ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES1508057**	Page	: 1 of 11
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: [redacted]	Contact	: Client Services
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Project	: 60339175 TASK NO 1 3 CHARNWOOD REMEDIATION	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: 60339175,TASK NO.1.3		
C-O-C number	: ----	Date Samples Received	: 09-APR-2015
Sampler	: RO	Issue Date	: 17-APR-2015
Site	: ----		
		No. of samples received	: 5
Quote number	: EN/004/14	No. of samples analysed	: 5

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Descriptive Results
- Surrogate Control Limits

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

WORLD RECOGNISED ACCREDITATION

Signatories

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

Signatories	*Position*	*Accreditation Category*
[redacted]	[redacted]	Newcastle - Asbestos
[redacted]	[redacted]	Sydney Organics
[redacted]	[redacted]	Sydney Organics
[redacted]	[redacted]	Sydney Inorganics

General Comments

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

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

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

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

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

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

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

- **Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero, for 'TEQ 1/2LOR' are treated as half the reported LOR, and for 'TEQ LOR' are treated as being equal to the reported LOR. Note: TEQ 1/2LOR and TEQ LOR will calculate as 0.6mg/Kg and 1.2mg/Kg respectively for samples with non-detects for all of the eight TEQ PAHs.**
- **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.**
- **EA200 Legend**
- **EA200 'Am' Amosite (brown asbestos)**
- **EA200 'Ch' Chrysotile (white asbestos)**
- **EA200 'Cr' Crocidolite (blue asbestos)**
- **EA200 'Trace' - Asbestos fibres ("Free Fibres") detected by trace analysis per AS4964. The result can be interpreted that the sample contains detectable 'respirable' asbestos fibres**
- **EA200: 'UMF' Unknown Mineral Fibres. "-" indicates fibres detected may or may not be asbestos fibres. Confirmation by alternative techniques is recommended.**
- **EA200: Asbestos Identification Samples were analysed by Polarised Light Microscopy including dispersion staining.**
- **EA200: Negative results for vinyl tiles should be confirmed by an independent analytical technique.**
- **EA200N: ALS laboratory procedures and methods used for the identification and quantitation of asbestos are consistent with AS4964-2004 and the requirements of the 2013 NEPM for Assessment of Site Contamination**
- **EA200N: Asbestos weights and percentages are not covered under the Scope of NATA Accreditation.**
  Weights of Asbestos are based on extracted bulk asbestos, fibre bundles, and/or ACM and do not include respirable fibres (if present)
  The Friable Asbestos weight is calculated from the extracted Fibrous Asbestos and Asbestos Fines as an equivalent weight of 100% Asbestos
  Percentages for Asbestos content in ACM are based on the 2013 NEPM default values.
  All calculations of percentage Asbestos under this method are approximate and should be used as a guide only.
- **PFOS and PFOA results are reported as an aggregate of linear and branched isomers.**

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Work Order : ES1508057
Client : AECOM Australia Pty Ltd
Project : 60339175 TASK NO 1 3 CHARNWOOD REMEDIATION

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	VS01	VS02	VS03	QC102	----
				Client sampling date / time	08-APR-2015 15:00	08-APR-2015 15:00	08-APR-2015 15:00	08-APR-2015 15:00	----
Compound	CAS Number	LOR	Unit		ES1508057-001	ES1508057-002	ES1508057-003	ES1508057-004	----
EA055: Moisture Content									
Moisture Content (dried @ 103°C)	----	1.0	%		24.0	23.2	23.8	23.6	----
EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples									
Asbestos Detected	1332-21-4	0.1	g/kg		No	No	No	No	----
Asbestos Type	1332-21-4	-	--		-	-	-	-	----
Sample weight (dry)	----	0.01	g		1930	1450	1550	1220	----
APPROVED IDENTIFIER:	----	-	--		G.MORGAN	G.MORGAN	G.MORGAN	G.MORGAN	----
EA200F: Friable Asbestos in Soil (non-NATA)									
Friable Asbestos	1332-21-4	0.0004	g		<0.0004	<0.0004	<0.0004	<0.0004	----
Free Fibres	----	5	Fibres		No	No	No	No	----
Friable Asbestos (as Asbestos in Soil)	1332-21-4	0.001	%		<0.001	<0.001	<0.001	<0.001	----
Weight Used for % Calculation	----	0.0001	kg		1.93	1.45	1.55	1.22	----
EG005T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		5	6	7	<5	----
Cadmium	7440-43-9	1	mg/kg		1	1	<1	1	----
Chromium	7440-47-3	2	mg/kg		33	36	32	33	----
Copper	7440-50-8	5	mg/kg		10	11	10	11	----
Lead	7439-92-1	5	mg/kg		25	15	13	14	----
Nickel	7440-02-0	2	mg/kg		15	13	13	17	----
Zinc	7440-66-6	5	mg/kg		20	21	19	22	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	----
EP066: Polychlorinated Biphenyls (PCB)									
Total Polychlorinated biphenyls	----	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	----
EP068A: Organochlorine Pesticides (OC)									
alpha-BHC	319-84-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	----
beta-BHC	319-85-7	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	----
gamma-BHC	58-89-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	----
delta-BHC	319-86-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	----
Heptachlor	76-44-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	----
Aldrin	309-00-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	----
Heptachlor epoxide	1024-57-3	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	----
^ Total Chlordane (sum)	----	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	----

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Work Order	: ES1508057
Client	: AECOM Australia Pty Ltd
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Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Compound	CAS Number	LOR	Unit	Client sample ID	VS01	VS02	VS03	QC102	----
				Client sampling date / time	08-APR-2015 15:00	08-APR-2015 15:00	08-APR-2015 15:00	08-APR-2015 15:00	----
					ES1508057-001	ES1508057-002	ES1508057-003	ES1508057-004	----
EP068A: Organochlorine Pesticides (OC) - Continued									
trans-Chlordane	5103-74-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	----
alpha-Endosulfan	959-98-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	----
cis-Chlordane	5103-71-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	----
Dieldrin	60-57-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	----
4.4`-DDE	72-55-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	----
Endrin	72-20-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	----
beta-Endosulfan	33213-65-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	----
^ Endosulfan (sum)	115-29-7	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	----
4.4`-DDD	72-54-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	----
Endrin aldehyde	7421-93-4	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	----
4.4`-DDT	50-29-3	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	----
Endrin ketone	53494-70-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	----
Methoxychlor	72-43-5	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	----
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	----
^ Sum of DDD + DDE + DDT	----	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	----
EP068B: Organophosphorus Pesticides (OP)									
Dichlorvos	62-73-7	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	----
Demeton-S-methyl	919-86-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	----
Monocrotophos	6923-22-4	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	----
Dimethoate	60-51-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	----
Diazinon	333-41-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	----
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	----
Parathion-methyl	298-00-0	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	----
Malathion	121-75-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	----
Fenthion	55-38-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	----
Chlorpyrifos	2921-88-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	----
Parathion	56-38-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	----
Pirimphos-ethyl	23505-41-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	----
Chlorfenvinphos	470-90-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	----
Bromophos-ethyl	4824-78-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	----
Fenamiphos	22224-92-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	----
Prothiofos	34643-46-4	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	----

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Work Order : ES1508057
Client : AECOM Australia Pty Ltd
Project : 60339175 TASK NO 1 3 CHARNWOOD REMEDIATION

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Compound	CAS Number	LOR	Unit	Client sample ID	VS01	VS02	VS03	QC102	----
				Client sampling date / time	08-APR-2015 15:00	08-APR-2015 15:00	08-APR-2015 15:00	08-APR-2015 15:00	----
					ES1508057-001	ES1508057-002	ES1508057-003	ES1508057-004	----
EP068B: Organophosphorus Pesticides (OP) - Continued									
Ethion	563-12-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	----
Carbophenothion	786-19-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	----
Azinphos Methyl	86-50-0	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
Fluorene	86-73-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
Phenanthrene	85-01-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
Anthracene	120-12-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
Fluoranthene	206-44-0	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
Pyrene	129-00-0	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
Benz(a)anthracene	56-55-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
Chrysene	218-01-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		<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	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		1.2	1.2	1.2	1.2	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	<10	<10	<10	----
C10 - C14 Fraction	----	50	mg/kg		<50	<50	<50	<50	----
C15 - C28 Fraction	----	100	mg/kg		<100	<100	<100	<100	----
C29 - C36 Fraction	----	100	mg/kg		<100	<100	<100	<100	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg		<50	<50	<50	<50	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	<10	<10	<10	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		<10	<10	<10	<10	----

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Work Order : ES1508057
Client : AECOM Australia Pty Ltd
Project : 60339175 TASK NO 1 3 CHARNWOOD REMEDIATION

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	VS01	VS02	VS03	QC102	----
				Client sampling date / time	08-APR-2015 15:00	08-APR-2015 15:00	08-APR-2015 15:00	08-APR-2015 15:00	----
Compound	CAS Number	LOR	Unit		ES1508057-001	ES1508057-002	ES1508057-003	ES1508057-004	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued									
>C10 - C16 Fraction	>C10_C16	50	mg/kg		<50	<50	<50	<50	----
>C16 - C34 Fraction	----	100	mg/kg		<100	<100	<100	<100	----
>C34 - C40 Fraction	----	100	mg/kg		<100	<100	<100	<100	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		<50	<50	<50	<50	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		<50	<50	<50	<50	----
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	----
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
^ Sum of BTEX	----	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	----
^ Total Xylenes	1330-20-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
Naphthalene	91-20-3	1	mg/kg		<1	<1	<1	<1	----
EP231: Perfluorinated Compounds									
PFOS	1763-23-1	0.0005	mg/kg		**1.30**	**1.06**	**1.92**	**1.30**	----
PFOA	335-67-1	0.0005	mg/kg		**0.0039**	**0.0043**	**0.0061**	**0.0048**	----
6:2 Fluorotelomer sulfonate (6:2 FtS)	27619-97-2	0.005	mg/kg		<0.005	<0.005	<0.005	<0.005	----
8:2 Fluorotelomer sulfonate	39108-34-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	----
EP066S: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	0.1	%		**103**	**112**	**101**	**97.5**	----
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.1	%		**76.2**	**83.7**	**78.6**	**71.1**	----
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.1	%		**81.6**	**61.7**	**66.2**	**80.4**	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.1	%		**75.4**	**74.8**	**78.5**	**74.8**	----
2-Chlorophenol-D4	93951-73-6	0.1	%		**79.2**	**77.0**	**81.0**	**74.2**	----
2.4.6-Tribromophenol	118-79-6	0.1	%		**82.3**	**81.8**	**85.9**	**71.6**	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.1	%		**99.6**	**96.9**	**102**	**95.5**	----

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Analytical Results

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

Compound	CAS Number	LOR	Unit	Client sample ID	VS01	VS02	VS03	QC102	----
				Client sampling date / time	08-APR-2015 15:00	08-APR-2015 15:00	08-APR-2015 15:00	08-APR-2015 15:00	----
					ES1508057-001	ES1508057-002	ES1508057-003	ES1508057-004	----
EP075(SIM)T: PAH Surrogates - Continued									
Anthracene-d10	1719-06-8	0.1	%		96.0	94.2	99.9	94.0	----
4-Terphenyl-d14	1718-51-0	0.1	%		96.2	94.3	99.7	93.2	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.1	%		102	102	102	98.4	----
Toluene-D8	2037-26-5	0.1	%		93.7	93.2	95.8	92.5	----
4-Bromofluorobenzene	460-00-4	0.1	%		95.5	90.6	95.0	90.3	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Client sample ID	QC300	----	----	----	----
			Client sampling date / time	08-APR-2015 15:00	----	----	----	----
Compound	CAS Number	LOR	Unit	ES1508057-005	----	----	----	----
EG020T: Total Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	<0.001	----	----	----	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	----	----	----	----
Chromium	7440-47-3	0.001	mg/L	<0.001	----	----	----	----
Copper	7440-50-8	0.001	mg/L	<0.001	----	----	----	----
Lead	7439-92-1	0.001	mg/L	<0.001	----	----	----	----
Nickel	7440-02-0	0.001	mg/L	<0.001	----	----	----	----
Zinc	7440-66-6	0.005	mg/L	<0.005	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	1.0	µg/L	<1.0	----	----	----	----
Acenaphthylene	208-96-8	1.0	µg/L	<1.0	----	----	----	----
Acenaphthene	83-32-9	1.0	µg/L	<1.0	----	----	----	----
Fluorene	86-73-7	1.0	µg/L	<1.0	----	----	----	----
Phenanthrene	85-01-8	1.0	µg/L	<1.0	----	----	----	----
Anthracene	120-12-7	1.0	µg/L	<1.0	----	----	----	----
Fluoranthene	206-44-0	1.0	µg/L	<1.0	----	----	----	----
Pyrene	129-00-0	1.0	µg/L	<1.0	----	----	----	----
Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	----	----	----	----
Chrysene	218-01-9	1.0	µg/L	<1.0	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1.0	µg/L	<1.0	----	----	----	----
Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<1.0	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	1.0	µg/L	<1.0	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	1.0	µg/L	<1.0	----	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L	<0.5	----	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L	<0.5	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	----	----	----	----
C10 - C14 Fraction	----	50	µg/L	<50	----	----	----	----
C15 - C28 Fraction	----	100	µg/L	<100	----	----	----	----
C29 - C36 Fraction	----	50	µg/L	<50	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Compound	CAS Number	LOR	Unit	Client sample ID: QC300	----	----	----	----
				Client sampling date / time: 08-APR-2015 15:00	----	----	----	----
				ES1508057-005	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons - Continued								
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	----	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	----	----	----	----
>C10 - C16 Fraction	>C10_C16	100	µg/L	<100	----	----	----	----
>C16 - C34 Fraction	----	100	µg/L	<100	----	----	----	----
>C34 - C40 Fraction	----	100	µg/L	<100	----	----	----	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L	<100	----	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	----	----	----	----
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	<1	----	----	----	----
Toluene	108-88-3	2	µg/L	<2	----	----	----	----
Ethylbenzene	100-41-4	2	µg/L	<2	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	----	----	----	----
ortho-Xylene	95-47-6	2	µg/L	<2	----	----	----	----
^ Total Xylenes	1330-20-7	2	µg/L	<2	----	----	----	----
^ Sum of BTEX	----	1	µg/L	<1	----	----	----	----
Naphthalene	91-20-3	5	µg/L	<5	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	25.5	----	----	----	----
2-Chlorophenol-D4	93951-73-6	0.1	%	57.6	----	----	----	----
2.4.6-Tribromophenol	118-79-6	0.1	%	49.1	----	----	----	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	58.9	----	----	----	----
Anthracene-d10	1719-06-8	0.1	%	87.5	----	----	----	----
4-Terphenyl-d14	1718-51-0	0.1	%	84.9	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	83.5	----	----	----	----
Toluene-D8	2037-26-5	0.1	%	99.6	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.1	%	93.6	----	----	----	----

Analytical Results

Descriptive Results

Sub-Matrix: **SOIL**

Method: Compound	*Client sample ID - Client sampling date / time*	*Analytical Results*
EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples		
EA200: Description	VS01 - 08-APR-2015 15:00	Mid orange clay soil.
EA200: Description	VS02 - 08-APR-2015 15:00	Mid orange clay soil.
EA200: Description	VS03 - 08-APR-2015 15:00	Mid orange clay soil.
EA200: Description	QC102 - 08-APR-2015 15:00	Mid orange clay soil.

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Work Order	: ES1508057
Client	: AECOM Australia Pty Ltd
Project	: 60339175 TASK NO 1 3 CHARNWOOD REMEDIATION

Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP066S: PCB Surrogate			
Decachlorobiphenyl	2051-24-3	39	149
EP068S: Organochlorine Pesticide Surrogate			
Dibromo-DDE	21655-73-2	49	147
EP068T: Organophosphorus Pesticide Surrogate			
DEF	78-48-8	35	143
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	63	123
2-Chlorophenol-D4	93951-73-6	66	122
2.4.6-Tribromophenol	118-79-6	40	138
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	70	122
Anthracene-d10	1719-06-8	66	128
4-Terphenyl-d14	1718-51-0	65	129
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	72.8	133.2
Toluene-D8	2037-26-5	73.9	132.1
4-Bromofluorobenzene	460-00-4	71.6	130.0

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	10.0	44
2-Chlorophenol-D4	93951-73-6	14	94
2.4.6-Tribromophenol	118-79-6	17	125
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	20	104
Anthracene-d10	1719-06-8	27.4	113
4-Terphenyl-d14	1718-51-0	32	112
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	71	137
Toluene-D8	2037-26-5	79	131
4-Bromofluorobenzene	460-00-4	70	128

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **ES1508057**	Page	: 1 of 19
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: [redacted]	Contact	: Client Services
Address	: LEVEL 2 60 MARCUS CLARKE ST CANBERRA ACT 2600	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: [redacted]@aecom.com	E-mail	: sydney@alsglobal.com
Telephone	: +61 [redacted]	Telephone	: +61-2-8784 8555
Facsimile	: ----	Facsimile	: +61-2-8784 8500
Project	: 60339175 TASK NO 1 3 CHARNWOOD REMEDIATION	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 09-APR-2015
Sampler	: RO	Issue Date	: 17-APR-2015
Order number	: 60339175,TASK NO.1.3		
		No. of samples received	: 5
Quote number	: EN/004/14	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

Page	: 2 of 19
Work Order	: ES1508057
Client	: AECOM Australia Pty Ltd
Project	: 60339175 TASK NO 1 3 CHARNWOOD REMEDIATION

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

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	Position	Accreditation Category
[redacted]	[redacted]	Newcastle - Asbestos
[redacted]	[redacted]	Sydney Organics
[redacted]	[redacted]	Sydney Organics
[redacted]	[redacted]	Sydney Inorganics

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EA055: Moisture Content (QC Lot: 3893972)									
ES1508048-001	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	6.5	6.5	0.0	No Limit
ES1508048-012	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	2.8	2.3	19.2	No Limit
EA055: Moisture Content (QC Lot: 3893973)									
ES1508061-002	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	25.1	24.9	0.8	0% - 20%
ES1508125-001	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	14.7	15.2	2.9	0% - 50%
EG005T: Total Metals by ICP-AES (QC Lot: 3896029)									
ES1508057-001	VS01	EG005T: Cadmium	7440-43-9	1	mg/kg	1	1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	33	37	13.2	0% - 50%
		EG005T: Nickel	7440-02-0	2	mg/kg	15	16	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	10	11	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	25	15	49.9	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	20	21	5.8	No Limit
ES1508126-001	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	37	38	2.8	0% - 50%
		EG005T: Nickel	7440-02-0	2	mg/kg	15	15	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	18	19	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	13	15	15.3	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	59	60	0.0	0% - 50%
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3896030)									
ES1508057-001	VS01	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
ES1508126-001	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EP066: Polychlorinated Biphenyls (PCB) (QC Lot: 3895113)									
ES1507987-001	Anonymous	EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EP068A: Organochlorine Pesticides (OC) (QC Lot: 3895112)									
ES1507987-001	Anonymous	EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit

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Work Order : ES1508057
Client : AECOM Australia Pty Ltd
Project : 60339175 TASK NO 1 3 CHARNWOOD REMEDIATION

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP068A: Organochlorine Pesticides (OC) (QC Lot: 3895112) - continued									
ES1507987-001	Anonymous	EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
ES1508061-008	Anonymous	EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
EP068B: Organophosphorus Pesticides (OP) (QC Lot: 3895112)									
ES1507987-001	Anonymous	EP068: Dichlorvos	62-73-7	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Dimethoate	60-51-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Diazinon	333-41-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Malathion	121-75-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit

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Work Order	: ES1508057
Client	: AECOM Australia Pty Ltd
Project	: 60339175 TASK NO 1 3 CHARNWOOD REMEDIATION

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP068B: Organophosphorus Pesticides (OP) (QC Lot: 3895112) - continued									
ES1507987-001	Anonymous	EP068: Fenthion	55-38-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Prothiofos	34643-46-4	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Ethion	563-12-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Carbophenothion	786-19-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP068: Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
ES1508061-008	Anonymous	EP068: Dichlorvos	62-73-7	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Dimethoate	60-51-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Diazinon	333-41-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Malathion	121-75-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Fenthion	55-38-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Prothiofos	34643-46-4	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Ethion	563-12-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Carbophenothion	786-19-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP068: Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3895115)									
ES1507987-001	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<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

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Work Order : ES1508057
Client : AECOM Australia Pty Ltd
Project : 60339175 TASK NO 1 3 CHARNWOOD REMEDIATION

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3895115) - continued									
ES1507987-001	Anonymous	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	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3893286)									
ES1507837-002	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
ES1508126-001	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3895114)									
ES1507987-001	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 Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 3893286)									
ES1507837-002	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
ES1508126-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 3895114)									
ES1507987-001	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	>C10_C16	50	mg/kg	<50	<50	0.0	No Limit
EP080: BTEXN (QC Lot: 3893286)									
ES1507837-002	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
ES1508126-001	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP080: BTEXN (QC Lot: 3893286) - continued									
ES1508126-001	Anonymous	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
EP231: Perfluorinated Compounds (QC Lot: 3893137)									
EM1503519-002	Anonymous	EP231: PFOS	1763-23-1	0.0005	mg/kg	5.59	4.78	15.8	0% - 20%
		EP231: PFOA	335-67-1	0.0005	mg/kg	0.213	0.213	0.2	0% - 20%
		EP231: 6:2 Fluorotelomer sulfonate (6:2 FtS)	27619-97-2	0.005	mg/kg	0.202	0.210	3.5	No Limit
ES1508057-003	VS03	EP231: PFOS	1763-23-1	0.0005	mg/kg	1.92	1.80	6.0	0% - 20%
		EP231: PFOA	335-67-1	0.0005	mg/kg	0.0061	0.0065	6.0	0% - 50%
		EP231: 6:2 Fluorotelomer sulfonate (6:2 FtS)	27619-97-2	0.005	mg/kg	<0.005	<0.005	0.0	No Limit

Sub-Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG020T: Total Metals by ICP-MS (QC Lot: 3896951)									
ES1507988-003	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	0.009	0.007	24.3	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	0.003	0.003	0.0	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	0.012	0.012	0.0	0% - 50%
		EG020A-T: Lead	7439-92-1	0.001	mg/L	0.016	0.016	0.0	0% - 50%
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.004	0.004	0.0	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	0.036	0.036	0.0	No Limit
ES1508141-004	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0010	<0.0010	0.0	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.010	<0.010	0.0	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.010	<0.010	0.0	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.010	<0.010	0.0	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.010	<0.010	0.0	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.010	<0.010	0.0	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.050	<0.050	0.0	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3895959)									
ES1507994-010	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
ES1508097-002	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3893403)									
ES1508018-001	Anonymous	EP071: C15 - C28 Fraction	---	100	µg/L	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	---	50	µg/L	<50	<50	0.0	No Limit
		EP071: C29 - C36 Fraction	---	50	µg/L	<50	<50	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3893649)									
ES1508120-001	Anonymous	EP080: C6 - C9 Fraction	---	20	µg/L	110	120	0.0	No Limit
ES1508175-002	Anonymous	EP080: C6 - C9 Fraction	---	20	µg/L	<20	<20	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 3893403)									
ES1508018-001	Anonymous	EP071: >C10 - C16 Fraction	>C10_C16	100	µg/L	<100	<100	0.0	No Limit
		EP071: >C16 - C34 Fracti	---	100	µg/L	<100	<100	0.0	No Limit

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Work Order : ES1508057
Client : AECOM Australia Pty Ltd
Project : 60339175 TASK NO 1 3 CHARNWOOD REMEDIATION

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 3893403) - continued									
ES1508018-001	Anonymous	EP071: >C34 - C40 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 3893649)									
ES1508120-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	110	120	0.0	No Limit
ES1508175-002	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
EP080: BTEXN (QC Lot: 3893649)									
ES1508120-001	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	66	70	6.4	0% - 20%
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit
ES1508175-002	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit

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

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

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EG005T: Total Metals by ICP-AES (QCLot: 3896029)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	118	92	130
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	110	87	121
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	123	80	136
EG005T: Copper	7440-50-8	5	mg/kg	<5	32.0 mg/kg	113	93	127
EG005T: Lead	7439-92-1	5	mg/kg	<5	40.0 mg/kg	108	86	124
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55.0 mg/kg	116	93	131
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	112	81	133
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3896030)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	81.3	70	105
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 3895113)								
EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	1 mg/kg	95.6	57.4	117
EP068A: Organochlorine Pesticides (OC) (QCLot: 3895112)								
EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	0.5 mg/kg	90.7	71	113
EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	0.5 mg/kg	93.6	66	122
EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	0.5 mg/kg	97.8	69	119
EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	0.5 mg/kg	93.0	71	115
EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	79.0	65	113
EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	0.5 mg/kg	98.8	68	116
EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	0.5 mg/kg	96.3	68	118
EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	0.5 mg/kg	94.7	68	116
EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	0.5 mg/kg	101	68	120
EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	0.5 mg/kg	99.0	69	119
EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	0.5 mg/kg	95.6	67	121
EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	0.5 mg/kg	97.7	66	118
EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	0.5 mg/kg	106	69	117
EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	0.5 mg/kg	102	67	123

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Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP068A: Organochlorine Pesticides (OC) (QCLot: 3895112) - continued								
EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	0.5 mg/kg	102	76	120
EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	0.5 mg/kg	99.7	76	120
EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	0.5 mg/kg	87.9	57.3	115
EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	0.5 mg/kg	106	60	124
EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	0.5 mg/kg	103	67	127
EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	0.5 mg/kg	98.8	65	123
EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	0.5 mg/kg	109	65	129
EP068B: Organophosphorus Pesticides (OP) (QCLot: 3895112)								
EP068: Dichlorvos	62-73-7	0.05	mg/kg	<0.05	0.5 mg/kg	109	56	126
EP068: Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	104	64	128
EP068: Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	0.5 mg/kg	105	54	122
EP068: Dimethoate	60-51-5	0.05	mg/kg	<0.05	0.5 mg/kg	97.3	64	124
EP068: Diazinon	333-41-5	0.05	mg/kg	<0.05	0.5 mg/kg	97.9	73	117
EP068: Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	0.5 mg/kg	95.2	55	119
EP068: Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	0.5 mg/kg	103	69	123
EP068: Malathion	121-75-5	0.05	mg/kg	<0.05	0.5 mg/kg	105	70	120
EP068: Fenthion	55-38-9	0.05	mg/kg	<0.05	0.5 mg/kg	94.6	71	115
EP068: Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	0.5 mg/kg	98.0	68	114
EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	0.5 mg/kg	97.3	68	122
EP068: Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	0.5 mg/kg	102	69	115
EP068: Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	0.5 mg/kg	109	70	118
EP068: Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	0.5 mg/kg	101	68	116
EP068: Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	0.5 mg/kg	94.0	64	120
EP068: Prothiofos	34643-46-4	0.05	mg/kg	<0.05	0.5 mg/kg	98.4	68	116
EP068: Ethion	563-12-2	0.05	mg/kg	<0.05	0.5 mg/kg	99.8	70	118
EP068: Carbophenothion	786-19-6	0.05	mg/kg	<0.05	0.5 mg/kg	98.2	67	123
EP068: Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	0.5 mg/kg	107	42	126
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3895115)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	6 mg/kg	90.2	80	124

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3895115) - continued								
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	6 mg/kg	88.2	77	123
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	6 mg/kg	87.9	79	123
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	6 mg/kg	89.1	77	123
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	6 mg/kg	91.1	79	123
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	6 mg/kg	90.0	79	123
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	6 mg/kg	89.1	79	123
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	6 mg/kg	88.9	79	125
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	6 mg/kg	90.3	73	121
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	6 mg/kg	95.6	81	123
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	6 mg/kg	88.1	70	118
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	6 mg/kg	93.8	77	123
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	6 mg/kg	90.4	76	122
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	6 mg/kg	92.0	71	113
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	6 mg/kg	93.7	71.7	113
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	6 mg/kg	97.8	72.4	114
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3893286)								
EP080: C6 - C9 Fraction	---	10	mg/kg	<10	26 mg/kg	94.2	68.4	128
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3895114)								
EP071: C10 - C14 Fraction	---	50	mg/kg	<50	200 mg/kg	113	71	131
EP071: C15 - C28 Fraction	---	100	mg/kg	<100	300 mg/kg	120	74	138
EP071: C29 - C36 Fraction	---	100	mg/kg	<100	200 mg/kg	114	64	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3893286)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	87.1	68.4	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3895114)								
EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	250 mg/kg	112	70	130
EP071: >C16 - C34 Fraction	---	100	mg/kg	<100	350 mg/kg	121	74	138
EP071: >C34 - C40 Fraction	---	50	mg/kg	<100	150 mg/kg	94.0	63	131
EP080: BTEXN (QCLot: 3893286)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	108	62	116

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EP080: BTEXN (QCLot: 3893286) - continued								
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	96.9	62	128
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	89.1	58	118
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	89.4	60	120
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	96.6	60	120
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	90.8	62	138
EP231: Perfluorinated Compounds (QCLot: 3893137)								
EP231: PFOS	1763-23-1	0.0005	mg/kg	<0.0005	0.0025 mg/kg	85.9	54	146
EP231: PFOA	335-67-1	0.0005	mg/kg	<0.0005	0.0025 mg/kg	105	54	134
EP231: 6:2 Fluorotelomer Sulfonate (6:2 FtS)	27619-97-2	0.005	mg/kg	<0.005	0.0125 mg/kg	100	56	138
EP231: 8:2 Fluorotelomer sulfonate	39108-34-4	0.001	mg/kg	<0.001	----	----	----	----

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EG020T: Total Metals by ICP-MS (QCLot: 3896951)								
EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	101	79	121
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	100	83	113
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	102	84	116
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	101	83	117
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	98.8	84	116
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	104	84	116
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	104	77	117
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3895959)								
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.010 mg/L	87.2	77	115
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3893404)								
EP075(SIM): Naphthalene	91-20-3	0.2	µg/L	<1.0	5 µg/L	68.4	58.6	119
EP075(SIM): Acenaphthylene	208-96-8	0.2	µg/L	<1.0	5 µg/L	80.9	63.6	114
EP075(SIM): Acenaphthene	83-32-9	0.2	µg/L	<1.0	5 µg/L	77.0	62.2	113
EP075(SIM): Fluorene	86-73-7	0.2	µg/L	<1.0	5 µg/L	83.8	63.9	115
EP075(SIM): Phenanthrene	85-01-8	0.2	µg/L	<1.0	5 µg/L	79.5	62.6	116
EP075(SIM): Anthracene	120-12-7	0.2	µg/L	<1.0	5 µg/L	81.9	64.3	116

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3893404) - continued								
EP075(SIM): Fluoranthene	206-44-0	0.2	µg/L	<1.0	5 µg/L	88.5	63.6	118
EP075(SIM): Pyrene	129-00-0	0.2	µg/L	<1.0	5 µg/L	90.2	63.1	118
EP075(SIM): Benz(a)anthracene	56-55-3	0.2	µg/L	<1.0	5 µg/L	81.3	64.1	117
EP075(SIM): Chrysene	218-01-9	0.2	µg/L	<1.0	5 µg/L	83.5	62.5	116
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.2	µg/L	<1.0	5 µg/L	83.8	61.7	119
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.2	µg/L	<1.0	5 µg/L	87.7	61.7	117
EP075(SIM): Benzo(a)pyrene	50-32-8	0.2	µg/L	<0.5	5 µg/L	84.1	63.3	117
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.2	µg/L	<1.0	5 µg/L	80.7	59.9	118
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.2	µg/L	<1.0	5 µg/L	81.9	61.2	117
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.2	µg/L	<1.0	5 µg/L	77.7	59.1	118
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3893403)								
EP071: C10 - C14 Fraction	---	50	µg/L	<50	2000 µg/L	85.5	59	129
EP071: C15 - C28 Fraction	---	100	µg/L	<100	3000 µg/L	98.5	71	131
EP071: C29 - C36 Fraction	---	50	µg/L	<50	2000 µg/L	100	62	120
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3893649)								
EP080: C6 - C9 Fraction	---	20	µg/L	<20	260 µg/L	79.6	75	127
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3893403)								
EP071: >C10 - C16 Fraction	>C10_C16	100	µg/L	<100	2500 µg/L	88.3	58.9	131
EP071: >C16 - C34 Fraction	---	100	µg/L	<100	3500 µg/L	98.9	73.9	138
EP071: >C34 - C40 Fraction	---	50	µg/L	<100	1500 µg/L	97.6	67	127
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3893649)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	310 µg/L	84.0	75	127
EP080: BTEXN (QCLot: 3893649)								
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	84.9	70	124
EP080: Toluene	108-88-3	2	µg/L	<2	10 µg/L	91.1	65	129
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	84.1	70	120
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	10 µg/L	83.5	69	121
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	84.2	72	122
EP080: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	94.2	70	124

Matrix Spike (MS) Report

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

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG005T: Total Metals by ICP-AES (QCLot: 3896029)							
ES1508057-001	VS01	EG005T: Arsenic	7440-38-2	50 mg/kg	93.6	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	100	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	95.0	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	97.5	70	130
		EG005T: Zinc	7440-66-6	250 mg/kg	97.8	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3896030)							
ES1508057-001	VS01	EG035T: Mercury	7439-97-6	5 mg/kg	90.5	70	130
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 3895113)							
ES1507987-001	Anonymous	EP066: Total Polychlorinated biphenyls	----	1 mg/kg	92.6	70	130
EP068A: Organochlorine Pesticides (OC) (QCLot: 3895112)							
ES1507987-001	Anonymous	EP068: gamma-BHC	58-89-9	0.5 mg/kg	80.2	70	130
		EP068: Heptachlor	76-44-8	0.5 mg/kg	84.1	70	130
		EP068: Aldrin	309-00-2	0.5 mg/kg	100	70	130
		EP068: Dieldrin	60-57-1	0.5 mg/kg	84.3	70	130
		EP068: Endrin	72-20-8	2 mg/kg	92.4	70	130
		EP068: 4.4`-DDT	50-29-3	2 mg/kg	84.8	70	130
EP068B: Organophosphorus Pesticides (OP) (QCLot: 3895112)							
ES1507987-001	Anonymous	EP068: Diazinon	333-41-5	0.5 mg/kg	96.5	70	130
		EP068: Chlorpyrifos-methyl	5598-13-0	0.5 mg/kg	107	70	130
		EP068: Pirimphos-ethyl	23505-41-1	0.5 mg/kg	100	70	130
		EP068: Bromophos-ethyl	4824-78-6	0.5 mg/kg	104	70	130
		EP068: Prothiofos	34643-46-4	0.5 mg/kg	101	70	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3895115)							
ES1507987-001	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	77.6	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	78.5	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3893286)							
ES1507837-002	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	94.3	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3895114)							
ES1507987-001	Anonymous	EP071: C10 - C14 Fraction	----	523 mg/kg	93.9	73	137

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Work Order : ES1508057
Client : AECOM Australia Pty Ltd
Project : 60339175 TASK NO 1 3 CHARNWOOD REMEDIATION

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Recovery Limits (%): Low	Recovery Limits (%): High
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3895114) - continued							
ES1507987-001	Anonymous	EP071: C15 - C28 Fraction	----	2319 mg/kg	102	53	131
		EP071: C29 - C36 Fraction	----	1714 mg/kg	125	52	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3893286)							
ES1507837-002	Anonymous	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	88.8	70	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3895114)							
ES1507987-001	Anonymous	EP071: >C10 - C16 Fraction	>C10_C16	860 mg/kg	103	73	137
		EP071: >C16 - C34 Fraction	----	3223 mg/kg	118	53	131
		EP071: >C34 - C40 Fraction	----	1058 mg/kg	113	52	132
EP080: BTEXN (QCLot: 3893286)							
ES1507837-002	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	87.3	70	130
		EP080: Toluene	108-88-3	2.5 mg/kg	80.6	70	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	77.4	70	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	77.7	70	130
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	81.1	70	130
		EP080: Naphthalene	91-20-3	2.5 mg/kg	72.6	70	130
EP231: Perfluorinated Compounds (QCLot: 3893137)							
EM1503519-002	Anonymous	EP231: PFOS	1763-23-1	0.0025 mg/kg	# Not Determined	54	146
		EP231: PFOA	335-67-1	0.0025 mg/kg	# Not Determined	54	134
		EP231: 6:2 Fluorotelomer sulfonate (6:2 FtS)	27619-97-2	0.0125 mg/kg	# Not Determined	56	138

Sub-Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Recovery Limits (%): Low	Recovery Limits (%): High
EG020T: Total Metals by ICP-MS (QCLot: 3896951)							
ES1507988-004	Anonymous	EG020A-T: Arsenic	7440-38-2	1 mg/L	109	70	130
		EG020A-T: Cadmium	7440-43-9	0.250 mg/L	103	70	130
		EG020A-T: Chromium	7440-47-3	1 mg/L	102	70	130
		EG020A-T: Copper	7440-50-8	1 mg/L	105	70	130
		EG020A-T: Lead	7439-92-1	1 mg/L	103	70	130
		EG020A-T: Nickel	7440-02-0	1 mg/L	98.5	70	130
		EG020A-T: Zinc	7440-66-6	1 mg/L	107	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3895959)							
ES1507994-011	Anonymous	EG035T: Mercury	743[illegible]6	0.010 mg/L	78.8	70	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3893403)							
ES1508018-001	Anonymous	EP071: C10 - C14 Fraction	----	200 µg/L	113	74	150
		EP071: C15 - C28 Fraction	----	300 µg/L	102	77	153
		EP071: C29 - C36 Fraction	----	150 µg/L	134	67	153
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3893649)							
ES1508120-001	Anonymous	EP080: C6 - C9 Fraction	----	325 µg/L	103	70	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3893403)							
ES1508018-001	Anonymous	EP071: >C10 - C16 Fraction	>C10_C16	250 µg/L	104	74	150
		EP071: >C16 - C34 Fraction	----	350 µg/L	104	77	153
		EP071: >C34 - C40 Fraction	----	150 µg/L	94.7	67	153
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3893649)							
ES1508120-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	106	70	130
EP080: BTEXN (QCLot: 3893649)							
ES1508120-001	Anonymous	EP080: Benzene	71-43-2	25 µg/L	75.8	70	130
		EP080: Toluene	108-88-3	25 µg/L	92.3	70	130
		EP080: Ethylbenzene	100-41-4	25 µg/L	77.7	70	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	25 µg/L	77.5	70	130
		EP080: ortho-Xylene	95-47-6	25 µg/L	78.0	70	130
		EP080: Naphthalene	91-20-3	25 µg/L	95.0	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 (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	MSD	Low	High	Value	Control Limit
EP231: Perfluorinated Compounds (QCLot: 3893137)										
EM1503519-002	Anonymous	EP231: PFOS	1763-23-1	0.0025 mg/kg	# Not Determined	----	54	146	----	----
		EP231: PFOA	335-67-1	0.0025 mg/kg	# Not Determined	----	54	134	----	----
		EP231: 6:2 Fluorotelomer sulfonate (6:2 FtS)	27619-97-2	0.0125 mg/kg	# Not Determined	----	56	138	----	----
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3893286)										
ES1507837-002	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	94.3	----	70	130	----	----

Sub-Matrix: **SOIL**

				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	MSD	Low	High	Value	Control Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3893286)										
ES1507837-002	Anonymous	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	88.8	----	70	130	----	----
EP080: BTEXN (QCLot: 3893286)										
ES1507837-002	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	87.3	----	70	130	----	----
		EP080: Toluene	108-88-3	2.5 mg/kg	80.6	----	70	130	----	----
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	77.4	----	70	130	----	----
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	77.7	----	70	130	----	----
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	81.1	----	70	130	----	----
		EP080: Naphthalene	91-20-3	2.5 mg/kg	72.6	----	70	130	----	----
EP068A: Organochlorine Pesticides (OC) (QCLot: 3895112)										
ES1507987-001	Anonymous	EP068: gamma-BHC	58-89-9	0.5 mg/kg	80.2	----	70	130	----	----
		EP068: Heptachlor	76-44-8	0.5 mg/kg	84.1	----	70	130	----	----
		EP068: Aldrin	309-00-2	0.5 mg/kg	100	----	70	130	----	----
		EP068: Dieldrin	60-57-1	0.5 mg/kg	84.3	----	70	130	----	----
		EP068: Endrin	72-20-8	2 mg/kg	92.4	----	70	130	----	----
		EP068: 4.4`-DDT	50-29-3	2 mg/kg	84.8	----	70	130	----	----
EP068B: Organophosphorus Pesticides (OP) (QCLot: 3895112)										
ES1507987-001	Anonymous	EP068: Diazinon	333-41-5	0.5 mg/kg	96.5	----	70	130	----	----
		EP068: Chlorpyrifos-methyl	5598-13-0	0.5 mg/kg	107	----	70	130	----	----
		EP068: Pirimphos-ethyl	23505-41-1	0.5 mg/kg	100	----	70	130	----	----
		EP068: Bromophos-ethyl	4824-78-6	0.5 mg/kg	104	----	70	130	----	----
		EP068: Prothiofos	34643-46-4	0.5 mg/kg	101	----	70	130	----	----
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 3895113)										
ES1507987-001	Anonymous	EP066: Total Polychlorinated biphenyls	----	1 mg/kg	92.6	----	70	130	----	----
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3895114)										
ES1507987-001	Anonymous	EP071: C10 - C14 Fraction	----	523 mg/kg	93.9	----	73	137	----	----
		EP071: C15 - C28 Fraction	----	2319 mg/kg	102	----	53	131	----	----
		EP071: C29 - C36 Fraction	----	1714 mg/kg	125	----	52	132	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3895114)										
ES1507987-001	Anonymous	EP071: >C10 - C16 Fraction	>C10_C16	860 mg/kg	103	----	73	137	----	----
		EP071: >C16 - C34 Fraction	----	3223 mg/kg	118	----	53	131	----	----
		EP071: >C34 - C40 Fraction	----	1058 mg/kg	113	----	52	132	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3895115)										

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Work Order	: ES1508057
Client	: AECOM Australia Pty Ltd
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Sub-Matrix: **SOIL**

				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	MSD	Low	High	Value	Control Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3895115) - continued										
ES1507987-001	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	77.6	----	70	130	----	----
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	78.5	----	70	130	----	----
EG005T: Total Metals by ICP-AES (QCLot: 3896029)										
ES1508057-001	VS01	EG005T: Arsenic	7440-38-2	50 mg/kg	93.6	----	70	130	----	----
		EG005T: Cadmium	7440-43-9	50 mg/kg	100	----	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	95.0	----	70	130	----	----
		EG005T: Nickel	7440-02-0	50 mg/kg	97.5	----	70	130	----	----
		EG005T: Zinc	7440-66-6	250 mg/kg	97.8	----	70	130	----	----
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3896030)										
ES1508057-001	VS01	EG035T: Mercury	7439-97-6	5 mg/kg	90.5	----	70	130	----	----

Sub-Matrix: **WATER**

				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	MSD	Low	High	Value	Control Limit
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3893403)										
ES1508018-001	Anonymous	EP071: C10 - C14 Fraction	----	200 µg/L	113	----	74	150	----	----
		EP071: C15 - C28 Fraction	----	300 µg/L	102	----	77	153	----	----
		EP071: C29 - C36 Fraction	----	150 µg/L	134	----	67	153	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3893403)										
ES1508018-001	Anonymous	EP071: >C10 - C16 Fraction	>C10_C16	250 µg/L	104	----	74	150	----	----
		EP071: >C16 - C34 Fraction	----	350 µg/L	104	----	77	153	----	----
		EP071: >C34 - C40 Fraction	----	150 µg/L	94.7	----	67	153	----	----
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3893649)										
ES1508120-001	Anonymous	EP080: C6 - C9 Fraction	----	325 µg/L	103	----	70	130	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3893649)										
ES1508120-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	106	----	70	130	----	----
EP080: BTEXN (QCLot: 3893649)										
ES1508120-001	Anonymous	EP080: Benzene	71-43-2	25 µg/L	75.8	----	70	130	----	----
		EP080: Toluene	108-88-3	25 µg/L	92.3	----	70	130	----	----
		EP080: Ethylbenzene	100-41-4	25 µg/L	77.7	----	70	130	----	----
		EP080: meta- & para-Xylene	108-38-3 106-42-3	25 µg/L	77.5	----	70	130	----	----

Sub-Matrix: **WATER**

				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	MSD	Low	High	Value	Control Limit
EP080: BTEXN (QCLot: 3893649) - continued										
ES1508120-001	Anonymous	EP080: ortho-Xylene	95-47-6	25 µg/L	78.0	----	70	130	----	----
		EP080: Naphthalene	91-20-3	25 µg/L	95.0	----	70	130	----	----
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3895959)										
ES1507994-011	Anonymous	EG035T: Mercury	7439-97-6	0.010 mg/L	78.8	----	70	130	----	----
EG020T: Total Metals by ICP-MS (QCLot: 3896951)										
ES1507988-004	Anonymous	EG020A-T: Arsenic	7440-38-2	1 mg/L	109	----	70	130	----	----
		EG020A-T: Cadmium	7440-43-9	0.250 mg/L	103	----	70	130	----	----
		EG020A-T: Chromium	7440-47-3	1 mg/L	102	----	70	130	----	----
		EG020A-T: Copper	7440-50-8	1 mg/L	105	----	70	130	----	----
		EG020A-T: Lead	7439-92-1	1 mg/L	103	----	70	130	----	----
		EG020A-T: Nickel	7440-02-0	1 mg/L	98.5	----	70	130	----	----
		EG020A-T: Zinc	7440-66-6	1 mg/L	107	----	70	130	----	----

ALS Environmental

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **ES1508057**	Page	: 1 of 8
Client	: AECOM Australia Pty Ltd	Laboratory	: Environmental Division Sydney
Contact	: [redacted]	Contact	: Client Services
Address	: LEVEL 2 60 MARCUS CLARKE ST CANBERRA ACT 2600	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: [redacted]@aecom.com	E-mail	: sydney@alsglobal.com
Telephone	: +61 [redacted]	Telephone	: +61-2-8784 8555
Facsimile	: ---	Facsimile	: +61-2-8784 8500
Project	: 60339175 TASK NO 1 3 CHARNWOOD REMEDIATION	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: ---		
C-O-C number	: ---	Date Samples Received	: 09-APR-2015
Sampler	: RO	Issue Date	: 17-APR-2015
Order number	: 60339175,TASK NO.1.3		
		No. of samples received	: 5
Quote number	: EN/004/14	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

Page	: 2 of 8
Work Order	: ES1508057
Client	: AECOM Australia Pty Ltd
Project	: 60339175 TASK NO 1 3 CHARNWOOD REMEDIATION

Analysis Holding Time Compliance

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

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

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

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content							
Soil Glass Jar - Unpreserved (EA055-103)							
VS01, VS02, VS03, QC102	**08-APR-2015**	---	---	---	**10-APR-2015**	22-APR-2015	✓
EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples							
Snap Lock Bag - Separate bag received (EA200)							
VS01, VS02, VS03, QC102	**08-APR-2015**	---	05-OCT-2015	---	**15-APR-2015**	05-OCT-2015	✓
EA200F: Friable Asbestos in Soil (non-NATA)							
Snap Lock Bag - Separate bag received (EA200N)							
VS01, VS02, VS03, QC102	**08-APR-2015**	---	05-OCT-2015	---	**15-APR-2015**	10-OCT-2015	✓
EG005T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved (EG005T)							
VS01, VS02, VS03, QC102	**08-APR-2015**	**13-APR-2015**	05-OCT-2015	✓	**14-APR-2015**	05-OCT-2015	✓
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved (EG035T)							
VS01, VS02, VS03, QC102	**08-APR-2015**	**13-APR-2015**	06-MAY-2015	✓	**15-APR-2015**	06-MAY-2015	✓
EP066: Polychlorinated Biphenyls (PCB)							
Soil Glass Jar - Unpreserved (EP066)							
VS01, VS02, VS03, QC102	**08-APR-2015**	**13-APR-2015**	22-APR-2015	✓	**14-APR-2015**	23-MAY-2015	✓
EP068A: Organochlorine Pesticides (OC)							
Soil Glass Jar - Unpreserved (EP068)							
VS01, VS02, VS03, QC102	**08-APR-2015**	**13-APR-2015**	22-APR-2015	✓	**14-APR-2015**	23-MAY-2015	✓
EP068B: Organophosphorus Pesticides (OP)							
Soil Glass Jar - Unpreserved (EP068)							
VS01, VS02, VS03, QC102	**08-APR-2015**	**13-APR-2015**	22-APR-2015	✓	**14-APR-2015**	23-MAY-2015	✓

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Work Order	: ES1508057
Client	: AECOM Australia Pty Ltd
Project	: 60339175 TASK NO 1 3 CHARNWOOD REMEDIATION

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP071)							
VS01, VS02, VS03, QC102	08-APR-2015	13-APR-2015	22-APR-2015	✓	14-APR-2015	23-MAY-2015	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved (EP075(SIM))							
VS01, VS02, VS03, QC102	08-APR-2015	13-APR-2015	22-APR-2015	✓	14-APR-2015	23-MAY-2015	✓
EP080: BTEXN							
Soil Glass Jar - Unpreserved (EP080)							
VS01, VS02, VS03, QC102	08-APR-2015	10-APR-2015	22-APR-2015	✓	10-APR-2015	22-APR-2015	✓
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP080)							
VS01, VS02, VS03, QC102	08-APR-2015	10-APR-2015	22-APR-2015	✓	10-APR-2015	22-APR-2015	✓
EP231: Perfluorinated Compounds							
Soil Glass Jar - Unpreserved (EP231)							
VS01, VS02, VS03, QC102	08-APR-2015	14-APR-2015	05-OCT-2015	✓	14-APR-2015	24-MAY-2015	✓

Matrix: **WATER**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG020T: Total Metals by ICP-MS							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG020A-T)							
QC300	08-APR-2015	14-APR-2015	05-OCT-2015	✓	14-APR-2015	05-OCT-2015	✓
EG035T: Total Recoverable Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG035T)							
QC300	08-APR-2015	---	06-MAY-2015	----	14-APR-2015	06-MAY-2015	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Amber Glass Bottle - Unpreserved (EP071)							
QC300	08-APR-2015	10-APR-2015	15-APR-2015	✓	13-APR-2015	20-MAY-2015	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP075(SIM))							
QC300	08-APR-2015	10-APR-2015	15-APR-2015	✓	11-APR-2015	20-MAY-2015	✓
EP080: BTEXN							
Amber VOC Vial - Sulfuric Acid (EP080)							
QC300	08-APR-2015	10-APR-2015	22-APR-2015	✓	10-APR-2015	22-APR-2015	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Amber VOC Vial - Sulfuric Acid (EP080)							
QC300	08-APR-2015	10-APR-2015	22-APR-2015	✓	10-APR-2015	22-APR-2015	✓

Quality Control Parameter Frequency Compliance

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

Matrix: **SOIL**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055-103	4	40	**10.0**	**10.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	1	9	**11.1**	**10.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Perfluorooctyl Acids and Sulfonates by LC/MS/MS	EP231	2	12	**16.7**	**10.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Pesticides by GCMS	EP068	2	12	**16.7**	**10.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	1	9	**11.1**	**10.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	19	**10.5**	**10.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	19	**10.5**	**10.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	1	9	**11.1**	**10.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	2	17	**11.8**	**10.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)	EP075(SIM)	1	9	**11.1**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Perfluorooctyl Acids and Sulfonates by LC/MS/MS	EP231	1	12	**8.3**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Pesticides by GCMS	EP068	1	12	**8.3**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	1	9	**11.1**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	19	**5.3**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	19	**5.3**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	1	9	**11.1**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	1	17	**5.9**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
PAH/Phenols (SIM)	EP075(SIM)	1	9	**11.1**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Perfluorooctyl Acids and Sulfonates by LC/MS/MS	EP231	1	12	**8.3**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Pesticides by GCMS	EP068	1	12	**8.3**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	1	9	**11.1**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	19	**5.3**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	19	**5.3**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	1	9	**11.1**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	1	17	**5.9**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	1	9	**11.1**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Perfluorooctyl Acids and Sulfonates by LC/MS/MS	EP231	1	12	**8.3**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Pesticides by GCMS	EP068	1	12	**8.3**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	1	9	**11.1**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	19	**5.3**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	19	**5.3**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	1	9	**11.1**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	E	1	17	**5.9**	**5.0**		NEPM 2013 Schedule B(3) and ALS QCS3 requirement

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Work Order : ES1508057
Client : AECOM Australia Pty Ltd
Project : 60339175 TASK NO 1 3 CHARNWOOD REMEDIATION

Matrix: **WATER**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Total Mercury by FIMS	EG035T	2	20	**10.0**	**10.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	2	16	**12.5**	**10.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	1	6	**16.7**	**10.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	2	20	**10.0**	**10.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	2	**50.0**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	20	**5.0**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	1	16	**6.3**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	1	6	**16.7**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	1	20	**5.0**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	2	**50.0**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	20	**5.0**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	1	16	**6.3**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	1	6	**16.7**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	1	20	**5.0**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
Total Mercury by FIMS	EG035T	1	20	**5.0**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	1	16	**6.3**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	1	6	**16.7**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	1	20	**5.0**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement

Brief Method Summaries

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

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055-103	SOIL	In-house. 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).
Asbestos Identification in Soils	EA200	SOIL	AS 4964 - 2004 Method for the qualitative identification of asbestos in bulk samples Analysis by Polarised Light Microscopy including dispersion staining
Asbestos Classification and Quantitation per NEPM 2013	* EA200N	SOIL	Asbestos Classification and Quantitation per NEPM 2013 with Confirmation of Identification by AS 4964 - 2004 Gravimetric determination of Asbestos Containing Material, Friable Asbestos and sample weight and calculation of percentage concentrations per NEPM protocols. Friable Asbestos is reported as the equivalent weight in the sample received after accounting for sub-sampling (where applicable for the <7mm and/or <2mm fractions).
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 21st ed., 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (2013) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	In house: Referenced to AS 3550, APHA 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 (2013) Schedule B(3)
Polychlorinated Biphenyls (PCB)	EP066	SOIL	(USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 504)
Pesticides by GCMS	EP068	SOIL	(USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This technique is compliant with NEPM (2013) Schedule B(3) (Method 504,505)
TRH - Semivolatile Fraction	EP071	SOIL	(USEPA SW 846 - 8015A) Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C40.
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)
TRH 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.
Perfluorooctyl Acids and Sulfonates by LC/MS/MS	EP231	SOIL	In-House. A portion of soil is soaked in sodium hydroxide followed by extraction with methanol. The extract is neutralised with HCl and an aliquot taken to dryness, made up in mobile phase. Analysis is by LC/MSMS, ESI Negative Mode using MRM.
Total Metals by ICP-MS - Suite A	EG020A-T	WATER	In house: Referenced to APHA 21st ed., 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.

Analytical Methods	Method	Matrix	Method Descriptions
Total Mercury by FIMS	EG035T	WATER	In house: Referenced to AS 3550, APHA 21st ed. 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the unfiltered sample. The 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 (2013) Schedule B(3)
TRH - Semivolatile Fraction	EP071	WATER	USEPA SW 846 - 8015A The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with the QC requirements of NEPM (2013) Schedule B(3)
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	WATER	USEPA SW 846 - 8270D Sample extracts are analysed by Capillary GC/MS in SIM Mode and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
TRH Volatiles/BTEX	EP080	WATER	USEPA SW 846 - 8260B Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. This method is compliant with the QC requirements of NEPM (2013) Schedule B(3)

Preparation Methods	Method	Matrix	Method Descriptions
Sample Extraction for Perfluoroalkyl Compounds	EP231-PR	SOIL	In-House
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	ORG17	SOIL	In-house, Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 30mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.
Digestion for Total Recoverable Metals	EN25	WATER	USEPA SW846-3005 Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM (2013) Schedule B(3)
Separatory Funnel Extraction of Liquids	ORG14	WATER	USEPA SW 846 - 3510B 100 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using 60mL DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM (2013) Schedule B(3) . ALS default excludes sediment which may be resident in the container.

Page	: 8 of 8
Work Order	: ES1508057
Client	: AECOM Australia Pty Ltd
Project	: 60339175 TASK NO 1 3 CHARNWOOD REMEDIATION

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 ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
EP231: Perfluorinated Compounds	EM1503519-002	Anonymous	**PFOS**	1763-23-1	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231: Perfluorinated Compounds	EM1503519-002	Anonymous	**PFOA**	335-67-1	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231: Perfluorinated Compounds	EM1503519-002	Anonymous	**6:2 Fluorotelomer sulfonate (6:2 FtS)**	27619-97-2	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

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

Regular Sample Surrogates

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

Outliers : Analysis Holding Time Compliance

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

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

Outliers : Frequency of Quality Control Samples

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

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

Lab / Analysis: QC202 → SGS → FWD. SGS
Organised By / Date:
Relinquished By / Date: 1 - 4 → EA200F → Newcastle

Form: 1 of 1

Chain of Custody & Analysis Request Form

AECOM

WO No:
Attach By PO / Internal Sheet:

AECOM - Canberra
Level 2, 60 Marcus Clarke Street
Canberra, ACT 2600
Tel: 02 6201 3000
Fax: 02 6201 3099
Email: [redacted]

Laboratory Details
Lab. Name: ALS Sydney
Lab. Address: Smithfield
Contact Name:
Lab. Ref:
Tel:
Fax:
Preliminary Report by:
Final Report by:
Lab Quote No: EN/004/14

Project Name: Charnwood ~~Block 2~~ Remediation **Project Number:** 60339175
Purchase Order Number: Project 60339175, Task No. ~~12~~ 13

Sample collected by [redacted] **Sample Results to be returned to:** ALS Sydney

Specifications:

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

7. Report Format: 8. Project Manager: tel:

Analysis Request

Lab. ID	Sample ID	Sampling Date	Sampling Time	Matrix: soil	water	other	Preservation: filt'ed	acid	ice	other	Container (No. & type)	TPH	BTEX	PAH	PCB	OCP	OPP	AE200F (Asbestos)	Metals	PFOS and PFOA sent to SGS Sydney	PFOS	PFOA
1	VS01	8/4/15	-	✓					✓		1xJar 1Bag	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓
2	VS02	8/4/2015	-	✓					✓		1xJar 1Bag	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓
3	VS03	8/4/2015	-	✓					✓		1xJar 1Bag	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓
4	QC102	8/4/2015	-	✓					✓		1xJar 1Bag	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓
~~4~~	QC202	8/4/2015	-	✓					✓		1xJar 1Bag	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
5	QC300	8/4/2015	-		✓				✓		2x1L 1xAmber 1Plastic	✓	✓	✓					✓			

Remarks & comments: ✓Send to SGS Sydney

Environmental Division Sydney
Work Order
ES1508057

Telephone : +61-2-8784 8555

SE138091 COC

Received: 10 – Apr – 2015

Relinquished By:	**Received by:** Ben B	Received in good condition?	Yes/No/NA	Method of Shipment	
Name: [redacted] Date: 8/04/2015	Name: 11:45 Date: 8/4/15	Samples received chilled?	Yes/No/NA	Consignment Note No.	
of: AECOM Time: ~~11:00~~ 11:25	of: Time:		Yes/No/NA	Transport Co:	
Relinquished By:	**Received by:** Steven 9/4/15 800	Received in good condition?	Yes/No/NA	Method of Shipment	☐ Courier ☐ Postal ☐ By Hand
Name: Date:	Name: Date: 12.55	Samples received chilled? Ice	Yes/No/NA	Consignment Note No.	
of: Time:	of: Time: 10/4/15		Yes/No/NA	Transport Co:	

Printed copies of this document are uncontrolled

Temp = 14.2°C

Environment

Revision: Oct 09
BMS-PM-DV-F046

SAMPLE RECEIPT ADVICE

SE138091

CLIENT DETAILS

Contact	[redacted]
Client	AECOM Australia Pty Ltd
Address	Level 2, 60 Marcus Clarke Street ACT 2600
Telephone	02 6201 3000
Facsimile	02 6201 3099
Email	[redacted]@aecom.com
Project	**60339175,Task 1.3- Charnwood Remediation**
Order Number	**60339175,Task 1.3**
Samples	1

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
Samples Received	Fri 10/4/2015
Report Due	Fri 24/4/2015
SGS Reference	**SE138091**

SUBMISSION DETAILS

This is to confirm that 1 sample was received on Friday 10/4/2015. Results are expected to be ready by Friday 24/4/2015. Please quote SGS reference SE138091 when making enquiries. Refer below for details relating to sample integrity upon receipt.

Sample counts by matrix	1 Soil	Type of documentation received	COC
Date documentation received	10/4/2015	Samples received in good order	Yes
Samples received without headspace	Yes	Sample temperature upon receipt	3.2°C
Sample container provider	SGS	Turnaround time requested	Standard
Samples received in correct containers	Yes	Sufficient sample for analysis	Yes
Sample cooling method	Ice	Samples clearly labelled	Yes
Complete documentation received	Yes		

Samples will be held for one month for water samples and two months for soil samples from date of report, unless otherwise instructed.

COMMENTS

PFOA/PFOS - subcontracted to SGS Leeder Consulting, 4 - 5, 18 Redland Drive Mitcham VIC, NATA Accreditation Number 14429.
Results will be available in 10 working days.
A separate homogenised portion (~100g) was not supplied for Asbestos analysis. SGS will proceed by sub-sampling a portion from the plastic bag supplied, on the provision that a comment will be reflected on the final report regarding this sub-sampling.

SGS

SAMPLE RECEIPT ADVICE

SE138091

CLIENT DETAILS

Client AECOM Australia Pty Ltd

Project 60339175,Task 1.3- Charnwood Remediation

SUMMARY OF ANALYSIS

No.	Sample ID	OC Pesticides in Soil	OP Pesticides in Soil	PAH (Polynuclear Aromatic Hydrocarbons) in Soil	PCBs in Soil	Total Recoverable Metals in Soil by ICPOES from	TRH (Total Recoverable Hydrocarbons) in Soil	VOC's in Soil	Volatile Petroleum Hydrocarbons in Soil
001	QC202	28	13	25	11	7	10	12	8

CONTINUED OVERLEAF

The above table represents SGS Environmental Services' interpretation of the client-supplied Chain Of Custody document.
The numbers shown in the table indicate the number of results requested in each package.
Please indicate as soon as possible should your request differ from these details .
Testing as per this table shall commence immediately unless the client intervenes with a correction .

SAMPLE RECEIPT ADVICE

SE138091

CLIENT DETAILS

Client AECOM Australia Pty Ltd

Project 60339175,Task 1.3- Charnwood Remediation

SUMMARY OF ANALYSIS

No.	Sample ID	Fibre Identification in soil	Mercury in Soil	Moisture Content	Perfluorinated Surfactants (PFOA, PFOS) in Soil by
001	QC202	2	1	1	4

The above table represents SGS Environmental Services' interpretation of the client-supplied Chain Of Custody document.
The numbers shown in the table indicate the number of results requested in each package.
Please indicate as soon as possible should your request differ from these details .
Testing as per this table shall commence immediately unless the client intervenes with a correction .

ANALYTICAL REPORT

CLIENT DETAILS		LABORATORY DETAILS	
Contact	[redacted]	Manager	[redacted]
Client	AECOM Australia Pty Ltd	Laboratory	SGS Alexandria Environmental
Address	Level 2, 60 Marcus Clarke Street ACT 2600	Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	02 6201 3000	Telephone	+61 2 [redacted]
Facsimile	02 6201 3099	Facsimile	+61 2 8594 0499
Email	[redacted]@aecom.com	Email	au.environmental.sydney@sgs.com
Project	**60339175,Task 1.3- Charnwood Remediation**	SGS Reference	**SE138091 R0**
Order Number	**60339175,Task 1.3**	Report Number	0000108647
Samples	1	Date Reported	28 Apr 2015
Date Started	14 Apr 2015	Date Received	10 Apr 2015

COMMENTS

Accredited for compliance with ISO/IEC 17025. NATA accredited laboratory 2562(4354).

PFOA/PFOS - subcontracted to SGS Leeder Consulting, 4 - 5, 18 Redland Drive Mitcham VIC, NATA Accreditation Number 14429.

No respirable fibres detected in all samples using trace analysis technique.

Asbestos analysed by Approved Identifier Yusuf Kuthpudin .

SIGNATORIES

[redacted]

SGS

ANALYTICAL REPORT

SE138091 R0

Parameter	Units	LOR	Sample Number: SE138091.001 Sample Matrix: Soil Sample Depth: 865g Clay Sample Date: 08 Apr 2015 Sample Name: QC202
VOC's in Soil Method: AN433/AN434 Tested: 14/4/2015			
Monocyclic Aromatic Hydrocarbons			
Benzene	mg/kg	0.1	<0.1
Toluene	mg/kg	0.1	<0.1
Ethylbenzene	mg/kg	0.1	<0.1
m/p-xylene	mg/kg	0.2	<0.2
o-xylene	mg/kg	0.1	<0.1
Polycyclic VOCs			
Naphthalene	mg/kg	0.1	<0.1
Surrogates			
Dibromofluoromethane (Surrogate)	%	-	**74**
d4-1,2-dichloroethane (Surrogate)	%	-	**73**
d8-toluene (Surrogate)	%	-	**75**
Bromofluorobenzene (Surrogate)	%	-	**73**
Totals			
Total Xylenes*	mg/kg	0.3	<0.3
Total BTEX*	mg/kg	0.6	<0.6
Volatile Petroleum Hydrocarbons in Soil Method: AN433/AN434/AN410 Tested: 14/4/2015			
TRH C6-C10	mg/kg	25	<25
TRH C6-C9	mg/kg	20	<20
Surrogates			
Dibromofluoromethane (Surrogate)	%	-	**74**
d4-1,2-dichloroethane (Surrogate)	%	-	**73**
d8-toluene (Surrogate)	%	-	**75**
Bromofluorobenzene (Surrogate)	%	-	**73**
VPH F Bands			
Benzene (F0)	mg/kg	0.1	<0.1
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25

SGS

ANALYTICAL REPORT

SE138091 R0

Parameter	Units	LOR	Sample Number: SE138091.001 Sample Matrix: Soil Sample Depth: 865g Clay Sample Date: 08 Apr 2015 Sample Name: QC202
TRH (Total Recoverable Hydrocarbons) in Soil Method: AN403 Tested: 13/4/2015			
TRH C10-C14	mg/kg	20	<20
TRH C15-C28	mg/kg	45	<45
TRH C29-C36	mg/kg	45	<45
TRH C37-C40	mg/kg	100	<100
TRH C10-C36 Total	mg/kg	110	<110
TRH C10-C40 Total	mg/kg	210	<210
TRH F Bands			
TRH >C10-C16 (F2)	mg/kg	25	<25
TRH >C10-C16 (F2) - Naphthalene	mg/kg	25	<25
TRH >C16-C34 (F3)	mg/kg	90	<90
TRH >C34-C40 (F4)	mg/kg	120	<120
PAH (Polynuclear Aromatic Hydrocarbons) in Soil Method: AN420 Tested: 13/4/2015			
Naphthalene	mg/kg	0.1	<0.1
2-methylnaphthalene	mg/kg	0.1	<0.1
1-methylnaphthalene	mg/kg	0.1	<0.1
Acenaphthylene	mg/kg	0.1	<0.1
Acenaphthene	mg/kg	0.1	<0.1
Fluorene	mg/kg	0.1	<0.1
Phenanthrene	mg/kg	0.1	<0.1
Anthracene	mg/kg	0.1	<0.1
Fluoranthene	mg/kg	0.1	<0.1
Pyrene	mg/kg	0.1	<0.1
Benzo(a)anthracene	mg/kg	0.1	<0.1
Chrysene	mg/kg	0.1	<0.1
Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1
Benzo(k)fluoranthene	mg/kg	0.1	<0.1
Benzo(a)pyrene	mg/kg	0.1	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1
Dibenzo(a&h)anthracene	mg/kg	0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.1	<0.1
Carcinogenic PAHs, BaP TEQ <LOR=0*	TEQ	0.2	<0.2
Carcinogenic PAHs, BaP TEQ <LOR=LOR*	TEQ (mg/kg)	0.3	<0.3
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2*	TEQ (mg/kg)	0.2	<0.2
Total PAH	mg/kg	0.8	<0.8

SGS

ANALYTICAL REPORT

SE138091 R0

Parameter	Units	LOR	Sample Number: SE138091.001 Sample Matrix: Soil Sample Depth: 865g Clay Sample Date: 08 Apr 2015 Sample Name: QC202
PAH (Polynuclear Aromatic Hydrocarbons) in Soil Method: AN420 Tested: 13/4/2015 (continued)			
Surrogates			
d5-nitrobenzene (Surrogate)	%	-	**72**
2-fluorobiphenyl (Surrogate)	%	-	**70**
d14-p-terphenyl (Surrogate)	%	-	**90**
OC Pesticides in Soil Method: AN400/AN420 Tested: 13/4/2015			
Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1
Alpha BHC	mg/kg	0.1	<0.1
Lindane	mg/kg	0.1	<0.1
Heptachlor	mg/kg	0.1	<0.1
Aldrin	mg/kg	0.1	<0.1
Beta BHC	mg/kg	0.1	<0.1
Delta BHC	mg/kg	0.1	<0.1
Heptachlor epoxide	mg/kg	0.1	<0.1
o,p'-DDE	mg/kg	0.1	<0.1
Alpha Endosulfan	mg/kg	0.2	<0.2
Gamma Chlordane	mg/kg	0.1	<0.1
Alpha Chlordane	mg/kg	0.1	<0.1
trans-Nonachlor	mg/kg	0.1	<0.1
p,p'-DDE	mg/kg	0.1	<0.1
Dieldrin	mg/kg	0.2	<0.2
Endrin	mg/kg	0.2	<0.2
o,p'-DDD	mg/kg	0.1	<0.1
o,p'-DDT	mg/kg	0.1	<0.1
Beta Endosulfan	mg/kg	0.2	<0.2
p,p'-DDD	mg/kg	0.1	<0.1
p,p'-DDT	mg/kg	0.1	<0.1
Endosulfan sulphate	mg/kg	0.1	<0.1
Endrin Aldehyde	mg/kg	0.1	<0.1
Methoxychlor	mg/kg	0.1	<0.1
Endrin Ketone	mg/kg	0.1	<0.1
Isodrin	mg/kg	0.1	<0.1
Mirex	mg/kg	0.1	<0.1

SGS

ANALYTICAL REPORT

SE138091 R0

Parameter	Units	LOR	Sample Number: SE138091.001 Sample Matrix: Soil Sample Depth: 865g Clay Sample Date: 08 Apr 2015 Sample Name: QC202
OC Pesticides in Soil Method: AN400/AN420 Tested: 13/4/2015 (continued)			
Surrogates			
Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	**103**
OP Pesticides in Soil Method: AN400/AN420 Tested: 13/4/2015			
Dichlorvos	mg/kg	0.5	<0.5
Dimethoate	mg/kg	0.5	<0.5
Diazinon (Dimpylate)	mg/kg	0.5	<0.5
Fenitrothion	mg/kg	0.2	<0.2
Malathion	mg/kg	0.2	<0.2
Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2
Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2
Bromophos Ethyl	mg/kg	0.2	<0.2
Methidathion	mg/kg	0.5	<0.5
Ethion	mg/kg	0.2	<0.2
Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2
Surrogates			
2-fluorobiphenyl (Surrogate)	%	-	**70**
d14-p-terphenyl (Surrogate)	%	-	**90**
PCBs in Soil Method: AN400/AN420 Tested: 13/4/2015			
Arochlor 1016	mg/kg	0.2	<0.2
Arochlor 1221	mg/kg	0.2	<0.2
Arochlor 1232	mg/kg	0.2	<0.2
Arochlor 1242	mg/kg	0.2	<0.2
Arochlor 1248	mg/kg	0.2	<0.2
Arochlor 1254	mg/kg	0.2	<0.2
Arochlor 1260	mg/kg	0.2	<0.2
Arochlor 1262	mg/kg	0.2	<0.2
Arochlor 1268	mg/kg	0.2	<0.2
Total PCBs (Arochlors)	mg/kg	1	<1

SGS

ANALYTICAL REPORT

SE138091 R0

Parameter	Units	LOR	Sample Number: SE138091.001 Sample Matrix: Soil Sample Depth: 865g Clay Sample Date: 08 Apr 2015 Sample Name: QC202
PCBs in Soil Method: AN400/AN420 Tested: 13/4/2015 (continued)			
Surrogates			
Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	**103**
Total Recoverable Metals in Soil by ICPOES from EPA 200.8 Digest Method: AN040/AN320 Tested: 21/4/2015			
Arsenic, As	mg/kg	3	**4**
Cadmium, Cd	mg/kg	0.3	<0.3
Chromium, Cr	mg/kg	0.3	**23**
Copper, Cu	mg/kg	0.5	**9.8**
Lead, Pb	mg/kg	1	**12**
Nickel, Ni	mg/kg	0.5	**8.6**
Zinc, Zn	mg/kg	0.5	**16**
Mercury in Soil Method: AN312 Tested: 20/4/2015			
Mercury	mg/kg	0.01	**0.02**
Fibre Identification in soil Method: AN602 Tested: 15/4/2015			
FibreID			
Asbestos Detected	No unit	-	No
SemiQuant			
Estimated Fibres	%w/w	0.01	<0.01
Moisture Content Method: AN002 Tested: 21/4/2015			
% Moisture	%	0.5	**23**

SGS

QC SUMMARY

SE138091 R0

MB blank results are compared to the Limit of Reporting
LCS and MS spike recoveries are measured as the percentage of analyte recovered from the sample compared the the amount of analyte spiked into the sample.
DUP and MSD relative percent differences are measured against their original counterpart samples according to the formula : *the absolute difference of the two results divided by the average of the two results as a percentage.* Where the DUP RPD is 'NA' , the results are less than the LOR and thus the RPD is not applicable.

Mercury in Soil Method: ME-(AU)-[ENV]AN312

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Mercury	LB075803	mg/kg	0.01	<0.01	0%	105%	90%

Moisture Content Method: ME-(AU)-[ENV]AN002

Parameter	QC Reference	Units	LOR	DUP %RPD
% Moisture	LB075869	%	0.5	0 - 2%

OC Pesticides in Soil Method: ME-(AU)-[ENV]AN400/AN420

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
Hexachlorobenzene (HCB)	LB075363	mg/kg	0.1	<0.1	0%	NA
Alpha BHC	LB075363	mg/kg	0.1	<0.1	0%	NA
Lindane	LB075363	mg/kg	0.1	<0.1	0%	NA
Heptachlor	LB075363	mg/kg	0.1	<0.1	0%	97%
Aldrin	LB075363	mg/kg	0.1	<0.1	0%	94%
Beta BHC	LB075363	mg/kg	0.1	<0.1	0%	NA
Delta BHC	LB075363	mg/kg	0.1	<0.1	0%	96%
Heptachlor epoxide	LB075363	mg/kg	0.1	<0.1	0%	NA
o,p'-DDE	LB075363	mg/kg	0.1	<0.1	0%	NA
Alpha Endosulfan	LB075363	mg/kg	0.2	<0.2	0%	NA
Gamma Chlordane	LB075363	mg/kg	0.1	<0.1	0%	NA
Alpha Chlordane	LB075363	mg/kg	0.1	<0.1	0%	NA
trans-Nonachlor	LB075363	mg/kg	0.1	<0.1	0%	NA
p,p'-DDE	LB075363	mg/kg	0.1	<0.1	0%	NA
Dieldrin	LB075363	mg/kg	0.2	<0.2	0%	91%
Endrin	LB075363	mg/kg	0.2	<0.2	0%	100%
o,p'-DDD	LB075363	mg/kg	0.1	<0.1	0%	NA
o,p'-DDT	LB075363	mg/kg	0.1	<0.1	0%	NA
Beta Endosulfan	LB075363	mg/kg	0.2	<0.2	0%	NA
p,p'-DDD	LB075363	mg/kg	0.1	<0.1	0%	NA
p,p'-DDT	LB075363	mg/kg	0.1	<0.1	0%	84%
Endosulfan sulphate	LB075363	mg/kg	0.1	<0.1	0%	NA
Endrin Aldehyde	LB075363	mg/kg	0.1	<0.1	0%	NA
Methoxychlor	LB075363	mg/kg	0.1	<0.1	0%	NA
Endrin Ketone	LB075363	mg/kg	0.1	<0.1	0%	NA
Isodrin	LB075363	mg/kg	0.1	<0.1	0%	NA
Mirex	LB075363	mg/kg	0.1	<0.1	0%	NA

Surrogates

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
Tetrachloro-m-xylene (TCMX) (Surrogate)	LB075363	%	-	101%	3%	91%

SGS

QC SUMMARY

SE138091 R0

MB blank results are compared to the Limit of Reporting
LCS and MS spike recoveries are measured as the percentage of analyte recovered from the sample compared the the amount of analyte spiked into the sample.
DUP and MSD relative percent differences are measured against their original counterpart samples according to the formula : *the absolute difference of the two results divided by the average of the two results as a percentage*. Where the DUP RPD is 'NA' , the results are less than the LOR and thus the RPD is not applicable.

OP Pesticides in Soil **Method: ME-(AU)-[ENV]AN400/AN420**

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
Dichlorvos	LB075363	mg/kg	0.5	<0.5	0%	108%
Dimethoate	LB075363	mg/kg	0.5	<0.5	0%	NA
Diazinon (Dimpylate)	LB075363	mg/kg	0.5	<0.5	0%	108%
Fenitrothion	LB075363	mg/kg	0.2	<0.2	0%	NA
Malathion	LB075363	mg/kg	0.2	<0.2	0%	NA
Chlorpyrifos (Chlorpyrifos Ethyl)	LB075363	mg/kg	0.2	<0.2	0%	104%
Parathion-ethyl (Parathion)	LB075363	mg/kg	0.2	<0.2	0%	NA
Bromophos Ethyl	LB075363	mg/kg	0.2	<0.2	0%	NA
Methidathion	LB075363	mg/kg	0.5	<0.5	0%	NA
Ethion	LB075363	mg/kg	0.2	<0.2	0%	117%
Azinphos-methyl (Guthion)	LB075363	mg/kg	0.2	<0.2	0%	NA

Surrogates

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
2-fluorobiphenyl (Surrogate)	LB075363	%	-	96%	2%	88%
d14-p-terphenyl (Surrogate)	LB075363	%	-	112%	0%	94%

PAH (Polynuclear Aromatic Hydrocarbons) in Soil **Method: ME-(AU)-[ENV]AN420**

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
Naphthalene	LB075363	mg/kg	0.1	<0.1	0%	102%
2-methylnaphthalene	LB075363	mg/kg	0.1	<0.1	0%	NA
1-methylnaphthalene	LB075363	mg/kg	0.1	<0.1	0%	NA
Acenaphthylene	LB075363	mg/kg	0.1	<0.1	0%	103%
Acenaphthene	LB075363	mg/kg	0.1	<0.1	0%	101%
Fluorene	LB075363	mg/kg	0.1	<0.1	0%	NA
Phenanthrene	LB075363	mg/kg	0.1	<0.1	0%	98%
Anthracene	LB075363	mg/kg	0.1	<0.1	0%	98%
Fluoranthene	LB075363	mg/kg	0.1	<0.1	18%	98%
Pyrene	LB075363	mg/kg	0.1	<0.1	18%	96%
Benzo(a)anthracene	LB075363	mg/kg	0.1	<0.1	0%	NA
Chrysene	LB075363	mg/kg	0.1	<0.1	0%	NA
Benzo(b&j)fluoranthene	LB075363	mg/kg	0.1	<0.1	10%	NA
Benzo(k)fluoranthene	LB075363	mg/kg	0.1	<0.1	0%	NA
Benzo(a)pyrene	LB075363	mg/kg	0.1	<0.1	0%	110%
Indeno(1,2,3-cd)pyrene	LB075363	mg/kg	0.1	<0.1	0%	NA
Dibenzo(a&h)anthracene	LB075363	mg/kg	0.1	<0.1	0%	NA
Benzo(ghi)perylene	LB075363	mg/kg	0.1	<0.1	0%	NA
Carcinogenic PAHs, BaP TEQ <LOR=0*	LB075363	TEQ	0.2	<0.2	0%	NA
Carcinogenic PAHs, BaP TEQ <LOR=LOR*	LB075363	TEQ (mg/kg)	0.3	<0.3	0%	NA
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2*	LB075363	TEQ (mg/kg)	0.2	<0.2	0%	NA
Total PAH	LB075363	mg/kg	0.8	<0.8	0%	NA

Surrogates

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
d5-nitrobenzene (Surrogate)	LB075363	%	-	104%	0%	92%
2-fluorobiphenyl (Surrogate)	LB075363	%	-	96%	2%	88%
d14-p-terphenyl (Surrogate)	LB075363	%	-	112%	0%	94%

SGS

QC SUMMARY

SE138091 R0

MB blank results are compared to the Limit of Reporting
LCS and MS spike recoveries are measured as the percentage of analyte recovered from the sample compared the the amount of analyte spiked into the sample.
DUP and MSD relative percent differences are measured against their original counterpart samples according to the formula : *the absolute difference of the two results divided by the average of the two results as a percentage.* Where the DUP RPD is 'NA' , the results are less than the LOR and thus the RPD is not applicable.

PCBs in Soil **Method: ME-(AU)-[ENV]AN400/AN420**

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
Arochlor 1016	LB075363	mg/kg	0.2	<0.2	0%	NA
Arochlor 1221	LB075363	mg/kg	0.2	<0.2	0%	NA
Arochlor 1232	LB075363	mg/kg	0.2	<0.2	0%	NA
Arochlor 1242	LB075363	mg/kg	0.2	<0.2	0%	NA
Arochlor 1248	LB075363	mg/kg	0.2	<0.2	0%	NA
Arochlor 1254	LB075363	mg/kg	0.2	<0.2	0%	NA
Arochlor 1260	LB075363	mg/kg	0.2	<0.2	0%	124%
Arochlor 1262	LB075363	mg/kg	0.2	<0.2	0%	NA
Arochlor 1268	LB075363	mg/kg	0.2	<0.2	0%	NA
Total PCBs (Arochlors)	LB075363	mg/kg	1	<1	0%	NA

Surrogates

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
Tetrachloro-m-xylene (TCMX) (Surrogate)	LB075363	%	-	101%	3%	77%

Total Recoverable Metals in Soil by ICPOES from EPA 200.8 Digest **Method: ME-(AU)-[ENV]AN040/AN320**

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Arsenic, As	LB075851	mg/kg	3	<3	2%	100%	75%
Cadmium, Cd	LB075851	mg/kg	0.3	<0.3	0%	100%	86%
Chromium, Cr	LB075851	mg/kg	0.3	<0.3	2%	100%	80%
Copper, Cu	LB075851	mg/kg	0.5	<0.5	4%	101%	93%
Lead, Pb	LB075851	mg/kg	1	<1	1%	101%	81%
Nickel, Ni	LB075851	mg/kg	0.5	<0.5	0%	101%	85%
Zinc, Zn	LB075851	mg/kg	0.5	<0.5	0%	100%	89%

TRH (Total Recoverable Hydrocarbons) in Soil **Method: ME-(AU)-[ENV]AN403**

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
TRH C10-C14	LB075363	mg/kg	20	<20	0%	100%
TRH C15-C28	LB075363	mg/kg	45	<45	0%	98%
TRH C29-C36	LB075363	mg/kg	45	<45	0%	85%
TRH C37-C40	LB075363	mg/kg	100	<100	0%	NA
TRH C10-C36 Total	LB075363	mg/kg	110	<110	0%	NA
TRH C10-C40 Total	LB075363	mg/kg	210	<210	0%	NA

TRH F Bands

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
TRH >C10-C16 (F2)	LB075363	mg/kg	25	<25	0%	100%
TRH >C10-C16 (F2) - Naphthalene	LB075363	mg/kg	25	<25	0%	NA
TRH >C16-C34 (F3)	LB075363	mg/kg	90	<90	0%	98%
TRH >C34-C40 (F4)	LB075363	mg/kg	120	<120	0%	75%

SGS

QC SUMMARY

SE138091 R0

MB blank results are compared to the Limit of Reporting
LCS and MS spike recoveries are measured as the percentage of analyte recovered from the sample compared the the amount of analyte spiked into the sample.
DUP and MSD relative percent differences are measured against their original counterpart samples according to the formula : *the absolute difference of the two results divided by the average of the two results as a percentage*. Where the DUP RPD is 'NA' , the results are less than the LOR and thus the RPD is not applicable.

VOC's in Soil Method: ME-(AU)-[ENV]AN433/AN434

Monocyclic Aromatic Hydrocarbons

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
Benzene	LB075468	mg/kg	0.1	<0.1	0%	76%
Toluene	LB075468	mg/kg	0.1	<0.1	0%	78%
Ethylbenzene	LB075468	mg/kg	0.1	<0.1	0%	81%
m/p-xylene	LB075468	mg/kg	0.2	<0.2	0%	83%
o-xylene	LB075468	mg/kg	0.1	<0.1	0%	82%

Polycyclic VOCs

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
Naphthalene	LB075468	mg/kg	0.1	<0.1	0%	NA

Surrogates

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
Dibromofluoromethane (Surrogate)	LB075468	%	-	75%	5 - 17%	97%
d4-1,2-dichloroethane (Surrogate)	LB075468	%	-	75%	8 - 16%	100%
d8-toluene (Surrogate)	LB075468	%	-	82%	2 - 6%	95%
Bromofluorobenzene (Surrogate)	LB075468	%	-	83%	3 - 18%	108%

Totals

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
Total Xylenes*	LB075468	mg/kg	0.3	<0.3	0%	NA
Total BTEX*	LB075468	mg/kg	0.6	<0.6	0%	NA

Volatile Petroleum Hydrocarbons in Soil Method: ME-(AU)-[ENV]AN433/AN434/AN410

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
TRH C6-C10	LB075468	mg/kg	25	<25	0%	93%
TRH C6-C9	LB075468	mg/kg	20	<20	0%	85%

Surrogates

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
Dibromofluoromethane (Surrogate)	LB075468	%	-	75%	5 - 17%	97%
d4-1,2-dichloroethane (Surrogate)	LB075468	%	-	75%	8 - 16%	100%
d8-toluene (Surrogate)	LB075468	%	-	82%	2 - 6%	95%
Bromofluorobenzene (Surrogate)	LB075468	%	-	83%	3 - 18%	108%

VPH F Bands

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
Benzene (F0)	LB075468	mg/kg	0.1	<0.1	0%	NA
TRH C6-C10 minus BTEX (F1)	LB075468	mg/kg	25	<25	0%	123%

SGS

METHOD SUMMARY

SE138091 R0

METHOD	METHODOLOGY SUMMARY
AN002	The test is carried out by drying (at either 40°C or 105°C) a known mass of sample in a weighed evaporating basin. After fully dry the sample is re-weighed. Samples such as sludge and sediment having high percentages of moisture will take some time in a drying oven for complete removal of water.
AN040	A portion of sample is digested with Nitric acid to decompose organic matter and Hydrochloric acid to complete the digestion of metals and then filtered for analsysis by ASS or ICP as per USEPA Method 200.8.
AN040/AN320	A portion of sample is digested with nitric acid to decompose organic matter and hydrochloric acid to complete the digestion of metals. The digest is then analysed by ICP OES with metals results reported on the dried sample basis. Based on USEPA method 200.8 and 6010C.
AN088	Orbital rolling for Organic pollutants are extracted from soil/sediment by transferring an appropriate mass of sample to a clear soil jar and extracting with 1:1 Dichloromethane/Acetone. Orbital Rolling method is intended for the extraction of semi-volatile organic compounds from soil/sediment samples, and is based somewhat on USEPA method 3570 (Micro Organic extraction and sample preparation). Method 3700.
AN312	Mercury by Cold Vapour AAS in Soils: After digestion with nitric acid, hydrogen peroxide and hydrochloric acid, mercury ions are reduced by stannous chloride reagent in acidic solution to elemental mercury. This mercury vapour is purged by nitrogen into a cold cell in an atomic absorption spectrometer or mercury analyser. Quantification is made by comparing absorbances to those of the calibration standards. Reference APHA 3112/3500
AN400	OC and OP Pesticides by GC-ECD: The determination of organochlorine (OC) and organophosphorus (OP) pesticides and polychlorinated biphenyls (PCBs) in soils, sludges and groundwater. (Based on USEPA methods 3510, 3550, 8140 and 8080.)
AN403	Total Recoverable Hydrocarbons: Determination of Hydrocarbons by gas chromatography after a solvent extraction. Detection is by flame ionisation detector (FID) that produces an electronic signal in proportion to the combustible matter passing through it. Total Recoverable Hydrocarbons (TRH) are routinely reported as four alkane groupings based on the carbon chain length of the compounds: C6-C9, C10-C14, C15-C28 and C29-C36 and in recognition of the NEPM 1999 (2013), >C10-C16 (F2), >C16-C34 (F3) and >C34-C40 (F4). F2 is reported directly and also corrected by subtracting Naphthalene (from VOC method AN433) where available.
AN403	Additionally, the volatile C6-C9 fraction may be determined by a purge and trap technique and GC/MS because of the potential for volatiles loss. Total Petroleum Hydrocarbons (TPH) follows the same method of analysis after silica gel cleanup of the solvent extract. Aliphatic/Aromatic Speciation follows the same method of analysis after fractionation of the solvent extract over silica with differential polarity of the eluent solvents .
AN403	The GC/FID method is not well suited to the analysis of refined high boiling point materials (ie lubricating oils or greases) but is particularly suited for measuring diesel, kerosene and petrol if care to control volatility is taken. This method will detect naturally occurring hydrocarbons, lipids, animal fats, phenols and PAHs if they are present at sufficient levels, dependant on the use of specific cleanup/fractionation techniques. Reference USEPA 3510B, 8015B.
AN420	(SVOCs) including OC, OP, PCB, Herbicides, PAH, Phthalates and Speciated Phenols (etc) in soils, sediments and waters are determined by GCMS/ECD technique following appropriate solvent extraction process (Based on USEPA 3500C and 8270D).
AN420	SVOC Compounds: Semi-Volatile Organic Compounds (SVOCs) including OC, OP, PCB, Herbicides, PAH, Phthalates and Speciated Phenols in soils, sediments and waters are determined by GCMS/ECD technique following appropriate solvent extraction process (Based on USEPA 3500C and 8270D).
AN433/AN434	VOCs and C6-C9 Hydrocarbons by GC-MS P&T: VOC's are volatile organic compounds. The sample is presented to a gas chromatograph via a purge and trap (P&T) concentrator and autosampler and is detected with a Mass Spectrometer (MSD). Solid samples are initially extracted with methanol whilst liquid samples are processed directly. References: USEPA 5030B, 8020A, 8260.

SGS

METHOD SUMMARY

SE138091 R0

METHOD	METHODOLOGY SUMMARY
AN433/AN434/AN410	VOCs and C6-C9/C6-C10 Hydrocarbons by GC-MS P&T: VOC`s are volatile organic compounds. The sample is presented to a gas chromatograph via a purge and trap (P&T) concentrator and autosampler and is detected with a Mass Spectrometer (MSD). Solid samples are initially extracted with methanol whilst liquid samples are processed directly. References: USEPA 5030B, 8020A, 8260.
AN602	Qualitative identification of chrysotile, amosite and crocidolite in bulk samples by polarised light microscopy (PLM) in conjunction with dispersion staining (DS). AS4964 provides the basis for this document. Unequivocal identification of the asbestos minerals present is made by obtaining sufficient diagnostic `clues`, which provide a reasonable degree of certainty, dispersion staining is a mandatory `clue` for positive identification. If sufficient `clues` are absent, then positive identification of asbestos is not possible. This procedure requires removal of suspect fibres/bundles from the sample which cannot be returned.
AN602	Fibres/material that cannot be unequivocably identified as one of the three asbestos forms, will be reported as unknown mineral fibres (umf).
AN602	AS4964.2004 Method for the Qualitative Identification of Asbestos in Bulk Samples, Section 8.4, Trace Analysis Criteria, Note 4 states:"Depending upon sample condition and fibre type, the detection limit of this technique has been found to lie generally in the range of 1 in 1,000 to 1 in 10,000 parts by weight, equivalent to 1 to 0.1 g/kg."
AN602	The sample can be reported "no asbestos found at the reporting limit of 0.1 g/kg" (<0.01%w/w) where AN602 section 4.5 of this method has been followed, and if- (a) no trace asbestos fibres have been detected (i.e. no 'respirable' fibres): (b) the estimated weight of non-respirable asbestos fibre bundles and/or the estimated weight of asbestos in asbestos-containing materials are found to be less than 0.1g/kg: and (c) these non-respirable asbestos fibre bundles and/or the asbestos containing materials are only visible under stereo-microscope viewing conditions.

FOOTNOTES

IS	Insufficient sample for analysis.	LOR	Limit of Reporting
LNR	Sample listed, but not received.	↑↓	Raised or Lowered Limit of Reporting
*	This analysis is not covered by the scope of accreditation.	QFH	QC result is above the upper tolerance
**	Indicative data, theoretical holding time exceeded.	QFL	QC result is below the lower tolerance
^	Performed by outside laboratory.	-	The sample was not analysed for this analyte
		NVL	Not Validated

Samples analysed as received.
Solid samples expressed on a dry weight basis.

Some totals may not appear to add up because the total is rounded after adding up the raw values.

The QC criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here: http://www.sgs.com.au/~/media/Local/Australia/Documents/Technical%20Documents/MP-AU-ENV-QU-022%20QA%20QC%20Plan.pdf

STATEMENT OF QA/QC PERFORMANCE

SE138091 R0

CLIENT DETAILS		LABORATORY DETAILS	
Contact	[redacted]	Manager	[redacted]
Client	AECOM Australia Pty Ltd	Laboratory	SGS Alexandria Environmental
Address	Level 2, 60 Marcus Clarke Street ACT 2600	Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	02 6201 3000	Telephone	+61 [redacted]
Facsimile	02 6201 3099	Facsimile	+61 2 8594 0499
Email	[redacted]@aecom.com	Email	au.environmental.sydney@sgs.com
Project	**60339175,Task 1.3- Charnwood Remediation**	SGS Reference	SE138091 R0
Order Number	**60339175,Task 1.3**	Report Number	0000108650
Samples	1	Date Reported	28 Apr 2015

COMMENTS

All the laboratory data for each environmental matrix was compared to SGS Environmental Services' stated Data Quality Objectives (DQO). Comments arising from the comparison were made and are reported below.

The data relating to sampling was taken from the Chain of Custody document and was supplied by the Client.
This QA/QC Statement must be read in conjunction with the referenced Analytical Report.
The Statement and the Analytical Report must not be reproduced except in full.

All Data Quality Objectives were met (within the SGS Alexandria Environmental laboratory).

SAMPLE SUMMARY

Sample counts by matrix	1 Soil	Type of documentation received	COC
Date documentation received	10/4/2015	Samples received in good order	Yes
Samples received without headspace	Yes	Sample temperature upon receipt	3.2°C
Sample container provider	SGS	Turnaround time requested	Standard
Samples received in correct containers	Yes	Sufficient sample for analysis	Yes
Sample cooling method	Ice	Samples clearly labelled	Yes
Complete documentation received	Yes		

HOLDING TIME SUMMARY

SE138091 R0

SGS holding time criteria are drawn from current regulations and are highly dependent on sample container preservation as specified in the SGS "Field Sampling Guide for Containers and Holding Time" (ref: GU-(AU)-ENV.001). Soil samples guidelines are derived from NEPM "Schedule B(3) Guideline on Laboratory Analysis of Potentially Contaminated Soils". Water sample guidelines are derived from "AS/NZS 5667.1 : 1998 Water Quality - sampling part 1" and APHA "Standard Methods for the Examination of Water and Wastewater" 21st edition 2005.

Extraction and analysis holding time due dates listed are calculated from the date sampled, although holding times may be extended after laboratory extraction for some analytes. The due dates are the suggested dates that samples may be held before extraction or analysis and still be considered valid.

Extraction and analysis dates are shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria. If the sampled date is not supplied then compliance with criteria cannot be determined. If the received date is after one or both due dates then holding time will fail by default.

Fibre Identification in soil

Method: ME-(AU)-[ENV]AN602

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
QC202	SE138091.001	LB075554	08 Apr 2015	10 Apr 2015	07 Apr 2016	15 Apr 2015	07 Apr 2016	23 Apr 2015

Mercury in Soil

Method: ME-(AU)-[ENV]AN312

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
QC202	SE138091.001	LB075803	08 Apr 2015	10 Apr 2015	06 May 2015	20 Apr 2015	06 May 2015	22 Apr 2015

Moisture Content

Method: ME-(AU)-[ENV]AN002

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
QC202	SE138091.001	LB075869	08 Apr 2015	10 Apr 2015	22 Apr 2015	21 Apr 2015	26 Apr 2015	22 Apr 2015

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN400/AN420

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
QC202	SE138091.001	LB075363	08 Apr 2015	10 Apr 2015	22 Apr 2015	13 Apr 2015	23 May 2015	15 Apr 2015

OP Pesticides in Soil

Method: ME-(AU)-[ENV]AN400/AN420

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
QC202	SE138091.001	LB075363	08 Apr 2015	10 Apr 2015	22 Apr 2015	13 Apr 2015	23 May 2015	23 Apr 2015

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN420

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
QC202	SE138091.001	LB075363	08 Apr 2015	10 Apr 2015	22 Apr 2015	13 Apr 2015	23 May 2015	23 Apr 2015

PCBs in Soil

Method: ME-(AU)-[ENV]AN400/AN420

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
QC202	SE138091.001	LB075363	08 Apr 2015	10 Apr 2015	22 Apr 2015	13 Apr 2015	23 May 2015	23 Apr 2015

Total Recoverable Metals in Soil by ICPOES from EPA 200.8 Digest

Method: ME-(AU)-[ENV]AN040/AN320

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
QC202	SE138091.001	LB075851	08 Apr 2015	10 Apr 2015	05 Oct 2015	21 Apr 2015	05 Oct 2015	22 Apr 2015

TRH (Total Recoverable Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN403

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
QC202	SE138091.001	LB075363	08 Apr 2015	10 Apr 2015	22 Apr 2015	13 Apr 2015	23 May 2015	23 Apr 2015

VOC's in Soil

Method: ME-(AU)-[ENV]AN433/AN434

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
QC202	SE138091.001	LB075468	08 Apr 2015	10 Apr 2015	22 Apr 2015	14 Apr 2015	24 May 2015	23 Apr 2015

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433/AN434/AN410

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
QC202	SE138091.001	LB075468	08 Apr 2015	10 Apr 2015	22 Apr 2015	14 Apr 2015	24 May 2015	23 Apr 2015

SGS

SURROGATES

SE138091 R0

Surrogate results are evaluated against upper and lower limit criteria established in the SGS QA/QC plan (Ref: MP-(AU)-[ENV]QU-022). At least two of three routine level soil sample surrogate spike recoveries for BTEX/VOC are to be within 70-130% where control charts have not been developed and within the established control limits for charted surrogates. Matrix effects may void this as an acceptance criterion. Water sample surrogate spike recoveries are to be within 40-130%. The presence of emulsions, surfactants and particulates may void this as an acceptance criterion.

Result is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN400/AN420

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Tetrachloro-m-xylene (TCMX) (Surrogate)	QC202	SE138091.001	%	60 - 130%	103

OP Pesticides in Soil

Method: ME-(AU)-[ENV]AN400/AN420

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
fluorobiphenyl (Surrogate)	QC202	SE138091.001	%	60 - 130%	70
14-p-terphenyl (Surrogate)	QC202	SE138091.001	%	60 - 130%	90

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN420

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2-fluorobiphenyl (Surrogate)	QC202	SE138091.001	%	70 - 130%	70
d14-p-terphenyl (Surrogate)	QC202	SE138091.001	%	70 - 130%	90
d5-nitrobenzene (Surrogate)	QC202	SE138091.001	%	70 - 130%	72

PCBs in Soil

Method: ME-(AU)-[ENV]AN400/AN420

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Tetrachloro-m-xylene (TCMX) (Surrogate)	QC202	SE138091.001	%	60 - 130%	103

VOC's in Soil

Method: ME-(AU)-[ENV]AN433/AN434

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	QC202	SE138091.001	%	60 - 130%	73
d4-1,2-dichloroethane (Surrogate)	QC202	SE138091.001	%	60 - 130%	73
d8-toluene (Surrogate)	QC202	SE138091.001	%	60 - 130%	75
Dibromofluoromethane (Surrogate)	QC202	SE138091.001	%	60 - 130%	74

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433/AN434/AN410

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	QC202	SE138091.001	%	60 - 130%	73
d4-1,2-dichloroethane (Surrogate)	QC202	SE138091.001	%	60 - 130%	73
d8-toluene (Surrogate)	QC202	SE138091.001	%	60 - 130%	75
Dibromofluoromethane (Surrogate)	QC202	SE138091.001	%	60 - 130%	74

SGS

METHOD BLANKS

SE138091 R0

Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, typically 2.5 times the statistically determined method detection limit (MDL).

Result is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Mercury In Soil

Method: ME-(AU)-[ENV]AN312

Sample Number	Parameter	Units	LOR	Result
LB075803.001	Mercury	mg/kg	0.01	<0.01

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN400/AN420

Sample Number		Parameter	Units	LOR	Result
LB075363.001		Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1
		Alpha BHC	mg/kg	0.1	<0.1
		Lindane	mg/kg	0.1	<0.1
		Heptachlor	mg/kg	0.1	<0.1
		Aldrin	mg/kg	0.1	<0.1
		Beta BHC	mg/kg	0.1	<0.1
		Delta BHC	mg/kg	0.1	<0.1
		Heptachlor epoxide	mg/kg	0.1	<0.1
		Alpha Endosulfan	mg/kg	0.2	<0.2
		Gamma Chlordane	mg/kg	0.1	<0.1
		Alpha Chlordane	mg/kg	0.1	<0.1
		p,p'-DDE	mg/kg	0.1	<0.1
		Dieldrin	mg/kg	0.2	<0.2
		Endrin	mg/kg	0.2	<0.2
		Beta Endosulfan	mg/kg	0.2	<0.2
		p,p'-DDD	mg/kg	0.1	<0.1
		p,p'-DDT	mg/kg	0.1	<0.1
		Endosulfan sulphate	mg/kg	0.1	<0.1
		Endrin Aldehyde	mg/kg	0.1	<0.1
		Methoxychlor	mg/kg	0.1	<0.1
		Endrin Ketone	mg/kg	0.1	<0.1
		Isodrin	mg/kg	0.1	<0.1
		Mirex	mg/kg	0.1	<0.1
	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	101

OP Pesticides in Soil

Method: ME-(AU)-[ENV]AN400/AN420

Sample Number		Parameter	Units	LOR	Result
LB075363.001		Dichlorvos	mg/kg	0.5	<0.5
		Dimethoate	mg/kg	0.5	<0.5
		Diazinon (Dimpylate)	mg/kg	0.5	<0.5
		Fenitrothion	mg/kg	0.2	<0.2
		Malathion	mg/kg	0.2	<0.2
		Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2
		Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2
		Bromophos Ethyl	mg/kg	0.2	<0.2
		Methidathion	mg/kg	0.5	<0.5
		Ethion	mg/kg	0.2	<0.2
		Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2
	Surrogates	2-fluorobiphenyl (Surrogate)	%	-	96
		d14-p-terphenyl (Surrogate)	%	-	112

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number	Parameter	Units	LOR	Result
LB075363.001	Naphthalene	mg/kg	0.1	<0.1
	2-methylnaphthalene	mg/kg	0.1	<0.1
	1-methylnaphthalene	mg/kg	0.1	<0.1
	Acenaphthylene	mg/kg	0.1	<0.1
	Acenaphthene	mg/kg	0.1	<0.1
	Fluorene	mg/kg	0.1	<0.1
	Phenanthrene	mg/kg	0.1	<0.1
	Anthracene	mg/kg	0.1	<0.1
	Fluoranthene	mg/kg	0.1	<0.1
	Pyrene	mg/kg	0.1	<0.1
	Benzo(a)anthracene	mg/kg	0.1	<0.1
	Chrysene	mg/kg	0.1	<0.1
	Benzo(a)pyrene	mg/kg	0.1	<0.1

SGS

METHOD BLANKS

SE138091 R0

Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, typically 2.5 times the statistically determined method detection limit (MDL).

Result is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

PAH (Polynuclear Aromatic Hydrocarbons) in Soil (continued)

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result
LB075363.001		Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1
		Dibenzo(a&h)anthracene	mg/kg	0.1	<0.1
		Benzo(ghi)perylene	mg/kg	0.1	<0.1
		Total PAH	mg/kg	0.8	<0.8
	Surrogates	d5-nitrobenzene (Surrogate)	%	-	104
		2-fluorobiphenyl (Surrogate)	%	-	96
		d14-p-terphenyl (Surrogate)	%	-	112

PCBs in Soil

Method: ME-(AU)-[ENV]AN400/AN420

Sample Number		Parameter	Units	LOR	Result
LB075363.001		Arochlor 1016	mg/kg	0.2	<0.2
		Arochlor 1221	mg/kg	0.2	<0.2
		Arochlor 1232	mg/kg	0.2	<0.2
		Arochlor 1242	mg/kg	0.2	<0.2
		Arochlor 1248	mg/kg	0.2	<0.2
		Arochlor 1254	mg/kg	0.2	<0.2
		Arochlor 1260	mg/kg	0.2	<0.2
		Arochlor 1262	mg/kg	0.2	<0.2
		Arochlor 1268	mg/kg	0.2	<0.2
		Total PCBs (Arochlors)	mg/kg	1	<1
	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	101

Total Recoverable Metals in Soil by ICPOES from EPA 200.8 Digest

Method: ME-(AU)-[ENV]AN040/AN320

Sample Number	Parameter	Units	LOR	Result
LB075851.001	Arsenic, As	mg/kg	3	<3
	Cadmium, Cd	mg/kg	0.3	<0.3
	Chromium, Cr	mg/kg	0.3	<0.3
	Copper, Cu	mg/kg	0.5	<0.5
	Lead, Pb	mg/kg	1	<1
	Nickel, Ni	mg/kg	0.5	<0.5
	Zinc, Zn	mg/kg	0.5	<0.5

H (Total Recoverable Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN403

Sample Number	Parameter	Units	LOR	Result
LB075363.001	TRH C10-C14	mg/kg	20	<20
	TRH C15-C28	mg/kg	45	<45
	TRH C29-C36	mg/kg	45	<45
	TRH C37-C40	mg/kg	100	<100
	TRH C10-C36 Total	mg/kg	110	<110

VOC's in Soil

Method: ME-(AU)-[ENV]AN433/AN434

Sample Number		Parameter	Units	LOR	Result
LB075468.001	Monocyclic Aromatic Hydrocarbons	Benzene	mg/kg	0.1	<0.1
		Toluene	mg/kg	0.1	<0.1
		Ethylbenzene	mg/kg	0.1	<0.1
		m/p-xylene	mg/kg	0.2	<0.2
		o-xylene	mg/kg	0.1	<0.1
	Polycyclic VOCs	Naphthalene	mg/kg	0.1	<0.1
	Surrogates	Dibromofluoromethane (Surrogate)	%	-	75
		d4-1,2-dichloroethane (Surrogate)	%	-	75
		d8-toluene (Surrogate)	%	-	82
		Bromofluorobenzene (Surrogate)	%	-	83
	Totals	Total BTEX*	mg/kg	0.6	<0.6

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433/AN434/AN410

Sample Number		Parameter	Units	LOR	Result
LB075468.001		TRH C6-C9	mg/kg	20	<20
	Surrogates	Dibromofluoromethane (Surrogate)	%	-	75
		d4-1,2-dichloroethane (Surrogate)	%	-	75
		d8-toluene (Surrogate)	%	-	82

SGS

DUPLICATES

SE138091 R0

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Mercury in Soil

Method: ME-(AU)-[ENV]AN312

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE138256.041	LB075803.014	Mercury	mg/kg	0.01	<0.01	<0.01	200	0
SE138300.001	LB075803.024	Mercury	mg/kg	0.01	<0.05	<0.05	200	0

Moisture Content

Method: ME-(AU)-[ENV]AN002

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE138311.004	LB075869.011	% Moisture	%w/w	0.5	12	12	38	0
SE138311.014	LB075869.022	% Moisture	%	0.5	14	14	37	0
SE138311.021	LB075869.030	% Moisture	%	0.5	8.3	8.5	42	2

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN400/AN420

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE138103.003	LB075363.010		Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	200	0
			Alpha BHC	mg/kg	0.1	<0.1	<0.1	200	0
			Lindane	mg/kg	0.1	<0.1	<0.1	200	0
			Heptachlor	mg/kg	0.1	<0.1	<0.1	200	0
			Aldrin	mg/kg	0.1	<0.1	<0.1	200	0
			Beta BHC	mg/kg	0.1	<0.1	<0.1	200	0
			Delta BHC	mg/kg	0.1	<0.1	<0.1	200	0
			Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	200	0
			o,p'-DDE	mg/kg	0.1	<0.1	<0.1	200	0
			Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	200	0
			Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	200	0
			Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	200	0
			trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	200	0
			p,p'-DDE	mg/kg	0.1	<0.1	<0.1	200	0
			Dieldrin	mg/kg	0.2	<0.2	<0.2	200	0
			Endrin	mg/kg	0.2	<0.2	<0.2	200	0
			o,p'-DDD	mg/kg	0.1	<0.1	<0.1	200	0
			o,p'-DDT	mg/kg	0.1	<0.1	<0.1	200	0
			Beta Endosulfan	mg/kg	0.2	<0.2	<0.2	200	0
			p,p'-DDD	mg/kg	0.1	<0.1	<0.1	200	0
			p,p'-DDT	mg/kg	0.1	<0.1	<0.1	200	0
			Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	200	0
			Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1	200	0
			Methoxychlor	mg/kg	0.1	<0.1	<0.1	200	0
			Endrin Ketone	mg/kg	0.1	<0.1	<0.1	200	0
			Isodrin	mg/kg	0.1	<0.1	<0.1	200	0
			Mirex	mg/kg	0.1	<0.1	<0.1	200	0
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.12	0.11	30	3

OP Pesticides in Soil

Method: ME-(AU)-[ENV]AN400/AN420

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE138103.003	LB075363.010		Dichlorvos	mg/kg	0.5	<0.5	<0.5	200	0
			Dimethoate	mg/kg	0.5	<0.5	<0.5	200	0
			Diazinon (Dimpylate)	mg/kg	0.5	<0.5	<0.5	200	0
			Fenitrothion	mg/kg	0.2	<0.2	<0.2	200	0
			Malathion	mg/kg	0.2	<0.2	<0.2	200	0
			Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2	<0.2	200	0
			Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2	<0.2	200	0
			Bromophos Ethyl	mg/kg	0.2	<0.2	<0.2	200	0
			Methidathion	mg/kg	0.5	<0.5	<0.5	200	0
			Ethion	mg/kg	0.2	<0.2	<0.2	200	0
			Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	<0.2	200	0
		Surrogates	2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.5	30	2
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.6	0.6	30	0

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN420

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE138103.003	LB075363.010	Naphthalene	mg/kg	0.1	<0.1	<0.1	200	0
		2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	200	0
		1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	200	0

SGS

DUPLICATES

SE138091 R0

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

PAH (Polynuclear Aromatic Hydrocarbons) in Soil (continued)

Method: ME-(AU)-[ENV]AN420

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE138103.003	LB075363.010		Acenaphthylene	mg/kg	0.1	<0.1	<0.1	200	0
			Acenaphthene	mg/kg	0.1	<0.1	<0.1	200	0
			Fluorene	mg/kg	0.1	<0.1	<0.1	200	0
			Phenanthrene	mg/kg	0.1	<0.1	<0.1	200	0
			Anthracene	mg/kg	0.1	<0.1	<0.1	200	0
			Fluoranthene	mg/kg	0.1	0.1	<0.1	125	18
			Pyrene	mg/kg	0.1	0.1	0.1	121	18
			Benzo(a)anthracene	mg/kg	0.1	<0.1	<0.1	200	0
			Chrysene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(b&j)fluoranthene	mg/kg	0.1	0.1	<0.1	130	10
			Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(a)pyrene	mg/kg	0.1	<0.1	<0.1	200	0
			Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	200	0
			Dibenzo(a&h)anthracene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	200	0
			Carcinogenic PAHs, BaP TEQ <LOR=0*	TEQ (mg/kg)	0.2	<0.2	<0.2	200	0
			Carcinogenic PAHs, BaP TEQ <LOR=LOR*	TEQ (mg/kg)	0.3	<0.3	<0.3	134	0
			Carcinogenic PAHs, BaP TEQ <LOR=LOR/2*	TEQ (mg/kg)	0.2	<0.2	<0.2	175	0
			Total PAH	mg/kg	0.8	<0.8	<0.8	200	0
		Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.5	0.5	30	0
			2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.5	30	2
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.6	0.6	30	0

PCBs in Soil

Method: ME-(AU)-[ENV]AN400/AN420

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE138103.003	LB075363.010		Arochlor 1016	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1221	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1232	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1242	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1248	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1254	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1260	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1262	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1268	mg/kg	0.2	<0.2	<0.2	200	0
			Total PCBs (Arochlors)	mg/kg	1	<1	<1	200	0
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0	0	30	3

Total Recoverable Metals in Soil by ICPOES from EPA 200.8 Digest

Method: ME-(AU)-[ENV]AN040/AN320

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE138311.004	LB075851.014	Arsenic, As	mg/kg	3	<3	<3	87	2
		Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	200	0
		Chromium, Cr	mg/kg	0.3	4.3	4.2	42	2
		Copper, Cu	mg/kg	0.5	4.3	4.2	42	4
		Lead, Pb	mg/kg	1	13	13	38	1
		Nickel, Ni	mg/kg	0.5	<0.5	<0.5	200	0
		Zinc, Zn	mg/kg	0.5	1.5	1.6	161	0

TRH (Total Recoverable Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN403

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE138103.003	LB075363.010		TRH C10-C14	mg/kg	20	<20	<20	200	0
			TRH C15-C28	mg/kg	45	<45	<45	200	0
			TRH C29-C36	mg/kg	45	<45	<45	200	0
			TRH C37-C40	mg/kg	100	<100	<100	200	0
			TRH C10-C36 Total	mg/kg	110	<110	<110	200	0
			TRH C10-C40 Total	mg/kg	210	<210	<210	200	0
		TRH F Bands	TRH >C10-C16 (F2)	mg/kg	25	<25	<25	200	0
			TRH >C10-C16 (F2) - Naphthalene	mg/kg	25	<25	<25	200	0
			TRH >C16-C34 (F3)	mg/kg	90	<90	<90	200	0
			TRH >C34-C40 (F4)	mg/kg	120	<120	<120	200	0

VOC's in Soil

Method: ME-(AU)-[ENV]AN433/AN434

Original	Duplicate	Parameter	Units	LOR

SGS

DUPLICATES

SE138091 R0

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

VOC's in Soil (continued)

Method: ME-(AU)-[ENV]AN433/AN434

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE138142.009	LB075468.014	Monocyclic	Benzene	mg/kg	0.1	<0.1	<0.1	200	0
		Aromatic	Toluene	mg/kg	0.1	<0.1	<0.1	200	0
			Ethylbenzene	mg/kg	0.1	<0.1	<0.1	200	0
			m/p-xylene	mg/kg	0.2	<0.2	<0.2	200	0
			o-xylene	mg/kg	0.1	<0.1	<0.1	200	0
		Polycyclic	Naphthalene	mg/kg	0.1	<0.1	<0.1	200	0
		Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	3.8	3.7	50	5
			d4-1,2-dichloroethane (Surrogate)	mg/kg	-	4.2	3.9	50	8
			d8-toluene (Surrogate)	mg/kg	-	3.7	3.6	50	2
			Bromofluorobenzene (Surrogate)	mg/kg	-	4.4	4.3	50	3
		Totals	Total Xylenes*	mg/kg	0.3	<0.3	<0.3	200	0
			Total BTEX*	mg/kg	0.6	<0.6	<0.6	200	0
SE138142.012	LB075468.018	Monocyclic	Benzene	mg/kg	0.1	<0.1	<0.1	200	0
		Aromatic	Toluene	mg/kg	0.1	<0.1	<0.1	200	0
			Ethylbenzene	mg/kg	0.1	<0.1	<0.1	200	0
			m/p-xylene	mg/kg	0.2	<0.2	<0.2	200	0
			o-xylene	mg/kg	0.1	<0.1	<0.1	200	0
		Polycyclic	Naphthalene	mg/kg	0.1	<0.1	<0.1	200	0
		Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	3.5	4.2	50	17
			d4-1,2-dichloroethane (Surrogate)	mg/kg	-	3.7	4.4	50	16
			d8-toluene (Surrogate)	mg/kg	-	3.8	4.0	50	6
			Bromofluorobenzene (Surrogate)	mg/kg	-	3.9	4.7	50	18
		Totals	Total Xylenes*	mg/kg	0.3	<0.3	<0.3	200	0
			Total BTEX*	mg/kg	0.6	<0.6	<0.6	200	0

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433/AN434/AN410

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE138142.009	LB075468.014		TRH C6-C10	mg/kg	25	<25	<25	200	0
			TRH C6-C9	mg/kg	20	<20	<20	200	0
		Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	3.8	3.7	30	5
			d4-1,2-dichloroethane (Surrogate)	mg/kg	-	4.2	3.9	30	8
			d8-toluene (Surrogate)	mg/kg	-	3.7	3.6	30	2
			Bromofluorobenzene (Surrogate)	mg/kg	-	4.4	4.3	30	3
		VPH F Bands	Benzene (F0)	mg/kg	0.1	<0.1	<0.1	200	0
			TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	200	0
SE138142.012	LB075468.018		TRH C6-C10	mg/kg	25	<25	<25	200	0
			TRH C6-C9	mg/kg	20	<20	<20	200	0
		Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	3.5	4.2	30	17
			d4-1,2-dichloroethane (Surrogate)	mg/kg	-	3.7	4.4	30	16
			d8-toluene (Surrogate)	mg/kg	-	3.8	4.0	30	6
			Bromofluorobenzene (Surrogate)	mg/kg	-	3.9	4.7	30	18
		VPH F Bands	Benzene (F0)	mg/kg	0.1	<0.1	<0.1	200	0
			TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	200	0

SGS

LABORATORY CONTROL SAMPLES

SE138091 R0

Laboratory Control Standard (LCS) results are evaluated against an expected result, typically the concentration of analyte spiked into the control during the sample preparation stage, producing a percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Mercury in Soil

Method: ME-(AU)-[ENV]AN312

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB075803.002	Mercury	mg/kg	0.01	0.21	0.2	70 - 130	105

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN400/AN420

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
075363.002		Heptachlor	mg/kg	0.1	0.2	0.2	60 - 140	97
		Aldrin	mg/kg	0.1	0.2	0.2	60 - 140	94
		Delta BHC	mg/kg	0.1	0.2	0.2	60 - 140	96
		Dieldrin	mg/kg	0.2	<0.2	0.2	60 - 140	91
		Endrin	mg/kg	0.2	0.2	0.2	60 - 140	100
		p,p'-DDT	mg/kg	0.1	0.2	0.2	60 - 140	84
	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.14	0.15	40 - 130	91

OP Pesticides in Soil

Method: ME-(AU)-[ENV]AN400/AN420

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB075363.002		Dichlorvos	mg/kg	0.5	2.2	2	60 - 140	108
		Diazinon (Dimpylate)	mg/kg	0.5	2.2	2	60 - 140	108
		Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	2.1	2	60 - 140	104
		Ethion	mg/kg	0.2	2.3	2	60 - 140	117
	Surrogates	2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.5	40 - 130	88
		d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	40 - 130	94

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB075363.002		Naphthalene	mg/kg	0.1	4.1	4	60 - 140	102
		Acenaphthylene	mg/kg	0.1	4.1	4	60 - 140	103
		Acenaphthene	mg/kg	0.1	4.0	4	60 - 140	101
		Phenanthrene	mg/kg	0.1	3.9	4	60 - 140	98
		Anthracene	mg/kg	0.1	3.9	4	60 - 140	98
		Fluoranthene	mg/kg	0.1	3.9	4	60 - 140	98
		Pyrene	mg/kg	0.1	3.8	4	60 - 140	96
		Benzo(a)pyrene	mg/kg	0.1	4.4	4	60 - 140	110
	Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.5	0.5	40 - 130	92
		2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.5	40 - 130	88
		d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	40 - 130	94

PCBs in Soil

Method: ME-(AU)-[ENV]AN400/AN420

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB075363.002	Arochlor 1260	mg/kg	0.2	0.5	0.4	60 - 140	124

Total Recoverable Metals in Soil by ICPOES from EPA 200.8 Digest

Method: ME-(AU)-[ENV]AN040/AN320

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB075851.002	Arsenic, As	mg/kg	3	50	50	80 - 120	100
	Cadmium, Cd	mg/kg	0.3	50	50	80 - 120	100
	Chromium, Cr	mg/kg	0.3	50	50	80 - 120	100
	Copper, Cu	mg/kg	0.5	51	50	80 - 120	101
	Lead, Pb	mg/kg	1	51	50	80 - 120	101
	Nickel, Ni	mg/kg	0.5	51	50	80 - 120	101
	Zinc, Zn	mg/kg	0.5	50	50	80 - 120	100

TRH (Total Recoverable Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN403

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB075363.002		TRH C10-C14	mg/kg	20	40	40	60 - 140	100
		TRH C15-C28	mg/kg	45	<45	40	60 - 140	98
		TRH C29-C36	mg/kg	45	<45	40	60 - 140	85
	TRH F Bands	TRH >C10-C16 (F2)	mg/kg	25	40	40	60 - 140	100
		TRH >C16-C34 (F3)	mg/kg	90	<90	40	60 - 140	98
		TRH >C34-C40 (F4)	mg/kg	120	<120	20	60 - 140	75

VOC's in Soil

Method: ME-(AU)-[ENV]AN433/AN434

Sample Number	Parameter	Units	LOR

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LABORATORY CONTROL SAMPLES

SE138091 R0

Laboratory Control Standard (LCS) results are evaluated against an expected result, typically the concentration of analyte spiked into the control during the sample preparation stage, producing a percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

VOC's in Soil (continued)

Method: ME-(AU)-[ENV]AN433/AN434

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB075468.002	Monocyclic	Benzene	mg/kg	0.1	2.2	2.9	60 - 140	76
	Aromatic	Toluene	mg/kg	0.1	2.3	2.9	60 - 140	78
		Ethylbenzene	mg/kg	0.1	2.3	2.9	60 - 140	81
		m/p-xylene	mg/kg	0.2	4.8	5.8	60 - 140	83
		o-xylene	mg/kg	0.1	2.4	2.9	60 - 140	82
	Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	4.9	5	60 - 140	97
		d4-1,2-dichloroethane (Surrogate)	mg/kg	-	5.0	5	60 - 140	100
		d8-toluene (Surrogate)	mg/kg	-	4.7	5	60 - 140	95
		Bromofluorobenzene (Surrogate)	mg/kg	-	5.4	5	60 - 140	108

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433/AN434/AN410

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB075468.002		TRH C6-C10	mg/kg	25	<25	24.65	60 - 140	93
		TRH C6-C9	mg/kg	20	<20	23.2	60 - 140	85
	Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	4.9	5	60 - 140	97
		d4-1,2-dichloroethane (Surrogate)	mg/kg	-	5.0	5	60 - 140	100
		d8-toluene (Surrogate)	mg/kg	-	4.7	5	60 - 140	95
		Bromofluorobenzene (Surrogate)	mg/kg	-	5.4	5	60 - 140	108
	VPH F Bands	TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	7.25	60 - 140	123

SGS

MATRIX SPIKES

SE138091 R0

Matrix Spike (MS) results are evaluated as the percentage recovery of an expected result, typically the concentration of analyte spiked into a field sub -sample during the sample preparation stage. The original sample's result is subtracted from the sub-sample result before determining the percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA/QC plan (ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Mercury in Soil — Method: ME-(AU)-[ENV]AN312

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE138091.001	LB075803.004	Mercury	mg/kg	0.01	0.20	0.02	0.2	90

Total Recoverable Metals in Soil by ICPOES from EPA 200.8 Digest — Method: ME-(AU)-[ENV]AN040/AN320

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE138091.001	LB075851.004	Arsenic, As	mg/kg	3	41	4	50	75
		Cadmium, Cd	mg/kg	0.3	43	<0.3	50	86
		Chromium, Cr	mg/kg	0.3	63	23	50	80
		Copper, Cu	mg/kg	0.5	56	9.8	50	93
		Lead, Pb	mg/kg	1	53	12	50	81
		Nickel, Ni	mg/kg	0.5	51	8.6	50	85
		Zinc, Zn	mg/kg	0.5	61	16	50	89

SGS

MATRIX SPIKE DUPLICATES

SE138091 R0

Matrix spike duplicates are calculated as Relative Percent Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The original result is the analyte concentration of the matrix spike. The Duplicate result is the analyte concentration of the matrix spike duplicate.

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

No matrix spike duplicates were required for this job.

SGS

FOOTNOTES

SE138091 R0

Samples analysed as received.

Solid samples expressed on a dry weight basis.

QC criteria are subject to internal review according to the SGS QA/QC plan and may be provided on request or alternatively can be found here: http://www.sgs.com.au/~/media/Local/Australia/Documents/Technical%20Documents/MP-AU-ENV-QU-022%20QA%20QC%20Plan.pdf

*	Non-accredited analysis.
-	Sample not analysed for this analyte.
^	Analysis performed by external laboratory.
IS	Insufficient sample for analysis.
LNR	Sample listed, but not received.
LOR	Limit of reporting.
QFH	QC result is above the upper tolerance.
QFL	QC result is below the lower tolerance.
①	At least 2 of 3 surrogates are within acceptance criteria.
②	RPD failed acceptance criteria due to sample heterogeneity.
③	Results less than 5 times LOR preclude acceptance criteria for RPD.
④	Recovery failed acceptance criteria due to matrix interference.
⑤	Recovery failed acceptance criteria due to the presence of significant concentration of analyte (i.e. the concentration of analyte exceeds the spike level).
⑥	LOR was raised due to sample matrix interference.
⑦	LOR was raised due to dilution of significantly high concentration of analyte in sample.
⑧	Reanalysis of sample in duplicate confirmed sample heterogeneity and inconsistency of results.
⑨	Recovery failed acceptance criteria due to sample heterogeneity.
⑩	LOR was raised due to high conductivity of the sample (required dilution).
†	Refer to Analytical Report comments for further information.

ANALYTICAL REPORT

CLIENT DETAILS		LABORATORY DETAILS	
Contact	[redacted]	Manager	[redacted]
Client	AECOM Australia Pty Ltd	Laboratory	SGS Alexandria Environmental
Address	Level 2, 60 Marcus Clarke Street ACT 2600	Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	02 6201 3000	Telephone	+61 2 [redacted]
Facsimile	02 6201 3099	Facsimile	+61 2 8594 0499
Email	[redacted]@aecom.com	Email	au.environmental.sydney@sgs.com
Project	**60339175,Task 1.3- Charnwood Remediation**	SGS Reference	SE138091 R0
Order Number	**60339175,Task 1.3**	Report Number	0000108649
Samples	1	Date Reported	28 Apr 2015
		Date Received	10 Apr 2015

COMMENTS

Accredited for compliance with ISO/IEC 17025. NATA accredited laboratory 2562(4354).

PFOA/PFOS - subcontracted to SGS Leeder Consulting, 4 - 5, 18 Redland Drive Mitcham VIC, NATA Accreditation Number 14429.

No respirable fibres detected in all samples using trace analysis technique.

Asbestos analysed by Approved Identifier Yusuf Kuthpudin .

SIGNATORIES

[redacted]

SGS

ANALYTICAL REPORT

SE138091 R0

RESULTS

Fibre Identification in soil — Method AN602

Laboratory Reference	Client Reference	Matrix	Sample Description	Date Sampled	Fibre Identification	Est.%w/w
SE138091.001	QC202	Soil	865g clay	08 Apr 2015	No Asbestos Found	<0.01

SGS

METHOD SUMMARY

SE138091 R0

METHOD	METHODOLOGY SUMMARY
AN602	Qualitative identification of chrysotile, amosite and crocidolite in bulk samples by polarised light microscopy (PLM) in conjunction with dispersion staining (DS). AS4964 provides the basis for this document. Unequivocal identification of the asbestos minerals present is made by obtaining sufficient diagnostic `clues`, which provide a reasonable degree of certainty, dispersion staining is a mandatory `clue` for positive identification. If sufficient `clues` are absent, then positive identification of asbestos is not possible. This procedure requires removal of suspect fibres/bundles from the sample which cannot be returned.
AN602	Fibres/material that cannot be unequivocably identified as one of the three asbestos forms, will be reported as unknown mineral fibres (umf).
AN602	AS4964.2004 Method for the Qualitative Identification of Asbestos in Bulk Samples, Section 8.4, Trace Analysis Criteria, Note 4 states:"Depending upon sample condition and fibre type, the detection limit of this technique has been found to lie generally in the range of 1 in 1,000 to 1 in 10,000 parts by weight, equivalent to 1 to 0.1 g/kg."
AN602	The sample can be reported "no asbestos found at the reporting limit of 0.1 g/kg" (<0.01%w/w) where AN602 section 4.5 of this method has been followed, and if- (a) no trace asbestos fibres have been detected (i.e. no 'respirable' fibres): (b) the estimated weight of non-respirable asbestos fibre bundles and/or the estimated weight of asbestos in asbestos-containing materials are found to be less than 0.1g/kg: and (c) these non-respirable asbestos fibre bundles and/or the asbestos containing materials are only visible under stereo-microscope viewing conditions.

FOOTNOTES

Amosite	-	Brown Asbestos	NA	-	Not Analysed
Chrysotile	-	White Asbestos	LNR	-	Listed, Not Required
Crocidolite	-	Blue Asbestos	*	-	Not Accredited
Amphiboles	-	Amosite and/or Crocidolite	**	-	Indicative data, theoretical holding time exceeded.

(In reference to soil samples only) This report does not comply with the analytical reporting recommendations in the Western Australian Department of Health Guidelines for the Assessment and Remediation and Management of Asbestos Contaminated sites in Western Australia - May 2009.

Sampled by the client.

Where reported: 'Asbestos Detected': Asbestos detected by polarized light microscopy, including dispersion staining.
Where reported: 'No Asbestos Found': No Asbestos Found by polarized light microscopy, including dispersion staining.
Where reported: 'UMF Detected': Mineral fibres of unknown type detected by polarized light microscopy, including dispersion staining. Confirmation by another independent analytical technique may be necessary.

Even after disintegration it can be very difficult, or impossible, to detect the presence of asbestos in some asbestos-containing bulk materials using polarised light microscopy. This is due to the low grade or small length or diameter of asbestos fibres present in the material, or to the fact that very fine fibres have been distributed intimately throughout the materials.

The QC criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here : http://www.sgs.com.au/~/media/Local/Australia/Documents/Technical%20Documents/MP-AU-ENV-QU-022%20QA%20QC%20Plan.pdf

SGS LEEDER CONSULTING

A.B.N. 44 000 964 278
3 - 5, 18 Redland Drive
Mitcham, Vic, 3132
Telephone: (03) 9874 1988
Fax: (03) 9874 1933

Chartered Chemists

28-Apr-2015

REPORT NUMBER: M150782

Site/Client Ref: SE138091

AECOM Canberra

Level 2
60 Marcus Clarke Street
Canberra
Australian Capital Territory 2600
Attention: Ryan O'Leary

CERTIFICATE OF ANALYSIS

SAMPLES:	One sample was received for analysis
DATE RECEIVED:	**13-Apr-2015**
DATE COMMENCED:	**13-Apr-2015**
METHODS:	See Attached Results
RESULTS:	Please refer to attached pages for results.

Note: Results are based on samples as received at SGS Leeder Consulting's laboratories

REPORTED BY:

[redacted]

NATA
WORLD RECOGNISED ACCREDITATION

NATA Accredited Laboratory Number: 14429

Accredited for compliance with ISO/IEC 17025.

SGS LEEDER CONSULTING

(I) RESULTS

Report N°: M150782

Matrix: Soil

Method: MA_1523.SL.01

Sample units are expressed in mg/kg on a dry weight basis unless otherwise stated

	Leeder ID	2015008387	2015008388
	Client ID	SE138091.001 QC202	Method
	Sampled Date	8/04/2015	
Analyte Name	**PQL**		Blank
Perfluorooctane sulfonate	0.01	2.1	nd
Perfluorooctanoic Acid	0.01	nd	nd

SGS LEEDER CONSULTING

(II) QUALITY CONTROL

Report N°: M150782

Matrix: Soil

Method: MA_1523.SL.01

Quality Control Results are expressed in Percent Recovery of expected result

	Leeder ID	2015008389	2015008390
	Client ID	Method	Method
	Sampled Date		
Analyte Name	**PQL**	Spike	Spike Dup
Perfluorooctane sulfonate		85	96
Perfluorooctanoic Acid		99	93

SGS LEEDER CONSULTING

Report N°: M150782

QUALIFIERS / NOTES FOR REPORTED RESULTS

PQL	Practical Quantitation Limit
nd	Not Detected – The analyte was not detected above the reported PQL.
is	Insufficient Sample to perform this analysis.
T	Tentative identification based on computer library search of mass spectra.
NC	Not calculated and/or Results below PQL
NV	No Vacuum, Canister received above standard atmospheric pressure
nr	Not Requested for analysis.
R	Rejected Result – results for this analysis failed QC checks.
SQ	Semi-Quantitative result – quantitation based on a generic response factor for this class of analyte.
IM	Inappropriate method of analysis for this compound
U	Unable to provide Quality Control data – high levels of compounds in sample interfered with analysis of QC results.
UF	Unable to provide Quality Control data- Surrogates failed QC checks due to sample matrix effects
L	Analyte detected at a level above the linear response of calibration curve.
E	Estimated result. NATA accreditation does not cover estimated results.
C1	These compounds co-elute.
--	Parameter Not Determined
CT	Elevated concentration. Results reported from carbon tube analysis
**	Sample shows non-petroleum hydrocarbon profile

SGS LEEDER CONSULTING

APPENDIX ONE.

CHAIN OF CUSTODY DOCUMENT

SGS

CHAIN OF CUSTODY & ANALYSIS REQUEST
(FOR INTERLAB WORK)

Receiving Laboratory: **SGS Leeder Consulting**

Initiating Laboratory: SGS Sydney - Alexandria
Initiating Contact: Huong Crawford
Send Results to: au.samplereceipt.sydney@sgs.com and au.environmental.sydney@sgs.com

Final Report Required: **Yes** / No / NATA	Prelim Report Due: / / am/pm	Special Prices Apply: Yes / No	
Send To: **Us** / Client	Final Report Due: **22/04/2015** am/pm	Quote No:	Client:**
Address To: Us / **Client***	Matrix / Preservation Method	Analysis Required	Remarks

SGS Job No: **SE138091**	Client Job No: **60339175,Task 1.3-Charnwood Remediation**	Water	Soil	DATE SAMPLED	Ice	Acid	Other	None	PFOS / PFOA
Sample No.	Sample No.								
SE138091.001	**QC202**		x	**08/04/2015**					x

Client Contacts for AUENVSE:
INVOICE = Invoice
SGS_SYD_REPORTS_PM = REPORTS
SGS_SYD_SRA_PM = Sample Receipt Advice

SE138091 SUBCON

Received: 10 – Apr – 2015

COURIER SERVICE: STARTRACK

CONSIGNMENT No:

Relinquished By: [redacted] Date/Time: 10/04/2015

[redacted] Date/Time 13/4/15 11:20am

*NOTES:** Client Address: Attention: [redacted]

To: AECOM Australia Pty Ltd

Address: Level 2, 60 Marcus Clarke Street, CANBERRA ACT 2600

*** Special Prices, Quotes, Clients **MUST BE** Referred

AECOM

APPENDIX D – CALIBRATION RECORDS

AECOM

ANZ

PID Calibration Form

Q4AN(EV)-336-FM12

Project Name	Charnwood Phase 2
Project Number	60339175
Frequency	☒ Daily on User ☐ Twice Daily

PID Serial No.	Date/Time	Hired Equipment Y/N (if yes, attach calibration sheet)	Fresh Air Cal. OK Y/N	Gas	Calibrate OK Y/N	Filter Change Required Y/N	Pump Clean Required Y/N	Charging Required Y/N	Comments	Name (print)	Signature
SN: 592-905519	4/2/15 8:15am	N	Y	Y Isobutylene	Y	N	N	N	99.9 ppm	[redacted]	
SN: 592-905519	5/2/15 8:30am	N	Y	Y "	Y	N	N	N	100.1 ppm		
SN: 592-905519	8/4/15 9:50am	N	Y	Y "	Y	N	N	Y	100.6 ppm		
SN: 592-905519	13/4/15 1:15pm	N	Y	Y "	Y	N	N	N	100.1 ppm		

AECOM

APPENDIX E – SITE PHOTOGRAPHS

AECOM

PHOTOGRAPHIC LOG

Site Name: Former Charnwood Fire Station	Site Location: Charnwood, ACT	Project No: 60339175

Plate No. 1	Date: 8 April 15

Direction Photo Taken:

South

Description:

Test pit 5 (TP05) located on the south-east corner of the site

Plate No. 2	Date: 8 April 15

Direction Photo Taken:

South west

Description:

Bobcat excavating TP05

AECOM

Plate No. 3	Date: 8 April 15
Direction Photo Taken: South	
Description: Bobcat stockpiling excavated material under the shed cover	

Plate No. 4	Date: 8 April 15
Direction Photo Taken: North	
Description: TP05 excavated to 0.3 m below ground level (bgl) prior to validation samples being taken	

AECOM

Plate No. 5	Date: 8 April 15
Direction Photo Taken: South west	
Description: TP05 excavated area where validation samples were taken	

Plate No. 6	Date: 8 April 15
Direction Photo Taken: NA	
Description: Validation sample 1 (VS01)	

AECOM

Plate No. 7	Date: 8 April 15
Direction Photo Taken: NA	
Description: Validation sample 2 (VS02)	

Plate No. 8	Date: 8 April 15
Direction Photo Taken: South	
Description: Completion of the excavation with appropriately bunded stockpiled material under the shed	

Moroney, Rebecca (Health)

From: EPAPlanningLiaison
Sent: Friday, 9 June 2017 2:41 PM
To: Pradhan, Jyoti
Subject: RE: DA2017314430-22/97 Charnwood - HPS comments - clarification from EPA [SEC=UNCLASSIFIED]

Hi Jyoti,

I would suggest this is a request for further information and that the applicant should be asked to provide that information.

Regards,

Robin Brown | Environment Protection Authority Planning Liaison
Phone 02 6207 5642
Environmental Quality | Construction Environment & Workplace Protection | Access Canberra | **ACT Government**
Dame Pattie Menzies House, Challis Street, Dickson | GPO Box 158 Canberra ACT 2601 | www.environment.act.gov.au

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From: Pradhan, Jyoti
Sent: Friday, 9 June 2017 1:12 PM
To: Yousaf, Irfan
Cc: Brown, Robin
Subject: DA2017314430-22/97 Charnwood - HPS comments - clarification from EPA [SEC=UNCLASSIFIED]
Importance: High

Good afternoon Irfan,

I refer to the attached comments from the Health Protection Services (HPS) in relation to the proposed child care centre in Charnwood.

HPS has requested further information in relation to the results of the perfluorooctane sulphonate and perfluorooctanoic acid analysis of soil. Could you please advise if EPA has any information or record in regards to this?

If you need to discuss this matter with HPS, please contact Faith Bvirakare on 6205 9616.

Your quick response will be most appreciated as if I need to ask the applicant to provide any additional information I can request it soon.

Regards,
Jyoti

Jyoti Pradhan

Assessment Officer | DA Merit Assessment - Commercial
(Working hours - Monday to Friday 8.00am - 2.30pm)
Phone 02 6207 1649 | Fax 02 6207 1856 |
Planning Delivery Division | Environment, Planning and Sustainable Development Directorate | **ACT Government**

Dame Pattie Menzies House, Challis Street, Dickson | GPO Box 1908 Canberra ACT 2601 | www.actpla.act.gov.au

From: HPS
Sent: Monday, 5 June 2017 8:56 AM
To: EPD, Customer Services
Subject: FW: Referral-Health-Development Application - 2017314430-22-97-Charnwood-03
Importance: High

Hi there,

Please see attached response from HPS mailbox.

Kind regards

Health Protection Service

ACT Government
Health

EPDcustomerservices@act.gov.au

Referral-Health-Development Application – 201731430-22-97-CHARNWOOD-03

Dear Sir/Madam,

Thank you for the documentation received on 12 May 2017 regarding a proposed childcare centre in Charnwood.

The Health Protection Service (HPS) notes that the proposed development will include:

a. demolition of an existing building
b. construction of a single storey, 1217 square meter childcare centre
c. construction of 1157 square meter playground, site works and fencing.

The development proposes construction of a kitchen. The applicant is required to submit a food business registration and fit-out assessment application (with suitably detailed plans) to the HPS for the food business prior to construction. The applicant is advised to contact the HPS for further information.

The HPS supports the Environment Protection Authority's (EPA) endorsement of the report conducted by AECOM Australia Pty Ltd, but seeks further information regarding the results of the perfluorooctane sulphonate and perfluorooctanoic acid analysis of soil.

HPS also supports the EPA's recommendation that a site specific unexpected finds protocol be developed by a suitably qualified environmental consultant and implemented during development works at the site.

There are no other public health concerns in relation to the proposed development.

Please contact Faith Bvirakare on (02) 62059616 if you require any further information.

Yours sincerely

Conrad Barr
Executive Director
Health Protection Service

7 June 2017

Rogers, Keith (Health)

From: Rogers, Keith (Health) on behalf of Environmental Health
Sent: Monday, 3 July 2017 5:13 PM
To: Bvirakare, Faith (Health)
Subject: FW: REFERRAL-ACT HEALTH-201731430-S141A & B-22/97 CHARNWOOD-01 [SEC=UNCLASSIFIED]
Attachments: ENTITYADVICE-201731430-S141A-01.pdf; SUPP-201731430-S141A-FURTHER INFO RESPONSE-01.pdf; RE: DA2017314430-22/97 Charnwood - HPS comments - clarification from EPA [SEC=UNCLASSIFIED]; FW: Referral-Health-Development Application - 2017314430-22-97-Charnwood-03

Hi Faith,

Can you have a look at this please. It may just be a filing thing or it may need response?

Cheers,

ACT Government Health
Care Excellence Collaboration Integrity

Keith Rogers
A/ Team Leader | Environmental Health
Health Protection Service | Population Health Protection and Prevention | ACT Health
25 Mulley Street Holder ACT | Locked Bag 5005 Weston Creek ACT 2611
T 02 6205 1716 | **M** [redacted] | **E** keith.rogers@act.gov.au | www.health.act.gov.au |

From: HPS
Sent: Monday, 3 July 2017 10:01 AM
To: Environmental Health
Subject: FW: REFERRAL-ACT HEALTH-201731430-S141A & B-22/97 CHARNWOOD-01 [SEC=UNCLASSIFIED]

Good Morning,
Does anyone know anything about this.

ACT Government Health
Care Excellence Collaboration Integrity

(Milly) Michelle Olsson
Business Support Services
Health Protection Service I Population Health I ACT Health
25 Mulley Street Holder ACT I Locked Bag 5005 Weston Creek ACT 2611
T 02 6205 1700 I E michelle.olsson@act.gov.au

From: EPD, Customer Services
Sent: Monday, 3 July 2017 9:45 AM
To: HPS <HPS@act.gov.au>
Subject: REFERRAL-ACT HEALTH-201731430-S141A & B-22/97 CHARNWOOD-01 [SEC=UNCLASSIFIED]

PLEASE IGNORE PREVIOUS EMAIL

DEVELOPMENT APPLICATION NO: 201731430 S141A & B
BLOCK: 22 **SECTION**: 97 **DIVISION:** CHARNWOOD

S141 Further Information prior to decision – PROPOSAL FOR NEW COMMERCIAL DEVELOPMENT - demolition of the existing buildings and construction of a childcare centre and pre-school, landscaping, surface car park, services intrastructure, signage and associated site works.

Pursuant to Section 148(1) of the Planning and Development Act 2007 the ACT Planning and Land Authority requests that you consider the above mentioned development application and provide any written advice no later than 15 working days after the date of this notice **(24/07/2017).**

In accordance with Section 150 of the Planning and Development Act 2007 If advice is not received within the prescribed time it will be taken that you have supported the application.

Please forward any written advice via email to Customer Services

EPDcustomerservices@act.gov.au

Please use the following format in the subject line of the email when providing advice:
COMM-Agency Name-20080XXXX-Block XX Section XX SuburbXXXXX-01
Example: COMM-Heritage-200801234-Block 10 Section 10 Dickson-01

Kind Regards

Customer Services

Phone 02 6207 1923
Access Canberra | ACT Government
Dame Pattie Menzies House, Challis Street, Dickson | GPO Box 158 Canberra ACT 2601
Access Canberra is an ACT Government service that brings together customer and regulatory services, including the former Environment and Planning Directorates Customer Services Team. Access Canberra has been set up to make it easier for business, community organisations and individuals to work with ACT Government and deliver a more seamless experience.
www.planning.act.gov.au |EPDcustomerservices@act.gov.au

1.92mg /1000g soil
1.92µg / g soil
.192µg / 0.1g
or
192ng / 100mg.