005T: Lead	7439-92-1	5	mg/kg	<5	40.0 mg/kg	99.9	86	124	
EP075(SIM)B: Polynuclear Aromatic Hydrocarb	ons (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(QC	Lot: 3462062)								
EP080: C6 - C9 Fraction		10	mg/kg	<10	26 mg/kg	109	68.4	128	
EP080/071: Total Petroleum Hydrocarbons(QC	Lot: 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 - N	NEPM 2013 (QCLot: 3462062	2)							
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	112	68.4	128	
EP080/071: Total Recoverable Hydrocarbons - N	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	

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ib-Matrix: SOIL				Method Blank (MB)	Laboratory Control Spike (LCS) Report				
				Report	Spike	Spike Recovery (%)	Recovery	Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	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	0.5	mg/kg	<0.5	2 mg/kg	92.2	60	120	
	106-42-3								
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.

ub-Matrix: SOIL			M	atrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery	Limits (%)
aboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG005T: Total M	etals by ICP-AES (QCLot: 3463716)						
ES1411923-004	Anonymous	EG005T: Lead	7439-92-1	125 mg/kg	114	70	130
EG005T: Total M	etals by ICP-AES (QCLot: 3465681)						
ES1411766-022	Anonymous	EG005T: Lead	7439-92-1	125 mg/kg	99.6	70	130
EP075(SIM)B: Po	lynuclear Aromatic Hydrocarbons (QCLot: 34	62070)					
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	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 (QC	CLot: 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 (QC	CLot: 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



ub-Matrix: SOIL			Matrix Spike (MS) Report				
			Spike	SpikeRecovery(%)	Recovery L	.imits (%)	
Laboratory sample ID Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High	
EP080: BTEXN (QCLot: 3462062) - continued							
ES1411803-001 EXCAV1-N	EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	79.2	70	130	
		106-42-3					
	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 representaive 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 (N	IS) and Matrix S	pike Duplicate	e (MSD) Report	t	
				Spike	Spike Red	overy (%)	Recovery	Limits (%)	RP	PDs (%)
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	MSD	Low	High	Value	Control Limi
EP080/071: Total P	etroleum Hydrocarbons(C	QCLot: 3462062)								
ES1411803-001	EXCAV1-N	EP080: C6 - C9 Fraction		32.5 mg/kg	102		70	130		
EP080/071: Total R	ecoverable Hydrocarbons	- NEPM 2013 (QCLot: 3462062)								
ES1411803-001	EXCAV1-N	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	100		70	130		
EP080: BTEXN (Q	CLot: 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 P	etroleum Hydrocarbons (C	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 R	ecoverable 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		
P075(SIM)B: Poly	nuclear Aromatic Hydroca	rbons (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		
G005T: Total Met	als by ICP-AES (QCLot: 34	163716)								
ES1411923-004	Anonymous	EG005T: Lead	7439-92-1	125 mg/kg	114		70	130		
EG005T: Total Met	als by ICP-AES (QCLot: 34	65681)								

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Sub-Matrix: SOIL			Matrix Spike (N	IS) and Matrix Spi	ike Duplicate	(MSD) Repo	rt			
				Spike	Spike Red	covery (%)	Recovery	Limits (%)	RPD	s (%)
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	MSD	Low	High	Value	Control Limit
EG005T: Total Meta	EG005T: Total Metals by ICP-AES (QCLot: 3465681) - continued									
ES1411766-022	Anonymous	EG005T: Lead	7439-92-1	125 mg/kg	99.6		70	130		

Sydney Inorganics



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Client	AECOM Australia Pty Ltd	Laboratory	Environmental Division Sydney
Contact	s22	Contact	: Client Services
Address	LEVEL 11, 44 MARKET STREET	Address	277-289 Woodpark Road Smithfield NSW Australia 2164
	SYDNEY NSW 1230		
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	2 million		
C-O-C number	2 	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:

s22

- General Comments
- Analytical Results
- Surrogate Control Limits

Signatories NATA Accredited Laboratory 825 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. Accredited for compliance with ΝΑΤΑ ISO/IEC 17025. Signatories Position Accreditation Category s22 Senior Spectroscopist Sydney Inorganics Senior Organic Chemist s22 Sydney Inorganics WORLD RECOGNISED s22 Senior Organic Chemist Sydney Organics

Metals Coordinator

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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.

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Sub-Matrix: SOIL (Matrix: SOIL)		Clie	ent sample ID	EXCAV1-N	EXCAV1-S	EXCAV1-E	EXCAV1-W	EXCAV1-B
	Cli	ent samplii	ng date / time	21-MAY-2014 15:00				
Compound	CAS Number	LOR	Unit	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 Hyd	Irocarbons					1		
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	000000	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ (zero)	1 <u>0367</u> 3	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 Hydrocarbo	ns							
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)	1400000	50	mg/kg	<50	<50	490	120	1090
EP080/071: Total Recoverable Hydrocart	oons - NEPM 201	3						
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

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Sub-Matrix: SOIL (Matrix: SOIL)		Client sample ID			EXCAV1-S	EXCAV1-E	EXCAV1-W	EXCAV1-B
	Client sampling date / time			21-MAY-2014 15:00				
Compound	CAS Number	LOR Unit		ES1411803-001	ES1411803-002	ES1411803-003	ES1411803-004	ES1411803-005
EP080/071: Total Recoverable Hydro	carbons - NEPM 201	3 - Contin	ued					
>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	1 <u>1-11-1</u>	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 S	urrogates							
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



Sub-Matrix: SOIL (Matrix: SOIL)		Clie	ent sample ID	EXCAV1-VS1	EXCAV1-VS2	EXCAV2-1	EXCAV2-2	EXCAV2-3
	Cli	ent samplii	ng date / time	28-MAY-2014 15:00				
Compound	CAS Number LOF		LOR Unit	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 Hyd	Irocarbons							
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	11.0000	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ (zero)	(<u>1996)</u>	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 Hydrocarbo	ns							
C6 - C9 Fraction	1 <u></u>	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	أعصفر	100	mg/kg	440	860	<100	<100	<100
C10 - C36 Fraction (sum)	1 <u>-1211</u>	50	mg/kg	930	1730	<50	<50	<50
EP080/071: Total Recoverable Hydrocart	oons - NEPM 201	3						
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



Sub-Matrix: SOIL (Matrix: SOIL)		Clie	ent sample ID	EXCAV1-VS1	EXCAV1-VS2	EXCAV2-1	EXCAV2-2	EXCAV2-3
	Client sampling date / time			28-MAY-2014 15:00				
Compound	CAS Number	LOR	Unit	ES1411803-006	ES1411803-007	ES1411803-008	ES1411803-009	ES1411803-010
EP080/071: Total Recoverable Hydroc	arbons - NEPM 201	3 - Contin	ued					
>C10 - C16 Fraction	>C10_C16	50	mg/kg	110	160	<50	<50	<50
>C16 - C34 Fraction	(<u>1367</u>)	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 <u>1862</u>	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 Su	urrogates							
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

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Sub-Matrix: SOIL (Matrix: SOIL)		Clie	ent sample ID	EXCAV2-4	EXCAV2-5	EXCAV2-6	EXCAV2-7	EXCAV2-8
	Clie	ent samplii	ng date / time	28-MAY-2014 15:00				
Compound	CAS Number	LOR	Unit	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 Hyd	rocarbons							
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)	1.2.2	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 Hydrocarbo	ns							
C6 - C9 Fraction	1222 ·	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	ا میسیر	100	mg/kg	<100	<100	<100	<100	<100
C10 - C36 Fraction (sum)	1.00000	50	mg/kg	<50	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrocarl	oons - NEPM <u>201</u>	3					*	
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



Sub-Matrix: SOIL (Matrix: SOIL)		Clie	ent sample ID	EXCAV2-4	EXCAV2-5	EXCAV2-6	EXCAV2-7	EXCAV2-8
	Client sampling date / time			28-MAY-2014 15:00				
Compound	CAS Number	LOR Unit		ES1411803-011	ES1411803-012	ES1411803-013	ES1411803-014	ES1411803-015
EP080/071: Total Recoverable Hydroc	arbons - NEPM 201	3 - Contin	ued					
>C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	<50	<50	<50
>C16 - C34 Fraction	(<u>1367</u>)	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 <u>1862</u>	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 Su	urrogates							
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

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Sub-Matrix: SOIL (Matrix: SOIL)		Clie	ent sample ID	EXCAV2-9	EXCAV2-10	EXCAV2-11	EXCAV2-VS1	EXCAV2-VS2
	Cli	ent samplii	ng date / time	28-MAY-2014 15:00				
Compound	CAS Number	LOR	Unit	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 Hyd	rocarbons							
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)	10363	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 Hydrocarbo	ns							
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	1	100	mg/kg	<100	<100	<100	<100	<100
C29 - C36 Fraction	المبدور	100	mg/kg	<100	<100	<100	<100	<100
C10 - C36 Fraction (sum)	1-2-2-22	50	mg/kg	<50	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrocarl	bons - NEPM 201	3						
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



Sub-Matrix: SOIL (Matrix: SOIL)		Clie	ent sample ID	EXCAV2-9	EXCAV2-10	EXCAV2-11	EXCAV2-VS1	EXCAV2-VS2
	Client sampling date / time			28-MAY-2014 15:00				
Compound	CAS Number	LOR Unit		ES1411803-016	ES1411803-017	ES1411803-018	ES1411803-019	ES1411803-020
EP080/071: Total Recoverable Hydroc	arbons - NEPM 201	3 - Contin	ued					
>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	1 <u>1352</u>	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 St	urrogates							
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		Recovery	Limits (%)
Compound	CAS Number	Low	High
EP075(SIM)S: Phenolic Compound	d 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-Brom of luor obenzene	460-00-4	71.6	130.0



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Environmental Division

INTERPRETIVE QUALITY CONTROL REPORT

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

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 Work Order
 : ES1310252

 Client
 : AECOM Australia Pty Ltd

 Project
 : 60221935 MOOREBANK



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) & o her metals (180 days). A recorded breach therefore does not guarantee a breach for all non-volatile parameters.

Matrix: SOIL					Evaluation	: × = Holding ime	breach ; ✓ = Withir	holding time
Method	Sample Date	Ex	traction / Preparation		Analysis			
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content								
Soil Glass Jar - Unpreserved (EA055-103) SP103-5, SP103-7, SP104-1,	SP103-6, SP103-8, SP103_9	06-MAY-2013				09-MAY-2013	20-MAY-2013	~
EG005T: Total Metals by ICP-AES								
Soil Glass Jar - Unpreserved (EG005T) SP103-8, SP103_9	SP104-1,	06-MAY-2013	10-MAY-2013	02-NOV-2013	1	11-MAY-2013	02-NOV-2013	~
EG035T: Total Recoverable Mercury by FIMS								
Soil Glass Jar - Unpreserved (EG035T) SP103-8, SP103_9	SP104-1,	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, SP103-7, SP104-1	SP103-6, SP103-8,	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	1	08-MAY-2013	17-JUN-2013	~
Soil Glass Jar - Unpreserved (EP075(SIM)) SP103-5, SP103-7, SP104-1	SP103-6, SP103-8,	06-MAY-2013	08-MAY-2013	20-MAY-2013	~	09-MAY-2013	17-JUN-2013	~

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Work Order	: ES1310252
Client	: AECOM Australia Pty Ltd
Project	: 60221935 MOOREBANK

Matrix: SOIL



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

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

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Project	: 60221935 MOOREBANK



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	n: 🗴 = Quality Cor	ntrol frequency r	not within specification ; \checkmark = Quality Control frequency within specification
Quality Control Sample Type		Co	ount		Rate (%)		Quality Control Specification
Analytical Methods	Method	QC	Reaular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
Moisture Content	EA055-103	2	20	10.0	10.0	\checkmark	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	1	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	1	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	1	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	1	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

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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.

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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	: ES1310252	Page	: 1 of 12
Client Contact Address	E AECOM Australia Pty Ltd s22 E LEVEL 11, 44 MARKET STREET SYDNEY NSW 1230	Laboratory Contact Address	: Environmental Division Sydney _: s22 : 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 Site	: 60221935 MOOREBANK :	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
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

Accredited for compliance with

ISO/IEC 17025.



NATA Accredited Laboratory 825 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

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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

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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 Co	ntent (QC Lot: 285854	7)								
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 Metal	Is 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 Reco	overable Mercury by FI	MS (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: Polyn	uclear Aromatic Hydro	ocarbons (QC Lot: 2854078)								
ES1310251-002	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
	, monymous	EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP075(SIM): Acenaphthylene	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	

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Sub-Matrix: SOIL						Laboratory I	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: Polyn	uclear Aromatic Hydroc	carbons (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		0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		hydrocarbons							
		EP075(SIM): Benzo(a)pyrene TEQ (WHO)		0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075(SIM)B: Polyn	uclear Aromatic Hydroc	arbons (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		0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		hydrocarbons							
		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



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Client	: AECOM Australia Pty Ltd
Project	: 60221935 MOOREBANK



Sub-Matrix: SOIL						Laboratory	Duplicate (DUP) Report	1	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP075(SIM)B: Polyn	uclear Aromatic Hydrod	carbons (QC Lot: 2855819) - continued							
ES1310250-019	Anonymous	EP075(SIM): Sum of polycyclic aroma ic		0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		hydrocarbons							
		EP075(SIM): Benzo(a)pyrene TEQ (WHO)		0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP080/071: Total Pe	troleum 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 Pe	troleum 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 Pe	troleum 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 Pe	troleum Hydrocarbons								
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 Re		ns - NEPM 2010 Draft (QC Lot: 2854077)			0.0				
ES1310251-002	Anonymous	EP071: >C16 - C34 Fraction		100	mg/kg	<100	<100	0.0	No Limit
	, alony mode	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 Po	coverable Hydrocarbor	ns - NEPM 2010 Draft (QC Lot: 2854652)						0.0	
ES1310096-001	Anonymous			10	mg/kg	<10	<10	0.0	No Limit
ES1310096-017	Anonymous	EP080: C6 - C10 Fraction EP080: C6 - C10 Fraction		10	mg/kg	<10	<10	0.0	No Limit
				10	iiig/kg	<10	<10	0.0	NO LITIIL
	-	ns - NEPM 2010 Draft (QC Lot: 2855818)		100		-100	100	0.0	N I a 1 Sec 14
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
504040050 040	A	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
		ns - 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

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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) - contin	ued							
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	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
			106-42-3						
		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	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
			106-42-3						
		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	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
			106-42-3						
		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	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
			106-42-3						
		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

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 : AECOM Australia Pty Ltd

 Project
 : 60221935 MOOREBANK



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)	Laboratory Control Spike (LCS) Report				
				Report	Spike	Spike Recovery (%)	Recovery	Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High	
EG005T: Total Metals by ICP-AES (QCLot: 28613	367)								
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(C	CLot: 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 Hydrocarbo	ns (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 Hydrocarbo	ns (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	

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Sub-Matrix: SOIL				Method Blank (MB)		Laboratory Control Spike (LCS	S) Report	
				Report	Spike	Spike Recovery (%)	Recovery	Limits (%)
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
P075(SIM)B: Polynuclear Aromatic Hydrocarbor	ns (QCLot: 2855819) - coi	ntinued						
P075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	4 mg/kg	110	78.9	113
P075(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
P075(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
P075(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
P080/071: Total Petroleum Hydrocarbons (QCL	ot: 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
P080/071: Total Petroleum Hydrocarbons (QCL	ot: 2854652)							
P080: C6 - C9 Fraction		10	mg/kg	<10	26 mg/kg	98.2	68.4	128
P080/071: Total Petroleum Hydrocarbons (QCL	ot: 2855818)							
P071: C10 - C14 Fraction		50	mg/kg	<50	200 mg/kg	107	59	131
P071: C15 - C28 Fraction		100	mg/kg	<100	300 mg/kg	112	74	138
P071: C29 - C36 Fraction		100	mg/kg	<100	200 mg/kg	105	63	131
P080/071: Total Petroleum Hydrocarbons(QCL	ot: 2856430)							
P080: C6 - C9 Fraction		10	mg/kg	<10	26 mg/kg	99.6	68.4	128
EP080/071: Total Recoverable Hydrocarbons - NE	EPM 2010 Draft (OCL of: 28	854077)						
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 - NE	EPM 2010 Draft (OCL at: 29	854652)						
P080: C6 - C10 Fraction		10	mg/kg	<10	31 mg/kg	95.0	68.4	128
			iligitig	10	o r mg/ng	00.0	00.1	120
EP080/071: Total Recoverable Hydrocarbons - NE	PM 2010 Draft (QCLot: 28	55818) 50	ma/ka	<50	250 mg/kg	106	59	131
P071: >C10 - C16 Fraction		100	mg/kg mg/kg	<100	250 mg/kg 350 mg/kg	108	74	131
P071: >C16 - C34 Fraction		100		<100				
EP071: >C34 - C40 Fraction		50	mg/kg mg/kg	<100	 150 mg/kg	101	63	131
			iiig/kg		100 mg/kg	101		101
EP080/071: Total Recoverable Hydrocarbons - NE	•	,	malka	<10	21 ma/ka	96.9	68.4	128
EP080: C6 - C10 Fraction		10	mg/kg	<1U	31 mg/kg	90.9	00.4	128
EP080: BTEXN (QCLot: 2854652)								
P080: 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

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Sub-Matrix: SOIL				Method Blank (MB)	Laboratory Control Spike (LCS) Report				
			Report	Spike	Spike Recovery (%)	Recovery	Limits (%)		
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	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	0.5	mg/kg	<0.5	2 mg/kg	89.5	60	120	
	106-42-3								
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.

b-Matrix: SOIL				Ма	atrix Spike (MS) Report		
				Spike	SpikeRecovery(%)	Recovery	Limits (%)
aboratory sample ID.	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG005T: Total Meta	als 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
G035T: Total Rec	coverable Mercury by FIMS (QCLot: 2861368)						
ES1310245-014	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	96.6	70	130
EP075(SIM)B: Poly	nuclear 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: Poly	nuclear Aromatic Hydrocarbons (QCLot: 2855819)						
504040440.000	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	94.1	70	130
ES1310140-002						70	

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Sub-Matrix: SOIL				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery	Limits (%)
aboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
P080/071: Total P	etroleum 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 P	etroleum Hydrocarbons (QCLot: 2854652)						
	Anonymous	EP080: C6 - C9 Fraction		32.5 mg/kg	110	70	130
	etroleum Hydrocarbons (QCLot: 2855818)			0 <u>1</u> .0			
				0.40 //	407	=0	107
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 P	etroleum Hydrocarbons (QCLot: 2856430)						
ES1310250-019	Anonymous	EP080: C6 - C9 Fraction		32.5 mg/kg	109	70	130
EP080/071: To <u>tal R</u>	ecoverable Hydrocarbons - NEPM 2010 Dra	ft (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
=P080/071: Total R	ecoverable Hydrocarbons - NEPM 2010 Dra						
	Anonymous	EP080: C6 - C10 Fraction		37.5 mg/kg	107	70	130
				57.5 mg/kg	107	10	150
	ecoverable Hydrocarbons - NEPM 2010 Dra	ift (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
P080/071: Total R	ecoverable Hydrocarbons - NEPM 2010 Dra	ift (QCLot: 2856430)					
ES1310250-019	Anonymous	EP080: C6 - C10 Fraction		37.5 mg/kg	106	70	130
EP080: BTEXN (QC	CLot: 2854652)						
ES1310096-001	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	74.4	70	130
201010000 001	,,	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	2.5 mg/kg	77.4	70	130
			106-42-3				
		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 (QC	CL of: 2856430)						
	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	78.6	70	130
ES1310250 010		EPU8U: Benzene	/ 1-43-2	∠.5 mg/kg	0.01	10	130
ES1310250-019	Anonymous	EP080: Toluene	108-88-3	2.5 mg/kg	89.8	70	130

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Sub-Matrix: SOIL			M	atrix Spike (MS) Report		
			Spike	SpikeRecovery(%)	Recovery L	imits (%)
Laboratory sample ID Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP080: BTEXN (QCLot: 2856430) - continued						
ES1310250-019 Anonymous	EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	87.5	70	130
		106-42-3				
	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					Matrix Spike (I	MS) and Matrix S	pike Duplicate	e (MSD) Repor	t	
				Spike Spike Recovery (%) Recovery Li		Limits (%)	RP	PDs (%)		
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	MSD	Low	High	Value	Control Limit
EP080/071: Total P	Petroleum Hydrocarbons (Q	CLot: 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 F	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: Poly	nuclear Aromatic Hydrocar	bons (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 P	Petroleum Hydrocarbons (Q	CLot: 2854652)								
ES1310096-001	Anonymous	EP080: C6 - C9 Fraction		32.5 mg/kg	110		70	130		
EP080/071: Total R	Recoverable Hydrocarbons -	NEPM 2010 Draft (QCLot: 2854652)								
ES1310096-001	Anonymous	EP080: C6 - C10 Fraction		37.5 mg/kg	107		70	130		
EP080: BTEXN (Q	CLot: 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	2.5 mg/kg	77.4		70	130		
			106-42-3							
		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 P	Petroleum Hydrocarbons (Q	CLot: 2855818)								
ES1310140-002	Anonymous	EP071: C10 - C14 Fraction		640 mg/kg	107		73	137		
		EP071: C15 - C28 Fraction		3140 mg/kg	120		53	131		

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Sub-Matrix: SOIL				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike	Spike Re	covery (%)	Recovery	Limits (%)	RP	Ds (%)
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	MSD	Low	High	Value	Control Limi
EP080/071: Total P	etroleum Hydrocarbons(QCLot: 2855818) - continued								
ES1310140-002	Anonymous	EP071: C29 - C36 Fraction		2860 mg/kg	86.5		52	132		
EP080/071: Total R	ecoverable 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: Poly	nuclear Aromatic Hydroca	rbons (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 P	etroleum Hydrocarbons (QCLot: 2856430)								
ES1310250-019	Anonymous	EP080: C6 - C9 Fraction		32.5 mg/kg	109		70	130		
EP080/071: Total R	ecoverable Hydrocarbons	- NEPM 2010 Draft (QCLot: 2856430)						1		
ES1310250-019	Anonymous	EP080: C6 - C10 Fraction		37.5 mg/kg	106		70	130		
EP080: BTEXN (Q	CLot: 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	2.5 mg/kg	87.5		70	130		
			106-42-3							
		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 Met	als by ICP-AES (QCLot: 28	861367)								
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 Red	coverable Mercury by FIMS	6 (QCLot: 2861368)								
ES1310245-014	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	96.6		70	130		





Environmental Division

(m.	CER [®]	TIFICATE OF ANALYSIS	
Work Order	ES1310252	Page	: 1 of 7
Client	: AECOM Australia Pty Ltd	Laboratory	: Environmental Division Sydney
Contact	s22	Contact	_s22
Address	ELEVEL 11, 44 MARKET STREET	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
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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:

Accredited for compliance with

ISO/IEC 17025.

- General Comments
- Analytical Results
- Surrogate Control Limits



NATA Accredited Laboratory 825 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	

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Work Order	: ES1310252
Client	: AECOM Australia Pty Ltd
Project	: 60221935 MOOREBANK



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



Sub-Matrix: SOIL (Matrix: SOIL)		Clie	ent sample ID	SP103-5	SP103-6	SP103-7	SP103-8	SP104-1
	Cli	ient sampli	ng date / time	06-MAY-2013 14:00				
Compound	CAS Number	LOR	Unit	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 F	lvdrocarbons							
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 hydrocarbon	s	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 Hydrocar	bons							
C6 - C9 Fraction		10	mg/kg	<10	<10	<10	<10	<10
C10 - C14 Fraction		50	mg/kg	70	<50	<50	60	<50



Sub-Matrix: SOIL (Matrix: SOIL)		Client sample I		SP103-5	SP103-6	SP103-7	SP103-8	SP104-1
	Cl	ient sampli	ng date / time	06-MAY-2013 14:00				
Compound	CAS Number	LOR	Unit	ES1310252-002	ES1310252-003	ES1310252-004	ES1310252-005	ES1310252-006
EP080/071: Total Petroleum Hydroca	arbons - 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 Hydro	carbons - NEPM 201	0 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 S	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



Sub-Matrix: SOIL (Matrix: SOIL)		Clie	ent sample ID	SP103_9	 	
	CI	ient sampli	ng 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 Hy	drocarbons					
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 Hydrocarb	ons					
C6 - C9 Fraction		10	mg/kg	<10	 	
C10 - C14 Fraction		50	mg/kg	<50	 	

Page	: 6 of 7
Work Order	: ES1310252
Client	: AECOM Australia Pty Ltd
Project	: 60221935 MOOREBANK



Sub-Matrix: SOIL (Matrix: SOIL)		Clie	ent sample ID	SP103_9	 	
	Cl	ient sampli	ng date / time	06-MAY-2013 14:00	 	
Compound	CAS Number	CAS Number LOR Unit		ES1310252-008	 	
EP080/071: Total Petroleum Hydroca	rbons - 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 Hydrod	carbons - NEPM 201	0 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 S	urrogates					
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		Recovery	Limits (%)
Compound	CAS Number	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



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AECOM Australia Pty Ltd Level 21, 420 George Street Sydney, NSW, 2000 PO Box Q410, QVB PO, Sydney, NSW, 1230 Sampled By:		T +61 2 8934 0000 F +61 2 8934 0001								AL	ALS SMITHFIELD						Fax: Lab Quote No:						
Sampled By:		AECOM Project No:	6	07	22	1917	54	/	P	roject Nam	e:	Len!	21.	bo	L					_	La	D Quote no.	
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Turnaround time required											-	1	1							Lary Si	T		
Special storage requirem								_			1												
Report Format: Email:	Pace	on.com	_																		1		
Lab. ID	Sample ID	Sampling Date		Matri	r	-	-	vation	C	ontainer	BIEX		Held							i.			
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Comments:						•		<u> </u>		a									_				
Relinguished by: s22	s22	Signed: 2		12		Date				ecleved by s22								Sign 22	ed:	-		i E	Date/Time:





SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive Report

Work Order	: ES1310251

Client Contact Address	: s22 : LEVE	M Australia Pty Ltd L 11, 44 MARKET STREET IEY NSW 1230	Laboratory Contact Address	 Environmental Division Sydney s22 277-289 Woodpark Road Smithfield NSW Australia 2164 								
E-mail Telephone Facsimile		@aecom.com 64 5100 64 5111	E-mail Telephone Facsimile	: s22 @alsglobal.com : +61 2 8784 8555 : +61 2 8784 8555								
Project Order number	60221	935 MOOREBANK	Page	: 1 of 2								
C-O-C number Site	:		Quote number	: ES2012HLAENV0454 (EN/004/12)								
Sampler	: s22		QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement								
Dates												
Date Samples Rece	eived	: 06-MAY-2013	Issue Date	: 06-MAY-2013 15:29								
Client Requested Due Date		: 13-MAY-2013	Scheduled Reporting	ng Date 13-MAY-2013								
Delivery Deta	ails											
Mode of Delivery		: Client Drop off	Temperature	: 3.6'C - Ice present								
No. of coolers/boxe	S	2 HARD	No. of samples rec	eived : 5								
Security Seal		: Intact.	No. of samples and	alysed : 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.

Address 277-289 Woodpark Road Smithfield NSW Australia 2164 PHONE +61-2-8784 8555 Facsimile +61-2-8784 8500 Environmental Division Sydney ABN 84 009 936 029 Part of the ALS Group An ALS Limited Company

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Issue Date	: 06-MAY-2013 15:29
Page	: 2 of 2
Work Order	: ES1310251
Client	: AECOM Australia Pty Ltd



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

bracketed without a time component.									
	Matrix: SOIL			<pre>D L - S-26 metals/TPH/BTEX/PAH</pre>					
	Laboratory sample ID	Client sampling date / time	Client sample ID	SOL-S 8 metals					
	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 Contact	AECOM Australia Pty Ltd s22	Laboratory Contact	: Environmental Division Sydney s22
Address	LEVEL 11, 44 MARKET STREET SYDNEY NSW 1230	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	s22 Daecom.com	E-mail	.s22 Dalsglobal.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	13. 	Date Samples Received	: 06-MAY-2013
Sampler	s22	Issue Date	: 10-MAY-2013
Order number			
		No. of samples received	8 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

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 Work Order
 ES1310251

 Client
 AECOM Australia Pty Ltd

 Project
 60221935 MOOREBANK



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				000 0000000 010	Evaluation	:: * = Holding time	breach ; 🖌 = Withir	n holding tin
Method		Sample Date Extraction / Prep		traction / Preparation		Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content								
Soil Glass Jar - Unpreserved (EA055-10								1
VS104-2,	VS104-3,	02-MA Y-2013	 6	0-053	007010	09-MAY-2013	16-MAY-2013	v
VS104-4,	VS104-5,							
QC23								
EG005T: Total Metals by ICP-AES								
Soil Glass Jar - Unpreserved (EG005T)								1
VS104-2,	VS104-3,	02-MA Y-2013	09-MAY-2013	29-OCT-2013	1	09-MAY-2013	29-OCT-2013	1
VS104-4,	VS104-5,							
QC23								
EG035T: Total Recoverable Mercury b	y FIMS							
Soil Glass Jar - Unpreserved (EG035T)	* 65% 27% to 25% 00							
VS104-2,	VS104-3,	02-MA Y-2013	09-MAY-2013	30-MAY-2013	1	09-MAY-2013	30-MAY-2013	-
VS104-4,	VS104-5,							
QC23					-	U		
EP080/071: Total Petroleum Hydrocarb	oons							
Soil Glass Jar - Unpreserved (EP071)								
VS104-2,	VS104-3,	02-MA Y-2013	08-MAY-2013	16-MAY-2013	1	09-MAY-2013	17-JUN-2013	1
VS104-4,	VS104-5,							
QC23						J		
EP075(SIM)B: Polynuclear Aromatic Hy	ydrocarbons							
Soil Glass Jar - Unpreserved (EP075(SII		Venterson of Establish and Alle					2010.00110000000000000	1.000
VS104-2,	VS104-3,	02-MA Y-2013	08-MAY-2013	16-MAY-2013	1	09-MAY-2013	17-JUN-2013	-
VS104-4,	VS104-5,							
QC23	22					J		
EP080: BTEX								
Soil Glass Jar - Unpreserved (EP080)				NA 2014 NATIONAL AND A SAME	24.22			
VS104-2,	VS104-3,	02-MA Y-2013	08-MAY-2013	16-MAY-2013	1	09-MAY-2013	16-MAY-2013	1
VS104-4,	VS104-5,							
QC23								

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Work Order	ES1310251
Client	AECOM Australia Pty Ltd
Project	60221935 MOOREBANK



Matrix: SOIL Evaluation: * = Holding time breach ; < = Within holding time. Method Sample Date Extraction / Preparation Analysis Container / Client Sample ID(s) Evaluation Date extracted Due for extraction Evaluation Date analysed Due for analysis EP080: BTEXN Soil Glass Jar - Unpreserved (EP080) 16-MAY-2013 16-MAY-2013 VS104-2, VS104-3, 02-MA Y-2013 08-MAY-2013 1 09-MAY-2013 1 VS104-4, VS104-5, QC23 EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft Soil Glass Jar - Unpreserved (EP080) VS104-3, 02-MA Y-2013 08-MAY-2013 16-MAY-2013 09-MAY-2013 16-MAY-2013 VS104-2, 1 1 VS104-4, VS104-5, QC23

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Client	AECOM Australia Pty Ltd
Project	60221935 MOOREBANK



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.

Aatrix: SOIL					and the second se	naonnequency i	not within specification ; \checkmark = Quality Control frequency within spe
Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Redular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
Moisture Content	EA055-103	2	20	10.0	10.0	1	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	1	10	10.0	10.0	1	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	5	20.0	10.0	1	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	5	20.0	10.0	1	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	10	10.0	10.0	1	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	20	10.0	10.0	1	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)	EP075(SIM)	1	10	10.0	5.0	1	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	5	20.0	5.0	1	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	5	20.0	5.0	1	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	10	10.0	5.0	1	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	20	5.0	5.0	1	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
PAH/Phenols (SIM)	EP075(SIM)	1	10	10.0	5.0	1	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Fotal Mercury by FIMS	EG035T	1	5	20.0	5.0	1	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Fotal Metals by ICP-AES	EG005T	1	5	20.0	5.0	1	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	10	10.0	5.0	1	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	20	5.0	5.0	1	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	1	10	10.0	5.0	1	ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	5	20.0	5.0	1	ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	5	20.0	5.0	1	ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	10	10.0	5.0	1	ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	20	5.0	5.0	1	ALS QCS3 requirement

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Work Order	ES1310251
Client	AECOM Australia Pty Ltd
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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.

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Work Order	ES1310251
Client	: AECOM Australia Pty Ltd
Project	60221935 MOOREBANK



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 s22	Laboratory	: Environmental Division Sydney s22
Contact Address	EEVEL 11, 44 MARKET STREET SYDNEY NSW 1230	Contact 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
acsimile	: 02 8264 5111	Facsimile	+61 2 8784 8555
Project	: 60221935 MOOREBANK	QC Level	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
ite			
C-O-C number	ž	Date Samples Received	: 06-MAY-2013
ampler	s22	Issue Date	10-MAY-2013
Order number	2. .		
		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	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.				
ISO/IEC 17025.	Signalories	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		
	Accredited for compliance with	Accredited for compliance with ISO/IEC 17025. This document has been ele carried out in compliance with pro Signatories \$22\$ \$22\$ \$22\$ \$22\$ \$22\$ \$22\$ \$22\$ \$22\$ \$22\$ \$22\$ \$22\$ \$22\$ \$22\$ \$22\$ \$22\$ \$22\$ \$22\$ \$22\$ \$22\$ \$22\$	Accredited for compliance with ISO/IEC17025. This document has been electronically signed by the authorized sign carried out in compliance with procedures specified in 21 CFR Part 11. Signalories Position \$22 Organic Chemist \$22 Organic Chemist \$22 Senior Spectro scopist \$22 Senior Spectro scopist \$22 Inorganic Chemist		

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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

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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 QVM-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%.

ub-Matrix: SOIL					· · · · · · · · · · · · · · · · · · ·	Laboratory l	Duplicate (DUP) Report		T
aboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%
A055: Moisture Co	ntent (QC Lot: 285854								
S1310251-002	VS104-2	EA055-103: Moisture Content (dried @ 103°C)		1.0	%	20.6	20.4	1.1	0% - 20%
S1310414-001	Anonymous	EA055-103: Moisture Content (dried @ 103°C)		1.0	%	23.4	23.1	1.0	0% - 20%
G005T: Total Meta	Is by ICP-AES (QC Lot	: 2859093)							
S1310251-002	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
G035T: Total Reco	overable Mercury by Fl	MS (QC Lot: 2859094)							
S1310251-002	VS104-2	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
P075(SIM)B: Polvr	uclear Aromatic Hvdro	carbons (QC Lot: 2854078)				1		041303000	
S1310251-002	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)pervlene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Sum of polycyclic aromatic		0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		hydrocarbons							
		EP075(SIM): Benzo(a)pyrene TEQ (WHO)		0.5	mg/kg	<0.5	<0.5	0.0	No Limit
2080/071: Total Pe	troleum Hydrocarbons	(QC Lot: 2854077)							
S1310251-002	VS104-2	EP071: C15 - C28 Fraction		100	mg/kg	<100	<100	0.0	No Limit
	 3059/99236330 	EP071: C29 - C36 Fraction		100	mg/kg	<100	<100	0.0	No Limit

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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 Pe	etroleum 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 Pe	etroleum 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 Re	ecoverable Hydrocarbo	ns - NEPM 2010 Draft (QC Lot: 2854077)					uit.		
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 Re	ecoverable Hydrocarbo	ns - NEPM 2010 Draft (QC Lot: 2856430)							
ES1310250-019	Anonymous	EP080: C6 - C10 Fraction	10000	10	mg/kg	<10	<10	0.0	No Limit
ES1310251-003	VS104-3	EP080: C6 - C10 Fraction	2222	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
	140%	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	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		10 M	106-42-3						
		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	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
			106-42-3		500 35-44	-			
		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

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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)		S) Report		
				Report	Spike	Spike Recovery (%)	Recovery	Limits (%)
Method: Compound			Result	Concentration	LCS	Low	Higl	
EG005T: Total Metals by ICP-AES (QCLot: 2859	9093)							
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 Hydrocarb	ons (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(QC	Lot: 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	3.00.00	100	mg/kg	<100	200 mg/kg	104	63	131
EP080/071: Total Petroleum Hydrocarbons(QC	Lot: 2856430)							
EP080: C6 - C9 Fraction		10	mg/kg	<10	26 mg/kg	99.6	68.4	128
EP080/071: Total Recoverable Hydrocarbons - I	NEPM 2010 Draft (OCL at: 28	54077)						
EP0000071, Fotal Recoverable Hydrocarbons - T EP071; >C10 - C16 Fraction	TEL M 2010 Brait (GELOL 20	50	mg/kg	<50	250 mg/kg	97.6	59	131

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Sub-Matrix: SOIL				Method Blank (MB)	Laboratory Control Spike (LCS) Report					
				Report	Spike	Spike Recovery (%)	Recovery	Limits (%)		
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High		
EP080/071: Total Recoverable Hydrocarbons - NE	PM 2010 Draft (QCLot: 28	54077) - contin	ued							
EP071: >C16 - C34 Fraction	() ()	100	mg/kg	<100	350 mg/kg	99.4	74	138		
EP071: >C34 - C40 Fraction	and the second second	100	mg/kg	<100	1000	1		10000		
		50	mg/kg	1000	150 mg/kg	101	63	131		
EP080/071: Total Recoverable Hydrocarbons - NE	PM 2010 Draft (QCLot: 28	56430)								
EP080: C6 - C10 Fraction	2 755 2	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	0.5	mg/kg	<0.5	2 mg/kg	89.5	60	120		
	106-42-3		122-672-990							
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		IA.	atrix Spike (MS) Report				
				Spike	SpikeRecovery(%)	Recovery	Limits (%)
aboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG005T: Total Met	als by ICP-AES (QCLot: 2859093)						
ES1310251-002	VS104-2	EG005T: Arsenic	7440-38-2	50 mg/kg	93.7	70	130
	Profit Contraction	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 Re	coverable Mercury by FIMS (QCLot: 2859	9094)			la la		
ES1310251-002	VS104-2	EG035T: Mercury	7439-97-6	5 mg/kg	102	70	130
EP075(SIM)B: Poly	nuclear Aromatic Hydrocarbons (QCLot	:: 2854078)					
ES1310251-002	VS104-2	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	105	70	130
	407540712.00149.	EP075(SIM): Pyrene	129-00-0	10 mg/kg	111	70	130
EP080/071: Total F	etroleum Hydrocarbons (QCLot: 285407	7)					
ES1310251-002	VS104-2	EP071: C10 - C14 Fraction	1000	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

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Sub-Matrix: SOIL				М	atrix Spike (MS) Report		
				Spike	SpikeRecovery(%)	Recovery l	Limits (%)
aboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP080/071: Total F	Petroleum Hydrocarbons (QCLot: 285	6430)					
ES1310250-019	Anonymous	EP080: C6 - C9 Fraction	12222	32.5 mg/kg	109	70	130
EP080/071: Total F	Recoverable Hydrocarbons - NEPM 20	10 Draft (QCLot: 2854077)					
ES1310251-002	VS104-2	EP071: >C10 - C16 Fraction	22.00	850 mg/kg	127	73	137
CHIDADE BREADINE - ACARIN - SUBBREADERNA		EP071: >C16 - C34 Fraction	00000	4800 mg/kg	106	53	131
		EP071: >C34 - C40 Fraction	00000	2400 mg/kg	59.8	52	132
EP080/071: Total F	Recoverable Hydrocarbons - NEPM 20	10 Draft (QCLot: 2856430)					
ES1310250-019	Anonymous	EP080: C6 - C10 Fraction	5 2732	37.5 mg/kg	106	70	130
EP080: BTEXN (Q	(CLot: 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	2.5 mg/kg	87.5	70	130
			106-42-3				
		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					Matrix Spike (I	MS) and Matrix S	pike Duplicate	(MSD) Report	(
				Spike	Spike Re	covery (%)	Recovery Limits (%)		RPDs (%)	
Laboratory sample ID	Client sample ID	Method: Comoound	CAS Number	Concentration	MS	MSD	Low	High	Value	Control Limi
EP080/071: Total I	Petroleum Hydrocarbons(QC	CLot: 2854077)								
ES1310251-002	VS104-2	EP071: C10 - C14 Fraction		640 mg/kg	102	2020	73	137	(1 <u>212.2</u> 3)	<u>199760</u> -
		EP071: C15 - C28 Fraction	7 <u></u> 7	3140 mg/kg	122	1202017	53	131	(<u>1997</u>)	Contract of Contra
		EP071: C29 - C36 Fraction		2860 mg/kg	90.0		52	132	(2004)	
EP080/071: Total I	Recoverable Hydrocarbons -	NEPM 2010 Draft (QCLot: 2854077)								
ES1310251-002 VS10	VS104-2	EP071: >C10 - C16 Fraction	No. of Concession, No. of Conces	850 mg/kg	127		73	137	(1 0.000)	0070
		EP071: >C16 - C34 Fraction	2.000	4800 mg/kg	106	3777	53	131	12742303	
		EP071: >C34 - C40 Fraction	- <u></u>	2400 mg/kg	59.8	0000	52	132		0000
EP075(SIM)B: Pol	ynuclear Aromatic Hydrocarb	ons (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	1.000000	
EP080/071: Total I	Petroleum Hydrocarbons (Q0	CLot: 2856430)								
ES1310250-019	Anonymous	EP080: C6 - C9 Fraction	<u>1949</u>	32.5 mg/kg	109	2020	70	130	022220	2020
	Construction of the second	EP080: C6 - C9 Fraction NEPM 2010 Draft (QCLot: 2856430)		32.5 mg/kg	109		70		130	130

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Sub-Matrix : SOIL			Matrix Spike (I	Spike (MS) and Matrix Spike Duplicate (MSD) Report						
		Spike	Spike Re	covery (%)	Recovery	Limits (%)	RP	Ds (%)		
Laboratory sample ID	Client sample ID	Method: Comoound	CAS Number	Concentration	MS	MSD	Low	High	Value	Control Limi
EP080/071: Total R	ecoverable Hydrocarbons -	NEPM 2010 Draft (QCLot: 2856430) - continued								
ES1310250-019	Anonymous	EP080: C6 - C10 Fraction	2000	37.5 mg/kg	106		70	130	1977-1975	
EP080: BTEXN (Q	CLot: 2856430)							11		- He
ES1310250-019	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	78.6		70	130	(المتعالي)	
	50°	108-88-3	2.5 mg/kg	89.8		70	130	(), (), () ()	ettere)	
	EP080: Ethylbenzene		100-41-4	2.5 mg/kg	86.8		70	130	0.000	
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	87.5	1307.0	70	130	(1 0,000)	0007520
			106-42-3							
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	87.7	2222	70	130	1 <u>1111</u> 1	
		EP080: Naphthalene	91-20-3	2.5 mg/kg	77.9	2000	70	130	(<u>2222</u>)	2000
EG005T: Total Met	als by ICP-AES (QCLot: 285	59093)								
ES1310251-002	VS104-2	EG005T: Arsenic	7440-38-2	50 mg/kg	93.7		70	130	13	
		EG005T: Cadmium	7440-43-9	50 mg/kg	102	(307.0)	70	130	(1 0.00)	(1007E)
		EG005T: Chromium	7440-47-3	50 mg/kg	102		70	130	1272375	
		EG005T: Copper	7440-50-8	250 mg/kg	105	2002	70	130	2 <u>0000</u> 0	0.00
		EG005T: Lead	7439-92-1	250 mg/kg	100	22227	70	130	(<u>1996)</u>	22227
		EG005T: Nickel	7440-02-0	50 mg/kg	103		70	130	1920020	
		EG005T: Zinc	7440-66-6	250 mg/kg	100		70	130	024240	
EG035T: Total Red	coverable Mercury by FIMS	(QCLot: 2859094)								
ES1310251-002	VS104-2	EG035T: Mercury	7439-97-6	5 mg/kg	102		70	130	197530	





Environmental Division

(Caller States)	CER	TIFICATE 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
elephone	02 8264 5100	Telephone	: +61 2 8784 8555
acsimile	: 02 8264 5111	Facsimile	: +61 2 8784 8555
Project	: 60221935 MOOREBANK	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
)rder number	Section 2		
C-O-C number	Section of the sectio	Date Samples Received	: 06-MAY-2013
Bampler	s22	Issue Date	: 10-MAY-2013
Bite			
		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:

NATA Accredited Laboratory 825

Accredited for compliance with

ISO/IEC 17025.

- General Comments
- Analytical Results
- Surrogate Control Limits



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	

Address 277-289 Woodpark Road Smithfield NSW Australia 2164 PHONE +61-2-8784 8555 Facsimile +61-2-8784 8500 Environmental Division Sydney ABN 84 000 936 029 Part of the ALS Croup An ALS Limited Company





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Page	: 2 of 5
Work Order	: ES1310251
Client	AECOM Australia Pty Ltd
Project	: 60221935 MOOREBANK



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

Page	: 3 of 5
Work Order	: ES1310251
Client	AECOM Australia Pty Ltd
Project	60221935 MOOREBANK



Sub-Matrix: SOIL (Matrix: SOIL)		Clie	ent sample ID	VS104-2	VS104-3	VS104-4	VS104-5	QC23	
	Cli	Client sampling date / time			02-MAY-2013 15:00	02-MAY-2013 15:00	02-MAY-2013 15:00	02-MAY-2013 15:0	
Compound	CAS Number	LOR	Unit	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	
Benzía)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)pervlene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Sum of polycyclic aromatic hydrocarboi		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 Hydroca	X								
C6 - C9 Fraction		10	mg/kg	<10	<10	<10	<10	<10	
C10 - C14 Fraction		50	mg/kg	<50	<50	<50	<50	<50	



Sub-Matrix: SOIL (Matrix: SOIL)		Clie	ent sample ID	VS104-2	VS104-3	VS104-4	VS104-5	QC23
	Client sampling date / time			02-MAY-2013 15:00				
Compound	CAS Number	LOR	Unit	ES1310251-002	ES1310251-003	ES1310251-004	ES1310251-005	ES1310251-006
EP080/071: Total Petroleum Hydroc	arbons - Continued							
C15 - C28 Fraction	1.000	100	mg/kg	<100	<100	<100	<100	<100
C29 - C36 Fraction	10000	100	mg/kg	<100	<100	<100	<100	<100
C10 - C36 Fraction (sum)		50	mg/kg	<50	<50	<50	<50	<50
EP080/071: Total Recoverable Hydro	ocarbons - NEPM 201	0 Draft						
C6 - C10 Fraction		10	mg/kg	<10	<10	<10	<10	<10
C6 - C10 Fraction minus BTEX (F1)	2000	10	mg/kg	<10	<10	<10	<10	<10
>C10 - C16 Fraction		50	mg/kg	<50	<50	<50	<50	<50
>C16 - C34 Fraction	<u>1948</u>	100	mg/kg	<100	<100	<100	<100	<100
>C34 - C40 Fraction	070	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		Recovery	Limits (%)
Compound	CAS Number	Low	High
EP075(SIM)S: Phenolic Compound	l Surrogates		
Phenol-d6	13127-88-3	63	127
2-Chlorophenol-D4	93951-73-6	64	126
2.4.6 - Tribrom ophenol	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



Defence FOI 235/19/20

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SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive Report

Work Order	: ES13	10250						
Client Contact Address	: s22 : LEVEL	M Australia Pty Ltd . 11, 44 MARKET STREET EY NSW 1230	Laboratory Contact Address	 Environmental Division Sydney s22 277-289 Woodpark Road Smithfield NSW Australia 2164 				
E-mail Telephone Facsimile	s22 : 02 826 : 02 826		E-mail Telephone Facsimile	: s22 @alsglobal.com : +61 2 8784 8555 : +61 2 8784 8555				
Project Order number	: 602219 :	935 MOOREBANK	Page	: 1 of 3				
C-O-C number Site	:		Quote number	: ES2012HLAENV0454 (EN/004/12)				
Sampler	: s22		QC Level	NEPM 1999 Schedule B(3) and ALS QCS3 requirement				
Dates								
Date Samples Rece	ived	: 06-MAY-2013	Issue Date	: 07-MAY-2013 12:06				
Client Requested D	sted Due Date : 13-MAY-2013		Scheduled Reportir	ng Date : 13-MAY-2013				
Delivery Deta	ails							
Mode of Delivery		: Client Drop off	Temperature	: 3.6'C - Ice present				
No. of coolers/boxes	5	2 HARD	No. of samples rec	eived : 26				
Security Seal		: Intact.	No. of samples ana	alysed : 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.

Address 277-289 Woodpark Road Smithfield NSW Australia 2164 PHONE +61-2-8784 8555 Facsimile +61-2-8784 8500

Environmental Division Sydney ABN 84 009 936 029 Part of the ALS Group An ALS Limited Company

Issue Date	: 07-MAY-2013 12:06
Page	: 2 of 3
Work Order	: ES1310250
Client	: AECOM Australia Pty Ltd

Sample Container(s)/Preservation Non-Compliances

PAH (SIM)

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	SOL-S-07 TPH/BTEX/
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	1
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	1
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	1
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	1
ES1310250-019	02-MAY-2013 15:00	VS103-17	✓
ES1310250-020	02-MAY-2013 15:00	VS103-18	1
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.



Issue Date	: 07-MAY-2013 12:06
Page	: 3 of 3
Work Order	: ES1310250
Client	: AECOM Australia Pty Ltd

ALS

Requested Deliverables

s22

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

- EDI Format - XTab (XTAB)

Email ^{S22} @aa Email @aa

@aecom.com





Environmental Division

INTERPRETIVE QUALITY CONTROL REPORT

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

Address 277-289 Woodpark Road Smithfield NSW Australia 2164 PHONE +61-2-8784 8555 Facsimile +61-2-8784 8500 Environmental Division Sydney ABN 84 009 936 029 Part of the ALS Group An ALS Limited Company



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 Page
 : 2 of 7

 Work Order
 : ES1310250

 Client
 : AECOM Australia Pty Ltd

 Project
 : 60221935 MOOREBANK



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) & o her metals (180 days). A recorded breach therefore does not guarantee a breach for all non-volatile parameters.

Matrix: SOIL					Evaluation	: × = Holding ime	breach ; ✓ = Within	n holding time
Method		Sample Date	Extraction / Preparation					
Container / Client Sample ID(s)			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	1	08-MAY-2013	17-JUN-2013	✓
VS103-19,	VS103-20,							
VS103-21,	VS103-22,							
VS103-23,	VS103-24							
Soil Glass Jar - Unpreserved (EP071)				40.0000			17 11 11 1 00 10	
VS103-1,	VS103-2,	02-MAY-2013	08-MAY-2013	16-MAY-2013	1	09-MAY-2013	17-JUN-2013	\checkmark
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							

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Matrix: SOIL					Evaluation	: × = Holding ime	breach ; ✓ = Withir	n holding tim
Method		Sample Date	ample Date Extraction / Preparation		Analysis			
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP075(SIM)B: Polynuclear Aromatic	Hydrocarbons							
Soil Glass Jar - Unpreserved (EP075(S	SIM))							
VS103-17,	VS103-18,	02-MAY-2013	08-MAY-2013	16-MAY-2013	1	08-MAY-2013	17-JUN-2013	✓
VS103-19,	VS103-20,							
VS103-21,	VS103-22,							
VS103-23,	VS103-24							
Soil Glass Jar - Unpreserved (EP075(ន	SIM))							
VS103-1,	VS103-2,	02-MAY-2013	08-MAY-2013	16-MAY-2013	1	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	1	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							

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Matrix: SOIL					Evaluation	: × = Holding ime	breach ; ✓ = Withir	n holding tim
Method		Sample Date	te Extraction / Preparation					
Container / Client Sample ID(s)			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	1	09-MAY-2013	16-MAY-2013	✓
VS103-19,	VS103-20,							
VS103-21,	VS103-22,							
VS103-23,	VS103-24							
EP080/071: Total Petroleum Hydrocarb	ons							
Soil Glass Jar - Unpreserved (EP080)								
VS103-1,	VS103-2,	02-MAY-2013	07-MAY-2013	16-MAY-2013	\checkmark	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	1	09-MAY-2013	16-MAY-2013	✓
VS103-19,	VS103-20,							
VS103-21,	VS103-22,							
VS103-23,	VS103-24							

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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	n: × = Quality Cor	ntrol frequency r	not within specification ; \checkmark = Quality Control frequency within specifica
Quality Control Sample Type		Count Rate (%)			Rate (%)	Quality Control Specification	
Analytical Methods	Method	QC	Reaular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
Moisture Content	EA055-103	3	26	11.5	10.0	\checkmark	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
_aboratory Control Samples (LCS)							
PAH/Phenols (SIM)	EP075(SIM)	2	37	5.4	5.0	\checkmark	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	1	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Aethod Blanks (MB)							
PAH/Phenols (SIM)	EP075(SIM)	2	37	5.4	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PH - 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
Aatrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	2	37	5.4	5.0	✓	ALS QCS3 requirement
PH - Semivolatile Fraction	EP071	2	37	5.4	5.0	~	ALS QCS3 requirement
PH Volatiles/BTEX	EP080	2	38	5.3	5.0	1	ALS QCS3 requirement

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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.

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Summary of Outliers

Outliers : Quality Control Samples

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

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: SOIL

Compound Group Name	Laboratory Sample ID	Client Sample D	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

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Client Contact Address	: AECOM Australia Pty Ltd s22 : LEVEL 11, 44 MARKET STREET SYDNEY NSW 1230	Laboratory Contact Address	: Environmental Division Sydney : s22 : 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 Site	: 60221935 MOOREBANK :	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
C-O-C number	s22	Date Samples Received	: 06-MAY-2013
Sampler		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

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NATA Accredited Laboratory 825 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

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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

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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 I	Duplicate (DUP) Report	t	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EA055: Moisture Co	ontent (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 Co	ontent (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: Polyr	uclear Aromatic Hydro	carbons (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		0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		hydrocarbons							
		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

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Sub-Matrix: SOIL			Γ			Laboratory	Duplicate (DUP) Report	t	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP075(SIM)B: Polyn	uclear Aromatic Hydro	ocarbons (QC Lot: 2853403) - continued							
ES1310250-011	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		0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		hydrocarbons							
		EP075(SIM): Benzo(a)pyrene TEQ (WHO)		0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075(SIM)B: Polyn	uclear Aromatic Hydro	ocarbons (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		0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		hydrocarbons							
		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

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Sub-Matrix: SOIL						Laboratory	Duplicate (DUP) Report	t	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP075(SIM)B: Polyr	nuclear Aromatic Hydro	ocarbons (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		0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		hydrocarbons							
		EP075(SIM): Benzo(a)pyrene TEQ (WHO)		0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP080/071: Total Pe	etroleum Hydrocarbon	s (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 Pe	troleum Hydrocarbon	s (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 Pe	etroleum Hydrocarbon	s (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 Pe	etroleum Hydrocarbon	s (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 Re	ecoverable Hydrocarbo	ons - 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 Re	ecoverable <u>Hydrocarbo</u>	ons - 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
EP080/07 <u>1: Total Re</u>	ecoverable <u>Hydrocarbo</u>	ons - 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

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Client sample ID

Anonymous

VS103-17

VS103-17

VS103-1

VS103-11

Anonymous

Method: Compound

EP071: >C10 - C16 Fraction

EP071: >C16 - C34 Fraction

EP071: >C34 - C40 Fraction

EP071: >C10 - C16 Fraction

EP080: C6 - C10 Fraction

EP080: C6 - C10 Fraction

EP080: Benzene

EP080: Toluene

EP080: Ethylbenzene

EP080: ortho-Xylene

EP080: Naphthalene

EP080: Ethylbenzene

EP080: Benzene

EP080: Toluene

EP080: meta- & para-Xylene

EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QC Lot: 2855818) - continued

EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QC Lot: 2856430)

Sub-Matrix: SOIL

ES1310140-002

ES1310250-019

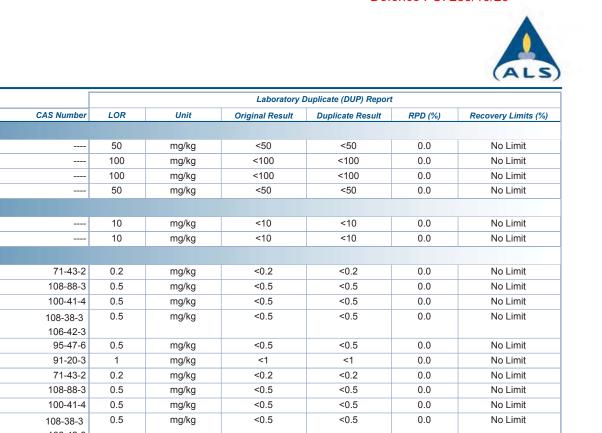
ES1310250-019

ES1310251-003

ES1310250-001

ES1310250-011

EP080: BTEXN (QC Lot: 2854651)



		EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
			106-42-3						
		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
P080: BTEXN (Q	C 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	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
			106-42-3						
		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	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
			106-42-3						
		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

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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)		Laboratory Control Spike (LCS) Report			
				Report	Spike	Spike Recovery (%)	Recovery	Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High	
EP075(SIM)B: Polynuclear Aromatic Hydrocarbor	ns (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 Hydrocarbor	ns (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	

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Sub-Matrix: SOIL				Method Blank (MB)		Laboratory Control Spike (LCS) Report		
				Spike	Spike Recovery (%)	Recovery	Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP080/071: Total Petroleum Hydrocarbons (QCLot: 285340	2) - 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: 285465	1)							
EP080: C6 - C9 Fraction		10	mg/kg	<10	26 mg/kg	76.6	68.4	128
EP080/071: Total Petroleum Hydrocarbons (QCLot: 285581	8)							
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: 285643	0)							
EP080: C6 - C9 Fraction		10	mg/kg	<10	26 mg/kg	99.6	68.4	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010	Draft (OCL at: 2	952402)						
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
D000/074, Tetal Decovership Undecoverson NEDW 2040								
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 EP080: C6 - C10 Fraction		10	mg/kg	<10	31 mg/kg	77.6	68.4	128
			ing/kg	10	o r nig/kg	11.0		120
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010		,		-50	050 ma/lun	400	50	404
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 50	mg/kg	<100	 150 mg/kg	 101	63	131
			mg/kg		150 mg/kg	101	03	131
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010					0.1 "			100
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	0.5	mg/kg	<0.5	2 mg/kg	78.2	60	120
	106-42-3							10-
P080: 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

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Sub-Matrix: SOIL	Method Blank (MB)	Laboratory Control Spike (LCS) Report						
				Report	Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP080: BTEXN (QCLot: 2856430) - continued								
EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	2 mg/kg	89.5	60	120
	106-42-3							(
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				M	atrix Spike (MS) Report		
				Spike	SpikeRecovery(%)	Recovery	Limits (%)
aboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP075(SIM)B: Pol	lynuclear 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: Pol	lynuclear 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: 285340	2)					
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: 285465	1)					
ES1310250-001	VS103-1	EP080: C6 - C9 Fraction		32.5 mg/kg	88.7	70	130
EP080/071: Total	Petroleum Hydrocarbons (QCLot: 285581	8)					
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: 285643	0)					
ES1310250-019	VS103-17	EP080: C6 - C9 Fraction		32.5 mg/kg	109	70	130
EP080/071: Total	Recoverable Hydrocarbons - NEPM 2010 I	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 I	Draft (QCLot: 2854651)					
ES1310250-001	VS103-1	EP080: C6 - C10 Fraction		37.5 mg/kg	89.8	70	130

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ub-Matrix: SOIL		Matrix Spike (MS) Report					
				Spike	SpikeRecovery(%)	Recovery I	Limits (%)
aboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP080/071: Total F	Recoverable Hydrocarbons - NEPM 2	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 F	Recoverable Hydrocarbons - NEPM 2	2010 Draft (QCLot: 2856430)					
ES1310250-019	VS103-17	EP080: C6 - C10 Fraction		37.5 mg/kg	106	70	130
EP080: BTEXN (Q	CLot: 2854651)						
ES1310250-001 VS103-1	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	2.5 mg/kg	78.4	70	130
			106-42-3				
		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 (Q	CLot: 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	2.5 mg/kg	87.5	70	130
			106-42-3				
		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					Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike	Spike Re	covery (%)	Recovery Limits (%)		RPDs (%)		
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	MSD	Low	High	Value	Control Limit	
EP080/071: Total P	etroleum Hydrocarbons (C	QCLot: 2853402)									
ES1310250-001	VS103-1	EP071: C10 - C14 Fraction		640 mg/kg	110		73	137			
	EP071: C15 - C28 Fraction	EP071: C15 - C28 Fraction		124		53	131				
		EP071: C29 - C36 Fraction		2860 mg/kg	99.3		52	132			
EP080/071: Total R	ecoverable 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			

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Sub-Matrix: SOIL					Matrix Spike (I	MS) and Matrix S	pike Duplicate	e (MSD) Repor	t		
			Spike	Spike Re	covery (%)	Recovery	Limits (%)	RP	Ds (%)		
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	MSD	Low	High	Value	Control Limi	
EP075(SIM)B: Poly	nuclear Aromatic Hydrocarb	oons (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 P	etroleum Hydrocarbons (QC	CLot: 2854651)									
ES1310250-001	VS103-1	EP080: C6 - C9 Fraction		32.5 mg/kg	88.7		70	130			
EP080/071: Total R	ecoverable Hydrocarbons - I	NEPM 2010 Draft (QCLot: 2854651)						11			
ES1310250-001	VS103-1	EP080: C6 - C10 Fraction		37.5 mg/kg	89.8		70	130			
				er te mgrig							
EP080: BTEXN (Q0 ES1310250-001	VS103-1		71-43-2	2.5 ma/ka	79.7		70	130			
ES1310250-001	VS103-1	EP080: Benzene	108-88-3	2.5 mg/kg 2.5 mg/kg	79.7		70	130			
		EP080: Toluene	100-00-3	2.5 mg/kg	78.0		70	130			
		EP080: Ethylbenzene		2.5 mg/kg	78.4		70	130			
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	70.4		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	73.0		70	130			
			51 20 0	2.0 mg/kg	12.1		10	100			
	etroleum Hydrocarbons (QC			0.40	407		70	407			
ES1310140-002 An	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			
		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: Poly	nuclear Aromatic Hydrocarb	ons (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 P	etroleum Hydrocarbons (QC	CLot: 2856430)									
ES1310250-019	VS103-17	EP080: C6 - C9 Fraction		32.5 mg/kg	109		70	130			
EP080/071. Total R	ecoverable Hydrocarbons - I	NEPM 2010 Draft (QCLot: 2856430)						11			
ES1310250-019	VS103-17	EP080: C6 - C10 Fraction		37.5 mg/kg	106		70	130			
				or to mgring							
EP080: BTEXN (Q0 ES1310250-019	VS103-17		71-43-2	2.5 mg/kg	78.6		70	130			
E31310230-019	vo100-17	EP080: Benzene	108-88-3	2.5 mg/kg	89.8		70				
		EP080: Toluene		2.5 mg/kg			-	130 130			
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	86.8 87.5		70	130			
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	C.10		70	130			
		ED000 ortho Videre	106-42-3 95-47-6	2.5 mc/kg	87.7		70	130			
		EP080: ortho-Xylene	95-47-6 91-20-3	2.5 mg/kg	77.9		70	130			
		EP080: Naphthalene	91-20-3	2.5 mg/kg	11.9		70	130			





Environmental Division

	CER	TIFICATE 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
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elephone	02 8264 5100	Telephone	+61 2 8784 8555
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Project	60221935 MOOREBANK	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
)rder number	S		
C-O-C number		Date Samples Received	: 06-MAY-2013
Sampler	s22	Issue Date	: 10-MAY-2013
Bite			
		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:

Accredited for compliance with

ISO/IEC 17025.

- General Comments
- Analytical Results
- Surrogate Control Limits



NATA Accredited Laboratory 825 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	

Address 277-289 Woodpark Road Smithfield NSW Australia 2164 PHONE +61-2-8784 8555 Facsimile +61-2-8784 8500 Environmental Division Sydney ABN 84 009 936 029 Part of the ALS Croup An ALS Limited Company



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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.

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Sub-Matrix: SOIL (Matrix: SOIL)		Clie	ent sample ID	VS103-1	VS103-2	VS103-3	V\$103-4	VS103-5
	Cli	Client sampling date / time			02-MAY-2013 15:00	02-MAY-2013 15:00	02-MAY-2013 15:00	02-MAY-2013 15:00
Compound	CAS Number	LOR	Unit	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	Hvdrocarbons							
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 hydrocarbor		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 Hydroca	rhons							
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 Hydro	carbons - NEPM 201	0 Draft					A	
C6 - C10 Fraction		10	mg/kg	<10	<10	<10	<10	<10
C6 - C10 Fraction minus BTEX (F1)	البيندر	10	mg/kg	<10	<10	<10	<10	<10
>C10 - C16 Fraction		50	mg/kg	<50	<50	<50	<50	<50
>C16 - C34 Fraction	1 <u>055-5</u> 2	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

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ub-Matrix: SOIL (Matrix: SOIL) Client same		ent sample ID	V\$103-1	V\$103-2	V\$103-3	VS103-4	VS103-5	
	Cli	ent sampli	ing date / time	02-MAY-2013 15:00				
Compound	CAS Number	LOR	Unit	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	(1194)	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 Compo	und 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 Surroga	tes							
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

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Sub-Matrix: SOIL (Matrix: SOIL)		Clie	ent sample ID	VS103-6	VS103-7	VS103-8	VS103-9	VS103-10
	Cli	ent samplii	ng date / time	02-MAY-2013 15:00				
Compound	CAS Number	LOR	Unit	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 Hy	drocarbons							
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 Hydrocarbo	ons							1
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 Hydrocar	bons - NEPM 201	0 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	1 <u>1111</u>	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

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Sub-Matrix: SOIL (Matrix: SOIL)		Cli	ent sample ID	VS103-6	V\$103-7	VS103-8	VS103-9	V\$103-10
	Cli	ent sampli	ing date / time	02-MAY-2013 15:00				
Compound	CAS Number	LOR	Unit	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 Compo	und 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 Surrogat	tes							
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

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Work Order	ES1310250
Client	AECOM Australia Pty Ltd
Project	60221935 MOOREBANK



Sub-Matrix: SOIL (Matrix: SOIL)		Clie	ent sample ID	VS103-11	VS103-12	VS103-13	VS103-14	VS103-15
	Cli	ient samplii	ng date / time	02-MAY-2013 15:00				
Compound	CAS Number	LOR	Unit	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 F	lydrocarbons							*
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 hydrocarbon		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 Hydrocar	bons							
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 Hydroc	arbons - NEPM 201	0 Draft					A	
C6 - C10 Fraction		10	mg/kg	<10	<10	<10	<10	<10
C6 - C10 Fraction minus BTEX (F1)	الريبيدر	10	mg/kg	<10	<10	<10	<10	<10
>C10 - C16 Fraction		50	mg/kg	<50	<50	<50	<50	<50
>C16 - C34 Fraction	1000	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

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Work Order	ES1310250
Client	AECOM Australia Pty Ltd
Project	60221935 MOOREBANK



Sub-Matrix: SOIL (Matrix: SOIL)		Cli	ent sample ID	V\$103-11	VS103-12	VS103-13	VS103-14	V\$103-15
	Cli	ent sampli	ng date / time	02-MAY-2013 15:00				
Compound	CAS Number	LOR	Unit	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 Compo	und 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 Surroga	tes							
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

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Work Order	: ES1310250
Client	AECOM Australia Pty Ltd
Project	60221935 MOOREBANK



Sub-Matrix: SOIL (Matrix: SOIL)		Clie	ent sample ID	VS103-16	QC21	QC22	VS103-17	VS103-18
	Cli	ent samplii	ng date / time	02-MAY-2013 15:00				
Compound	CAS Number	LOR	Unit	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 Hy	drocarbons							
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 Hydrocarb	ons							
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	10000	100	mg/kg	<100	<100	<100	<100	<100
C10 - C36 Fraction (sum)		50	mg/kg	<50	<50	<50	<50	<50
EP080/071: Total Recoverable Hydroca	rbons - NEPM 201	0 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	- <u>1111</u>	50	mg/kg	<50	<50	<50	<50	<50
>C16 - C34 Fraction	7 <u>1818</u>	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

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Work Order	ES1310250
Client	AECOM Australia Pty Ltd
Project	60221935 MOOREBANK



Sub-Matrix: SOIL (Matrix: SOIL)		Cli	ent sample ID	VS103-16	QC21	QC22	VS103-17	VS103-18
	Cli	ent sampli	ing date / time	02-MAY-2013 15:00				
Compound	CAS Number	LOR	Unit	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 Compo	und 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 Surroga	tes							
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



Sub-Matrix: SOIL (Matrix: SOIL)		Clie	ent sample ID	VS103-19	VS103-20	VS103-21	VS103-22	VS103-23
	Cli	ient samplii	ng date / time	02-MAY-2013 15:00				
Compound	CAS Number	LOR	Unit	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 F	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 hydrocarbon		0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ (WHO)	j eres	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
EP080/071: Total Petroleum Hydrocar	bons							1
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	1000	100	mg/kg	<100	<100	<100	<100	<100
C10 - C36 Fraction (sum)		50	mg/kg	<50	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrod	arbons - NEPM 201	0 Draft						
C6 - C10 Fraction		10	mg/kg	<10	<10	<10	51	<10
C6 - C10 Fraction minus BTEX (F1)	الريبيدر	10	mg/kg	<10	<10	<10	51	<10
>C10 - C16 Fraction		50	mg/kg	<50	<50	<50	<50	<50
>C16 - C34 Fraction	1000	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

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Work Order	: ES1310250
Client	AECOM Australia Pty Ltd
Project	60221935 MOOREBANK



Sub-Matrix: SOIL (Matrix: SOIL)		Cli	ent sample ID	V\$103-19	VS103-20	VS103-21	VS103-22	V\$103-23
	Cli	ent sampli	ng date / time	02-MAY-2013 15:00				
Compound	CAS Number	LOR	Unit	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	<u></u>	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 Compo	und 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 Surroga	tes							
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

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Work Order	ES1310250
Client	AECOM Australia Pty Ltd
Project	60221935 MOOREBANK



Sub-Matrix: SOIL (Matrix: SOIL)		Clie	ent sample ID	V\$103-24				
	Cli	ent sampli	ng date / time	02-MAY-2013 15:00	0000			<u></u>
Compound	CAS Number	LOR	Unit	ES1310250-026	8527			A-74
EA055: Moisture Content								
Moisture Content (dried @ 103°C)		1.0	%	6.2	200230	27.27.0	200220	
EP075(SIM)B: Polynuclear Aromatic H	lydrocarbons							
Naphthalene	91-20-3	0.5	mg/kg	<0.5				
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<u></u>	NTRICE.	J Nine	1000
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	2002	2002	2002	2222
Fluorene	86-73-7	0.5	mg/kg	<0.5	2010-1			2016 24
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	2027	20221	2027	<u>200</u> 2
Pyrene	129-00-0	0.5	mg/kg	<0.5				55070
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	e	67052	eres:	5-35 3
Chrysene	218-01-9	0.5	mg/kg	<0.5				
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	0-02)	0-020	0-02)	2.02)
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	2122	2122)	2122	22229
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5		20000		
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5				6-0 10
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	0.027	0.027	0.00)	0-027
Sum of polycyclic aromatic hydrocarbons	s	0.5	mg/kg	<0.5		<u>2002</u> 3		2222
Benzo(a)pyrene TEQ (WHO)		0.5	mg/kg	<0.5	2002	7007	2002	7.75%
EP080/071: Total Petroleum Hydrocar	bons							
C6 - C9 Fraction	100 100 100 100 100 100 100 100 100 100	10	mg/kg	<10	0.02			2.0.7
C10 - C14 Fraction		50	mg/kg	<50	2222	2222	2222	2222
C15 - C28 Fraction		100	mg/kg	<100	37777)	2000	37777)	37030
C29 - C36 Fraction		100	mg/kg	<100				6-3 53
C10 - C36 Fraction (sum)	- <u></u>	50	mg/kg	<50				
EP080/071: Total Recoverable Hydroc	arbons - NEPM 201	0 Draft						
C6 - C10 Fraction		10	mg/kg	<10	20020	37753		35530
C6 - C10 Fraction minus BTEX (F1)		10	mg/kg	<10		6785)	67070	67875)
>C10 - C16 Fraction		50	mg/kg	<50				
>C16 - C34 Fraction	1 <u>.255</u>	100	mg/kg	<100	0-02)	e.or;	0.0T)	
>C34 - C40 Fraction		100	mg/kg	<100	2222	<u>2002</u>	2222	<u>9997</u> 9
>C10 - C40 Fraction (sum)		50	mg/kg	<50				

Page	: 14 of 15
Work Order	ES1310250
Client	AECOM Australia Pty Ltd
Project	60221935 MOOREBANK



	Cli	ent sample ID	VS103-24	किस्ट	70750		
Cli	ent sampli	ng date / time	02-MAY-2013 15:00	2020		200	2.22
CAS Number	LOR	Unit	ES1310250-026	10000	A1000		177720
71-43-2	0.2	mg/kg	<0.2	377770	10000	3763/	55539
108-88-3	0.5	mg/kg	<0.5	2000		20110524	20100-00
100-41-4	0.5	mg/kg	<0.5				entel
108-38-3 106-42-3	0.5	mg/kg	<0.5	0-029	<u>0.07</u>	0.027	<u>0-07</u>
95-47-6	0.5	mg/kg	<0.5		<u></u>	<u>2.60</u>	<u>2122</u>
	0.2	mg/kg	<0.2		tinte.	1.11.0	1710
1330-20-7	0.5	mg/kg	<0.5				
91-20-3	1	mg/kg	<1	<u>10.000</u>	<u>2.02</u>	2207	<u>10 - 10 - 10</u>
d Surrogates							
13127-88-3	0.1	%	80.6			1757 3	6-3 -5
93951-73-6	0.1	%	85.2	2222			2.500 (
118-79-6	0.1	%	67.3	<u>2000</u>	2.021	2000	<u>17.00</u> 0
321-60-8	0.1	%	91.7	6-35		6-95	
1719-06-8	0.1	%	92.6	tinite)			<u>1.100</u>
1718-51-0	0.1	%	90.4		<u>2007</u>	2007	
S							
17060-07-0	0.1	%	93.5	6-35 3			6-3 6
2037-26-5	0.1	%	100				
460-00-4	0.1	%	95.4	<u>0-02</u>)	<u>e.or</u>	0.02	0.00
	CAS Number 71-43-2 108-88-3 100-41-4 108-38-3 106-42-3 95-47-6 1330-20-7 1330-20-7 1330-20-7 0 5 13127-88-3 93951-73-6 13127-88-3 93951-73-6 13127-88-3 93951-73-6 13127-88-3 93951-73-6 13127-88-3 93951-73-6 13127-88-3 93951-73-6 13127-88-3 93951-73-6 13127-88-3 93951-73-6 13127-88-3 93951-73-6 13127-88-3 93951-73-6 13127-88-3 93951-73-6 13127-88-3 93951-73-6 13127-88-3 13127-88-5 13127-88-5 13127-88-5 13127-88-5 13127-88-5 13127-88-5 1312	CAS Number LOR CAS Number LOR 71-43-2 0.2 108-88-3 0.5 100-41-4 0.5 108-38-3 106-42-3 108-38-3 106-42-3 95-47-6 0.5 95-47-6 0.5 95-47-6 0.5 95-47-6 0.5 95-47-6 0.5 91-20-3 1 0.1 13127-88-3 939551-73-6 0.1 118-79-6 0.1 118-79-6 0.1 11719-06-8 0.1 1718-51-0 0.1 1717060-07-0 0.1 2037-26-5 0.1	71-43-2 0.2 mg/kg 108-88-3 0.5 mg/kg 100-41-4 0.5 mg/kg 108-38-3 0.6 mg/kg 108-38-3 0.5 mg/kg 95-47-6 0.5 mg/kg 95-47-6 0.5 mg/kg 0.2 mg/kg 95-47-6 0.5 mg/kg 0.2 mg/kg 1330-20-7 0.5 mg/kg 91-20-3 1 mg/kg 13127-88-3 0.1 % 93951-73-6 0.1 % 118-79-6 0.1 % 321-60-8 0.1 % 1719-06-8 0.1 % 1719-06-8 0.1 % 17060-07-0 0.1 % 2037-26-5 0.1 %	Client sampling date / time 02-MAY-2013 15:00 CAS Number LOR Unit ES1310250-026 Cas Number Unit ES1310250-026 Imit Cas Number Unit ES1310250-026 Imit Cas Number Unit ES1310250-026 Imit Cas Number Unit Gas Number Unit ES1310250-026 Cas Number Unit Gas Number Unit ES1310250-026 100-41-4 0.5 mg/kg <0.5 Imit 108-38-3 0.5 mg/kg <0.5 Imit 95-47-6 0.5 mg/kg <0.2 Imit Imit E 0.1 % 80.6 Imit Imit 13127-88-3 0.1 % 91.7 <th< td=""><td>Client sampling date / time 02-MAY-2013 15:00 CAS Number LOR Unit ES1310250-026 71-43-2 0.2 mg/kg <0.2 108-88-3 0.5 mg/kg <0.5 108-88-3 0.5 mg/kg <0.5 100-41-4 0.5 mg/kg <0.5 108-38-3 106-42-3 0.5 mg/kg <0.5 108-38-3 106-42-3 0.5 mg/kg <0.5 95-47-8 0.5 mg/kg <0.5 108-38-3 106-42-3 0.5 mg/kg <0.5 95-47-8 0.5 mg/kg <0.5 108-38-3 106-42-3 1 mg/kg <0.5 1330-20-7 0.5 mg/kg <0.5 13127-88-3 0.1 % 80.6 321-60-8 0.1 % 91.7 </td><td>Client sampling date / time 02-MAY-2013 15:00 CAS Number LOR Unit ES1310250-026 71-43-2 0.2 mg/kg <0.2</td> 108-88-3 0.5 mg/kg <0.5</th<>	Client sampling date / time 02-MAY-2013 15:00 CAS Number LOR Unit ES1310250-026 71-43-2 0.2 mg/kg <0.2 108-88-3 0.5 mg/kg <0.5 108-88-3 0.5 mg/kg <0.5 100-41-4 0.5 mg/kg <0.5 108-38-3 106-42-3 0.5 mg/kg <0.5 108-38-3 106-42-3 0.5 mg/kg <0.5 95-47-8 0.5 mg/kg <0.5 108-38-3 106-42-3 0.5 mg/kg <0.5 95-47-8 0.5 mg/kg <0.5 108-38-3 106-42-3 1 mg/kg <0.5 1330-20-7 0.5 mg/kg <0.5 13127-88-3 0.1 % 80.6 321-60-8 0.1 % 91.7	Client sampling date / time 02-MAY-2013 15:00 CAS Number LOR Unit ES1310250-026 71-43-2 0.2 mg/kg <0.2	Client samping date / time 02-MAY-2013 15:00 CAS Number LOR Unit ES1310260-026 T1-43-2 0.2 mg/kg <0.2 T1-43-2 0.2 mg/kg <0.2 T1-43-2 0.2 mg/kg <0.2 T1-43-2 0.2 mg/kg <0.2 T08-88-3 0.5 mg/kg <0.5 109-38-3 108-42-3 0.5 mg/kg <0.5 94-47-8 0.5 mg/kg <0.5 94-47-8 0.5 mg/kg <0.5 11332-20-7 0.5 mg/kg <0.5

Surrogate Control Limits

Sub-Matrix: SOIL		Recovery	Limits (%)
Compound	CAS Number	Low	High
EP075(SIM)S: Phenolic Compound	d 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 Form: Chain of Custody & Analysis Request Form AECOM - Sydney Laboratory Details Tel: Level 21, 420 George Street Tel: 02 8934 0000 Lab. Name: Fax: Preliminary Report by: Sydney, NSW 2000 Fax: 02 8934 0001 Email \$22 Lab. Address: ALS - Sydney Contact Name: Final Report by: Lab Quote No: EN/004/12 Lab. Ref: Project Number: **Project Name:** Moorebank 60221935 1.82 Purchase Order Number: Sample collected by s22 22 Sample Results to be returned to: \$22 Environmental Division s22 Qaec 20ecom.com Sydney Analysis Request Specifications: (Tick) Work Order No No ES1309731 STANDARD C Yes N/A 1. Urgent TAT required? (please circle: 24hr 48hr days) 530 T Yes D No □ N/A 2. Fast TAT Guarantee Required? ASBESTOS IN WATER TYes D No N/A 3. Is any sediment layer present in waters to be excluded from extractions? SOIL 1 D No T Yes N/A 4. Special storage requirements? U D No D N/A □ Yes 5. Preservation requirements? Z No No D N/A TPH COLOR □ Yes 6. Other requirements? □ Fax Hard copy Email Email S C36 METALS TPH C6-C9 tel: O 8 METALS 8. Project Manager: Jonathan Ho 02 8394 0000 Telephone: +61-2-8784 8555 7. Report Format: 69-5 ASBE: PAHs BTEX Matrix Preservation Container Lab. Hd P Sample ID Sampling Date Sampling Time 1D sall water other filled acid Ice other (No. & type) 5 7 metals: As. Cd. Cr. Cu. Х X 29/4/13 11:30 1 SP103 -1 X 270ml Jar 2 × × x × х SP103-2 Fe, Pb, Zn X F 3 × X SP 103-3 X × U V × х SP103-+ х х s would herstate х х See. 14 ind х х Method of Shipment Courier Postal By Hand Received in good Yes/No/NA Received by: **Relinguished By:** s22 condition? s22 s22 Name:s22 Date: 29/4/13 Samples received Yes/No/NA **Consignment Note** Date: 29/4/13 chilled? No. **.** Time: 1: 2 Yes/No/NA Transport Co: Time: pres of: AECOM Received in good Yes/No/NA Method of Shipment Courier D Postal D By Hand Received by: **Relinguished By:** condition? Samples received Consignment Note Date: Yes/No/NA Date: Name: Name: chilled? No. Transport Co: Yes/No/NA Time: of: Time:

Defence FOI 235/19/20





SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive Report

Work Order : ES1309731

Client Contact Address	: s22 : LEVE	M Australia Pty Ltd L 11, 44 MARKET STREET IEY NSW 1230	Laboratory Contact Address	 Environmental Division Sydney Client Services 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail Telephone Facsimile		@aecom.com 95 3600 62 5060	E-mail Telephone Facsimile	 sydney@alsglobal.com +61-2-8784 8555 +61-2-8784 8500
Project Order number		935_1 82 MOOREBANK	Page	: 1 of 2
C-O-C number Site	: :		Quote number	: EP2013HLAENV0468 (EN/004/12)
Sampler	: s22		QC Level	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dates				
Date Samples Reco Client Requested D		: 29-APR-2013 : 30-APR-2013	Issue Date Scheduled Reporti	: 29-APR-2013 15:12 ng Date : 30-APR-2013
Delivery Deta	ails			
Mode of Delivery No. of coolers/boxe Security Seal		: Carrier : 1 HARD : Not intact.	Temperature No. of samples rec No. of samples and	

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.

Address 277-289 Woodpark Road Smithfield NSW Australia 2164 PHONE +61-2-8784 8555 Facsimile +61-2-8784 8500

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Issue Date	: 29-APR-2013 15:12
Page	: 2 of 2
Work Order	: ES1309731
Client	: AECOM Australia Pty Ltd



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

Matrix: SOIL			S-07 TEX/PAH (SIM)
Laboratory sample ID	Client sampling date / time	Client sample ID	SOL-S- TPH/BTE
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		s22	
 *AU Certificate of Analysis - NATA (COA) 	Email	522	Daecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email		Daecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email		Daecom.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN	Email		Daecom.com
- A4 - AU Tax Invoice (INV)	Email		Daecom.com
- Chain of Custody (CoC) (COC)	Email		Daecom.com
- EDI Format - ENMRG (ENMRG)	Email		2)aecom.com
- EDI Format - ESDAT (ESDAT)	Email		Daecom.com
- EDI Format - HLAPro (HLAPro)	Email		Daecom.com
- EDI Format - XTab (XTAB)	Email		Daecom.com





Environmental Division

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: ES1309731	Page	: 1 of 5
Client Contact	: AECOM Australia Pty Ltd . s22	Laboratory Contact	: Environmental Division Sydney · 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

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 Work Order
 ES1309731

 Client
 AECOM Australia Pty Ltd

 Project
 60221935 1 82 MOOREBANK



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 ; 🖌 = Withir	i holding time
Method Container / Client Sample ID(s)		Samp	Sample Date	Extraction / Preparation			Analysis		
					Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content									
Soil Glass Jar - Unpreserved (EA055-103)									1
SP103-1,	SP103-2,	29-AP	PR-2013	88286	6-923	00001	29-APR-2013	13-MAY-2013	v
SP103-3,	SP103-4								
EP080/071: Total Petroleum Hydrocarbons									
Soil Glass Jar - Unpreserved (EP071)			10 0042		10 MANY 2010	P		00 1111 0010	
SP103-1,	SP103-2,	29-AP	PR-2013	29-APR-2013	13-MAY-2013	1	29-APR-2013	08-JUN-2013	1
SP103-3,	SP103-4								
EP075(SIM)B: Polynuclear Aromatic Hydrocarbon	15								
Soil Glass Jar - Unpreserved (EP075(SIM))	00400.0	20.48	PR-2013	29-APR-2013	13-MAY-2013	1	29-APR-2013	08-JUN-2013	
SP103-1,	SP103-2, SP103-4	29-AF	-R-2013	29-APR-2013	13-MAT-2013	4	29-4F R-2013	00-JUN-2013	1
SP103-3,	5P103-4								
EP080: BTEX									
Soil Glass Jar - Unpreserved (EP080) SP103-1,	SP103-2.	20.08	PR-2013	29-APR-2013	13-MAY-2013	1	29-APR-2013	13-MAY-2013	1
SP103-1, SP103-3,	SP103-2, SP103-4	25-AF	-R-2015	29-AP R-2013	13-MIR1-2013	4	29-AFR-2013	13-MAT-2013	1
	3F 103-4								
EP080: BTEXN			_				1		
Soil Glass Jar - Unpreserved (EP080) SP103-1.	SP103-2.	29-AP	PR-2013	29-APR-2013	13-MAY-2013	1	29-APR-2013	13-MAY-2013	1
SP103-3.	SP103-4	207.1	1010	2070102010	10 111 1 2010		20711112010	10 111 12010	×
TRUETRO REAL PROPERTY AND A RE	31 103-4								
EP080/071: Total Petroleum Hydrocarbons		1					1		
Soil Glass Jar - Unpreserved (EP080) SP103-1.	SP103-2.	29-AP	PR-2013	29-APR-2013	13-MAY-2013	1	29-APR-2013	13-MAY-2013	1
SP103-3,	SP103-4				10 10 10 2010				
0,1000,							1	18	L

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Work Order	ES1309731
Client	AECOM Australia Pty Ltd
Project	60221935_1 82 MOOREBANK



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	n: \star = Quality Cor	ntrol frequency r	not within specification ; 🖌 = Quality Control frequency within spec	
Quality Control Sample Type		Count		Rate (%)			Quality Control Specification	
Analytical Methods	Method	QC Reaular		Actual Expected		Evaluation		
Laboratory Duplicates (DUP)								
Moisture Content	EA055-103	2	20	10.0	10.0	1	NEPM 1999 Schedule B(3) and ALS QCS3 requirement	
PAH/Phenols (SIM)	EP075(SIM)	1	5	20.0	10.0	1	NEPM 1999 Schedule B(3) and ALS QCS3 requirement	
TPH - Semivolatile Fraction	EP071	1	5	20.0	10.0	1	NEPM 1999 Schedule B(3) and ALS QCS3 requirement	
TPH Volatiles/BTEX	EP080	1	5	20.0	10.0	1	NEPM 1999 Schedule B(3) and ALS QCS3 requirement	
Laboratory Control Samples (LCS)								
PAH/Phenols (SIM)	EP075(SIM)	1	5	20.0	5.0	1	NEPM 1999 Schedule B(3) and ALS QCS3 requirement	
TPH - Semivolatile Fraction	EP071	1	5	20.0	5.0	1	NEPM 1999 Schedule B(3) and ALS QCS3 requirement	
TPH Volatiles/BTEX	EP080	1	5	20.0	5.0	1	NEPM 1999 Schedule B(3) and ALS QCS3 requirement	
Method Blanks (MB)								
PAH/Phenols (SIM)	EP075(SIM)	1	5	20.0	5.0	1	NEPM 1999 Schedule B(3) and ALS QCS3 requirement	
TPH - Semivolatile Fraction	EP071	1	5	20.0	5.0	1	NEPM 1999 Schedule B(3) and ALS QCS3 requirement	
TPH Volatiles/BTEX	EP080	1	5	20.0	5.0	1	NEPM 1999 Schedule B(3) and ALS QCS3 requirement	
Matrix Spikes (MS)								
PAH/Phenols (SIM)	EP075(SIM)	1	5	20.0	5.0	1	ALS QCS3 requirement	
TPH - Semivolatile Fraction	EP071	1	5	20.0	5.0	1	ALS QCS3 requirement	
TPH Volatiles/BTEX	EP080	1	5	20.0	5.0	1	ALS QCS3 requirement	

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Work Order	ES1309731
Client	AECOM Australia Pty Ltd
Project	60221935_1 82 MOOREBANK



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 G C/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

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E AECOM Australia Pty Ltd S22 E LEVEL 11, 44 MARKET STREET SYDNEY NSW 1230	Laboratory Contact Address	: Environmental Division Sydney : Client Services : 277-289 Woodpark Road Smithfield NSW Australia 2164
: s22 @aecom.com : 02 8295 3600 : 03 9262 5060	E-mail Telephone Facsimile	: sydney@alsglobal.com : +61-2-8784 8555 : +61-2-8784 8500
: 60221935_1 82 MOOREBANK :	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
s22	Date Samples Received Issue Date	: 29-APR-2013 : 30-APR-2013
: : EN/004/12	No. of samples received No. of samples analysed	: 4 : 4
	AECOM Australia Pty Ltd s22 LEVEL 11, 44 MARKET STREET SYDNEY NSW 1230 s22 @aecom.com 02 8295 3600 03 9262 5060 60221935_1 82 MOOREBANK s22 	AECOM Australia Pty Ltd Laboratory s22 Contact LEVEL 11, 44 MARKET STREET Address SYDNEY NSW 1230 E-mail s22 @aecom.com s22 @aecom.com s23 @aecom.com s24 @aecom.com s25 @aecom.com s26 @aecom.com s27 @aecom.com s28 @aecom.com s295 3600 Facsimile c03 9262 5060 Facsimile 60221935_1 82 MOOREBANK QC Level Date Samples Received s22 Issue Date No. of samples received

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

Accredited for compliance with

ISO/IEC 17025.



NATA Accredited Laboratory 825 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	

Address 277-289 Woodpark Road Smithfield NSW Australia 2164 PHONE +61-8-7574 7FFF ca(simile +61-2-8784 8500 Environmental Division Sydney ABN 84 009 936 029 Part of the ALS Group An ALS Limited Company



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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

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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%.

ub-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 (%	
A0FF: Moisture Co	ontent)QC Lot: 87487FF	FB								
ES1309674-005	Anonymous	EA055-103: Moisture Content (dried @ 103°C)		1.0	%	14.9	14.9	0.0	0% - 50%	
S1309731-004	SP103-4	EA055-103: Moisture Content (dried @ 103°C)		1.0	%	18.4	21.1	13.8	0% - 20%	
P05F)SIMBb: Polyr	nu(lear Aromati(Hydro	(ar9ons)QC Lot: 87482FFB								
S1309731-004	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		0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		hydrocarbons								
		EP075(SIM): Benzo(a)pyrene TEQ (WHO)		0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
P070/051: Total Pe	etroleum Hydro(ar9ons)QC Lot: 8748234B								
S1309731-003	SP103-3	EP080: C6 - C9 Fraction		10	mg/kg	<10	<10	0.0	No Limit	
P070/051: Total Pe	etroleum Hydro(ar9ons)QC Lot: 87482F4B								
S1309731-004	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	
P070/051: Total Re	e(overa9le Hvdro(ar9or	ns - NEPM 8010 Draft)QC Lot: 8748234B								
S1309731-003	SP103-3	EP080: C6 - C10 Fraction		10	mg/kg	<10	<10	0.0	No Limit	
		ns - NEPM 8010 Draft)QC Lot: 87482F4B								
S1309731-004	SP103-4	EP071: >C16 - C34 Fraction		100	mg/kg	<100	<100	0.0	No Limit	
	0. 100 1	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	

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Sub-Matrix: SOIL	b-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 - (ontin	nued								
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	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
			106-42-3							
		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	

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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)		Laboratory Control Spike (LCS) Report			
			Unit	Report	Spike	Spike Recovery (%)	Recovery	Limits (%)
Method: Compound	CAS Number	LOR		Result	Concentration	LCS	Low	High
EP05F)SIMBb: Polynu(lear Aromati(Hydro(ar9ons)QC	Lot: 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: 874	8234B							
EP080: C6 - C9 Fraction		10	mg/kg	<10	26 mg/kg	118	68.4	128
EP070/051: Total Petroleum Hydro(ar9ons)QCLot: 874	82F4B							
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 80	10 Draft)QCLot: 8	748234B						
EP080: C6 - C10 Fraction		10	mg/kg	<10	31 mg/kg	110	68.4	128
EP070/051: Total Re(overa9le Hydro(ar9ons - NEPM 80	10 Draft)QCI of 8	7482F4B						1
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								1
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

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Sub-Matrix: SOIL				Method Blank (MB)	Laboratory Control Spike (LCS) Report				
			Report	Spike	Spike Recovery (%)	Recovery Limits (%)			
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High	
EP070: bTEXN)QCLot: 8748234B - (ontinued									
EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	2 mg/kg	81.7	60	120	
	106-42-3								
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				Matrix Spike (MS) Report					
				Spike	SpikeRecovery(%)	Recovery	imits (%)		
aboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High		
EP05F)SIMBo: Poly	ynu(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 F	Petroleum Hydro(ar9ons)QCLot:	8748234B							
ES1309731-003	SP103-3	EP080: C6 - C9 Fraction		32.5 mg/kg	126	70	130		
EP070/051: Total F	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 F	Re(overa9le Hydro(ar9ons - NEPM	N 8010 Draft)QCLot: 8748234B							
ES1309731-003	SP103-3	EP080: C6 - C10 Fraction		37.5 mg/kg	122	70	130		
EP070/051: Total F	Re(overa9le Hydro(ar9ons - NEPM	M 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)Q	CLot: 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	2.5 mg/kg	101	70	130		
			106-42-3						
		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		

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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 (N	(MSD) Report	SD) Report			
			Spike	Spike Red	Recovery	Limits (%)	RP	Ds (%)		
Laboratory sample ID Client sample ID Method: Compound			CAS Number	Concentration	MS	MSD	Low	High	Value	Control Limit
EP070/051: Total P	etroleum Hydro(ar9ons)Q	CLot: 8748234B								
ES1309731-003	SP103-3	EP080: C6 - C9 Fraction		32.5 mg/kg	126		70	130		
EP070/051: Total F	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)Q	CLot: 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	2.5 mg/kg	101		70	130		
			106-42-3							
		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 P	etroleum Hydro(ar9ons)Q	CLot: 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 F	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)SIMBo: Poly	nu(lear Aromati(Hydro(ars	Pons)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

(Care -	CER	TIFICATE OF ANALYSIS	
Nork Order	ES1302531	Page	: 1 of 5
Client	: AECOM Australia Pty Ltd	Laboratory	: Environmental Division Sydney
Contact	, s22	Contact	Client Services
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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:

Accredited for compliance with

ISO/IEC 17025.

- General Comments
- Analytical Results
- Surrogate Control Limits



NATA Accredited Laboratory 825 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

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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

 \mathbf{f} = This result is computed from individual analyte detections at or above the level of reporting

Page: 3 of 5Work Order: ES1309731Client: AECOM Australia Pty LtdProject: 60221935_1 82 MOOREBANK



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)		Clie	ent sample ID	SP103-1	SP103-2	SP103-3	SP103-4	7	
	Client sampling date / time			29-APR-2013 11:30	29-APR-2013 11:30	29-APR-2013 11:30	29-APR-2013 11:30	<u>2000</u>	
Compound	CAS Number	LOR	Unit	ES1309731-001	ES1309731-002	ES1309731-003	ES1309731-004	X-3	
EA055: Moisture Content									
Moisture Content (dried @ 103°C)		1.0	%	27.7	47.3	15.7	18.4	57755A	
EP075(SIM)B: Polynuclear Aromatic Hyd	rocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	2000	
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	201000	
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<u>2002</u> 3	
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	20224	
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	<u>4-142</u>	
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<u>2006</u> 24	
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	<u>8-92)</u>	
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<u>29927</u>)	
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	27.675	
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	6-95	
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	0-02)	
Sum of polycyclic aromatic hydrocarbons	in the contract of the contract	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<u>9587</u> 3	
Benzo(a)pyrene TEQ (WHO)		0.5	mg/kg	<0.5	<0.5	<0.5	<0.5		
EP080/071: Total Petroleum Hydrocarbo	ns						1		
C6 - C9 Fraction		10	mg/kg	<10	<10	<10	<10	2.029	
C10 - C14 Fraction	1	50	mg/kg	200	<50	<50	<50	25829	
C15 - C28 Fraction		100	mg/kg	2770	11100	860	<100	57579	
C29 - C36 Fraction) and a	100	mg/kg	2310	8160	740	<100	6-55 3	
C10 - C36 Fraction (sum)		50	mg/kg	5280	19300	1600	<50	<u>2.22</u>	
EP080/071: Total Recoverable Hydrocart	ons - NEPM 201	0 Draft							
C6 - C10 Fraction		10	mg/kg	12	<10	<10	<10	2000	
C6 - C10 Fraction minus BTEX (F1)	ا میں در امیں در	10	mg/kg	12	<10	<10	<10	67053	
>C10 - C16 Fraction	14100	50	mg/kg	300	210	<50	<50		
>C16 - C34 Fraction	7 <u>1-1-1-</u>	100	mg/kg	4430	17700	1450	<100	<u>8-82</u>)	
>C34 - C40 Fraction	1	100	mg/kg	1600	4060	410	<100	25223	
>C10 - C40 Fraction (sum)		50	mg/kg	6330	22000	1860	<50		

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Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)		Client sample ID		SP103-1	SP103-2	SP103-3	SP103-4	
		ent sampli	ng date / time	29-APR-2013 11:30	29-APR-2013 11:30	29-APR-2013 11:30	29-APR-2013 11:30	<u>2011-02-02</u>
Compound	CAS Number	LOR Unit		ES1309731-001	ES1309731-002	ES1309731-003	ES1309731-004	177 - 174
EP080: BTEX								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	277276
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	2000-4
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	0-02)
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	20021
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	2.22;
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	1000
EP075(SIM)S: Phenolic Compou	nd Surrogates							
Phenol-d6	13127-88-3	0.1	%	83.7	83.7	80.3	83.7	67873)
2-Chlorophenol-D4	93951-73-6	0.1	%	80.2	87.3	83.1	87.5	2.122
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	57573)
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	101020
EP080S: TPH(V)/BTEX Surrogate	s							
1.2-Dichloroethane-D4	17060-07-0	0.1	%	84.6	74.7	94.4	90.0	ಕಾಶನ
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	0-92)

Surrogate Control Limits

Sub-Matrix: SOIL		Recovery	Limits (%)
Compound	CAS Number	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 - Tribrom ophenol	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



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alia Pty Ltd George Street , 2000 QVB PO, Sydney,	NSW, 1230	T +61 2 8934 0000 F +61 2 8934 0001							Address:	AL\$ 277	ils S Environmental 7-289 Woodpark nithfield, NSW, 2164	61 2 8784 8555 Fax: 61 2 8784 8500 Lab Quote No: EN-004-12
22		AECOM Project No:	60	22	19	35			Project Name:	:	Moorebank	
			-		-					1		Analysis
ne required: 24 hr					_					⊢		
e requirements?			_							1		
: Email:s22	@aecom.com s22	@aecom.com			_							
ID	Sample ID	Sampling Date	soil	Mater water	other	Pres Pres		ion eg	Container	PBH	PAH (TCLP	
(SP102-1	16/04/13	x				-	x	Jar	X	┼╾┼╶┼╼┼─	
2	SP102-2	. 16/04/13	x				T	x		X		
3	SP102-3	16/04/13	x					x		1		
4	SP102-4	16/04/13	х			-		x		X		
S	SP102-5	16/04/13	x					x	- 1.	X		
G	SP102-6	16/04/13	x					х		X		
	SP102-7	16/04/13	x			_	-	x	4	¥		Environmental Division Sydney
			<u> </u>	<u> </u>		_	-	_				Work Order
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W: (A	S22	Cinded.			16/	Date	Time		Recieved hv: s22		ALS	Signed: Date/Time: s22 16-4-13 15 2





SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive Report

Work Order : E31306/93	Work Order	: ES1308793
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Client Contact Address	contact : s22		Laboratory Contact Address	 Environmental Division Sydney s22 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail Telephone Facsimile	: s22 : 02 826 : 02 826		E-mail Telephone Facsimile	: s22 @alsglobal.com : +61 2 8784 8555 : +61 2 8784 8555
Project Order number	60221935 MOOREBANK		Page	: 1 of 2
C-O-C number Site	:		Quote number	: ES2012HLAENV0454 (EN/004/12)
Sampler	: s22		QC Level	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dates				
Date Samples Received: 16-APR-2013Client Requested Due Date: 17-APR-2013		Issue Date Scheduled Reporti	: 17-APR-2013 13:05 ng Date : 17-APR-2013	
Delivery Deta Mode of Delivery No. of coolers/boxe Security Seal		: Carrier : 1 HARD : Intact.	Temperature No. of samples rec No. of samples ana	-

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.

Address 277-289 Woodpark Road Smithfield NSW Australia 2164 PHONE +61-2-8784 8555 Facsimile +61-2-8784 8500 Environmental Division Sydney ABN 84 009 936 029 Part of the ALS Group An ALS Limited Company

Environmental 💭

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Issue Date	: 17-APR-2013 13:05
Page	: 2 of 2
Work Order	: ES1308793
Client	: AECOM Australia Pty Ltd

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

Matrix: SOIL

laboratory for p bracketed without a Matrix: SOIL	0 1 1	s and will be shown	SO L - EA055-103 Moisture Content	EP075 SIM PAH only AH only
Laboratory sample ID	Client sampling date / time	Client sample ID	SO L - E Moisture	SOL-E
ES1308793-001	16-APR-2013 15:00	SP102-1	✓	✓
ES1308793-002	16-APR-2013 15:00	SP102-2	1	✓
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	1	✓

Proactive Holding Time Report

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

Requested Deliverables

s22

522			
- *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 Contact Address	: AECOM Australia Pty Ltd :s22 : LEVEL 11, 44 MARKET STREET SYDNEY NSW 1230	Laboratory Contact Address	: Environmental Division Sydney : s22 : 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail Telephone Facsimile	s22 @aecom.com : 02 8264 5100 : 02 8264 5111	E-mail Telephone Facsimile	s22 @alsglobal.com : +61 2 8784 8555 : +61 2 8784 8555
Project Site	: 60221935 MOOREBANK :	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
C-O-C number Sampler Order number	s22	Date Samples Received Issue Date	: 16-APR-2013 : 17-APR-2013
Quote number	: EN/004/12	No. of samples received No. of samples analysed	: 7 : 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

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 Work Order
 : ES1308793

 Client
 : AECOM Australia Pty Ltd

 Project
 : 60221935 MOOREBANK



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) & o her metals (180 days). A recorded breach therefore does not guarantee a breach for all non-volatile parameters.

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

Page	: 3 of 5
Work Order	: ES1308793
Client	: AECOM Australia Pty Ltd
Project	: 60221935 MOOREBANK



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	i: × = Quality Cor	ntrol frequency n	ot within specification ; \checkmark = Quality Control frequency within specification.
Quality Control Sample Type		Co	ount		Rate (%)		Quality Control Specification
Analytical Methods	Method	QC	Reaular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
Moisture Content	EA055-103	2	20	10.0	10.0	\checkmark	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

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Project	: 60221935 MOOREBANK



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

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

Accredited for compliance with

ISO/IEC 17025.



NATA Accredited Laboratory 825 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

Address 277-289 Woodpark Road Smithfield NSW Australia 2164 PHONE +61-2-8784 8555 Facsimile +61-2-8784 8500 Environmental Division Sydney ABN 84 009 936 029 Part of the ALS Group An ALS Limited Company



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Page	: 2 of 5
Work Order	: ES1308793
Client	: AECOM Australia Pty Ltd
Project	: 60221935 MOOREBANK



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

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Work Order	: ES1308793
Client	: AECOM Australia Pty Ltd
Project	: 60221935 MOOREBANK



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			Γ			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 Co	ntent (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: Polyn	uclear Aromatic Hydrocarb	ons (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

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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)	Laboratory Control Spike (LCS) Report					
				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				M	atrix Spike (MS) Report		
				Spike	SpikeRecovery(%)	Recovery L	imits (%)
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP075(SIM)B: Poly	nuclear 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 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 (M	IS) and Matrix Sp	oike Duplicate	(MSD) Repo	rt	
		SpikeSpike Recovery (%)Recovery Limits (%)RPDs (%)			s (%)					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	MSD	Low	High	Value	Control Limit

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Sub-Matrix: SOIL					Matrix Spike (N	IS) and Matrix Spi	ke Duplicate	(MSD) Repo	rt	
				Spike	Spike Red	overy (%)	Recovery	Limits (%)	RPL)s (%)
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	MSD	Low	High	Value	Control Limit
EP075(SIM)B: Poly	nuclear 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

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Nork Order	· ES1308793	Page	: 1 of 5	
Client	AECOM Australia Pty Ltd	Laboratory	: Environmental Division Sydney	
Contact	s22	Contact	s22	
Address	ELEVEL 11, 44 MARKET STREET SYDNEY NSW 1230	Address	277-289 Woodpark Road Smithfield N	SW Australia 2164
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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	S			
C-O-C number	en Norwented	Date Samples Received	: 16-APR-2013	
Bampler	s22	Issue Date	17-APR-2013	
Bite				
		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:

Accredited for compliance with

ISO/IEC 17025.

- General Comments
- Analytical Results
- Surrogate Control Limits



NATA Accredited Laboratory 825	Signatories
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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.

Signalories	Position	Accreditation Category
s22	Organic Coordinator	Sydney Inorganics
s22	Organic Coordinator	Sydney Organics

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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

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Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)		Clie	ent sample ID	SP102-1	SP102-2	SP102-3	SP102-4	SP102-5
	Client sampling date / time		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 Hyd	Irocarbons							
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 Surro	ogates							9
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

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Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)		Clie	ent sample ID	SP102-6	SP102-7	70700		
	Cli	ent sampli	ng date / time	16-APR-2013 15:00	16-APR-2013 15:00	1000 C		
Compound	CAS Number	LOR	Unit	ES1308793-006	ES1308793-007	1-22.2		
EA055: Moisture Content								
Moisture Content (dried @ 103°C)	(1.0	%	14.0	13.8		566570	5000.0
EP075(SIM)B: Polynuclear Aromatic Hyd	rocarbons							
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5			
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	0.6	2010	<u>201000</u>	<u>201000</u>
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	2222)	25323	20023
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	2	7-47 -5	
Phenanthrene	85-01-8	0.5	mg/kg	3.2	3.7		Read	Read
Anthracene	120-12-7	0.5	mg/kg	1.1	1.4		<u> </u>	
Fluoranthene	206-44-0	0.5	mg/kg	7.4	10.1	1000	2000	2000
Pyrene	129-00-0	0.5	mg/kg	6.6	9.3	20000	55550	55550
Benz(a)anthracene	56-55-3	0.5	mg/kg	2.6	3.8	6-05 3	6-350	6-31)
Chrysene	218-01-9	0.5	mg/kg	2.1	3.1		stat .	
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	3.3	5.4	2.02)	<u>e.an</u>	<u>e.a.n</u>
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	1.3	2.0	2222	20023	20023
Benzo(a)pyrene	50-32-8	0.5	mg/kg	2.7	4.6	200000	55550	55555
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	1.2	2.0		6-60	6785)
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	0.00	<u>e.an</u>	<u>e.a.a</u>
Sum of polycyclic aromatic hydrocarbons		0.5	mg/kg	32.9	48.4	2222	20020	2222
Benzo(a)pyrene TEQ (WHO)	(entropy	0.5	mg/kg	3.6	6.0			
EP075(SIM)S: Phenolic Compound Surro	gates							
Phenol-d6	13127-88-3	0,1	%	85.0	86.8	2.02	e.an	<u>e.oz</u>)
2-Chlorophenol-D4	93951-73-6	0.1	%	92.7	92.7		22224	2222
2.4.6-Tribromophenol	118-79-6	0.1	%	115	112		50003k	5753
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	92.9	87.0		0.02	2.02
Anthracene-d10	1719-06-8	0.1	%	86.3	80.1	2222	22224	22224
4-Terphenyl-d14	1718-51-0	0.1	%	94.0	86.7	57.57	55574	55534

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Surrogate Control Limits

Sub-Matrix: SOIL		Recovery	Limits (%)
Compound	CAS Number	Low	High
EP075(SIM)S: Phenolic Compound Su	rogates		
Phenol-d6	13127-88-3	63	127
2-Chlorophenol-D4	93951-73-6	64	126
2.4.6 - Tribrom ophenol	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



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SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive Report

Work Order : ES1307104

No. of coolers/boxes Security Seal		1 HARD Intact.	No. of samples received No. of samples analysed		: 4 : 3					
Delivery Details Mode of Delivery Carrier		Temperature		2.2'C - Ice present						
Client Requested E	nen e a constante	28-MAR-2013	Scheduled Reportir	ng Date	28-MAR-2013					
Date Samples Rec		26-MAR-2013	Issue Date		:: 26-MAR-2013 16:28					
Dates										
Sampler	s22		QC Level	NEPM 1999 Schedule B(3) and AL QCS3 requirement						
C-O-C number Site	60221935_1 82 MOOREBANK 		Quote number	ES2	012HLAENV0454 (EN/004/12)					
Project Order number			Page	: 1 of	2					
Telephone : 02 8295 3600 Facsimile : 03 9262 5060		95 3600	Telephone Facsimile	: +61	2 8784 8555 2 8784 8555					
E-mail	s22	@aecom.com	E-mail	s22						
Address		L 11, 44 MARKET STREET EY NSW 1230	Address	s22 277-289 Woodpark Road Smithfield NSW Australia 2164						
Contact	s22	•	Contact							
Client	AECO	M Australia Pty Ltd	Laboratory	Envi	ronmental Division Sydney					

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
- Sample's 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.

dress 277-289 Woodpark Road Smithfeld NSW Australia 2164 PHONE +61-2-8784 8555 Facsimile +61-2-8784 8500

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Issue Date	: 26-MAR-2013 16:28
Page	2 of 2
Work Order	: ES1307104
Client	: AECOM Australia Pty Ltd



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

10 C	processing purpose:	will be assumed by the a and will be shown)L (Subcont int (Salid)		SIM PAH or «
Matrix: SOIL Laboratory sample ID	Client sampling date /time	Client sample ID	SOIL - ASB-SOI Asbestos - Cour	SOIL - EA055-10 Moisture Content	OIL - EP075 M - PAH onl
ES1307104-001	26-MAR-2013 15:00	VS19_0.7-0.8		1	1
ES1307104-002	26-MAR-2013 15:00	SP102		1	1
ES1307104-003	26-MAR-2013 15:00	QC01		1	 Image: A second s
ES1307104-004	26-MAR-2013 15:00	VS16_0.2-0.3	1		

Proactive Holding Time Report

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

Requested Deliverables

-	-	2	
5	/	/	
-	_	_	

- *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			<u>O</u> ssassassossassa
 *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

SB-SOL (Subcontracted)

only





Environmental Division

INTERPRETIVE QUALITY CONTROL REPORT

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

Address 277-289 Woodpark Road Smithfield NSW Australia 2164 PHONE +61-2-8784 8555 Facsimile +61-2-8784 8500 Environmental Division Sydney ABN 84 009 936 029 Part of the ALS Group An ALS Limited Company



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 Work Order
 : ES1307104

 Client
 : AECOM Australia Pty Ltd

 Project
 : 60221935 1 82 MOOREBANK



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) & o her metals (180 days). A recorded breach therefore does not guarantee a breach for all non-volatile parameters.

Matrix: SOIL					Evaluation	: × = Holding ime	breach ; ✓ = Within	n holding time
Method		Sample Date	Ex	traction / Preparation				
Container / Client Sample ID(s)			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 Hydrod	carbons							
Soil Glass Jar - Unpreserved (EP075(SIM)) VS19_0.7-0.8, QC01	SP102,	26-MAR-2013	26-MAR-2013	09-APR-2013	1	26-MAR-2013	05-MAY-2013	~

Page	: 3 of 5
Work Order	: ES1307104
Client	: AECOM Australia Pty Ltd
Project	: 60221935_1 82 MOOREBANK



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	i: × = Quality Cor	ntrol frequency n	ot within specification ; \checkmark = Quality Control frequency within specification.
Quality Control Sample Type		Co	ount	Rate (%)			Quality Control Specification
Analytical Methods	Method	QC Reaular 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

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Client	: AECOM Australia Pty Ltd
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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 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.

Matrix: SOIL

Quality Control Sample Type	Co	ount	Rate	e (%)	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 Contact Address	E AECO9 AMstralia Ptu Ltd s22 E LEVEL 11, 44 MARKET STREET SYDNEY NSW 1230	Laboratory Contact Address	: Environmental Division Sydney : s22 : 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 Site	: 60221935_1 82 MOOREBANK	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
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

Accredited for compliance with

ISO/IEC 17025.



NATA Accredited Laboratory 825 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

Address 277-289 Woodpark Road Smithfield NSW Australia 2164 yP| ONE H+16 @827 2444 y5aFsimile +61-2-8784 8500 Environmental Division Sydney ABN 84 009 936 029 Part of the ALS Group An ALS Limited Company



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Work Order	: ES1307104
Client	: AECOM Australia Pty Ltd
Project	: 60221935_1 82 MOOREBANK



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

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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%.

			Laboratory I	Duplicate (DUP) Report		
Client sample ID Method: Compound	r LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
Content oQC Lot: - 8(322()						
Anonymous EA055-103: Moisture Content (dried @ 103°C)	- 1.0	%	10.7	12.1	12.0	0% - 50%
unMFlear AromatiF udroFarbons cQC Lot: - 8(3201)						
Anonymous EP075(SIM): Naphthalene	3 0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075(SIM): Acenaphthylene	3 0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075(SIM): Acenaphthene	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075(SIM): Fluorene	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075(SIM): Phenanthrene	3 0.5	mg/kg	0.8	0.8	0.0	No Limit
EP075(SIM): Anthracene	7 0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075(SIM): Fluoranthene	0.5	mg/kg	1.8	1.6	9.5	No Limit
EP075(SIM): Pyrene	0.5	mg/kg	1.7	1.6	7.8	No Limit
EP075(SIM): Benz(a)anthracene	3 0.5	mg/kg	1.0	0.9	0.0	No Limit
EP075(SIM): Chrysene	0.5	mg/kg	0.9	0.8	11.6	No Limit
EP075(SIM): Benzo(b)fluoranthene	2 0.5	mg/kg	1.1	1.0	0.0	No Limit
EP075(SIM): Benzo(k)fluoranthene	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075(SIM): Benzo(a)pyrene	3 0.5	mg/kg	0.7	0.6	0.0	No Limit
EP075(SIM): Indeno(1.2.3.cd)pyrene	5 0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075(SIM): Dibenz(a.h)anthracene	3 0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075(SIM): Benzo(g.h.i)perylene	2 0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075(SIM): Sum of polycyclic aroma ic	- 0.5	mg/kg	8.0	7.3	9.2	0% - 50%
	- 0.5	ma/ka	0.9	0.8	14 1	No Limit
					8.0 7.3	8.0 7.3 9.2

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 Work Order
 : ES1307104

 Client
 : AECOM Australia Pty Ltd

 Project
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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)	Laboratory Control Spike (LCS) Report					
				Report	Spike	Spike Recovery (%)	Recovery	Limits (%)		
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High		
EP084cSI9)B: PolunMFlear AromatiF udroFarboi	ns 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 L	imits (%)				
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High		
EP084cSl9)B: Polu	nMFlear AromatiF udroFarbons								
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 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 Rec	Recovery	Limits (%)	RPDs (%)				
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS MSD		Low	High	Value	Control Limit		

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Work Order	: ES1307104
Client	: AECOM Australia Pty Ltd
Project	: 60221935_1 82 MOOREBANK



Sub-Matrix: SOIL					Matrix Spike (N	IS) and Matrix Spi	ke Duplicate	(MSD) Repo	rt	
				Spike	Spike Red	overy (%)	Recovery	Limits (%)	RPD	s (%)
Laboratory sample ID	ample ID Client sample ID Method: Compound		CAS Number	Concentration	MS	MSD	Low	High	Value	Control Limit
EP084cSI9)B: Polu	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		





Environmental Division

Contraction of the second seco	CER	TIFICATE OF ANALYSIS	
Work Order	· ES1307104	Page	: 1 of 4
Client	AECOM Australia Pty Ltd	Laboratory	Environmental Division Sydney
Contact	s22	Contact	s22
Address	ELEVEL 11, 44 MARKET STREET SYDNEY NSW 1230	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	s22 Daecom.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
)rder number	S-man		
C-O-C number	en Normania	Date Samples Received	: 26-MAR-2013
Sampler	s22	Issue Date	27-MAR-2013
Site	Sector Se		
		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:

Accredited for compliance with

ISO/IEC 17025.

- General Comments
- Analytical Results
- Surrogate Control Limits



NATA Accredited Laboratory 825	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.

Signalories	Position	Accreditation Category
s22	Senior Organic Chemist	Sydney Inorganics
s22	Senior Organic Chemist	Sydney Organics

Address 277-289 Woodpark Road Smithfield NSW Australia 2164 PHONE +61-2-8784 8555 Facsimile +61-2-8784 8500 Environmental Division Sydney ABN 84 009 936 029 Part of the ALS Croup An ALS Limited Company





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Page	2 of 4
Work Order	: ES1307104
Client	: AECOM Australia Pty Ltd
Project	60221935_1 82 MOOREBANK



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

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 Work Order
 : ES1307104

 Client
 : AECOM Australia Pty Ltd

 Project
 : 60221935_1 82 MOOREBANK



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)		Clie	ent sample ID	VS19_0.7-0.8	SP102	QC01		
	Cli	ent samplii	ng date / time	26-MAR-2013 15:00	26-MAR-2013 15:00	26-MAR-2013 15:00	<u>2000</u>	
Compound	CAS Number	LOR	Unit	ES1307104-001	ES1307104-002	ES1307104-003		
EA055: Moisture Content								
Moisture Content (dried @ 103°C)	1.000 (come)	1.0	%	12.3	11.0	11.5	200220	
EP075(SIM)B: Polynuclear Aromatic Hydi	rocarbons							
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	NEW C	<u>2000</u>
Acenaphthene	83-32-9	0.5	mg/kg	1.5	0.8	1.0	200233	20020
Fluorene	86-73-7	0.5	mg/kg	1.2	0.6	0.7	<u>7-07</u> .	27.0024
Phenanthrene	85-01-8	0.5	mg/kg	19.7	10.3	11.8	1116	
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	<u>10160</u>	22221
Pyrene	129-00-0	0.5	mg/kg	41.5	17.3	23.8	2000.00	55533
Benz(a)anthracene	56-55-3	0.5	mg/kg	16.5	6.8	9.3		6-35
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	0.02	0-02)
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	7.1	3.0	3.8	2002)	2222
Benzo(a)pyrene	50-32-8	0.5	mg/kg	16.2	6.6	9.1	200000	5555
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	6.1	2.6	3.2		ಕಾರ
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	0-02	0-02)
Sum of polycyclic aromatic hydrocarbons	in the second second	0.5	mg/kg	206	88.3	117	200013	25020
Benzo(a)pyrene TEQ (WHO)		0.5	mg/kg	22.5	9.2	12.5		
EP075(SIM)S: Phenolic Compound Surro	rates							1
Phenol-d6	13127-88-3	0.1	%	90.3	98.3	92.3	6-02	
2-Chlorophenol-D4	93951-73-6	0.1	%	98.1	110	97.2	20020	2002)
2.4.6-Tribromophenol	118-79-6	0.1	%	88.0	102	95.4	377639	55550
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	84.7	96.2	88.9	2.027	e.oz
Anthracene-d10	1719-06-8	0.1	%	86.0	94.7	88.3	2122	2002
4-Terphenyl-d14	1718-51-0	0.1	%	99.8	111	102		

Surrogate Control Limits

Sub-Matrix: SOIL		Recovery	/ Limits (%)	
Compound	CAS Number	Low	High	
EP075(SIM)S: Phenolic Compound	l Surrogates			
Phenol-d6	13127-88-3	63	127	
2-Chlorophenol-D4	93951-73-6	64	126	
2.4.6 - Tribrom ophenol	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 Australia Pty Ltd																				
Level 21, 420 George Stree Sydney, NSW, 2000 PO Box Q410, QVB PO, Syd		T +61 2 8934 0000 F +61 2 8934 0001						Laboratory LSb. Name: Adidress;	Au	ils stralia iihfick	n Lab	oratory	Serica	os				02 9910 6200 ax: 02 9910 6201	hain of Custody	
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Special storage requirement	is?								-											
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	EXCAV6-B	18/06/14	x						×		-+	-	+-	1	┢─┤	-+	-	+		
6	EXCAV6-VS1	18/06/14	x		1	\square	\neg				-+		+-		$\left - \right $	- -			Environmental	
7	EXCAV6-VS2	18/06/14		+	+	+	$\left - \right $		<u>×</u> .	×		_ _			\square				Sydney	
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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 Daecom.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	š		
C-O-C number	3.——	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

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 Work Order
 ES1413712

 Client
 AECOM Australia Pty Ltd

 Project
 60221935 MOOREBANK



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 <u>VOC in soils</u> 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.

Method		Sample Date	Ex	traction / Preparation		Analysis			
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
EA055: Moisture Content									
Soil Glass Jar - Unpreserved (EA055-103) EXCAV6-N, EXCAV6-E, EXCAV6-B, EXCAV6-B, EXCAV6-VS2	EXCAV6-S, EXCAV6-W, EXCAV6-VS1,	18-JUN-2014				25-JUN-2014	02-JUL-2014	1	
EG005T: Total Metals by ICP-AES					-				
Soil Glass Jar - Unpreserved (EG005T) EXCAV6-N, EXCAV6-E, EXCAV6-B, EXCAV6-B, EXCAV6-VS2	EXCAV6-S, EXCAV6-W, EXCAV6-VS1,	18-JUN-2014	25-JUN-2014	15-DEC-2014	1	26-JUN-2014	15-DEC-2014	1	
EP080/071: Total Recoverable Hydrocarbons - N	EPM 2013								
Soil Glass Jar - Unpreserved (EP071) EXCAV6-N, EXCAV6-E, EXCAV6-B, EXCAV6-B, EXCAV6-VS2	EXCAV6-S, EXCAV6-W, EXCAV6-VS1,	18-JUN-2014	25-JUN-2014	02-JUL-2014	1	25-JUN-2014	04-AUG-2014	1	
EP080: BTEXN									
Soil Glass Jar - Unpreserved (EP080) EXCAV6-N, EXCAV6-E, EXCAV6-B, EXCAV6-B, EXCAV6-VS2	EXCAV6-S, EXCAV6-W, EXCAV6-VS1,	18-JUN-2014	25-JUN-2014	02-JUL-2014	1	25-JUN-2014	02-JUL-2014	1	
EP080/071: Total Recoverable Hydrocarbons - N	IEPM 2013								
Soil Glass Jar - Unpreserved (EP080) EXCAV6-N, EXCAV6-E, EXCAV6-B, EXCAV6-B, EXCAV6-VS2	EXCAV6-S, EXCAV6-W, EXCAV6-VS1,	18-JUN-2014	25-JUN-2014	02-JUL-2014	1	25-JUN-2014	02-JUL-2014	1	

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Work Order	ES1413712
Client	AECOM Australia Pty Ltd
Project	60221935 MOOREBANK



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	n: \star = Quality Cor	ntrol frequency r	not within specification ; \checkmark = Quality Control frequency within specif
Quality Control Sample Type		С	ount	Rate (%)			Quality Control Specification
Analytical Methods	Method	QC Redular		Actual Expected		Evaluation	
Laboratory Duplicates (DUP)							
Moisture Content	EA055-103	2	20	10.0	10.0	1	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	10	10.0	10.0	1	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	9	11.1	10.0	1	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	19	10.5	10.0	1	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
_aboratory Control Samples (LCS)							
Total Metals by ICP-AES	EG005T	1	10	10.0	5.0	1	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	9	11.1	5.0	1	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	19	5.3	5.0	1	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Total Metals by ICP-AES	EG005T	1	10	10.0	5.0	1	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	9	11.1	5.0	1	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	19	5.3	5.0	1	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
Total Metals by ICP-AES	EG005T	1	10	10.0	5.0	1	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	9	11.1	5.0	1	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	19	5.3	5.0	1	NEPM 2013 Schedule B(3) and ALS QCS3 requirement

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Work Order	ES1413712
Client	AECOM Australia Pty Ltd
Project	60221935 MOOREBANK



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	* ORG18	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.

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Client	AECOM Australia Pty Ltd
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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.



QUALITY CONTROL REPORT

Nork Order	: ES1413712	Page	1 of 6
Client	: AECOM Australia Pty Ltd	Laboratory	: Environmental Division Sydney
Contact	s22	Contact	Client Services
Address	EVEL 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	S		
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 Accredited Signatories

Laboratory 825 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.

Accredited for	Signatories	Position	Accreditation Category	
compliance with	-00		Sydney Inorganics	
ISO/IEC 17025.	s22	Senior Spectroscopist	Sydney Inorganics	
	SZZ	Senior Organic Chemist	Sydney Organics	

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Page	: 2 of 6
Work Order	: ES1413712
Client	AECOM Australia Pty Ltd
Project	60221935 MOOREBANK



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

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Work Order	: ES1413712
Client	AECOM Australia Pty Ltd
Project	60221935 MOOREBANK



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 QVM-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%.

Bub-Matrix: SOIL						Laboratory I	Duplicate (DUP) Report		ar
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%
EA055: Moisture Co	ontent (QC Lot: 350912:	2)							
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 Meta	Is 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 Pe	etroleum 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 Pe	etroleum Hydrocarbons	(QC Lot: 3507188)			n				
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 Re	ecoverable Hydrocarbo	ns - NEPM 2013 (QC Lot: 3507177)							
ES1413712-001 EXCAV6-N	EXCAV6-N	EP071: >C16 - C34 Fraction		100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	10000	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 Re	ecoverable Hydrocarbo	ns - NEPM 2013 (QC Lot: 3507188)			h				nh
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	CLot: 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	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
			106-42-3						
		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

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 Work Order
 : ES1413712

 Client
 : AECOM Australia Pty Ltd

 Project
 : 60221935 MOOREBANK



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)	Laboratory Control Spike (LCS) Report				
				Report	Spike	Spike Recovery (%)	Recovery	Limits (%)	
Method: Compound	CAS Number	CAS Number LOR Unit Result Concentrati		Concentration	LCS	Low	High		
EG005T: Total Metals by ICP-AES (QCLot: 350956	33)								
EG005T: Lead	7439-92-1	5	mg/kg	<5	40.0 mg/kg	103	86	124	
EP080/071: Total Petroleum Hydrocarbons (QCLo	ot: 3507177)								
EP071: C10 - C14 Fraction		50	mg/kg	<50	200 mg/kg	103	71	131	
EP071: C15 - C28 Fraction	8 7055 8	100	mg/kg	<100	300 mg/kg	90.7	74	138	
EP071: C29 - C36 Fraction	a ron te.	100	mg/kg	<100	200 mg/kg	90.0	64	128	
EP080/071: Total Petroleum Hydrocarbons (QCLo	ot: 3507188)								
EP080: C6 - C9 Fraction	(<u>1999)</u>	10	mg/kg	<10	26 mg/kg	94.8	68.4	128	
EP080/071: Total Recoverable Hydrocarbons - NE	PM 2013 (QCLot: 3507177)							
EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	250 mg/kg	96.2	70	130	
EP071: >C16 - C34 Fraction	2 5575 4	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 - NE	PM 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	0.5	mg/kg	<0.5	2 mg/kg	98.9	60	120	
	106-42-3								
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				M			
				Spike	SpikeRecovery(%)	Recovery L	limits (%)
aboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG005T: Total Met	als by ICP-AES (QCLot: 3509563)						
ES1413586-002	Anonymous	EG005T: Lead	7439-92-1	250 mg/kg	106	70	1 30
EP080/071: Total F	etroleum Hydrocarbons (QCLot: 35	07177)					
ES1413712-001	EXCAV6-N	EP071: C10 - C14 Fraction	51001	640 mg/kg	86.1	73	137

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Sub-Matrix: SOIL		Matrix Spike (MS) Report					
				Spike	SpikeRecovery(%)	Recovery	Limits (%)
aboratory sample ID	Client sample ID	Method: Compound	Method: Compound CAS Number				High
EP080/071: Total I	Petroleum Hydrocarbons (QCLot: 350717	7) - continued					
ES1413712-001	EXCAV6-N	EP071: C15 - C28 Fraction	10000	3140 mg/kg	81.4	53	131
		EP071: C29 - C36 Fraction	7 <u>01-00</u>	2860 mg/kg	70.2	52	132
EP080/071: Total I	Petroleum Hydrocarbons (QCLot: 350718	3)					
ES1413712-001	EXCAV6-N	EP080: C6 - C9 Fraction		32.5 mg/kg	103	70	130
EP080/071: Total I	Recoverable Hydrocarbons - NEPM 2013	(QCLot: 3507177)					
ES1413712-001 EXCAV6-N	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 I	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 (Q	(CLot: 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	2.5 mg/kg	91.4	70	130
			106-42-3		· · · · · · · · · · · · · · · · · · ·	511-5 150-7 X	
		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				Matrix Spike (I	MS) and Matrix S	Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report							
				Spike	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)				
aboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	MSD	Low	High	Value	Control Limi			
EP080/071: Total F	etroleum Hydrocarbons(QC	Lot: 3507177)											
ES1413712-001 EXCAV6-N		EP071: C10 - C14 Fraction		640 mg/kg	86.1		73	137	102004%				
Charles and a state of the second state of the	EP071: C15 - C28 Fraction		3140 mg/kg	81.4		53	131	(1 004 6)					
		EP071: C29 - C36 Fraction	EP071: C29 - C36 Fraction		70.2		52	132	0 8963 0				
EP080/071: Total F	Recoverable Hydrocarbons - N	NEPM 2013 (QCLot: 3507177)											
ES1413712-001	EXCAV6-N	EP071: >C10 - C16 Fraction	>C10_C16	850 mg/kg	108	5525	73	137	2 <u>2422</u> 23	5612			
		EP071: >C16 - C34 Fraction	<u>, 199</u>	4800 mg/kg	73.6	2000	53	131	022223				
		EP071: >C34 - C40 Fraction		2400 mg/kg	55.0	2000	52	132	100000				
P080/071: Total F	etroleum Hydrocarbons (QC	Lot: 3507188)											
	EXCAV6-N	EP080: C6 - C9 Fraction		32.5 mg/kg	103		70	130	23 2				

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Sub-Matrix: SOIL					Matrix Spike (i	MS) and Matrix S	pike Duplicate	(MSD) Report		
				Spike	Spike Re	covery (%)	Recovery	Limits (%)	RPDs (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	MSD	Low	High	Value	Control Limit
EP080/071: Total R	ecoverable Hydrocarbons - I	NEPM 2013 (QCLot: 3507188) - continued								
ES1413712-001	EXCAV6-N	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	98.9		70	130	100000	
EP080: BTEXN (Q	CLot: 3507188)							h		- Marco
ES1413712-001	EXCAV6-N	EP080: Benzene	71-43-2	2.5 mg/kg	77.8		70	130	(4444)	
		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	0.000	
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	91.4	00700	70	130	0 0390 3	
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	91.0	5555	70	130	2 <u>222</u> 23	0000
		EP080: Naphthalene	91-20-3	2.5 mg/kg	83.0	<u>19120</u> 7	70	130	(<u>2000</u> 07)	2220
EG005T: Total Met	als by ICP-AES (QCLot: 3509	9563)								
ES1413586-002	Anonymous	EG005T: Lead	7439-92-1	250 mg/kg	106		70	130	10 0000 0	



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Client	AECOM Australia Pty Ltd	Laboratory	Environmental Division Sydney
Contact	s22	Contact	: Client Services
Address	LEVEL 11, 44 MARKET STREET	Address	277-289 Woodpark Road Smithfield NSW Australia 2164
	SYDNEY NSW 1230		
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			indicated below. Electronic signing has been
NATA	Accredited for compliance with ISO/IEC 17025.	carried out in compliance with procedures s Signalories	specified in 21 CFR Part 11. Position	Accreditation Category
	130/LC17023.	Signalones	POSITION	
$\mathbf{\mathbf{v}}$		s22	Senior Spectroscopist	Sydney Inorganics Sydney Inorganics
ACCREDITATION		s22	Senior Organic Chemist	Sydney Organics

Address 277-289 Woodpark Road Smithfield NSW Australia 2164 PHONE +61-2-8784 8555 Facsimile +61-2-8784 8500

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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)		Clie	ent 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 15:0	
Compound	CAS Number	LOR	Unit	ES1413712-001	ES1413712-002	ES1413712-003	ES1413712-004	ES1413712-005	
EA055: Moisture Content									
Moisture Content (dried @ 103°C)	1.000 (come)	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 Hydrocarb	oons								
C6 - C9 Fraction	1.000	10	mg/kg	<10	<10	<10	<10	<10	
C10 - C14 Fraction	وبيدور	50	mg/kg	<50	<50	<50	<50	<50	
C15 - C28 Fraction		100	mg/kg	<100	<100	<100	<100	<100	
C29 - C36 Fraction	1775	100	mg/kg	<100	<100	<100	<100	<100	
C10 - C36 Fraction (sum)	P-00103	50	mg/kg	<50	<50	<50	<50	<50	
EP080/071: Total Recoverable Hydroca	arbons - NEPM 201	3							
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)	أوبيدو	50	mg/kg	<50	<50	<50	<50	<50	
>C10 - C16 Fraction minus Naphthalene (F2)	<u>sectoriti</u>	50	mg/kg	<50	<50	<50	<50	<50	
EP080: BTEXN								8	
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	

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Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)		Clie	ent sample ID	EXCAV6-VS1	EXCAV6-VS2				
	Client sampling date / time			18-JUN-2014 15:00	18-JUN-2014 15:00		<u>thirty</u>	2227	
Compound	CAS Number	LOR	Unit	ES1413712-006	ES1413712-007	2000 a		A A	
EA055: Moisture Content									
Moisture Content (dried @ 103°C)	(error)	1.0	%	10.0	10.9	57070			
EG005T: Total Metals by ICP-AES									
Lead	7439-92-1	5	mg/kg	8	7				
EP080/071: Total Petroleum Hydrocart	oons								
C6 - C9 Fraction	1.000	10	mg/kg	<10	<10	57575	35532	2 201032	
C10 - C14 Fraction	10000	50	mg/kg	<50	<50	6705 3	6-35 3	6-63 3	
C15 - C28 Fraction	544982	100	mg/kg	<100	<100				
C29 - C36 Fraction	1775	100	mg/kg	<100	<100	0.02)	<u>0.02)</u>	2-02)	
C10 - C36 Fraction (sum)		50	mg/kg	<50	<50	2022	2222	2222	
EP080/071: Total Recoverable Hydroca	arbons - NEPM 201	3							
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	1795 1	7177777	1755	
C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	5.027	9-92)	2.22)	
>C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	e.oz	2.029	e-92)	
>C16 - C34 Fraction		100	mg/kg	<100	<100		2022		
>C34 - C40 Fraction		100	mg/kg	<100	<100		<u>2007</u> 0		
>C10 - C40 Fraction (sum)	2000	50	mg/kg	<50	<50				
>C10 - C16 Fraction minus Naphthalene (F2)	<u>101200</u>	50	mg/kg	<50	<50			<u></u>	
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2		2.22	<u></u>	
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5			2 2000-00	
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	2. Ka	2015-0	20.00m	
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5		1725	1716	
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	8-92)	C-02)	0-02)	
Sum of BTEX		0.2	mg/kg	<0.2	<0.2	<u>NUMP</u>	<u>NIMP</u> :	i <u>nile</u> tet	
Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	<0.5	20050	57707A	2005b	
Naphthalene	91-20-3	1	mg/kg	<1	<1		6-950		
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.1	%	76.2	76.4	22201	2020	<u></u>	
Toluene-D8	2037-26-5	0.1	%	106	103	50000			
4-Bromofluorobenzene	460-00-4	0.1	%	115	116				

Defence FOI 235/19/20

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Surrogate Control Limits

Sub-Matrix: SOIL		Recovery	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		



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AECOM Australia Pty Ltd			_		_						_											ofCustody	
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Sydney, NSW, 2000 PO Box Q410, QVB PO, Sydn	ev. NSW. 1230	F +61 2 8934 0001							Address:		ithfie			., 500				۴a	02 991 × 02 991	10 6200 10 6201			
Sampled By: S22	y, naw, 1230	AECOM Emissible						_		_	_				_		_		b Quote				
Specifications		AECOM Project No	. 602	21935	•				Project Name	e: Mo	oreb	ank		_									
Turnaround time required: sta				_	_					┢		1	1-				Ana	lysis			ы. 		
Special storage requirements? Report Format: Email:							_																
iteport Porthac Email:	@aecom.com.s22	@aecom.com	-				_													ť)		
			\vdash	Matrix	-	Prese	rvat	lion	Container	-											1. 2.		
Lab, IO	Sample ID								:												51 		
	Gample ID	Sampling Date	soil	water	other	filtered	gg	9		Ж										6	<u>.</u>	l	
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	EXCAV4-N	16/06/14	1×		4		+			×	×											Sydn	
3	EXCAV4-S	16/06/14	×	-	-	-	+	_		×	×		\square		_		_			i		Work C)rder
	EXCAV4-E	16/06/14	×	\square	-	_	+	_		×	×				_					i		ES141	324
5	EXCAV4-W	16/06/14	×	\square	4	-	+			x	×												
6	EXCAV4-B	16/05/14	×		+	_	+	_		×	×											H I III H H I I I I I I	
	EXCAV4-VS1	16/06/14	×	$\left - \right $	+	_	+	_		×	×			_									
8	EXCAV4-VS2	16/06/14	×	┝╌┦	_	+	4			×	×												
<u> </u>	EXCAV5-N	16/06/14	×	-	+	_ _	+		125tml jar	×	×									- "	Tel	lephone:+61	-2-8794
ίυ	EXCAV5-S	16/06/14	×	-	-	_				x	×												2-0/048
11	EXCAV5-E	16/06/14	×	$\left \right $	-		_			×	×											j	
12	EXCAV5-W	16/06/14	x	_	+		_			×	×												
13	EXCAV5-B	16/06/14	×	-	+		+			x	×												
14 14	EXCAV5-VS1	16/06/14	×	$ \vdash \downarrow$	+		\downarrow			×	×												
- K	EXCAV5-V\$2	16/06/14	×	┝┼	+	+	+			x	×	1_								_			
	QC01	16/06/14	×	-	+	_ -	\downarrow	1		x	. ×												
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Comments;					_		-			<u> </u>	<u> </u>				<u> </u>	L							
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(***	INTERPRETIVE	EQUALITY 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	3.—	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

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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 <u>VOC in soils</u> 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			-		Lvaldation	. + - Hording arric	breach ; 🖌 = Within	r nolaling an
Method		Sample Date		ktraction / Preparation			Analysis	
Container / Client Sample ID(s)			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,	16-JUN-2014	670 6 6	0-053	5575 2	18-JUN-2014	30-JUN-2014	×
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			-					
EG005T: Total Metals by ICP-AES								
Soil Glass Jar - Unpreserved (EG005T)								
EXCAV4-N,	EXCAV4-S,	16-JUN-2014	19-JUN-2014	13-DEC-2014	1	19-JUN-2014	13-DEC-2014	×
EXCAV4-E,	EXCAV4-VV,							
EXCAV4-B,	EXCAV4-VS1,							
EXCAV4-VS2,	EXCAV5-N,							
EXCAV5-S,	EXCAV5-E,							
EXCAV5-W,	EXCAV5-B,							
EXCAV5-VS1,	EXCAV5-VS2,							
QC01								
EP080/071: Total Petroleum Hydrocarbons								
Soil Glass Jar - Unpreserved (EP071)					1.37			
EXCAV4-N,	EXCAV4-S,	16-JUN-2014	19-JUN-2014	30-JUN-2014	1	19-JUN-2014	29-JUL-2014	1
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								

Defence FOI 235/19/20

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Client	AECOM Australia Pty Ltd
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EXCAV4-S,

EXCAV4-W,

EXCAV5-N,

EXCAV5-E,

EXCAV5-B,

EXCAV5-VS2,

EXCAV4-VS1,

Matrix: SOIL

EP080: BTEXN

EXCAV4-N, EXCAV4-E,

EXCAV4-B,

EXCAV5-S.

EXCAV5-W,

EXCAV4-N,

EXCAV4-E,

EXCAV4-B,

EXCAV5-S,

EXCAV5-W,

QC01

EXCAV5-VS1,

EXCAV4-VS2,

EXCAV5-VS1, QC01

EXCAV4-VS2,

Method



1

Evaluation: * = Holding time breach ; < = Within holding time. Sample Date Extraction / Preparation Analysis Container / Client Sample ID(s) Date extracted Due for extraction Evaluation Date analysed Due for analysis Evaluation Soil Glass Jar - Unpreserved (EP080) 30-JUN-2014 30-JUN-2014 EXCAV4-S, 16-JUN-2014 18-JUN-2014 1 19-JUN-2014 1 EXCAV4-W, EXCAV4-VS1, EXCAV5-N, EXCAV5-E. EXCAV5-B, EXCAV5-VS2, EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Soil Glass Jar - Unpreserved (EP080)

16-JUN-2014

18-JUN-2014

30-JUN-2014

1

19-JUN-2014

30-JUN-2014

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Project	60221935 TASK 1 82 MOOREBANK



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	n: \star = Quality Cor	ntrol frequency r	not within specification ; 🖌 = Quality Control frequency within spec		
Quality Control Sample Type		C	Count Rate (%)			Quality Control Specification			
Analytical Methods	Method	QC	Reaular	Actual	Expected	Evaluation			
Laboratory Duplicates (DUP)									
Moisture Content	EA055-103	2	20	10.0	10.0	1	NEPM 2013 Schedule B(3) and ALS QCS3 requirement		
Total Metals by ICP-AES	EG005T	4	33	12.1	10.0	1	NEPM 2013 Schedule B(3) and ALS QCS3 requirement		
TPH - Semivolatile Fraction	EP071	2	16	12.5	10.0	1	NEPM 2013 Schedule B(3) and ALS QCS3 requirement		
TPH Volatiles/BTEX	EP080	2	20	10.0	10.0	1	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	1	NEPM 2013 Schedule B(3) and ALS QCS3 requirement		
TPH - Semivolatile Fraction	EP071	1	16	6.3	5.0	1	NEPM 2013 Schedule B(3) and ALS QCS3 requirement		
TPH Volatiles/BTEX	EP080	1	20	5.0	5.0	1	NEPM 2013 Schedule B(3) and ALS QCS3 requirement		
Method Blanks (MB)									
Total Metals by ICP-AES	EG005T	2	33	6.1	5.0	1	NEPM 2013 Schedule B(3) and ALS QCS3 requirement		
TPH - Semivolatile Fraction	EP071	1	16	6.3	5.0	1	NEPM 2013 Schedule B(3) and ALS QCS3 requirement		
TPH Volatiles/BTEX	EP080	1	20	5.0	5.0	1	NEPM 2013 Schedule B(3) and ALS QCS3 requirement		
Matrix Spikes (MS)									
Total Metals by ICP-AES	EG005T	2	33	6.1	5.0	1	NEPM 2013 Schedule B(3) and ALS QCS3 requirement		
TPH - Semivolatile Fraction	EP071	1	16	6.3	5.0	1	NEPM 2013 Schedule B(3) and ALS QCS3 requirement		
TPH Volatiles/BTEX	EP080	1	20	5.0	5.0	1	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		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.



QUALITY CONTROL REPORT

Nork Order	: ES1413246	Page	1 of 7
Client	: AECOM Australia Pty Ltd	Laboratory	Environmental Division Sydney
Contact	s22	Contact	Client Services
Address	EVEL 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	2. 		
C-O-C number	ž.	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 Accredited Signatories

Laboratory 825 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.

Accredited for	Signatories	Position	Accreditation Category	
compliance with			Sydney Inorganics	
ISO/IEC 17025.	s22	Senior Organic Chemist	Sydney Organics	
	s22	Metals Coordinator	Sydney Inorganics	

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Project	60221935 TASK 1 82 MOOREBANK



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 QVM-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 I	Duplicate (DUP) Report		ar
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%
EA055: Moisture Co	ontent (QC Lot: 349625	1)							
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 Meta	Is 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 Meta	Is 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 Pe	etroleum Hydrocarbons				Ac again				
ES1413198-001	Anonymous	EP080: C6 - C9 Fraction	1000	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 Pe	etroleum Hydrocarbons								
ES1413246-001	EXCAV4-N	EP071: C15 - C28 Fraction		100	mg/kg	<100	<100	0.0	No Limit
	Externa 14	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	10.220	50	mg/kg	<50	<50	0.0	No Limit
EP080/071: Total Re	ecoverable Hvdrocarbo	ns - NEPM 2013 (QC Lot: 3496235)						10000000	
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 Re	coverable Hydrocarbo	ns - NEPM 2013 (QC Lot: 3496475)	_						
ES1413246-001	EXCAV4-N	EP071: >C16 - C34 Fraction	2222	100	mg/kg	<100	<100	0.0	No Limit
201110210.001	D. COLUMN T	EP071: >C34 - C40 Fraction	0.00	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)								1
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	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
			106-42-3			2020367	852940.		Contraction (
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit

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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) - contin	ued								
ES1413198-001	Anonymous	EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit	
ES1413246-006	EXCAV4-VS1	246-006 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	

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 Client
 AECOM Australia Pty Ltd

 Project
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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)	Laboratory Control Spike (LCS) Report					
				Report	Spike	Spike Recovery (%)	Recovery	Limits (%)
Method: Compound	CAS Number	LOR Unit		Result	Concentration	LCS	Low	High
EG005T: Total Metals by ICP-AES (QCLot: 349	8517)							
EG005T: Lead	7439-92-1	5	mg/kg	<5	40.0 mg/kg	108	86	124
EG005T: Total Metals by ICP-AES (QCLot: 349	9123)							
EG005T: Lead	7439-92-1	5	mg/kg	<5	40.0 mg/kg	98.6	86	124
EP080/071: Total Petroleum Hydrocarbons (Q)	CLot: 3496235)							
EP080: C6 - C9 Fraction	511110	10	mg/kg	<10	26 mg/kg	96.4	68.4	128
EP080/071: Total Petroleum Hydrocarbons (Q)	CLot: 3496475)							
EP071: C10 - C14 Fraction		50	mg/kg	<50	200 mg/kg	113	71	131
EP071: C15 - C28 Fraction	1	100	mg/kg	<100	300 mg/kg	107	74	138
EP071: C29 - C36 Fraction	the start of the	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)ř						
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	2 <u>1111</u> 23	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	0.5	mg/kg	<0.5	2 mg/kg	90.1	60	120
	106-42-3							
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.

ub-Matrix: SOIL				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
aboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low H	
EG005T: Total Me	tals by ICP-AES (QCLot: 3498517)						
ES1413119-001	Anonymous	EG005T: Lead	7439-92-1	250 mg/kg	110	70	130

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Sub-Matrix: SOIL				М	atrix Spike (MS) Report		
				Spike	SpikeRecovery(%)	Recovery l	Limits (%)
aboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	INS	Low	High
EG005T: Total Me	tals by ICP-AES (QCLot: 3499123)						
ES1413198-001	Anonymous	EG005T: Lead	7439-92-1	250 mg/kg	108	70	130
EP080/071: Total F	Petroleum Hydrocarbons (QCLot: 34	96235)					
ES1413198-001	Anonymous	EP080: C6 - C9 Fraction		32.5 mg/kg	130	70	130
EP080/071: Total F	Petroleum Hydrocarbons (QCLot: 34	96475)					
ES1413246-001	EXCAV4-N	EP071: C10 - C14 Fraction	9 <u>9.00</u>	790 mg/kg	74.3	73	137
	- Wassing with C	EP071: C15 - C28 Fraction		3490 mg/kg	96.4	53	131
		EP071: C29 - C36 Fraction		2400 mg/kg	114	52	132
EP080/071: Total F	Recoverable Hydrocarbons - NEPM 20	013 (QCLot: 3496235)					
ES1413198-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	128	70	130
P080/071: Total F	Recoverable Hydrocarbons - NEPM 20	013 (QCLot: 3496475)					
ES1413246-001	EXCAV4-N	EP071: >C10 - C16 Fraction	>C10_C16	987 mg/kg	105	73	137
		EP071: >C16 - C34 Fraction	1	5235 mg/kg	94.3	53	131
		EP071: >C34 - C40 Fraction	10000	1600 mg/kg	106	4 53 4 52 3 70 5 73 3 53	132
P080: BTEXN (Q	CLot: 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	2.5 mg/kg	102	70	130
			106-42-3				
		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). I deal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: SOIL	ub-Matrix: SOIL				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report								
				Spike	Spike Re	covery (%)	Recovery	Limits (%)	RP	Ds (%)			
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	MSD	Low	High	Value	Control Limi			
EP080/071: Total P	etroleum Hydrocarbons (QC	:Lot: 3496235)											
ES1413198-001	Anonymous	EP080: C6 - C9 Fraction	(قيمتير)	32.5 mg/kg	130	-	70	130	(state)				
EP080/071: Total R	ecoverable Hydrocarbons - I	NEPM 2013 (QCLot: 3496235)											
ES1413198-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	128		70	130	1974 Section				
EP080: BTEXN (Q	CLot: 3496235)												
ES1413198-001	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	99.9		70	130	(6466)				
	55	EP080: Toluene	108-88-3	2.5 mg/kg	99.1		70	130	(1 1)-1(1 (1)				
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	96.0		70	130	13-6-53				

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Sub-Matrix : SOIL					Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike	Spike Re	covery (%)	Recovery Limits (%)		RP	Ds (%)	
Laboratory sample ID	Client sample ID	Method: Comoound	CAS Number	Concentration	MS	MSD	Low	High	Value	Control Limit	
EP080: BTEXN (Q	CLot: 3496235) - continued										
ES1413198-001	Anonymous	EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	102		70	130	1977-1976		
			106-42-3				-				
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	96.6		70	130	1020820		
		EP080: Naphthalene	91-20-3	2.5 mg/kg	85.3		70	130	1020020		
EP080/071: Total F	etroleum Hydrocarbons (Q0	CLot: 3496475)									
ES1413246-001	EXCAV4-N	EP071: C10 - C14 Fraction		790 mg/kg	74.3		73	137	18773775		
		EP071: C15 - C28 Fraction	1	3490 mg/kg	96.4		53	131	19769765	0000	
		EP071: C29 - C36 Fraction		2400 mg/kg	114	2222	52	132		<u> 2222</u>	
EP080/071: Total F	ecoverable Hydrocarbons -	NEPM 2013 (QCLot: 3496475)									
ES1413246-001	EXCAV4-N	EP071: >C10 - C16 Fraction	>C10_C16	987 mg/kg	105		73	137	13 2002 0	1000	
		EP071: >C16 - C34 Fraction		5235 mg/kg	94.3		53	131	0.00000		
		EP071: >C34 - C40 Fraction		1600 mg/kg	<mark>1</mark> 06	00.00	52	132	(40,007,0)	00050.	
EG005T: Total Met	als by ICP-AES (QCLot: 349	8517)									
ES1413119-001	Anonymous	EG005T: Lead	7439-92-1	250 mg/kg	110		70	130	1 <u>92004</u> 1		
EG005T: Total Met	als by ICP-AES (QCLot: 349	9123)									
ES1413198-001	Anonymous	EG005T: Lead	7439-92-1	250 mg/kg	108		70	130	19741070	0000	