

APPENDIX IV – ANALYTICAL RESULTS

New South Wales Office:
A. D. Envirotech Australia Pty Ltd
Unit 4, 10-11 Millennium Court
Silverwater, NSW 2128

Queensland Office:
A. D. Envirotech Australia Pty Ltd
P.O. Box 288
Upper Coomera, QLD 4209

Telephone:
NSW: (02) 9648 6669
QLD: (07) 5519 4610

Internet:
site: www.ADenvirotech.com.au
e-mail: info@ADenvirotech.com.au



Environmental and OH&S Laboratory

A division of A. D. Envirotech Australia Pty Ltd

A.C.N. 093 452 950

Unit 4/10-11 Millennium Court,
Silverwater 2128

Ph: (02) 9648-6669

Analysis report: 8695-WAC1

Customer: A. D. Envirotech Australia Pty. Ltd.

Attention: Clifton Thompson

Sample Log In Details

Your reference: 8695-WAC1
 No. of Samples: 4
 Date Received: 02.02.2015
 Date completed instructions received: 02.02.2015
 Date of analysis: 02.02-04.02.2015

Report Details

Report Date: 04.02.2015
 Method number**:
 ESA-MP-01
 ESA-MP-02
 ESA-P-ORG3
 ESA-P-ORG07
 ESA-P-ORG08
 ESA-P-ORG09
 ESA-P-ORG14
 ESA-P-ORG15
 AS 1289.4.3.1
 *ESA-P-16
 *Texture Assessment

Results Authorised By:

Dr Dominika Wojtalewicz (MRACI CCHEM)

Laboratory Manager



Accreditation No.14664.

Accredited for compliance with ISO/IEC 17025.

The results of the tests, calibrations and/or
 measurements included in this document are traceable
 to Australian/national standards.

Tests not covered by NATA are denoted with *.

Lab ID	PQL (mg/kg)	8695-C1	8695-C2	8695-C3	8695-C4
		8695-WAC1	8695-WAC2	8695-WAC3	8695-WAC4
Sample Name					
PAH					
Acenaphthene	0.3	<0.3	<0.3	<0.3	<0.3
Acenaphthylene	0.3	<0.3	<0.3	<0.3	<0.3
Anthracene	0.3	<0.3	<0.3	<0.3	<0.3
Benzo[a]anthracene	0.3	<0.3	<0.3	0.4	<0.3
Benzo[a]pyrene	0.3	<0.3	<0.3	0.5	<0.3
Benzo[b]fluoranthene	0.3	0.3	<0.3	0.7	<0.3
Benzo[g,h,i]perylene	0.3	<0.3	<0.3	0.5	<0.3
Benzo[k]fluoranthene	0.3	<0.3	<0.3	<0.3	<0.3
Chrysene	0.3	<0.3	<0.3	0.4	<0.3
Dibenzo[a,h]anthracene	0.3	<0.3	<0.3	<0.3	<0.3
Fluoranthene	0.3	0.4	0.6	0.9	<0.3
Fluorene	0.3	<0.3	<0.3	<0.3	<0.3
Indeno(1,2,3-cd)pyrene	0.3	<0.3	<0.3	0.5	<0.3
Naphthalene	0.3	<0.3	<0.3	<0.3	<0.3
Phenanthrene	0.3	<0.3	<0.3	<0.3	<0.3
Pyrene	0.3	0.4	0.5	0.9	<0.3
p-Terphenyl-d14	surr.	101%	101%	97%	98%
OCPs					
aldrin	0.1	<0.1	<0.1	<0.1	<0.1
a-BHC	0.1	<0.1	<0.1	<0.1	<0.1
b-BHC	0.1	<0.1	<0.1	<0.1	<0.1
d-BHC	0.1	<0.1	<0.1	<0.1	<0.1
g-BHC (lindane)	0.1	<0.1	<0.1	<0.1	<0.1
cis-chlordane	0.1	<0.1	<0.1	<0.1	<0.1
trans-chlordane	0.1	<0.1	<0.1	<0.1	<0.1
4,4'-DDD	0.1	<0.1	<0.1	<0.1	<0.1
4,4'-DDE	0.1	<0.1	<0.1	<0.1	<0.1
4,4'-DDT	0.1	<0.1	<0.1	<0.1	<0.1
dieldrin	0.1	<0.1	<0.1	<0.1	<0.1
endosulfan I	0.2	<0.2	<0.2	<0.2	<0.2
endosulfan II	0.2	<0.2	<0.2	<0.2	<0.2
endosulfan sulfate	0.1	<0.1	<0.1	<0.1	<0.1
endrin	0.2	<0.2	<0.2	<0.2	<0.2
endrin aldehyde	0.1	<0.1	<0.1	<0.1	<0.1
endrin ketone	0.1	<0.1	<0.1	<0.1	<0.1
heptachlor	0.1	<0.1	<0.1	<0.1	<0.1
heptachlor epoxide	0.1	<0.1	<0.1	<0.1	<0.1
hexachlorobenzene	0.1	<0.1	<0.1	<0.1	<0.1
methoxychlor	0.1	<0.1	<0.1	<0.1	<0.1
TCMX	surr.	108%	109%	103%	105%
OPPs					
chlorpyrifos	0.1	<0.1	<0.1	<0.1	<0.1
chlorpyrifos methyl	0.1	<0.1	<0.1	<0.1	<0.1
diazinon	0.1	<0.1	<0.1	<0.1	<0.1
fenchlorphos	0.1	<0.1	<0.1	<0.1	<0.1
methyl parathion	0.1	<0.1	<0.1	<0.1	<0.1
prophos	0.1	<0.1	<0.1	<0.1	<0.1
tributylphosphorothioite	0.1	<0.1	<0.1	<0.1	<0.1
PCB					
Total PCB		<0.6	<0.6	<0.6	<0.6
2-fluorobiphenyl	surr.	116%	117%	114%	114%

Lab ID	PQL (mg/kg)	8695-C1	8695-C2	8695-C3	8695-C4
Sample Name		8695-WAC1	8695-WAC2	8695-WAC3	8695-WAC4
TRH					
>C6-C10	35	<35	<35	<35	<35
>C10-C16	50	<50	<50	<50	<50
>C16-C34	100	<100	<100	<100	<100
>C34-C40	100	<100	<100	<100	<100
BTEX					
Benzene	0.5	<0.5	<0.5	<0.5	<0.5
Toluene	0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	1	<1	<1	<1	<1
m, p- Xylene(s)	2	<2	<2	<2	<2
o-Xylene	1	<1	<1	<1	<1
Fluorobenzene	surr.	105%	106%	103%	102%
Metals					
Arsenic	2	6.2	<2	12	<2
Cadmium	0.3	<0.3	<0.3	<0.3	<0.3
Chromium	5	<5	<5	6.1	<5
Copper	5	45	5.7	51	47
Lead	10	200	54	190	31
Mercury	0.2	<0.2	<0.2	<0.2	<0.2
Nickel	10	18	<10	11	44
Zinc	5	160	27	140	110
Moisture	%	13%	13%	18%	10%
pH (average for 3 measurements)		7.2	6.9	6.4	9.7
EC	[dS/m]	2.21	0.11	0.04	0.27
Soil Texture Group		Light Clays	Sands	Medium & Heavy Clays	Light Clays
Approximate Clay		35-45	up to 10	>45	35-45
EC1:5 to ECE conversion factor		8.6	17	7	8.6

Lab ID	PQL (mg/kg)	Blank 1	Blank spike 1	Matrix spike 1	Duplicate 1- Value 1	Duplicate 1- Value 2	Duplicate 1
Sample Name							
PAH							
Acenaphthene	0.3	<0.3	99%	101%	<0.3	<0.3	ACCEPT
Acenaphthylene	0.3	<0.3	NT	NT	<0.3	<0.3	ACCEPT
Anthracene	0.3	<0.3	103%	104%	<0.3	<0.3	ACCEPT
Benzo[a]anthracene	0.3	<0.3	NT	NT	<0.3	<0.3	ACCEPT
Benzo[a]pyrene	0.3	<0.3	NT	NT	<0.3	<0.3	ACCEPT
Benzo[b]fluoranthene	0.3	<0.3	NT	NT	<0.3	<0.3	ACCEPT
Benzo[g,h,i]perylene	0.3	<0.3	NT	NT	<0.3	<0.3	ACCEPT
Benzo[k]fluoranthene	0.3	<0.3	NT	NT	<0.3	<0.3	ACCEPT
Chrysene	0.3	<0.3	NT	NT	<0.3	<0.3	ACCEPT
Dibenzo[a,h]anthracene	0.3	<0.3	NT	NT	<0.3	<0.3	ACCEPT
Fluoranthene	0.3	<0.3	99%	97%	0.6	<0.3	ACCEPT
Fluorene	0.3	<0.3	NT	NT	<0.3	<0.3	ACCEPT
Indeno(1,2,3-cd)pyrene	0.3	<0.3	NT	NT	<0.3	<0.3	ACCEPT
Naphthalene	0.3	<0.3	105%	108%	<0.3	<0.3	ACCEPT
Phenanthrene	0.3	<0.3	103%	104%	<0.3	<0.3	ACCEPT
Pyrene	0.3	<0.3	102%	103%	0.5	<0.3	ACCEPT
p-Terphenyl-d14	surr.		79%	79%	101%	107%	
OCPs							
aldrin	0.1	<0.1	94%	96%	<0.1	<0.1	ACCEPT
a-BHC	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
b-BHC	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
d-BHC	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
g-BHC (lindane)	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
cis-chlordane	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
trans-chlordane	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
4,4'-DDD	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
4,4'-DDE	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
4,4'-DDT	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
dieldrin	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
endosulfan I	0.2	<0.2	NT	NT	<0.2	<0.2	ACCEPT
endosulfan II	0.2	<0.2	NT	NT	<0.2	<0.2	ACCEPT
endosulfan sulfate	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
endrin	0.2	<0.2	77%	91%	<0.2	<0.2	ACCEPT
endrin aldehyde	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
endrin ketone	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
heptachlor	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
heptachlor epoxide	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
hexachlorobenzene	0.1	<0.1	105%	106%	<0.1	<0.1	ACCEPT
methoxychlor	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
TCMX	surr.		101%	102%	109%	113%	
OPPs							
chlorpyrifos	0.1	<0.1	90%	97%	<0.1	<0.1	ACCEPT
chlorpyrifos methyl	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
diazinon	0.1	<0.1	91%	95%	<0.1	<0.1	ACCEPT
fenchlorphos	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
methyl parathion	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
prophos	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
tributylphosphorotrithioite	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
PCB							
Total PCB		<0.6	NT	NT	<0.6	<0.6	ACCEPT
2-fluorobiphenyl	surr.		119%	120%	117%	120%	

Lab ID	PQL (mg/kg)	Blank 1	Blank spike 1	Matrix spike 1	Duplicate 1- Value 1	Duplicate 1- Value 2	Duplicate 1
Sample Name							
TRH							
>C6-C10	35	<35	NT	NT	<35	<35	ACCEPT
>C10-C16	50	<50	100%	99%	<50	<50	ACCEPT
>C16-C34	100	<100	NT	NT	<100	<100	ACCEPT
>C34-C40	100	<100	NT	NT	<100	<100	ACCEPT
BTEX							
Benzene	0.5	<0.5	104%	99%	<0.5	<0.5	ACCEPT
Toluene	0.5	<0.5	107%	101%	<0.5	<0.5	ACCEPT
Ethylbenzene	1	<1	108%	99%	<1	<1	ACCEPT
m, p- Xylene(s)	2	<2	106%	102%	<2	<2	ACCEPT
o-Xylene	1	<1	107%	102%	<1	<1	ACCEPT
Fluorobenzene	surr.		105%	98%	106%	98%	
Metals							
Arsenic	2	<2	87%	92%	<2	<2	ACCEPT
Cadmium	0.3	<0.3	95%	78%	<0.3	<0.3	ACCEPT
Chromium	5	<5	93%	110%	<5	<5	ACCEPT
Copper	5	<5	89%	87%	5.7	6.9	ACCEPT
Lead	10	<10	98%	89%	54	37	ACCEPT
Mercury	0.2	<0.2	102%	99%	<0.2	<0.2	ACCEPT
Nickel	10	<10	90%	111%	<10	<10	ACCEPT
Zinc	5	<5	94%	122%	27	27	ACCEPT
Moisture	%						
pH (average for 3 measurements)							
EC	[dS/m]						
Soil Texture Group							
Approximate Clay							
EC1:5 to ECe conversion factor							

Comments:

Sands - sand, loamy sand, clayey sand

Light Clays - sandy clay, silty clay, light clay, light medium clay

General Comments and Glossary

Tests not covered by NATA are denoted with *.

Samples are analysed on "as received" basis.

Samples were delivered chilled

Samples were preserved in correct manner

Sample containers for volatile analysis were received with minimal headspace

Samples were analysed within holding time

Some samples have been subcontracted

Yes

Yes

Yes

Yes

No

1. All samples are tested in batches of 20.

2. All results for soil samples are reported per gram of dry soil, unless otherwise stated.

3. However surrogate standards are added to samples due to PAH and BTEX analysis and recoveries are calculated, samples' results are not corrected for standards recoveries.

4. Analysis of VOC in water samples are performed on unfiltered waters (as received), spiked with surrogate

5. If heterogenous or insufficient material provided LCS is used as matrix spike for QA/QC purposes.

6. Duplicate sample and matrix spike recoveries may not be prepared on smaller jobs, however, were analysed at a frequency

7. QA/QC samples shown within the report that states the word "BATCH"; Batch Blank, Matrix Spike and Duplicate were prepared on samples from outside of reported job.

Blank: This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.

Duplicate: This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.

Matrix Spike: A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

LCS (Laboratory Control Sample): This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

Surr. (Surrogate Spike): Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

INS: Insufficient sample for this test

>: Greater than

LCS: Laboratory Control Sample

NT: Not tested

<: Less than

RPD: Relative Percent Difference

NA: Test not required

PQL: Practical Quantitation Limit

Laboratory Acceptance Criteria

Matrix Spikes and LCS: Ger Matrix heterogeneity may result in matrix spike analyses falling outside these limits

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the PQL : No Limit

Results between 10-20 times the PQL : RPD must lie between 0-50%

Results >20 times the PQL : RPD must lie between 0-30%

Surrogate Recoveries : Recoveries must lie between 50-150% - Phenols 20-130%.



Accreditation No.14664.

Accredited for compliance with ISO/IEC 17025.

The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Tests not covered by NATA are denoted with *.

****Methods Number Description:**

ESA-MP-01	Determination of metals by MP-AES
ESA-MP-02	Digestion of soil samples for MP-AES analysis
ESA-MP-03	Preparation of water samples for metals determination by MP-AES
ESA-MP-04	TCLP for inorganic contaminants
ESA-MP-05	Digestion of paint and dust samples for lead content determination
ESA-MP-06	Digestion of air filters
ESA-MP-07	Digestion of swabs for determination of lead content in dust
ESA-P-ORG02	Analysis of PAHs by GC-MS
ESA-P-ORG03	Analysis of TRH and TPH by GC-FID
ESA-P-ORG04	Separatory funnel extraction of PAHs from water matrices including TCLP extracts
ESA-P-ORG05	Separatory funnel extraction of TRH and TPH from water matrices
ESA-P-ORG06	Silica gel clean up of soil and water extracts, prior analysis for STPH
ESA-P-ORG07	Extraction of BTEX and VTRX from soil matrices
ESA-P-ORG08	Analysis of soil extracts and waters by P&T GCMS
ESA-P-ORG09	Extraction of TRH from solid matrices
ESA-P-ORG11	Extraction of OCP OPP and PAH from soil matrices
ESA-P-ORG12	Analysis of OCP OPP and PAHs by GC-MS
AS 1289.4.3.1	Determination of the pH value of a soil-Electrometric method
AS 1289.3.6.1	Determination of the particle size distribution of a soil - Standard method of analysis by sieving
T276	NSW RMS Test Method T 276 Foreign materials content of recycled crushed concrete
*Texture Assessment based on; Salinity Notes, Number 8, Oct 2000, ISSN 1 325-4448, "How to Texture soils & Test for Salinity"	
*ESA-P-16	Procedure for measurement of Electrical Conductivity EC
ESA-P-ORG14	Extraction of PCB (Aroclor) OCP OPP and PAH from soil matrices
ESA-P-ORG15	Analysis of PCB OCP OPP and PAH by GCMS

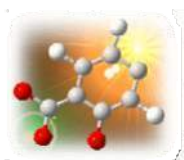
**Accreditation No.14664.**

Accredited for compliance with ISO/IEC 17025.

The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Tests not covered by NATA are denoted with *.

This document shall not be reproduced, except in full.



Environmental and OH&S Laboratory

A division of A. D. Envirotech Australia Pty Ltd

A.C.N. 093 452 950

Unit 4/10-11 Millennium Court,
Silverwater 2128
Ph: (02) 9648-6669

Analysis report: 8695-pH1

Customer: A. D. Envirotech Australia Pty. Ltd.
Attention: Karl Finnerty

Sample Log In Details

Your reference: 8695-pH1
No. of Samples: 5
Date Received: 23.02.2015
Date completed instructions received: 23.02.2015
Date of analysis: 24.02.2015

Report Details

Report Date: 24.02.2015
Method number:** AS 1289.4.3.1

Results Authorised By:

Dr Dominika Wojtalewicz (MRACI CCHEM)
Laboratory Manager/Principal Chemist



Accreditation No.14664.

Accredited for compliance with ISO/IEC 17025.

The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Tests not covered by NATA are denoted with *.

		8695-C8	8695-C9	8695-C10	8695-C11	8695-C12
Lab ID	PQL (mg/kg)					
		8695-pH1	8695-pH2	8695-pH3	8695-pH4	8695-pH5
Sample Name						
pH (average for 3 measurements)		8.0	7.9	8.0	9.3	8.1

General Comments and Glossary

Samples are analysed on "as received" basis.

Samples were delivered chilled

Samples were preserved in correct manner

Sample containers for volatile analysis were received with minimal headspace

Samples were analysed within holding time

Some samples have been subcontracted

Yes

Yes

Yes

Yes

No

1. All samples are tested in batches of 20.

2. All results for soil samples are reported per gram of dry soil, unless otherwise stated

3. However surrogate standards are added to samples due to PAH and BTEX analysis and recoveries are calculated, samples' results are not corrected for standards recoveries.

4. Analysis of VOC in water samples are performed on unfiltered waters (as received), spiked with surrogate

5. If heterogenous or insufficient material provided LCS is used as matrix spike for QA/QC purposes

6. Duplicate sample and matrix spike recoveries may not be prepared on smaller jobs, however, were analysed at a frequency

7. QA/QC samples shown within the report that states the word "BATCH"; Batch Blank, Matrix Spike and Duplicate were prepared on samples from outside of reported job.

Blank: This is the component of the analytical signal which is not derived from the sample but from reagents glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples

Duplicate: This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable

Matrix Spike: A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist

LCS (Laboratory Control Sample): This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

Surr. (Surrogate Spike): Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

INS: Insufficient sample for this test

>: Greater than

LCS: Laboratory Control Sample

NT: Not tested

<: Less than

RPD: Relative Percent Difference

NA: Test not required

PQL: Practical Quantitation Limit

Laboratory Acceptance Criteria

Matrix Spikes and LCS: Generally 70-130% for inorganics/metals, 60-140% for organics is acceptable.

Matrix heterogeneity may result in matrix spike analyses falling outside these limits

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the PQL : No Limit

Results between 10-20 times the PQL : RPD must lie between 0-50%

Results >20 times the PQL : RPD must lie between 0-30%

Surrogate Recoveries : Recoveries must lie between 50-150% - Phenols 20-130%.

Accreditation No.14664.

Accredited for compliance with ISO/IEC 17025.

The results of the tests, calibrations and/or

measurements included in this document are traceable to Australian/national standards.

Tests not covered by NATA are denoted with *.



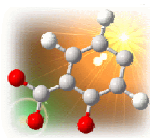
****Methods Number Description:**

ESA-MP-01	Determination of metals by MP-AES
ESA-MP-02	Digestion of soil samples for MP-AES analysis
ESA-MP-03	Preparation of water samples for metals determination by MP-AES
ESA-MP-04	TCLP for inorganic contaminants
ESA-MP-05	Digestion of paint and dust samples for lead context determination
ESA-MP-06	Digestion of air filters
ESA-MP-07	Digestion of swabs for determination of lead content in dust
ESA-P-ORG02	Analysis of PAHs by GC-MS
ESA-P-ORG03	Analysis of TRH and TPH by GC-FID
ESA-P-ORG04	Separatory funnel extraction of PAHs from water matrices including TCLP extracts
ESA-P-ORG05	Separatory funnel extraction of TRH and TPH from water matrices
ESA-P-ORG06	Silica gel clean up of soil and water extracts, prior analysis for STPH
ESA-P-ORG07	Extraction of BTEX and VTRX from soil matrices
ESA-P-ORG08	Analysis of soil extracts and waters by P&T GCMS
ESA-P-ORG09	Extraction of TRH from solid matrices
ESA-P-ORG14	Extraction of PCB (Aroclor) OCP OPP and PAH from soil matrices
ESA-P-ORG15	Analysis of PCB OCP OPP and PAH by GCMS
AS 1289.4.3.1	Determination of the pH value of a soil-Electrometric method
AS 1289.3.6.1	Determination of the particle size distribution of a soil - Standard method of analysis by sieving
T276	NSW RMS Test Method T 276 Foreign materials content of recycled crushed concrete
*Texture Assessment based on; Salinity Notes, Number 8, Oct 2000, ISSN 1 325-4448, "How to Texture soils & Test for Salinity"	
*ESA-P-16	Procedure for measurement of Electrical Conductivity EC

**Accreditation No.14664.**

Accredited for compliance with ISO/IEC 17025.
 The results of the tests, calibrations and/or
 measurements included in this document are traceable
 to Australian/national standards.

Tests not covered by NATA are denoted with *.



Environmental and OH&S Laboratory

A division of A. D. Envirotech Australia Pty Ltd

A.C.N. 093 452 950

Unit 4/10-11 Millennium Court,
Silverwater 2128
Ph: (02) 9648-6669

Analysis report: 8695-WAC3

Customer: A. D. Envirotech Australia Pty. Ltd.
Attention: Karl Finnerty

Sample Log In Details

Your reference: 8695-WAC3
No. of Samples: 2
Date Received: 12.02.2015
Date completed instructions received: 12.02.2015
Date of analysis: 12.02-20.02.2015

Report Details

Report Date: 20.02.2015
Method number:** ESA-MP-01
ESA-MP-02
ESA-P-ORG3
ESA-P-ORG07
ESA-P-ORG08
ESA-P-ORG09
ESA-P-ORG14
ESA-P-ORG15
AS 1289.4.3.1
*ESA-P-16
*Texture Assessment

Results Authorised By:

Dr Dominika Wojtalewicz (MRACI CCHEM)
Laboratory Manager



Accreditation No.14664.

Accredited for compliance with ISO/IEC 17025.

The results of the tests, calibrations and/or
measurements included in this document are traceable
to Australian/national standards.

Tests not covered by NATA are denoted with *.

Lab ID	PQL (mg/kg)	8695-C6	8695-C7
Sample Name		8695-WAC6	8695-WAC7
PAH			
Acenaphthene	0.3	<0.3	<0.3
Acenaphthylene	0.3	<0.3	<0.3
Anthracene	0.3	<0.3	<0.3
Benzo[a]anthracene	0.3	<0.3	<0.3
Benzo[a]pyrene	0.3	<0.3	<0.3
Benzo[b]fluoranthene	0.3	<0.3	<0.3
Benzo[g,h,i]perylene	0.3	<0.3	<0.3
Benzo[k]fluoranthene	0.3	<0.3	<0.3
Chrysene	0.3	<0.3	<0.3
Dibenzo[a,h]anthracene	0.3	<0.3	<0.3
Fluoranthene	0.3	<0.3	<0.3
Fluorene	0.3	<0.3	<0.3
Indeno(1,2,3-cd)pyrene	0.3	<0.3	<0.3
Naphthalene	0.3	<0.3	<0.3
Phenanthrene	0.3	<0.3	<0.3
Pyrene	0.3	<0.3	<0.3
p-Terphenyl-d14	surr.	104%	105%
OCPs			
aldrin	0.1	<0.1	<0.1
a-BHC	0.1	<0.1	<0.1
b-BHC	0.1	<0.1	<0.1
d-BHC	0.1	<0.1	<0.1
g-BHC (lindane)	0.1	<0.1	<0.1
cis-chlordane	0.1	<0.1	<0.1
trans-chlordane	0.1	<0.1	<0.1
4,4'-DDD	0.1	<0.1	<0.1
4,4'-DDE	0.1	<0.1	<0.1
4,4'-DDT	0.1	<0.1	<0.1
dieldrin	0.1	<0.1	<0.1
endosulfan I	0.2	<0.2	<0.2
endosulfan II	0.2	<0.2	<0.2
endosulfan sulfate	0.1	<0.1	<0.1
endrin	0.2	<0.2	<0.2
endrin aldehyde	0.1	<0.1	<0.1
endrin ketone	0.1	<0.1	<0.1
heptachlor	0.1	<0.1	<0.1
heptachlor epoxide	0.1	<0.1	<0.1
hexachlorobenzene	0.1	<0.1	<0.1
methoxychlor	0.1	<0.1	<0.1
TCMX	surr.	105%	106%
OPPs			
chlorpyrifos	0.1	<0.1	<0.1
chlorpyrifos methyl	0.1	<0.1	<0.1
diazinon	0.1	<0.1	<0.1
fenchlorphos	0.1	<0.1	<0.1
methyl parathion	0.1	<0.1	<0.1
prophos	0.1	<0.1	<0.1
tributylphosphorotrithioite	0.1	<0.1	<0.1
PCB			
Total PCB		<0.6	<0.6
2-fluorobiphenyl	surr.	107%	108%

Lab ID	PQL (mg/kg)	8695-C6	8695-C7
Sample Name		8695-WAC6	8695-WAC7
TRH			
>C6-C10	35	<35	<35
>C10-C16	50	<50	<50
>C16-C34	100	<100	<100
>C34-C40	100	<100	<100
BTEX			
Benzene	0.5	<0.5	<0.5
Toluene	0.5	<0.5	<0.5
Ethylbenzene	1	<1	<1
m, p- Xylene(s)	2	<2	<2
o-Xylene	1	<1	<1
Fluorobenzene	surr.	117%	111%
Metals			
Arsenic	2	7.1	15
Cadmium	0.3	<0.3	<0.3
Chromium	5	7.9	<5
Copper	5	<5	39
Lead	10	<10	<10
Mercury	0.2	<0.2	<0.2
Nickel	10	<10	<10
Zinc	5	5.7	41
Moisture	%	12%	12%
pH (average for 3 measurements)		4.0	5.6
EC	[dS/m]	0.04	0.18
Soil Texture Group		Light Clays	Medium & Heavy Clays
Approximate Clay		35-45	>45
EC _{1:5} to EC _e conversion factor		8.6	7

Lab ID	PQL (mg/kg)	Blank 1	Blank spike 1	Matrix spike 1	Duplicate 1-Value 1	Duplicate 1-Value 2	Duplicate 1
Sample Name							
PAH							
Acenaphthene	0.3	<0.3	99%	99%	<0.3	<0.3	ACCEPT
Acenaphthylene	0.3	<0.3	NT	NT	<0.3	<0.3	ACCEPT
Anthracene	0.3	<0.3	107%	106%	<0.3	<0.3	ACCEPT
Benzo[a]anthracene	0.3	<0.3	NT	NT	<0.3	<0.3	ACCEPT
Benzo[a]pyrene	0.3	<0.3	NT	NT	<0.3	<0.3	ACCEPT
Benzo[b]fluoranthene	0.3	<0.3	NT	NT	<0.3	<0.3	ACCEPT
Benzo[g,h,i]perylene	0.3	<0.3	NT	NT	<0.3	<0.3	ACCEPT
Benzo[k]fluoranthene	0.3	<0.3	NT	NT	<0.3	<0.3	ACCEPT
Chrysene	0.3	<0.3	NT	NT	<0.3	<0.3	ACCEPT
Dibenzo[a,h]anthracene	0.3	<0.3	NT	NT	<0.3	<0.3	ACCEPT
Fluoranthene	0.3	<0.3	100%	100%	<0.3	0.4	ACCEPT
Fluorene	0.3	<0.3	NT	NT	<0.3	<0.3	ACCEPT
Indeno(1,2,3-cd)pyrene	0.3	<0.3	NT	NT	<0.3	<0.3	ACCEPT
Naphthalene	0.3	<0.3	110%	110%	<0.3	<0.3	ACCEPT
Phenanthrene	0.3	<0.3	107%	106%	<0.3	<0.3	ACCEPT
Pyrene	0.3	<0.3	105%	104%	<0.3	0.4	ACCEPT
p-Terphenyl-d14	surr.		82%	83%	105%	106%	
OCPs							
aldrin	0.1	<0.1	104%	103%	<0.1	<0.1	ACCEPT
a-BHC	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
b-BHC	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
d-BHC	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
g-BHC (lindane)	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
cis-chlordane	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
trans-chlordane	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
4,4'-DDD	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
4,4'-DDE	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
4,4'-DDT	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
dieldrin	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
endosulfan I	0.2	<0.2	NT	NT	<0.2	<0.2	ACCEPT
endosulfan II	0.2	<0.2	NT	NT	<0.2	<0.2	ACCEPT
endosulfan sulfate	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
endrin	0.2	<0.2	94%	94%	<0.2	<0.2	ACCEPT
endrin aldehyde	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
endrin ketone	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
heptachlor	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
heptachlor epoxide	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
hexachlorobenzene	0.1	<0.1	105%	104%	<0.1	<0.1	ACCEPT
methoxychlor	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
TCMX	surr.		104%	105%	106%	109%	
OPPs							
chlorpyrifos	0.1	<0.1	105%	106%	<0.1	<0.1	ACCEPT
chlorpyrifos methyl	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
diazinon	0.1	<0.1	101%	102%	<0.1	<0.1	ACCEPT
fenchlorphos	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
methyl parathion	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
prophos	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
tributylphosphorotrithioite	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
PCB							
Total PCB		<0.6	NT	NT	<0.6	<0.6	ACCEPT
2-fluorobiphenyl	surr.		111%	108%	108%	108%	

Lab ID	PQL (mg/kg)	Blank 1	Blank spike 1	Matrix spike 1	Duplicate 1- Value 1	Duplicate 1- Value 2	Duplicate 1
Sample Name							
TRH							
>C6-C10	35	<35	NT	NT	<35	<35	ACCEPT
>C10-C16	50	<50	90%	84%	<50	<50	ACCEPT
>C16-C34	100	<100	NT	NT	<100	<100	ACCEPT
>C34-C40	100	<100	NT	NT	<100	<100	ACCEPT
BTEX							
Benzene	0.5	<0.5	133%	109%	<0.5	<0.5	ACCEPT
Toluene	0.5	<0.5	125%	106%	<0.5	<0.5	ACCEPT
Ethylbenzene	1	<1	124%	104%	<1	<1	ACCEPT
m, p- Xylene(s)	2	<2	126%	105%	<2	<2	ACCEPT
o-Xylene	1	<1	126%	106%	<1	<1	ACCEPT
Fluorobenzene	surr.		129%	108%	111%	109%	
Metals							
Arsenic	2	<2	108%	111%	15	10	ACCEPT
Cadmium	0.3	<0.3	100%	103%	<0.3	<0.3	ACCEPT
Chromium	5	<5	101%	84%	<5	<5	ACCEPT
Copper	5	<5	99%	95%	39	43	ACCEPT
Lead	10	<10	100%	92%	<10	<10	ACCEPT
Mercury	0.2	<0.2	109%	111%	<0.2	<0.2	ACCEPT
Nickel	10	<10	99%	95%	<10	<10	ACCEPT
Zinc	5	<5	94%	98%	41	52	ACCEPT
Moisture	%						
pH (average for 3 measurements)							
EC	[dS/m]						
Soil Texture Group							
Approximate Clay							
EC _{1:5} to EC _e conversion factor							

Comment:

Light Clays - sandy clay, silty clay, light clay, light medium clay

General Comments and Glossary

Tests not covered by NATA are denoted with *.

Samples are analysed on "as received" basis.

Samples were delivered chilled

Samples were preserved in correct manner

Sample containers for volatile analysis were received with minimal headspace

Samples were analysed within holding time

Some samples have been subcontracted

Yes

Yes

Yes

Yes

No

1. All samples are tested in batches of 20.

2. All results for soil samples are reported per gram of dry soil, unless otherwise stated.

3. However surrogate standards are added to samples due to PAH and BTEX analysis and recoveries are calculated, samples' results are not corrected for standards recoveries.

4. Analysis of VOC in water samples are performed on unfiltered waters (as received), spiked with surrogate

5. If heterogenous or insufficient material provided LCS is used as matrix spike for QA/QC purposes.

6. Duplicate sample and matrix spike recoveries may not be prepared on smaller jobs, however, were analysed at a frequency

7. QA/QC samples shown within the report that states the word "BATCH"; Batch Blank, Matrix Spike and Duplicate were prepared on samples from outside of reported job.

Blank: This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.

Duplicate: This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.

Matrix Spike: A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

LCS (Laboratory Control Sample): This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

Surr. (Surrogate Spike): Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

INS: Insufficient sample for this test

>: Greater than

LCS: Laboratory Control Sample

NT: Not tested

<: Less than

RPD: Relative Percent Difference

NA: Test not required

PQL: Practical Quantitation Limit

Laboratory Acceptance Criteria

Matrix Spikes and LCS: Ge Matrix heterogeneity may result in matrix spike analyses falling outside these limits

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the PQL : No Limit

Results between 10-20 times the PQL : RPD must lie between 0-50%

Results >20 times the PQL : RPD must lie between 0-30%

Surrogate Recoveries : Recoveries must lie between 50-150% - Phenols 20-130%.



Accreditation No.14664.

Accredited for compliance with ISO/IEC 17025.

The results of the tests, calibrations and/or

measurements included in this document are traceable to Australian/national standards.

Tests not covered by NATA are denoted with *.

New South Wales Office:

A. D. Envirotech Australia Pty Ltd

Unit 4, 10-11 Millennium Court

Silverwater, NSW 2128

Telephone:

(02) 9648 6669

e-mail: info@ADenvirotech.com.au

ABN: 520 934 529 50

****Methods Number Description:**

ESA-MP-01	Determination of metals by MP-AES
ESA-MP-02	Digestion of soil samples for MP-AES analysis
ESA-MP-03	Preparation of water samples for metals determination by MP-AES
ESA-MP-04	TCLP for inorganic contaminants
ESA-MP-05	Digestion of paint and dust samples for lead content determination
ESA-MP-06	Digestion of air filters
ESA-MP-07	Digestion of swabs for determination of lead content in dust
ESA-P-ORG02	Analysis of PAHs by GC-MS
ESA-P-ORG03	Analysis of TRH and TPH by GC-FID
ESA-P-ORG04	Separatory funnel extraction of PAHs from water matrices including TCLP extracts
ESA-P-ORG05	Separatory funnel extraction of TRH and TPH from water matrices
ESA-P-ORG06	Silica gel clean up of soil and water extracts, prior analysis for STPH
ESA-P-ORG07	Extraction of BTEX and VTRX from soil matrices
ESA-P-ORG08	Analysis of soil extracts and waters by P&T GCMS
ESA-P-ORG09	Extraction of TRH from solid matrices
ESA-P-ORG14	Extraction of PCB (Aroclor) OCP OPP and PAH from soil matrices
ESA-P-ORG15	Analysis of PCB OCP OPP and PAH by GCMS
AS 1289.4.3.1	Determination of the pH value of a soil-Electrometric method
AS 1289.3.6.1	Determination of the particle size distribution of a soil - Standard method of analysis by sieving
T276	NSW RMS Test Method T 276 Foreign materials content of recycled crushed concrete
*Texture Assessment based on; Salinity Notes, Number 8, Oct 2000, ISSN 1 325-4448, "How to Texture soils & Test for Salinity"	
*ESA-P-16	Procedure for measurement of Electrical Conductivity EC

**Accreditation No.14664.**

Accredited for compliance with ISO/IEC 17025.

The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Tests not covered by NATA are denoted with *.

This document shall not be reproduced, except in full.

New South Wales Office:

A. D. Envirotech Australia Pty Ltd
Unit 4, 10-11 Millennium Court
Silverwater, NSW 2128

Telephone:

(02) 9648 6669

e-mail: info@ADenvirotech.com.au

ABN: 520 934 529 50



Environmental and OH&S Laboratory

A division of A. D. Envirotech Australia Pty Ltd

A.C.N. 093 452 950

Unit 4/10-11 Millennium Court,
Silverwater 2128
Ph: (02) 9648-6669

Analysis report: 8695-WAC2

Customer: A. D. Envirotech Australia Pty. Ltd.
Attention: Karl Finnerty

Sample Log In Details

Your reference: 8695-WAC2
No. of Samples: 1
Date Received: 06.02.2015
Date completed instructions received: 06.02.2015
Date of analysis: 06.02-18.02.2015

Report Details

Report Date: 18.02.2015
Method number:** ESA-P-ORG3
ESA-P-ORG07
ESA-P-ORG08
ESA-P-ORG09
ESA-P-ORG14
ESA-P-ORG15
AS 1289.4.3.1
*ESA-P-16
*Texture Assessment

Results Authorised By:

Dr Dominika Wojtalewicz (MRACI CCHEM)
Laboratory Manager



Accreditation No.14664.

Accredited for compliance with ISO/IEC 17025.

The results of the tests, calibrations and/or
measurements included in this document are traceable
to Australian/national standards.

Tests not covered by NATA are denoted with *.

Lab ID	PQL (mg/kg)	8695-C5
Sample Name		8695-WAC5
PAH		
Acenaphthene	0.3	<0.3
Acenaphthylene	0.3	<0.3
Anthracene	0.3	<0.3
Benzo[a]anthracene	0.3	<0.3
Benzo[a]pyrene	0.3	<0.3
Benzo[b]fluoranthene	0.3	<0.3
Benzo[g,h,i]perylene	0.3	<0.3
Benzo[k]fluoranthene	0.3	<0.3
Chrysene	0.3	<0.3
Dibenzo[a,h]anthracene	0.3	<0.3
Fluoranthene	0.3	<0.3
Fluorene	0.3	<0.3
Indeno(1,2,3-cd)pyrene	0.3	<0.3
Naphthalene	0.3	<0.3
Phenanthrene	0.3	<0.3
Pyrene	0.3	<0.3
p-Terphenyl-d14	surr.	91%
OCPs		
aldrin	0.1	<0.1
a-BHC	0.1	<0.1
b-BHC	0.1	<0.1
d-BHC	0.1	<0.1
g-BHC (lindane)	0.1	<0.1
cis-chlordane	0.1	<0.1
trans-chlordane	0.1	<0.1
4,4'-DDD	0.1	<0.1
4,4'-DDE	0.1	<0.1
4,4'-DDT	0.1	<0.1
dieldrin	0.1	<0.1
endosulfan I	0.2	<0.2
endosulfan II	0.2	<0.2
endosulfan sulfate	0.1	<0.1
endrin	0.2	<0.2
endrin aldehyde	0.1	<0.1
endrin ketone	0.1	<0.1
heptachlor	0.1	<0.1
heptachlor epoxide	0.1	<0.1
hexachlorobenzene	0.1	<0.1
methoxychlor	0.1	<0.1
TCMX	surr.	103%
OPPs		
chlorpyrifos	0.1	<0.1
chlorpyrifos methyl	0.1	<0.1
diazinon	0.1	<0.1
fenchlorphos	0.1	<0.1
methyl parathion	0.1	<0.1
prophos	0.1	<0.1
tributylphosphorotrithioite	0.1	<0.1
PCB		
Total PCB		<0.6
2-fluorobiphenyl	surr.	114%

Lab ID	PQL (mg/kg)	8695-C5
Sample Name		8695-WAC5
TRH		
>C6-C10	35	<35
>C10-C16	50	<50
>C16-C34	100	<100
>C34-C40	100	<100
BTEX		
Benzene	0.5	<0.5
Toluene	0.5	<0.5
Ethylbenzene	1	<1
m, p- Xylene(s)	2	<2
o-Xylene	1	<1
Fluorobenzene	surr.	108%
Moisture	%	13%
pH (average for 3 measurements)		7.0
EC	[dS/m]	0.26
Soil Texture Group		Medium & Heavy Clays
Approximate Clay		>45
EC _{1:5} to EC _e conversion factor		7

Lab ID	PQL (mg/kg)	Blank 1	Blank spike 1	Matrix spike 1	Duplicate 1- Value 1	Duplicate 1- Value 2	Duplicate 1
Sample Name							
PAH							
Acenaphthene	0.3	<0.3	87%	90%	<0.3	<0.3	ACCEPT
Acenaphthylene	0.3	<0.3	NT	NT	<0.3	<0.3	ACCEPT
Anthracene	0.3	<0.3	92%	94%	<0.3	<0.3	ACCEPT
Benzo[a]anthracene	0.3	<0.3	NT	NT	<0.3	<0.3	ACCEPT
Benzo[a]pyrene	0.3	<0.3	NT	NT	<0.3	<0.3	ACCEPT
Benzo[b]fluoranthene	0.3	<0.3	NT	NT	<0.3	<0.3	ACCEPT
Benzo[g,h,i]perylene	0.3	<0.3	NT	NT	<0.3	<0.3	ACCEPT
Benzo[k]fluoranthene	0.3	<0.3	NT	NT	<0.3	<0.3	ACCEPT
Chrysene	0.3	<0.3	NT	NT	<0.3	<0.3	ACCEPT
Dibenzo[a,h]anthracene	0.3	<0.3	NT	NT	<0.3	<0.3	ACCEPT
Fluoranthene	0.3	<0.3	88%	90%	<0.3	<0.3	ACCEPT
Fluorene	0.3	<0.3	NT	NT	<0.3	<0.3	ACCEPT
Indeno(1,2,3-cd)pyrene	0.3	<0.3	NT	NT	<0.3	<0.3	ACCEPT
Naphthalene	0.3	<0.3	94%	98%	<0.3	<0.3	ACCEPT
Phenanthrene	0.3	<0.3	92%	95%	<0.3	<0.3	ACCEPT
Pyrene	0.3	<0.3	92%	94%	<0.3	<0.3	ACCEPT
p-Terphenyl-d14	surr.		69%	71%	91%	94%	
OCPs							
aldrin	0.1	<0.1	87%	89%	<0.1	<0.1	ACCEPT
a-BHC	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
b-BHC	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
d-BHC	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
g-BHC (lindane)	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
cis-chlordane	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
trans-chlordane	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
4,4'-DDD	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
4,4'-DDE	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
4,4'-DDT	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
dieldrin	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
endosulfan I	0.2	<0.2	NT	NT	<0.2	<0.2	ACCEPT
endosulfan II	0.2	<0.2	NT	NT	<0.2	<0.2	ACCEPT
endosulfan sulfate	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
endrin	0.2	<0.2	69%	72%	<0.2	<0.2	ACCEPT
endrin aldehyde	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
endrin ketone	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
heptachlor	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
heptachlor epoxide	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
hexachlorobenzene	0.1	<0.1	94%	97%	<0.1	<0.1	ACCEPT
methoxychlor	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
TCMX	surr.		90%	94%	103%	106%	
OPPs							
chlorpyrifos	0.1	<0.1	82%	86%	<0.1	<0.1	ACCEPT
chlorpyrifos methyl	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
diazinon	0.1	<0.1	82%	86%	<0.1	<0.1	ACCEPT
fenchlorphos	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
methyl parathion	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
prophos	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
tributylphosphorotrithioite	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
PCB							
Total PCB		<0.6	NT	NT	<0.6	<0.6	ACCEPT
2-fluorobiphenyl	surr.		109%	112%	114%	116%	

Lab ID	PQL (mg/kg)	Blank 1	Blank spike 1	Matrix spike 1	Duplicate 1- Value 1	Duplicate 1- Value 2	Duplicate 1
Sample Name							
TRH							
>C6-C10	35	<35	NT	NT	<35	<35	ACCEPT
>C10-C16	50	<50	107%	103%	<50	<50	ACCEPT
>C16-C34	100	<100	NT	NT	<100	<100	ACCEPT
>C34-C40	100	<100	NT	NT	<100	<100	ACCEPT
BTEX							
Benzene	0.5	<0.5	113%	113%	<0.5	<0.5	ACCEPT
Toluene	0.5	<0.5	104%	105%	<0.5	<0.5	ACCEPT
Ethylbenzene	1	<1	102%	93%	<1	<1	ACCEPT
m, p- Xylene(s)	2	<2	103%	97%	<2	<2	ACCEPT
o-Xylene	1	<1	103%	96%	<1	<1	ACCEPT
Fluorobenzene	surr.		112%	110%	108%	119%	
Moisture	%						
pH (average for 3 measurements)							
EC	[dS/m]						
Soil Texture Group							
Approximate Clay							
EC _{1:5} to EC _e conversion factor							

General Comments and Glossary

Tests not covered by NATA are denoted with *.

Samples are analysed on "as received" basis.

Samples were delivered chilled

Samples were preserved in correct manner

Sample containers for volatile analysis were received with minimal headspace

Samples were analysed within holding time

Some samples have been subcontracted

Yes

Yes

Yes

Yes

No

1. All samples are tested in batches of 20.

2. All results for soil samples are reported per gram of dry soil, unless otherwise stated.

3. However surrogate standards are added to samples due to PAH and BTEX analysis and recoveries are calculated, samples' results are not corrected for standards recoveries.

4. Analysis of VOC in water samples are performed on unfiltered waters (as received), spiked with surrogate

5. If heterogenous or insufficient material provided LCS is used as matrix spike for QA/QC purposes.

6. Duplicate sample and matrix spike recoveries may not be prepared on smaller jobs, however, were analysed at a frequency

7. QA/QC samples shown within the report that states the word "BATCH"; Batch Blank, Matrix Spike and Duplicate were prepared on samples from outside of reported job.

Blank: This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.

Duplicate: This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.

Matrix Spike: A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

LCS (Laboratory Control Sample): This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

Surr. (Surrogate Spike): Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

INS: Insufficient sample for this test

>: Greater than

LCS: Laboratory Control Sample

NT: Not tested

<: Less than

RPD: Relative Percent Difference

NA: Test not required

PQL: Practical Quantitation Limit

Laboratory Acceptance Criteria

Matrix Spikes and LCS: Ger Matrix heterogeneity may result in matrix spike analyses falling outside these limits

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the PQL : No Limit

Results between 10-20 times the PQL : RPD must lie between 0-50%

Results >20 times the PQL : RPD must lie between 0-30%

Surrogate Recoveries : Recoveries must lie between 50-150% - Phenols 20-130%.



Accreditation No.14664.

Accredited for compliance with ISO/IEC 17025.

The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Tests not covered by NATA are denoted with *.

****Methods Number Description:**

ESA-MP-01	Determination of metals by MP-AES
ESA-MP-02	Digestion of soil samples for MP-AES analysis
ESA-MP-03	Preparation of water samples for metals determination by MP-AES
ESA-MP-04	TCLP for inorganic contaminants
ESA-MP-05	Digestion of paint and dust samples for lead content determination
ESA-MP-06	Digestion of air filters
ESA-MP-07	Digestion of swabs for determination of lead content in dust
ESA-P-ORG02	Analysis of PAHs by GC-MS
ESA-P-ORG03	Analysis of TRH and TPH by GC-FID
ESA-P-ORG04	Separatory funnel extraction of PAHs from water matrices including TCLP extracts
ESA-P-ORG05	Separatory funnel extraction of TRH and TPH from water matrices
ESA-P-ORG06	Silica gel clean up of soil and water extracts, prior analysis for STPH
ESA-P-ORG07	Extraction of BTEX and VTRX from soil matrices
ESA-P-ORG08	Analysis of soil extracts and waters by P&T GCMS
ESA-P-ORG09	Extraction of TRH from solid matrices
ESA-P-ORG14	Extraction of PCB (Aroclor) OCP OPP and PAH from soil matrices
ESA-P-ORG15	Analysis of PCB OCP OPP and PAH by GCMS
AS 1289.4.3.1	Determination of the pH value of a soil-Electrometric method
AS 1289.3.6.1	Determination of the particle size distribution of a soil - Standard method of analysis by sieving
T276	NSW RMS Test Method T 276 Foreign materials content of recycled crushed concrete
*Texture Assessment	based on; Salinity Notes, Number 8, Oct 2000, ISSN 1 325-4448, "How to Texture soils & Test for Salinity"
*ESA-P-16	Procedure for measurement of Electrical Conductivity EC

**Accreditation No.14664.**

Accredited for compliance with ISO/IEC 17025.

The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Tests not covered by NATA are denoted with *.

This document shall not be reproduced, except in full.



Environmental and OH&S Laboratory

A division of A. D. Envirotech Australia Pty Ltd

A.C.N. 093 452 950

Unit 4/10-11 Millennium Court,
Silverwater 2128
Ph: (02) 9648-6669

Analysis report: 8622 WAC1

Customer: A. D. Envirotech Australia Pty. Ltd.
Attention: Clifton Thompson

Sample Log In Details

Your reference: 8622 WAC1
No. of Samples: 2
Date Received: 20.01.2015
Date completed instructions received: 20.01.2015
Date of analysis: 20.01-23.01.2015

Report Details

Report Date: 23.01.2015
Method number:** ESA-MP-01
ESA-MP-02
ESA-P-ORG3
ESA-P-ORG07
ESA-P-ORG08
ESA-P-ORG09
ESA-P-ORG14
ESA-P-ORG15
AS 1289.4.3.1
*ESA-P-16
*Texture Assessment

Results Authorised By:

Dr Dominika Wojtalewicz (MRACI CCHEM)
Laboratory Manager



Accreditation No.14664.

Accredited for compliance with ISO/IEC 17025.

The results of the tests, calibrations and/or
measurements included in this document are traceable
to Australian/national standards.

Tests not covered by NATA are denoted with *.

Lab ID	PQL (mg/kg)	8622-C1	8622-C2
		8622-WAC1	8622-WAC2
Sample Name			
PAH			
Acenaphthene	0.3	<0.3	<0.3
Acenaphthylene	0.3	<0.3	<0.3
Anthracene	0.3	0.3	<0.3
Benzo[a]anthracene	0.3	0.9	<0.3
Benzo[a]pyrene	0.3	1.1	<0.3
Benzo[b]fluoranthene	0.3	1.3	<0.3
Benzo[g,h,i]perylene	0.3	1.0	<0.3
Benzo[k]fluoranthene	0.3	0.5	<0.3
Chrysene	0.3	0.9	<0.3
Dibenzo[a,h]anthracene	0.3	<0.3	<0.3
Fluoranthene	0.3	3.3	<0.3
Fluorene	0.3	<0.3	<0.3
Indeno[1,2,3-cd]pyrene	0.3	1.0	<0.3
Naphthalene	0.3	<0.3	<0.3
Phenanthrene	0.3	0.3	<0.3
Pyrene	0.3	3.2	<0.3
p-Terphenyl-d14	surr.	81%	81%
OCPs			
aldrin	0.1	<0.1	<0.1
a-BHC	0.1	<0.1	<0.1
b-BHC	0.1	<0.1	<0.1
d-BHC	0.1	<0.1	<0.1
g-BHC (lindane)	0.1	<0.1	<0.1
cis-chlordane	0.1	<0.1	<0.1
trans-chlordane	0.1	<0.1	<0.1
4,4'-DDD	0.1	<0.1	<0.1
4,4'-DDE	0.1	<0.1	<0.1
4,4'-DDT	0.1	<0.1	<0.1
dieldrin	0.1	<0.1	<0.1
endosulfan I	0.2	<0.2	<0.2
endosulfan II	0.2	<0.2	<0.2
endosulfan sulfate	0.1	<0.1	<0.1
endrin	0.2	<0.2	<0.2
endrin aldehyde	0.1	<0.1	<0.1
endrin ketone	0.1	<0.1	<0.1
heptachlor	0.1	<0.1	<0.1
heptachlor epoxide	0.1	<0.1	<0.1
hexachlorobenzene	0.1	<0.1	<0.1
methoxychlor	0.1	<0.1	<0.1
TCMX	surr.	91%	91%
OPPs			
chlorpyrifos	0.1	<0.1	<0.1
chlorpyrifos methyl	0.1	<0.1	<0.1
diazinon	0.1	<0.1	<0.1
fenchlorphos	0.1	<0.1	<0.1
methyl parathion	0.1	<0.1	<0.1
prophos	0.1	<0.1	<0.1
tributylphosphorothioite	0.1	<0.1	<0.1
PCB			
Total PCB		<0.6	<0.6
2-fluorobiphenyl	surr.	102%	100%

Lab ID	PQL (mg/kg)	8622-C1	8622-C2
Sample Name		8622-WAC1	8622-WAC2
TRH			
>C6-C10	35	<35	<35
>C10-C16	50	<50	<50
>C16-C34	100	<100	<100
>C34-C40	100	<100	<100
BTEX			
Benzene	0.5	<0.5	<0.5
Toluene	0.5	<0.5	<0.5
Ethylbenzene	1	<1	<1
m, p- Xylene(s)	2	<2	<2
o-Xylene	1	<1	<1
Fluorobenzene	surr.	109%	111%
Metals			
Arsenic	2	17	17
Cadmium	0.3	<0.3	<0.3
Chromium	5	29	<5
Copper	5	13	22
Lead	10	25	17
Mercury	0.2	<0.2	<0.2
Nickel	10	<10	<10
Zinc	5	22	33
Moisture	%	10%	13%
pH (average for 3 measurements)		4.9	9.4
EC	[dS/m]	0.27	0.06
Soil Texture Group		Medium & Heavy Clays	Clay Loams
Approximate Clay		>45	30-35
EC1:5 to ECe conversion factor		7	8.6

Lab ID	PQL (mg/kg)	Blank 1	Blank spike 1	Matrix spike 1	Duplicate 1- Value 1	Duplicate 1- Value 2	Duplicate 1
Sample Name							
PAH							
Acenaphthene	0.3	<0.3	90%	90%	<0.3	<0.3	ACCEPT
Acenaphthylene	0.3	<0.3	NT	NT	<0.3	<0.3	ACCEPT
Anthracene	0.3	<0.3	95%	92%	<0.3	<0.3	ACCEPT
Benzo[a]anthracene	0.3	<0.3	NT	NT	<0.3	<0.3	ACCEPT
Benzo[a]pyrene	0.3	<0.3	NT	NT	<0.3	<0.3	ACCEPT
Benzo[b]fluoranthene	0.3	<0.3	NT	NT	<0.3	<0.3	ACCEPT
Benzo[g,h,i]perylene	0.3	<0.3	NT	NT	<0.3	<0.3	ACCEPT
Benzo[k]fluoranthene	0.3	<0.3	NT	NT	<0.3	<0.3	ACCEPT
Chrysene	0.3	<0.3	NT	NT	<0.3	<0.3	ACCEPT
Dibenzo[a,h]anthracene	0.3	<0.3	NT	NT	<0.3	<0.3	ACCEPT
Fluoranthene	0.3	<0.3	92%	68%	<0.3	<0.3	ACCEPT
Fluorene	0.3	<0.3	NT	NT	<0.3	<0.3	ACCEPT
Indeno[1,2,3-cd]pyrene	0.3	<0.3	NT	NT	<0.3	<0.3	ACCEPT
Naphthalene	0.3	<0.3	96%	96%	<0.3	<0.3	ACCEPT
Phenanthrene	0.3	<0.3	95%	92%	<0.3	<0.3	ACCEPT
Pyrene	0.3	<0.3	95%	73%	<0.3	<0.3	ACCEPT
p-Terphenyl-d14	surr.		72%	72%	81%	91%	
OCPs							
aldrin	0.1	<0.1	92%	93%	<0.1	<0.1	ACCEPT
a-BHC	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
b-BHC	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
d-BHC	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
g-BHC (lindane)	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
cis-chlordane	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
trans-chlordane	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
4,4'-DDD	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
4,4'-DDE	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
4,4'-DDT	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
dieldrin	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
endosulfan I	0.2	<0.2	NT	NT	<0.2	<0.2	ACCEPT
endosulfan II	0.2	<0.2	NT	NT	<0.2	<0.2	ACCEPT
endosulfan sulfate	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
endrin	0.2	<0.2	77%	81%	<0.2	<0.2	ACCEPT
endrin aldehyde	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
endrin ketone	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
heptachlor	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
heptachlor epoxide	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
hexachlorobenzene	0.1	<0.1	97%	98%	<0.1	<0.1	ACCEPT
methoxychlor	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
TCMX	surr.		93%	95%	91%	101%	
OPPs							
chlorpyrifos	0.1	<0.1	90%	93%	<0.1	<0.1	ACCEPT
chlorpyrifos methyl	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
diazinon	0.1	<0.1	86%	88%	<0.1	<0.1	ACCEPT
fenchlorphos	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
methyl parathion	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
prophos	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
tributylphosphorotrithioate	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
PCB							
Total PCB		<0.6	NT	NT	<0.6	<0.6	ACCEPT
2-fluorobiphenyl	surr.		107%	108%	100%	108%	

Lab ID	PQL (mg/kg)	Blank 1	Blank spike 1	Matrix spike 1	Duplicate 1- Value 1	Duplicate 1- Value 2	Duplicate 1
Sample Name							
TRH							
>C6-C10	35	<35	NT	NT	<35	<35	ACCEPT
>C10-C16	50	<50	97%	91%	<50	<50	ACCEPT
>C16-C34	100	<100	NT	NT	<100	<100	ACCEPT
>C34-C40	100	<100	NT	NT	<100	<100	ACCEPT
BTEX							
Benzene	0.5	<0.5	84%	90%	<0.5	<0.5	ACCEPT
Toluene	0.5	<0.5	80%	86%	<0.5	<0.5	ACCEPT
Ethylbenzene	1	<1	79%	86%	<1	<1	ACCEPT
m, p- Xylene(s)	2	<2	81%	85%	<2	<2	ACCEPT
o-Xylene	1	<1	78%	87%	<1	<1	ACCEPT
Fluorobenzene	surr.		85%	89%	111%	105%	
Metals							
Arsenic	2	<2	93%	94%	17	9.4	ACCEPT
Cadmium	0.3	<0.3	93%	90%	<0.3	<0.3	ACCEPT
Chromium	5	<5	95%	96%	<5	<5	ACCEPT
Copper	5	<5	91%	99%	22	22	ACCEPT
Lead	10	<10	100%	97%	17	15	ACCEPT
Mercury	0.2	<0.2	101%	104%	<0.2	<0.2	ACCEPT
Nickel	10	<10	90%	99%	<10	<10	ACCEPT
Zinc	5	<5	91%	92%	33	30	ACCEPT
Moisture	%						
pH (average for 3 measurements)							
EC	[dS/m]						
Soil Texture Group							
Approximate Clay							
EC1:5 to ECe conversion factor							

Comment:

Clay Loams - fine sandy clay loam, clay loam, silty clay loam

General Comments and Glossary

Tests not covered by NATA are denoted with *.

Samples are analysed on "as received" basis.

Samples were delivered chilled

Samples were preserved in correct manner

Sample containers for volatile analysis were received with minimal headspace

Samples were analysed within holding time

Some samples have been subcontracted

Yes
Yes
Yes
Yes
No

1. All samples are tested in batches of 20.

2. All results for soil samples are reported per gram of dry soil, unless otherwise stated.

3. However surrogate standards are added to samples due to PAH and BTEX analysis and recoveries are calculated, samples' results are not corrected for standards recoveries.

4. Analysis of VOC in water samples are performed on unfiltered waters (as received), spiked with surrogate

5. If heterogenous or insufficient material provided LCS is used as matrix spike for QA/QC purposes.

6. Duplicate sample and matrix spike recoveries may not be prepared on smaller jobs, however, were analysed at a frequency

7. QA/QC samples shown within the report that states the word "BATCH"; Batch Blank, Matrix Spike and Duplicate were prepared on samples from outside of reported job.

Blank: This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.

Duplicate: This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.

Matrix Spike: A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

LCS (Laboratory Control Sample): This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

Surr. (Surrogate Spike): Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

INS: Insufficient sample for this test

>: Greater than

LCS: Laboratory Control Sample

NT: Not tested

<: Less than

RPD: Relative Percent Difference

NA: Test not required

PQL: Practical Quantitation Limit

Laboratory Acceptance Criteria

Matrix Spikes and LCS: Ger Matrix heterogeneity may result in matrix spike analyses falling outside these limits

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the PQL : No Limit

Results between 10-20 times the PQL : RPD must lie between 0-50%

Results >20 times the PQL : RPD must lie between 0-30%

Surrogate Recoveries : Recoveries must lie between 50-150% - Phenols 20-130%.



Accreditation No.14664.

Accredited for compliance with ISO/IEC 17025.

The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Tests not covered by NATA are denoted with *.

****Methods Number Description:**

ESA-MP-01	Determination of metals by MP-AES
ESA-MP-02	Digestion of soil samples for MP-AES analysis
ESA-MP-03	Preparation of water samples for metals determination by MP-AES
ESA-MP-04	TCLP for inorganic contaminants
ESA-MP-05	Digestion of paint and dust samples for lead content determination
ESA-MP-06	Digestion of air filters
ESA-MP-07	Digestion of swabs for determination of lead content in dust
ESA-P-ORG02	Analysis of PAHs by GC-MS
ESA-P-ORG03	Analysis of TRH and TPH by GC-FID
ESA-P-ORG04	Separatory funnel extraction of PAHs from water matrices including TCLP extracts
ESA-P-ORG05	Separatory funnel extraction of TRH and TPH from water matrices
ESA-P-ORG06	Silica gel clean up of soil and water extracts, prior analysis for STPH
ESA-P-ORG07	Extraction of BTEX and VTRX from soil matrices
ESA-P-ORG08	Analysis of soil extracts and waters by P&T GCMS
ESA-P-ORG09	Extraction of TRH from solid matrices
ESA-P-ORG11	Extraction of OCP OPP and PAH from soil matrices
ESA-P-ORG12	Analysis of OCP OPP and PAHs by GC-MS
AS 1289.4.3.1	Determination of the pH value of a soil-Electrometric method
AS 1289.3.6.1	Determination of the particle size distribution of a soil - Standard method of analysis by sieving
T276	NSW RMS Test Method T 276 Foreign materials content of recycled crushed concrete
*Texture Assessment based on; Salinity Notes, Number 8, Oct 2000, ISSN 1 325-4448, "How to Texture soils & Test for Salinity"	
*ESA-P-16	Procedure for measurement of Electrical Conductivity EC
ESA-P-ORG14	Extraction of PCB (Aroclor) OCP OPP and PAH from soil matrices
ESA-P-ORG15	Analysis of PCB OCP OPP and PAH by GCMS

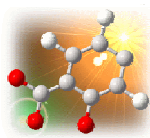
**Accreditation No.14664.**

Accredited for compliance with ISO/IEC 17025.

The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Tests not covered by NATA are denoted with *.

This document shall not be reproduced, except in full.



Environmental and OH&S Laboratory

A division of A. D. Envirotech Australia Pty Ltd

A.C.N. 093 452 950

Unit 4/10-11 Millennium Court,
Silverwater 2128
Ph: (02) 9648-6669

Analysis report: 8622 WAC2

Customer: A. D. Envirotech Australia Pty. Ltd.
Attention: Clifton Thompson

Sample Log In Details

Your reference: 8622 WAC2
No. of Samples: 2
Date Received: 27.01.2015
Date completed instructions received: 27.01.2015
Date of analysis: 27.01-30.01.2015

Report Details

Report Date: 30.01.2015
Method number:** ESA-MP-01
ESA-MP-02
ESA-P-ORG3
ESA-P-ORG07
ESA-P-ORG08
ESA-P-ORG09
ESA-P-ORG14
ESA-P-ORG15
AS 1289.4.3.1
*ESA-P-16
*Texture Assessment

Results Authorised By:

Dr Dominika Wojtalewicz (MRACI CCHEM)
Laboratory Manager



Accreditation No.14664.

Accredited for compliance with ISO/IEC 17025.

The results of the tests, calibrations and/or
measurements included in this document are traceable
to Australian/national standards.

Tests not covered by NATA are denoted with *.

Lab ID	PQL (mg/kg)	8622-C3	8622-C4
Sample Name		8622-WAC3	8622-WAC4
PAH			
Acenaphthene	0.3	<0.3	<0.3
Acenaphthylene	0.3	<0.3	<0.3
Anthracene	0.3	<0.3	<0.3
Benzo[a]anthracene	0.3	<0.3	<0.3
Benzo[a]pyrene	0.3	<0.3	<0.3
Benzo[b]fluoranthene	0.3	<0.3	<0.3
Benzo[g,h,i]perylene	0.3	<0.3	<0.3
Benzo[k]fluoranthene	0.3	<0.3	<0.3
Chrysene	0.3	<0.3	<0.3
Dibenzo[a,h]anthracene	0.3	<0.3	<0.3
Fluoranthene	0.3	<0.3	<0.3
Fluorene	0.3	<0.3	<0.3
Indeno(1,2,3-cd)pyrene	0.3	<0.3	<0.3
Naphthalene	0.3	<0.3	<0.3
Phenanthrene	0.3	<0.3	<0.3
Pyrene	0.3	<0.3	<0.3
p-Terphenyl-d14	surr.	112%	109%
OCPs			
aldrin	0.1	<0.1	<0.1
a-BHC	0.1	<0.1	<0.1
b-BHC	0.1	<0.1	<0.1
d-BHC	0.1	<0.1	<0.1
g-BHC (lindane)	0.1	<0.1	<0.1
cis-chlordane	0.1	<0.1	<0.1
trans-chlordane	0.1	<0.1	<0.1
4,4'-DDD	0.1	<0.1	<0.1
4,4'-DDE	0.1	<0.1	<0.1
4,4'-DDT	0.1	<0.1	<0.1
dieldrin	0.1	<0.1	<0.1
endosulfan I	0.2	<0.2	<0.2
endosulfan II	0.2	<0.2	<0.2
endosulfan sulfate	0.1	<0.1	<0.1
endrin	0.2	<0.2	<0.2
endrin aldehyde	0.1	<0.1	<0.1
endrin ketone	0.1	<0.1	<0.1
heptachlor	0.1	<0.1	<0.1
heptachlor epoxide	0.1	<0.1	<0.1
hexachlorobenzene	0.1	<0.1	<0.1
methoxychlor	0.1	<0.1	<0.1
TCMX	surr.	122%	118%
OPPs			
chlorpyrifos	0.1	<0.1	<0.1
chlorpyrifos methyl	0.1	<0.1	<0.1
diazinon	0.1	<0.1	<0.1
fenchlorphos	0.1	<0.1	<0.1
methyl parathion	0.1	<0.1	<0.1
prophos	0.1	<0.1	<0.1
tributylphosphorotrithioite	0.1	<0.1	<0.1
PCB			
Total PCB		<0.6	<0.6
2-fluorobiphenyl	surr.	129%	124%

Lab ID	PQL (mg/kg)	8622-C3	8622-C4
Sample Name		8622-WAC3	8622-WAC4
TRH			
>C6-C10	35	<35	<35
>C10-C16	50	<50	<50
>C16-C34	100	<100	<100
>C34-C40	100	<100	<100
BTEX			
Benzene	0.5	<0.5	<0.5
Toluene	0.5	<0.5	<0.5
Ethylbenzene	1	<1	<1
m, p- Xylene(s)	2	<2	<2
o-Xylene	1	<1	<1
Fluorobenzene	surr.	119%	122%
Metals			
Arsenic	2	3.7	42
Cadmium	0.3	<0.3	<0.3
Chromium	5	<5	<5
Copper	5	5.5	69
Lead	10	39	65
Mercury	0.2	<0.2	<0.2
Nickel	10	<10	40
Zinc	5	16	110
Moisture	%	9%	9%
pH (average for 3 measurements)		8.0	8.4
EC	[dS/m]	0.09	0.15
Soil Texture Group		Light Clays	Sands
Approximate Clay		35-45	up to 10
EC1:5 to ECe conversion factor		8.6	17

Lab ID	PQL (mg/kg)	Blank 1	Blank spike 1	Matrix spike 1	Duplicate 1- Value 1	Duplicate 1- Value 2	Duplicate 1
Sample Name							
PAH							
Acenaphthene	0.3	<0.3	106%	106%	<0.3	<0.3	ACCEPT
Acenaphthylene	0.3	<0.3	NT	NT	<0.3	<0.3	ACCEPT
Anthracene	0.3	<0.3	112%	112%	<0.3	<0.3	ACCEPT
Benzo[a]anthracene	0.3	<0.3	NT	NT	<0.3	<0.3	ACCEPT
Benzo[a]pyrene	0.3	<0.3	NT	NT	<0.3	<0.3	ACCEPT
Benzo[b]fluoranthene	0.3	<0.3	NT	NT	<0.3	<0.3	ACCEPT
Benzo[g,h,i]perylene	0.3	<0.3	NT	NT	<0.3	<0.3	ACCEPT
Benzo[k]fluoranthene	0.3	<0.3	NT	NT	<0.3	<0.3	ACCEPT
Chrysene	0.3	<0.3	NT	NT	<0.3	<0.3	ACCEPT
Dibenzo[a,h]anthracene	0.3	<0.3	NT	NT	<0.3	<0.3	ACCEPT
Fluoranthene	0.3	<0.3	110%	108%	<0.3	0.3	ACCEPT
Fluorene	0.3	<0.3	NT	NT	<0.3	<0.3	ACCEPT
Indeno[1,2,3-cd]pyrene	0.3	<0.3	NT	NT	<0.3	<0.3	ACCEPT
Naphthalene	0.3	<0.3	114%	114%	<0.3	<0.3	ACCEPT
Phenanthrene	0.3	<0.3	112%	112%	<0.3	<0.3	ACCEPT
Pyrene	0.3	<0.3	114%	112%	<0.3	0.3	ACCEPT
p-Terphenyl-d14	surr.		86%	86%	109%	111%	
OCPs							
aldrin	0.1	<0.1	110%	110%	<0.1	<0.1	ACCEPT
a-BHC	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
b-BHC	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
d-BHC	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
g-BHC (lindane)	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
cis-chlordane	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
trans-chlordane	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
4,4'-DDD	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
4,4'-DDE	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
4,4'-DDT	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
dieldrin	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
endosulfan I	0.2	<0.2	NT	NT	<0.2	<0.2	ACCEPT
endosulfan II	0.2	<0.2	NT	NT	<0.2	<0.2	ACCEPT
endosulfan sulfate	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
endrin	0.2	<0.2	95%	98%	<0.2	<0.2	ACCEPT
endrin aldehyde	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
endrin ketone	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
heptachlor	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
heptachlor epoxide	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
hexachlorobenzene	0.1	<0.1	114%	112%	<0.1	<0.1	ACCEPT
methoxychlor	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
TCMX	surr.		112%	110%	118%	120%	
OPPs							
chlorpyrifos	0.1	<0.1	112%	111%	<0.1	<0.1	ACCEPT
chlorpyrifos methyl	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
diazinon	0.1	<0.1	106%	106%	<0.1	<0.1	ACCEPT
fenchlorphos	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
methyl parathion	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
prophos	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
tributylphosphorotrithioite	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
PCB							
Total PCB		<0.6	NT	NT	<0.6	<0.6	ACCEPT
2-fluorobiphenyl	surr.		130%	126%	124%	125%	

Lab ID	PQL (mg/kg)	Blank 1	Blank spike 1	Matrix spike 1	Duplicate 1- Value 1	Duplicate 1- Value 2	Duplicate 1
Sample Name							
TRH							
>C6-C10	35	<35	NT	NT	<35	<35	ACCEPT
>C10-C16	50	<50	114%	113%	<50	<50	ACCEPT
>C16-C34	100	<100	NT	NT	<100	<100	ACCEPT
>C34-C40	100	<100	NT	NT	<100	<100	ACCEPT
BTEX							
Benzene	0.5	<0.5	103%	113%	<0.5	<0.5	ACCEPT
Toluene	0.5	<0.5	96%	100%	<0.5	<0.5	ACCEPT
Ethylbenzene	1	<1	96%	99%	<1	<1	ACCEPT
m, p- Xylene(s)	2	<2	94%	99%	<2	<2	ACCEPT
o-Xylene	1	<1	96%	101%	<1	<1	ACCEPT
Fluorobenzene	surr.		103%	110%	122%	116%	
Metals							
Arsenic	2	<2	112%	114%	42	47	ACCEPT
Cadmium	0.3	<0.3	93%	95%	<0.3	<0.3	ACCEPT
Chromium	5	<5	92%	103%	<5	8.8	ACCEPT
Copper	5	<5	90%	90%	69	68	ACCEPT
Lead	10	<10	97%	99%	65	64	ACCEPT
Mercury	0.2	<0.2	97%	97%	<0.2	<0.2	ACCEPT
Nickel	10	<10	90%	92%	40	30	ACCEPT
Zinc	5	<5	89%	95%	110	81	ACCEPT
Moisture	%						
pH (average for 3 measurements)							
EC	[dS/m]						
Soil Texture Group							
Approximate Clay							
EC1:5 to E _c e conversion factor							

Comments:

Sands - sand, loamy sand, clayey sand

Light Clays - sandy clay, silty clay, light clay, light medium clay

General Comments and Glossary

Tests not covered by NATA are denoted with *.

Samples are analysed on "as received" basis.

Samples were delivered chilled

Samples were preserved in correct manner

Sample containers for volatile analysis were received with minimal headspace

Samples were analysed within holding time

Some samples have been subcontracted

Yes
Yes
Yes
Yes
No

1. All samples are tested in batches of 20.
2. All results for soil samples are reported per gram of dry soil, unless otherwise stated.
3. However surrogate standards are added to samples due to PAH and BTEX analysis and recoveries are calculated, samples' results are not corrected for standards recoveries.
4. Analysis of VOC in water samples are performed on unfiltered waters (as received), spiked with surrogate
5. If heterogenous or insufficient material provided LCS is used as matrix spike for QA/QC purposes.
6. Duplicate sample and matrix spike recoveries may not be prepared on smaller jobs, however, were analysed at a frequency
7. QA/QC samples shown within the report that states the word "BATCH"; Batch Blank, Matrix Spike and Duplicate were prepared on samples from outside of reported job.

Blank: This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.

Duplicate: This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.

Matrix Spike: A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

LCS (Laboratory Control Sample): This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

Surr. (Surrogate Spike): Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

INS: Insufficient sample for this test

>: Greater than

LCS: Laboratory Control Sample

NT: Not tested

<: Less than

RPD: Relative Percent Difference

NA: Test not required

PQL: Practical Quantitation Limit

Laboratory Acceptance Criteria

Matrix Spikes and LCS: Ge Matrix heterogeneity may result in matrix spike analyses falling outside these limits

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the PQL : No Limit

Results between 10-20 times the PQL : RPD must lie between 0-50%

Results >20 times the PQL : RPD must lie between 0-30%

Surrogate Recoveries : Recoveries must lie between 50-150% - Phenols 20-130%.



Accreditation No.14664.

Accredited for compliance with ISO/IEC 17025.

The results of the tests, calibrations and/or

measurements included in this document are traceable to Australian/national standards.

Tests not covered by NATA are denoted with *.

New South Wales Office:

A. D. Envirotech Australia Pty Ltd
Unit 4, 10-11 Millennium Court
Silverwater, NSW 2128

Telephone:

(02) 9648 6669

e-mail: info@ADenvirotech.com.au

ABN: 520 934 529 50

****Methods Number Description:**

ESA-MP-01	Determination of metals by MP-AES
ESA-MP-02	Digestion of soil samples for MP-AES analysis
ESA-MP-03	Preparation of water samples for metals determination by MP-AES
ESA-MP-04	TCLP for inorganic contaminants
ESA-MP-05	Digestion of paint and dust samples for lead content determination
ESA-MP-06	Digestion of air filters
ESA-MP-07	Digestion of swabs for determination of lead content in dust
ESA-P-ORG02	Analysis of PAHs by GC-MS
ESA-P-ORG03	Analysis of TRH and TPH by GC-FID
ESA-P-ORG04	Separatory funnel extraction of PAHs from water matrices including TCLP extracts
ESA-P-ORG05	Separatory funnel extraction of TRH and TPH from water matrices
ESA-P-ORG06	Silica gel clean up of soil and water extracts, prior analysis for STPH
ESA-P-ORG07	Extraction of BTEX and VTRX from soil matrices
ESA-P-ORG08	Analysis of soil extracts and waters by P&T GCMS
ESA-P-ORG09	Extraction of TRH from solid matrices
ESA-P-ORG11	Extraction of OCP OPP and PAH from soil matrices
ESA-P-ORG12	Analysis of OCP OPP and PAHs by GC-MS
AS 1289.4.3.1	Determination of the pH value of a soil-Electrometric method
AS 1289.3.6.1	Determination of the particle size distribution of a soil - Standard method of analysis by sieving
T276	NSW RMS Test Method T 276 Foreign materials content of recycled crushed concrete
*Texture Assessment based on; Salinity Notes, Number 8, Oct 2000, ISSN 1 325-4448, "How to Texture soils & Test for Salinity"	
*ESA-P-16	Procedure for measurement of Electrical Conductivity EC
ESA-P-ORG14	Extraction of PCB (Aroclor) OCP OPP and PAH from soil matrices
ESA-P-ORG15	Analysis of PCB OCP OPP and PAH by GCMS

**Accreditation No.14664.**

Accredited for compliance with ISO/IEC 17025.

The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Tests not covered by NATA are denoted with *.

This document shall not be reproduced, except in full.

New South Wales Office:

A. D. Envirotech Australia Pty Ltd
Unit 4, 10-11 Millennium Court
Silverwater, NSW 2128

Telephone:

(02) 9648 6669

e-mail: info@ADenvirotech.com.au

ABN: 520 934 529 50



Environmental and OH&S Laboratory

A division of A. D. Envirotech Australia Pty Ltd

A.C.N. 093 452 950

Unit 4/10-11 Millennium Court,
Silverwater 2128
Ph: (02) 9648-6669

Analysis report: 8937-2

Customer: A. D. Envirotech Australia Pty. Ltd.
Attention: Karl Finnerty & Clifton Thompson

Sample Log In Details

Your reference: 8937-2
No. of Samples: 3
Date Received: 14.04.2015
Date completed instructions received: 14.04.2015
Date of analysis: 14.04-15.04.2015

Report Details

Report Date: 16.04.2015
Method number:** ESA-MP-01
ESA-MP-02
ESA-P-ORG3
ESA-P-ORG07
ESA-P-ORG08
ESA-P-ORG09
ESA-P-ORG14
ESA-P-ORG15
AS 1289.4.3.1
*ESA-P-16
*pH FOX Test -Determination of Acid Sulfate Soils Field pH

Results Authorised By:

Dr Dominika Wojtalewicz (MRACI CCHEM)
Laboratory Manager



Accreditation No.14664.

Accredited for compliance with ISO/IEC 17025.

The results of the tests, calibrations and/or
measurements included in this document are traceable
to Australian/national standards.

Tests not covered by NATA are denoted with *.

Lab ID	PQL (mg/kg)	8937-C3	8937-C4	8937-C5
		8937-WAC03	8937-WAC04	8937-WAC05
Sample Name				
PAH				
Acenaphthene	0.3	<0.3	<0.3	<0.3
Acenaphthylene	0.3	<0.3	<0.3	<0.3
Anthracene	0.3	<0.3	<0.3	<0.3
Benzo[a]anthracene	0.3	<0.3	<0.3	<0.3
Benzo[a]pyrene	0.3	<0.3	<0.3	<0.3
Benzo[b]fluoranthene	0.3	<0.3	<0.3	<0.3
Benzo[g,h,i]perylene	0.3	<0.3	<0.3	<0.3
Benzo[k]fluoranthene	0.3	<0.3	<0.3	<0.3
Chrysene	0.3	<0.3	<0.3	<0.3
Dibenzo[a,h]anthracene	0.3	<0.3	<0.3	<0.3
Fluoranthene	0.3	<0.3	<0.3	<0.3
Fluorene	0.3	<0.3	<0.3	<0.3
Indeno[1,2,3-cd]pyrene	0.3	<0.3	<0.3	<0.3
Naphthalene	0.3	<0.3	<0.3	<0.3
Phenanthrene	0.3	<0.3	<0.3	<0.3
Pyrene	0.3	<0.3	<0.3	<0.3
p-Terphenyl-d14	surr.	100%	104%	102%
OCPs				
aldrin	0.1	<0.1	<0.1	<0.1
a-BHC	0.1	<0.1	<0.1	<0.1
b-BHC	0.1	<0.1	<0.1	<0.1
d-BHC	0.1	<0.1	<0.1	<0.1
g-BHC (lindane)	0.1	<0.1	<0.1	<0.1
cis-chlordane	0.1	<0.1	<0.1	<0.1
trans-chlordane	0.1	<0.1	<0.1	<0.1
4,4'-DDD	0.1	<0.1	<0.1	<0.1
4,4'-DDE	0.1	<0.1	<0.1	<0.1
4,4'-DDT	0.1	<0.1	<0.1	<0.1
dieldrin	0.1	<0.1	<0.1	<0.1
endosulfan I	0.2	<0.2	<0.2	<0.2
endosulfan II	0.2	<0.2	<0.2	<0.2
endosulfan sulfate	0.1	<0.1	<0.1	<0.1
endrin	0.2	<0.2	<0.2	<0.2
endrin aldehyde	0.1	<0.1	<0.1	<0.1
endrin ketone	0.1	<0.1	<0.1	<0.1
heptachlor	0.1	<0.1	<0.1	<0.1
heptachlor epoxide	0.1	<0.1	<0.1	<0.1
hexachlorobenzene	0.1	<0.1	<0.1	<0.1
methoxychlor	0.1	<0.1	<0.1	<0.1
TCMX	surr.	114%	120%	120%
OPPs				
chlorpyrifos	0.1	<0.1	<0.1	<0.1
chlorpyrifos methyl	0.1	<0.1	<0.1	<0.1
diazinon	0.1	<0.1	<0.1	<0.1
fenchlorphos	0.1	<0.1	<0.1	<0.1
methyl parathion	0.1	<0.1	<0.1	<0.1
prophos	0.1	<0.1	<0.1	<0.1
tributylphosphorothioite	0.1	<0.1	<0.1	<0.1
PCB				
Total PCB		<0.6	<0.6	<0.6
2-fluorobiphenyl	surr.	97%	97%	100%

Lab ID	PQL (mg/kg)	8937-C3	8937-C4	8937-C5
Sample Name		8937-WAC03	8937-WAC04	8937-WAC05
TRH				
>C6-C10	35	<35	<35	<35
>C10-C16	50	<50	<50	<50
>C16-C34	100	<100	<100	<100
>C34-C40	100	<100	<100	<100
BTEX				
Benzene	0.5	<0.5	<0.5	<0.5
Toluene	0.5	<0.5	<0.5	<0.5
Ethylbenzene	1	<1	<1	<1
m, p- Xylene(s)	2	<2	<2	<2
o-Xylene	1	<1	<1	<1
Fluorobenzene	surr.	105%	132%	133%
Metals				
Arsenic	2	29	18	2.2
Cadmium	0.3	<0.3	<0.3	<0.3
Chromium	5	<5	9.1	23
Copper	5	89	41	24
Lead	10	63	55	12
Mercury	0.2	<0.2	<0.2	<0.2
Nickel	10	13	17	27
Zinc	5	83	70	26
Moisture	%	17%	12%	16%
pH (average for 3 measurements)		7.9	9.1	7.1
EC	[dS/m]	0.14	0.20	0.36
pH F		7.4	8.6	6.0
pH FOX		5.6	7.8	3.4
Reaction rate		XXXX	XXXX	XXXX

Lab ID	PQL (mg/kg)	Batch Blank 1	Batch Blank spike 1	Batch Matrix spike 1	Batch Duplicate 1- Value 1	Batch Duplicate 1- Value 2	Batch Duplicate 1
Sample Name							
PAH							
Acenaphthene	0.3	<0.3	86%	82%	<0.3	<0.3	ACCEPT
Acenaphthylene	0.3	<0.3	NT	NT	<0.3	<0.3	ACCEPT
Anthracene	0.3	<0.3	92%	89%	<0.3	0.3	ACCEPT
Benzo[a]anthracene	0.3	<0.3	NT	NT	0.7	1.1	ACCEPT
Benzo[a]pyrene	0.3	<0.3	NT	NT	0.9	1.1	ACCEPT
Benzo[b]fluoranthene	0.3	<0.3	NT	NT	0.8	1.0	ACCEPT
Benzo[g,h,i]perylene	0.3	<0.3	NT	NT	0.6	0.7	ACCEPT
Benzo[k]fluoranthene	0.3	<0.3	NT	NT	<0.3	0.4	ACCEPT
Chrysene	0.3	<0.3	NT	NT	0.8	1.1	ACCEPT
Dibenzo[a,h]anthracene	0.3	<0.3	NT	NT	<0.3	<0.3	ACCEPT
Fluoranthene	0.3	<0.3	87%	90%	1.2	2.1	ACCEPT
Fluorene	0.3	<0.3	NT	NT	<0.3	<0.3	ACCEPT
Indeno[1,2,3-cd]pyrene	0.3	<0.3	NT	NT	0.6	0.7	ACCEPT
Naphthalene	0.3	<0.3	97%	94%	<0.3	<0.3	ACCEPT
Phenanthrene	0.3	<0.3	92%	89%	<0.3	0.3	ACCEPT
Pyrene	0.3	<0.3	98%	99%	1.4	2.4	ACCEPT
p-Terphenyl-d14	surr.		70%	69%	106%	106%	
OCPs							
aldrin	0.1	<0.1	95%	91%	<0.1	<0.1	ACCEPT
a-BHC	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
b-BHC	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
d-BHC	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
g-BHC (lindane)	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
cis-chlordane	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
trans-chlordane	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
4,4'-DDD	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
4,4'-DDE	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
4,4'-DDT	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
dieldrin	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
endosulfan I	0.2	<0.2	NT	NT	<0.2	<0.2	ACCEPT
endosulfan II	0.2	<0.2	NT	NT	<0.2	<0.2	ACCEPT
endosulfan sulfate	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
endrin	0.2	<0.2	74%	82%	<0.2	<0.2	ACCEPT
endrin aldehyde	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
endrin ketone	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
heptachlor	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
heptachlor epoxide	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
hexachlorobenzene	0.1	<0.1	100%	97%	<0.1	<0.1	ACCEPT
methoxychlor	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
TCMX	surr.		97%	93%	100%	106%	
OPPs							
chlorpyrifos	0.1	<0.1	96%	94%	<0.1	<0.1	ACCEPT
chlorpyrifos methyl	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
diazinon	0.1	<0.1	93%	92%	<0.1	<0.1	ACCEPT
fenchlorphos	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
methyl parathion	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
prophos	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
tributylphosphorothioate	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
PCB							
Total PCB		<0.6	NT	NT	<0.6	<0.6	ACCEPT
2-fluorobiphenyl	surr.		102%	99%	96%	98%	

Lab ID	PQL (mg/kg)	Batch Blank 1	Batch Blank spike 1	Batch Matrix spike 1	Batch Duplicate 1- Value 1	Batch Duplicate 1- Value 2	Batch Duplicate 1
Sample Name							
TRH							
>C6-C10	35	<35	NT	NT	<35	<35	ACCEPT
>C10-C16	50	<50	121%	117%	<50	<50	ACCEPT
>C16-C34	100	<100	NT	NT	<100	<100	ACCEPT
>C34-C40	100	<100	NT	NT	<100	<100	ACCEPT
BTEX							
Benzene	0.5	<0.5	97%	113%	<0.5	<0.5	ACCEPT
Toluene	0.5	<0.5	99%	116%	<0.5	<0.5	ACCEPT
Ethylbenzene	1	<1	98%	115%	<1	<1	ACCEPT
m, p- Xylene(s)	2	<2	100%	118%	<2	<2	ACCEPT
o-Xylene	1	<1	99%	115%	<1	<1	ACCEPT
Fluorobenzene	surr.		95%	111%	143%	110%	
Metals							
Arsenic	2	<2	93%	111%	19	21	ACCEPT
Cadmium	0.3	<0.3	100%	100%	<0.3	<0.3	ACCEPT
Chromium	5	<5	102%	110%	6.5	9.7	ACCEPT
Copper	5	<5	95%	91%	16	18	ACCEPT
Lead	10	<10	99%	106%	52	45	ACCEPT
Mercury	0.2	<0.2	101%	105%	<0.2	<0.2	ACCEPT
Nickel	10	<10	97%	106%	<10	<10	ACCEPT
Zinc	5	<5	98%	98%	35	39	ACCEPT
Moisture	%						
pH (average for 3 measurements)							
EC	[dS/m]						
pH F							
pH FOX							
Reaction rate							

Lab ID	PQL (mg/kg)	Duplicate 2- Value 1	Duplicate 2- Value 2	Duplicate 2
Sample Name				
PAH				
Acenaphthene	0.3	<0.3	<0.3	ACCEPT
Acenaphthylene	0.3	<0.3	<0.3	ACCEPT
Anthracene	0.3	<0.3	<0.3	ACCEPT
Benzo[a]anthracene	0.3	<0.3	<0.3	ACCEPT
Benzo[a]pyrene	0.3	<0.3	<0.3	ACCEPT
Benzo[b]fluoranthene	0.3	<0.3	<0.3	ACCEPT
Benzo[g,h,i]perylene	0.3	<0.3	<0.3	ACCEPT
Benzo[k]fluoranthene	0.3	<0.3	<0.3	ACCEPT
Chrysene	0.3	<0.3	<0.3	ACCEPT
Dibenzo[a,h]anthracene	0.3	<0.3	<0.3	ACCEPT
Fluoranthene	0.3	<0.3	<0.3	ACCEPT
Fluorene	0.3	<0.3	<0.3	ACCEPT
Indeno(1,2,3-cd)pyrene	0.3	<0.3	<0.3	ACCEPT
Naphthalene	0.3	<0.3	<0.3	ACCEPT
Phenanthrene	0.3	<0.3	<0.3	ACCEPT
Pyrene	0.3	<0.3	<0.3	ACCEPT
p-Terphenyl-d14	surr.	100%	105%	
OCPs				
aldrin	0.1	<0.1	<0.1	ACCEPT
a-BHC	0.1	<0.1	<0.1	ACCEPT
b-BHC	0.1	<0.1	<0.1	ACCEPT
d-BHC	0.1	<0.1	<0.1	ACCEPT
g-BHC (lindane)	0.1	<0.1	<0.1	ACCEPT
cis-chlordane	0.1	<0.1	<0.1	ACCEPT
trans-chlordane	0.1	<0.1	<0.1	ACCEPT
4,4'-DDD	0.1	<0.1	<0.1	ACCEPT
4,4'-DDE	0.1	<0.1	<0.1	ACCEPT
4,4'-DDT	0.1	<0.1	<0.1	ACCEPT
dieldrin	0.1	<0.1	<0.1	ACCEPT
endosulfan I	0.2	<0.2	<0.2	ACCEPT
endosulfan II	0.2	<0.2	<0.2	ACCEPT
endosulfan sulfate	0.1	<0.1	<0.1	ACCEPT
endrin	0.2	<0.2	<0.2	ACCEPT
endrin aldehyde	0.1	<0.1	<0.1	ACCEPT
endrin ketone	0.1	<0.1	<0.1	ACCEPT
heptachlor	0.1	<0.1	<0.1	ACCEPT
heptachlor epoxide	0.1	<0.1	<0.1	ACCEPT
hexachlorobenzene	0.1	<0.1	<0.1	ACCEPT
methoxychlor	0.1	<0.1	<0.1	ACCEPT
TCMX	surr.	114%	122%	
OPPs				
chlorpyrifos	0.1	<0.1	<0.1	ACCEPT
chlorpyrifos methyl	0.1	<0.1	<0.1	ACCEPT
diazinon	0.1	<0.1	<0.1	ACCEPT
fenchlorphos	0.1	<0.1	<0.1	ACCEPT
methyl parathion	0.1	<0.1	<0.1	ACCEPT
prophos	0.1	<0.1	<0.1	ACCEPT
tributylphosphorotrithioite	0.1	<0.1	<0.1	ACCEPT
PCB				
Total PCB		<0.6	<0.6	ACCEPT
2-fluorobiphenyl	surr.	97%	104%	

Lab ID	PQL (mg/kg)	Duplicate 2- Value 1	Duplicate 2- Value 2	Duplicate 2
Sample Name				
TRH				
>C6-C10	35	<35	<35	ACCEPT
>C10-C16	50	<50	<50	ACCEPT
>C16-C34	100	<100	<100	ACCEPT
>C34-C40	100	<100	<100	ACCEPT
BTEX				
Benzene	0.5	<0.5	<0.5	ACCEPT
Toluene	0.5	<0.5	<0.5	ACCEPT
Ethylbenzene	1	<1	<1	ACCEPT
m, p- Xylene(s)	2	<2	<2	ACCEPT
o-Xylene	1	<1	<1	ACCEPT
Fluorobenzene	surr.	87%	105%	
Metals				
Arsenic	2	29	29	ACCEPT
Cadmium	0.3	<0.3	<0.3	ACCEPT
Chromium	5	<5	8.5	ACCEPT
Copper	5	89	93	ACCEPT
Lead	10	63	62	ACCEPT
Mercury	0.2	<0.2	<0.2	ACCEPT
Nickel	10	13	13	ACCEPT
Zinc	5	83	77	ACCEPT
Moisture	%			
pH (average for 3 measurements)				
EC	[dS/m]			
pH F				
pH FOX				
Reaction rate				

Comment:
XXXX = Vigorou

General Comments and Glossary

Tests not covered by NATA are denoted with *.

Samples are analysed on "as received" basis.

Samples were delivered chilled

Samples were preserved in correct manner

Sample containers for volatile analysis were received with minimal headspace

Samples were analysed within holding time

Some samples have been subcontracted

Yes

Yes

Yes

Yes

No

1. All samples are tested in batches of 20.

2. All results for soil samples are reported per gram of dry soil, unless otherwise stated.

3. However surrogate standards are added to samples due to PAH and BTEX analysis and recoveries are calculated, samples' results are not corrected for standards recoveries.

4. Analysis of VOC in water samples are performed on unfiltered waters (as received), spiked with surrogate

5. If heterogenous or insufficient material provided LCS is used as matrix spike for QA/QC purposes.

6. Duplicate sample and matrix spike recoveries may not be prepared on smaller jobs, however, were analysed at a frequency

7. QA/QC samples shown within the report that states the word "BATCH"; Batch Blank, Matrix Spike and Duplicate were prepared on samples from outside of reported job.

Blank: This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.

Duplicate: This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.

Matrix Spike: A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

LCS (Laboratory Control Sample): This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

Surr. (Surrogate Spike): Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

INS: Insufficient sample for this test

>: Greater than

LCS: Laboratory Control Sample

NT: Not tested

<: Less than

RPD: Relative Percent Difference

NA: Test not required

PQL: Practical Quantitation Limit

Laboratory Acceptance Criteria

Matrix Spikes and LCS: Generally 70-130% for inorganics/metals, 60-140% for organics is acceptable. Matrix heterogeneity may result in matrix spike analyses falling outside these limits.

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the PQL : No Limit

Results between 10-20 times the PQL : RPD must lie between 0-50%

Results >20 times the PQL : RPD must lie between 0-30%

Surrogate Recoveries : Recoveries must lie between 50-150% - Phenols 20-130%.

Accreditation No.14664.

Accredited for compliance with ISO/IEC 17025.

The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Tests not covered by NATA are denoted with *.



****Methods Number Description:**

ESA-MP-01	Determination of metals by MP-AES
ESA-MP-02	Digestion of soil samples for MP-AES analysis
ESA-MP-03	Preparation of water samples for metals determination by MP-AES
ESA-MP-04	TCLP for inorganic contaminants
ESA-MP-05	Digestion of paint and dust samples for lead content determination
ESA-MP-06	Digestion of air filters
ESA-MP-07	Digestion of swabs for determination of lead content in dust
ESA-P-ORG02	Analysis of PAHs by GC-MS
ESA-P-ORG03	Analysis of TRH and TPH by GC-FID
ESA-P-ORG04	Separatory funnel extraction of PAHs from water matrices including TCLP extracts
ESA-P-ORG05	Separatory funnel extraction of TRH and TPH from water matrices
ESA-P-ORG06	Silica gel clean up of soil and water extracts, prior analysis for STPH
ESA-P-ORG07	Extraction of BTEX and VTRX from soil matrices
ESA-P-ORG08	Analysis of soil extracts and waters by P&T GCMS
ESA-P-ORG09	Extraction of TRH from solid matrices
ESA-P-ORG14	Extraction of PCB (Aroclor) OCP OPP and PAH from soil matrices
ESA-P-ORG15	Analysis of PCB OCP OPP and PAH by GCMS
AS 1289.4.3.1	Determination of the pH value of a soil-Electrometric method
AS 1289.3.6.1	Determination of the particle size distribution of a soil - Standard method of analysis by sieving
T276	NSW RMS Test Method T 276 Foreign materials content of recycled crushed concrete
*Texture Assessment based on; Salinity Notes, Number 8, Oct 2000, ISSN 1 325-4448, "How to Texture soils & Test for Salinity"	
*ESA-P-16	Procedure for measurement of Electrical Conductivity EC
*pH FOX Test -Determination of Acid Sulfate Soils Field pH	

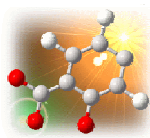
**Accreditation No.14664.**

Accredited for compliance with ISO/IEC 17025.

The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Tests not covered by NATA are denoted with *.

This document shall not be reproduced, except in full.



Environmental and OH&S Laboratory

A division of A. D. Envirotech Australia Pty Ltd

A.C.N. 093 452 950

Unit 4/10-11 Millennium Court,
Silverwater 2128
Ph: (02) 9648-6669

Analysis report: 8937-1

Customer: A. D. Envirotech Australia Pty. Ltd.
Attention: Clifton Thompson

Sample Log In Details

Your reference: 8937-1
No. of Samples: 2
Date Received: 02.04.2015
Date completed instructions received: 02.04.2015
Date of analysis: 02.04-08.04.2015

Report Details

Report Date: 23.04.2015
Method number:** ESA-MP-01
ESA-MP-02
ESA-P-ORG3
ESA-P-ORG07
ESA-P-ORG08
ESA-P-ORG09
ESA-P-ORG14
ESA-P-ORG15
AS 1289.4.3.1
*ESA-P-16
*pH FOX Test -Determination of Acid Sulfate Soils Field pH

Results Authorised By:

Dr Dominika Wojtalewicz (MRACI CCHEM)
Laboratory Manager



Accreditation No.14664.

Accredited for compliance with ISO/IEC 17025.

The results of the tests, calibrations and/or
measurements included in this document are traceable
to Australian/national standards.

Tests not covered by NATA are denoted with *.

Lab ID	PQL (mg/kg)	8937-C1	8937-C2
		8937-WAC01	8937-WAC02
Sample Name			
PAH			
Acenaphthene	0.3	<0.3	<0.3
Acenaphthylene	0.3	<0.3	<0.3
Anthracene	0.3	<0.3	<0.3
Benzo[a]anthracene	0.3	<0.3	0.6
Benzo[a]pyrene	0.3	<0.3	0.6
Benzo[b]fluoranthene	0.3	<0.3	<0.3
Benzo[g,h,i]perylene	0.3	<0.3	0.5
Benzo[k]fluoranthene	0.3	<0.3	<0.3
Chrysene	0.3	<0.3	0.6
Dibenzo[a,h]anthracene	0.3	<0.3	<0.3
Fluoranthene	0.3	<0.3	1.1
Fluorene	0.3	<0.3	<0.3
Indeno(1,2,3-cd)pyrene	0.3	<0.3	0.4
Naphthalene	0.3	<0.3	<0.3
Phenanthrene	0.3	<0.3	<0.3
Pyrene	0.3	<0.3	1.2
p-Terphenyl-d14	surr.	145%	138%
OCPs			
aldrin	0.1	<0.1	<0.1
a-BHC	0.1	<0.1	<0.1
b-BHC	0.1	<0.1	<0.1
d-BHC	0.1	<0.1	<0.1
g-BHC (lindane)	0.1	<0.1	<0.1
cis-chlordane	0.1	<0.1	<0.1
trans-chlordane	0.1	<0.1	<0.1
4,4'-DDD	0.1	<0.1	<0.1
4,4'-DDE	0.1	<0.1	<0.1
4,4'-DDT	0.1	<0.1	<0.1
dieldrin	0.1	<0.1	<0.1
endosulfan I	0.2	<0.2	<0.2
endosulfan II	0.2	<0.2	<0.2
endosulfan sulfate	0.1	<0.1	<0.1
endrin	0.2	<0.2	<0.2
endrin aldehyde	0.1	<0.1	<0.1
endrin ketone	0.1	<0.1	<0.1
heptachlor	0.1	<0.1	<0.1
heptachlor epoxide	0.1	<0.1	<0.1
hexachlorobenzene	0.1	<0.1	<0.1
methoxychlor	0.1	<0.1	<0.1
TCMX	surr.	116%	110%
OPPs			
chlorpyrifos	0.1	<0.1	<0.1
chlorpyrifos methyl	0.1	<0.1	<0.1
diazinon	0.1	<0.1	<0.1
fenchlorphos	0.1	<0.1	<0.1
methyl parathion	0.1	<0.1	<0.1
prophos	0.1	<0.1	<0.1
tributylphosphorotrithioite	0.1	<0.1	<0.1
PCB			
Total PCB		<0.6	<0.6
2-fluorobiphenyl	surr.	98%	97%

Lab ID	PQL (mg/kg)	8937-C1	8937-C2
Sample Name		8937-WAC01	8937-WAC02
TRH			
>C6-C10	35	<35	<35
>C10-C16	50	<50	<50
>C16-C34	100	<100	<100
>C34-C40	100	<100	<100
BTEX			
Benzene	0.5	<0.5	<0.5
Toluene	0.5	<0.5	<0.5
Ethylbenzene	1	<1	<1
m, p- Xylene(s)	2	<2	<2
o-Xylene	1	<1	<1
Fluorobenzene	surr.	96%	139%
Metals			
Arsenic	2	6.1	2.9
Cadmium	0.3	<0.3	<0.3
Chromium	5	<5	<5
Copper	5	12	22
Lead	10	25	52
Mercury	0.2	<0.2	<0.2
Nickel	10	<10	<10
Zinc	5	41	44
Moisture	%	19%	14%
pH (average for 3 measurements)		8.7	8.2
EC	[dS/m]	0.18	0.15
pH F		9.2	9.1
pH FOX		5.4	5.8
Reaction rate		XXXX	XXXX

Lab ID	PQL (mg/kg)	Batch Blank 1	Batch Blank spike 1	Batch Matrix spike 1	Batch Duplicate 1- Value 1	Batch Duplicate 1- Value 2	Batch Duplicate 1
Sample Name							
PAH							
Acenaphthene	0.3	<0.3	98%	100%	<0.3	<0.3	ACCEPT
Acenaphthylene	0.3	<0.3	NT	NT	<0.3	<0.3	ACCEPT
Anthracene	0.3	<0.3	106%	107%	<0.3	<0.3	ACCEPT
Benzo[a]anthracene	0.3	<0.3	NT	NT	<0.3	<0.3	ACCEPT
Benzo[a]pyrene	0.3	<0.3	NT	NT	<0.3	<0.3	ACCEPT
Benzo[b]fluoranthene	0.3	<0.3	NT	NT	<0.3	<0.3	ACCEPT
Benzo[g,h,i]perylene	0.3	<0.3	NT	NT	<0.3	<0.3	ACCEPT
Benzo[k]fluoranthene	0.3	<0.3	NT	NT	<0.3	<0.3	ACCEPT
Chrysene	0.3	<0.3	NT	NT	<0.3	<0.3	ACCEPT
Dibenzo[a,h]anthracene	0.3	<0.3	NT	NT	<0.3	<0.3	ACCEPT
Fluoranthene	0.3	<0.3	101%	105%	<0.3	<0.3	ACCEPT
Fluorene	0.3	<0.3	NT	NT	<0.3	<0.3	ACCEPT
Indeno[1,2,3-cd]pyrene	0.3	<0.3	NT	NT	<0.3	<0.3	ACCEPT
Naphthalene	0.3	<0.3	105%	107%	<0.3	<0.3	ACCEPT
Phenanthrene	0.3	<0.3	106%	105%	<0.3	<0.3	ACCEPT
Pyrene	0.3	<0.3	105%	110%	<0.3	<0.3	ACCEPT
p-Terphenyl-d14	surr.		85%	95%	146%	143%	
OCPs							
aldrin	0.1	<0.1	110%	112%	<0.1	<0.1	ACCEPT
a-BHC	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
b-BHC	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
d-BHC	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
g-BHC (lindane)	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
cis-chlordane	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
trans-chlordane	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
4,4'-DDD	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
4,4'-DDE	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
4,4'-DDT	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
dieldrin	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
endosulfan I	0.2	<0.2	NT	NT	<0.2	<0.2	ACCEPT
endosulfan II	0.2	<0.2	NT	NT	<0.2	<0.2	ACCEPT
endosulfan sulfate	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
endrin	0.2	<0.2	87%	92%	<0.2	<0.2	ACCEPT
endrin aldehyde	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
endrin ketone	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
heptachlor	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
heptachlor epoxide	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
hexachlorobenzene	0.1	<0.1	111%	117%	<0.1	<0.1	ACCEPT
methoxychlor	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
TCMX	surr.		106%	109%	129%	128%	
OPPs							
chlorpyrifos	0.1	<0.1	109%	114%	<0.1	<0.1	ACCEPT
chlorpyrifos methyl	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
diazinon	0.1	<0.1	100%	102%	<0.1	<0.1	ACCEPT
fenchlorphos	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
methyl parathion	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
prophos	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
tributylphosphorotrithioite	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
PCB							
Total PCB		<0.6	NT	NT	<0.6	<0.6	ACCEPT
2-fluorobiphenyl	surr.		104%	105%	110%	106%	

Lab ID	PQL (mg/kg)	Batch Blank 1	Batch Blank spike 1	Batch Matrix spike 1	Batch Duplicate 1- Value 1	Batch Duplicate 1- Value 2	Batch Duplicate 1
Sample Name							
TRH							
>C6-C10	35	<35	NT	NT	<35	<35	ACCEPT
>C10-C16	50	<50	128%	120%	<50	<50	ACCEPT
>C16-C34	100	<100	NT	NT	<100	<100	ACCEPT
>C34-C40	100	<100	NT	NT	<100	<100	ACCEPT
BTEX							
Benzene	0.5	<0.5	129%	130%	<0.5	<0.5	ACCEPT
Toluene	0.5	<0.5	123%	123%	<0.5	<0.5	ACCEPT
Ethylbenzene	1	<1	121%	121%	<1	<1	ACCEPT
m, p- Xylene(s)	2	<2	122%	122%	<2	<2	ACCEPT
o-Xylene	1	<1	123%	121%	<1	<1	ACCEPT
Fluorobenzene	surr.		126%	127%	115%	130%	
Metals							
Arsenic	2	<2	101%	100%	28	33	ACCEPT
Cadmium	0.3	<0.3	100%	100%	<0.3	<0.3	ACCEPT
Chromium	5	<5	102%	95%	16	11	ACCEPT
Copper	5	<5	97%	98%	49	58	ACCEPT
Lead	10	<10	101%	109%	54	66	ACCEPT
Mercury	0.2	<0.2	117%	123%	<0.2	<0.2	ACCEPT
Nickel	10	<10	94%	86%	17	22	ACCEPT
Zinc	5	<5	94%	88%	63	91	ACCEPT
Moisture	%						
pH (average for 3 measurements)							
EC	[dS/m]						
pH F							
pH FOX							
Reaction rate							

Lab ID	PQL (mg/kg)	Batch Duplicate 2- Value 1	Batch Duplicate 2- Value 2	Batch Duplicate 2
Sample Name				
PAH				
Acenaphthene	0.3	<0.3	<0.3	ACCEPT
Acenaphthylene	0.3	<0.3	<0.3	ACCEPT
Anthracene	0.3	<0.3	<0.3	ACCEPT
Benzo[a]anthracene	0.3	<0.3	<0.3	ACCEPT
Benzo[a]pyrene	0.3	<0.3	<0.3	ACCEPT
Benzo[b]fluoranthene	0.3	<0.3	<0.3	ACCEPT
Benzo[g,h,i]perylene	0.3	<0.3	<0.3	ACCEPT
Benzo[k]fluoranthene	0.3	<0.3	<0.3	ACCEPT
Chrysene	0.3	<0.3	<0.3	ACCEPT
Dibenzo[a,h]anthracene	0.3	<0.3	<0.3	ACCEPT
Fluoranthene	0.3	0.4	0.4	ACCEPT
Fluorene	0.3	<0.3	<0.3	ACCEPT
Indeno(1,2,3-cd)pyrene	0.3	<0.3	<0.3	ACCEPT
Naphthalene	0.3	<0.3	<0.3	ACCEPT
Phenanthrene	0.3	<0.3	<0.3	ACCEPT
Pyrene	0.3	0.4	0.4	ACCEPT
p-Terphenyl-d14	surr.	138%	147%	
OCPs				
aldrin	0.1	<0.1	<0.1	ACCEPT
a-BHC	0.1	<0.1	<0.1	ACCEPT
b-BHC	0.1	<0.1	<0.1	ACCEPT
d-BHC	0.1	<0.1	<0.1	ACCEPT
g-BHC (lindane)	0.1	<0.1	<0.1	ACCEPT
cis-chlordane	0.1	<0.1	<0.1	ACCEPT
trans-chlordane	0.1	<0.1	<0.1	ACCEPT
4,4'-DDD	0.1	<0.1	<0.1	ACCEPT
4,4'-DDE	0.1	<0.1	<0.1	ACCEPT
4,4'-DDT	0.1	<0.1	<0.1	ACCEPT
dieldrin	0.1	<0.1	<0.1	ACCEPT
endosulfan I	0.2	<0.2	<0.2	ACCEPT
endosulfan II	0.2	<0.2	<0.2	ACCEPT
endosulfan sulfate	0.1	<0.1	<0.1	ACCEPT
endrin	0.2	<0.2	<0.2	ACCEPT
endrin aldehyde	0.1	<0.1	<0.1	ACCEPT
endrin ketone	0.1	<0.1	<0.1	ACCEPT
heptachlor	0.1	<0.1	<0.1	ACCEPT
heptachlor epoxide	0.1	<0.1	<0.1	ACCEPT
hexachlorobenzene	0.1	<0.1	<0.1	ACCEPT
methoxychlor	0.1	<0.1	<0.1	ACCEPT
TCMX	surr.	108%	122%	
OPPs				
chlorpyrifos	0.1	<0.1	<0.1	ACCEPT
chlorpyrifos methyl	0.1	<0.1	<0.1	ACCEPT
diazinon	0.1	<0.1	<0.1	ACCEPT
fenchlorphos	0.1	<0.1	<0.1	ACCEPT
methyl parathion	0.1	<0.1	<0.1	ACCEPT
prophos	0.1	<0.1	<0.1	ACCEPT
tributylphosphorotrithioite	0.1	<0.1	<0.1	ACCEPT
PCB				
Total PCB		NT	NT	NT
2-fluorobiphenyl	surr.	NT	NT	

Lab ID	PQL (mg/kg)	Batch Duplicate 2- Value 1	Batch Duplicate 2- Value 2	Batch Duplicate 2
Sample Name				
TRH				
>C6-C10	35	<35	<35	ACCEPT
>C10-C16	50	<50	<50	ACCEPT
>C16-C34	100	<100	<100	ACCEPT
>C34-C40	100	<100	<100	ACCEPT
BTEX				
Benzene	0.5	<0.5	<0.5	ACCEPT
Toluene	0.5	<0.5	<0.5	ACCEPT
Ethylbenzene	1	<1	<1	ACCEPT
m, p- Xylene(s)	2	<2	<2	ACCEPT
o-Xylene	1	<1	<1	ACCEPT
Fluorobenzene	surr.	130%	134%	
Metals				
Arsenic	2	25	40	ACCEPT
Cadmium	0.3	<0.3	<0.3	ACCEPT
Chromium	5	8.0	15	ACCEPT
Copper	5	91	95	ACCEPT
Lead	10	78	100	ACCEPT
Mercury	0.2	<0.2	<0.2	ACCEPT
Nickel	10	32	26	ACCEPT
Zinc	5	160	120	ACCEPT
Moisture	%			
pH (average for 3 measurements)				
EC	[dS/m]			
pH F				
pH FOX				
Reaction rate				

Comment:
XXXX = Vigorou

General Comments and Glossary

Tests not covered by NATA are denoted with *.
Samples are analysed on "as received" basis.

Samples were delivered chilled

Samples were preserved in correct manner

Sample containers for volatile analysis were received with minimal headspace

Samples were analysed within holding time

Some samples have been subcontracted

Yes
Yes
Yes
Yes
No

1. All samples are tested in batches of 20.
2. All results for soil samples are reported per gram of dry soil, unless otherwise stated.
3. However surrogate standards are added to samples due to PAH and BTEX analysis and recoveries are calculated, samples' results are not corrected for standards recoveries.
4. Analysis of VOC in water samples are performed on unfiltered waters (as received), spiked with surrogate
5. If heterogenous or insufficient material provided LCS is used as matrix spike for QA/QC purposes.
6. Duplicate sample and matrix spike recoveries may not be prepared on smaller jobs, however, were analysed at a frequency
7. QA/QC samples shown within the report that states the word "BATCH"; Batch Blank, Matrix Spike and Duplicate were prepared on samples from outside of reported job.

Blank: This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.

Duplicate: This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.

Matrix Spike: A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

LCS (Laboratory Control Sample): This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

Surr. (Surrogate Spike): Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

INS: Insufficient sample for this test

>: Greater than

LCS: Laboratory Control Sample

NT: Not tested

<: Less than

RPD: Relative Percent Difference

NA: Test not required

PQL: Practical Quantitation Limit

Laboratory Acceptance Criteria

Matrix Spikes and LCS: Generally 70-130% for inorganics/metals, 60-140% for organics is acceptable.
Matrix heterogeneity may result in matrix spike analyses falling outside these limits.

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the PQL : No Limit

Results between 10-20 times the PQL : RPD must lie between 0-50%

Results >20 times the PQL : RPD must lie between 0-30%

Surrogate Recoveries : Recoveries must lie between 50-150% - Phenols 20-130%.



Accreditation No.14664.

Accredited for compliance with ISO/IEC 17025.

The results of the tests, calibrations and/or

measurements included in this document are traceable to Australian/national standards.

Tests not covered by NATA are denoted with *.

New South Wales Office:

A. D. Envirotech Australia Pty Ltd
Unit 4, 10-11 Millennium Court
Silverwater, NSW 2128

Telephone:

(02) 9648 6669

e-mail: info@ADenvirotech.com.au

ABN: 520 934 529 50

****Methods Number Description:**

ESA-MP-01	Determination of metals by MP-AES
ESA-MP-02	Digestion of soil samples for MP-AES analysis
ESA-MP-03	Preparation of water samples for metals determination by MP-AES
ESA-MP-04	TCLP for inorganic contaminants
ESA-MP-05	Digestion of paint and dust samples for lead content determination
ESA-MP-06	Digestion of air filters
ESA-MP-07	Digestion of swabs for determination of lead content in dust
ESA-P-ORG02	Analysis of PAHs by GC-MS
ESA-P-ORG03	Analysis of TRH and TPH by GC-FID
ESA-P-ORG04	Separatory funnel extraction of PAHs from water matrices including TCLP extracts
ESA-P-ORG05	Separatory funnel extraction of TRH and TPH from water matrices
ESA-P-ORG06	Silica gel clean up of soil and water extracts, prior analysis for STPH
ESA-P-ORG07	Extraction of BTEX and VTRX from soil matrices
ESA-P-ORG08	Analysis of soil extracts and waters by P&T GCMS
ESA-P-ORG09	Extraction of TRH from solid matrices
ESA-P-ORG14	Extraction of PCB (Aroclor) OCP OPP and PAH from soil matrices
ESA-P-ORG15	Analysis of PCB OCP OPP and PAH by GCMS
AS 1289.4.3.1	Determination of the pH value of a soil-Electrometric method
AS 1289.3.6.1	Determination of the particle size distribution of a soil - Standard method of analysis by sieving
T276	NSW RMS Test Method T 276 Foreign materials content of recycled crushed concrete
*Texture Assessment based on; Salinity Notes, Number 8, Oct 2000, ISSN 1 325-4448, "How to Texture soils & Test for Salinity"	
*ESA-P-16	Procedure for measurement of Electrical Conductivity EC
*pH FOX Test -Determination of Acid Sulfate Soils Field pH	

**Accreditation No.14664.**

Accredited for compliance with ISO/IEC 17025.

The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Tests not covered by NATA are denoted with *.

This document shall not be reproduced, except in full.

New South Wales Office:

A. D. Envirotech Australia Pty Ltd
Unit 4, 10-11 Millennium Court
Silverwater, NSW 2128

Telephone:

(02) 9648 6669

e-mail: info@ADenvirotech.com.au

ABN: 520 934 529 50



Environmental and OH&S Laboratory

A division of A. D. Envirotech Australia Pty Ltd
Unit 4/10-11 Millennium Court,
Silverwater 2128

A.C.N. 093 452 950

Analysis report: 8695 ASB 1

Date Received: 02.02.2015
Date Analysed: 04.02.2015
Report Date: 05.02.2015
Client: Gregory Hills Development Company Pty Ltd
Job Location: Gregory Hills NSW
Analytical method: Polarised Light Microscopy with dispersion staining (ADE method ABI)

Analysis performed by:

Dr Dominika Wojtalewicz (MRACI CCHEM)
Laboratory Manager/Principal Chemist
NATA approved asbestos identifier

Results Authorised By:

Dr Dominika Wojtalewicz (MRACI CCHEM)
Laboratory Manager/Principal Chemist
NATA signatory



Accreditation No.14664.

Accredited for compliance with ISO/IEC 17025.

The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Tests not covered by NATA are denoted with *.

Laboratory Sample No.	Sample Description/Matrix	Sample Dimensions (cm) unless stated otherwise	Result	Comments
8695-Asb1	Soil	147 grams	No Chrysotile asbestos found at reporting limit of 0.1 g/kg.	Nil
			No Amosite asbestos found at reporting limit of 0.1 g/kg.	Nil
			No Crocidolite asbestos found at reporting limit of 0.1 g/kg.	Nil
			No Synthetic Mineral Fibres found	Nil
			Organic fibres found	Nil
8695-Asb2	Soil	136 grams	No Chrysotile asbestos found at reporting limit of 0.1 g/kg.	Nil
			No Amosite asbestos found at reporting limit of 0.1 g/kg.	Nil
			No Crocidolite asbestos found at reporting limit of 0.1 g/kg.	Nil
			No Synthetic Mineral Fibres found	Nil
			Organic fibres found	Nil
8695-Asb3	Soil	105 grams	No Chrysotile asbestos found at reporting limit of 0.1 g/kg.	Nil
			No Amosite asbestos found at reporting limit of 0.1 g/kg.	Nil
			No Crocidolite asbestos found at reporting limit of 0.1 g/kg.	Nil
			No Synthetic Mineral Fibres found	Nil
			Organic fibres found	Nil
8695-Asb4	Soil	157 grams	No Chrysotile asbestos found at reporting limit of 0.1 g/kg.	Nil
			No Amosite asbestos found at reporting limit of 0.1 g/kg.	Nil
			No Crocidolite asbestos found at reporting limit of 0.1 g/kg.	Nil
			No Synthetic Mineral Fibres found	Nil
			Organic fibres found	Nil

General Comments:

All samples are analysed as received.

Sampling performed by AD Envirotech is not covered by NATA scope.

Samples are stored for period of 3 months.

Due to the difficulty of estimating the load on the swab the test is carried out for presence or absence of asbestos only.

¹ Independent confirming technique such as infrared spectroscopy, X-ray diffraction, scanning or transmission electron microscopy is advised.



Accreditation No.14664.

Accredited for compliance with ISO/IEC 17025.

The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Tests not covered by NATA are denoted with *.



Environmental and OH&S Laboratory

A division of A. D. Envirotech Australia Pty Ltd
Unit 4/10-11 Millennium Court,
Silverwater 2128

A.C.N. 093 452 950

Analysis report: 8695 ASB 2

Date Received: 06.02.2015
Date Analysed: 13.02.2015
Report Date: 16.02.2015
Client: Gregory Hills Development Company Pty Ltd
Job Location: Gregory Hills NSW
Analytical method: Polarised Light Microscopy with dispersion staining (ADE method ABI)

Analysis performed by:

Dr Dominika Wojtalewicz (MRACI CCHEM)
Laboratory Manager/Principal Chemist
NATA approved asbestos identifier

Results Authorised By:

Dr Dominika Wojtalewicz (MRACI CCHEM)
Laboratory Manager/Principal Chemist
NATA signatory



Accreditation No.14664.

Accredited for compliance with ISO/IEC 17025.

The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Tests not covered by NATA are denoted with *.

Laboratory Sample No.	Sample Description/Matrix	Sample Dimensions (cm) unless stated otherwise	Result	Comments
8695-Asb5	Soil	131 grams	No Chrysotile asbestos found at reporting limit of 0.1 g/kg.	Nil
			No Amosite asbestos found at reporting limit of 0.1 g/kg.	Nil
			No Crocidolite asbestos found at reporting limit of 0.1 g/kg.	Nil
			No Synthetic Mineral Fibres found	Nil
			Organic fibres found	Nil

General Comments:

All samples are analysed as received.

Sampling performed by AD Envirotech is not covered by NATA scope.

Samples are stored for period of 3 months.

Due to the difficulty of estimating the load on the swab the test is carried out for presence or absence of asbestos only.

¹ Independent confirming technique such as infrared spectroscopy, X-ray diffraction, scanning or transmission electron microscopy is advised.



Accreditation No.14664.

Accredited for compliance with ISO/IEC 17025.

The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Tests not covered by NATA are denoted with *.



Environmental and OH&S Laboratory

A division of A. D. Envirotech Australia Pty Ltd
Unit 4/10-11 Millennium Court,
Silverwater 2128

A.C.N. 093 452 950

Analysis report: 8622 ASB 1

Date Received: 20.01.2015
Date Analysed: 28.01.2015
Report Date: 29.01.2015
Client: Gregory Hills Development Company Pty Ltd
Job Location: Gregory Hills NSW
Analytical method: Polarised Light Microscopy with dispersion staining (ADE method ABI)

Analysis performed by:

Dr Dominika Wojtalewicz (MRACI CCHEM)
Laboratory Manager/Principal Chemist
NATA approved asbestos identifier

Results Authorised By:

Dr Dominika Wojtalewicz (MRACI CCHEM)
Laboratory Manager/Principal Chemist
NATA signatory



Accreditation No.14664.

Accredited for compliance with ISO/IEC 17025.

The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Tests not covered by NATA are denoted with *.

Laboratory Sample No.	Sample Description/Matrix	Sample Dimensions (cm) unless stated otherwise	Result	Comments
8622-Asb1	Soil	85 grams	No Chrysotile asbestos found at reporting limit of 0.1 g/kg.	Nil
			No Amosite asbestos found at reporting limit of 0.1 g/kg.	Nil
			No Crocidolite asbestos found at reporting limit of 0.1 g/kg.	Nil
			No Synthetic Mineral Fibres found	Nil
			Organic fibres found	Nil
8622-Asb2	Soil	96 grams	No Chrysotile asbestos found at reporting limit of 0.1 g/kg.	Nil
			No Amosite asbestos found at reporting limit of 0.1 g/kg.	Nil
			No Crocidolite asbestos found at reporting limit of 0.1 g/kg.	Nil
			No Synthetic Mineral Fibres found	Nil
			Organic fibres found	Nil

General Comments:

All samples are analysed as received.

Sampling performed by AD Envirotech is not covered by NATA scope.

Samples are stored for period of 3 months.

Due to the difficulty of estimating the load on the swab the test is carried out for presence or absence of asbestos only.

¹ Independent confirming technique such as infrared spectroscopy, X-ray diffraction, scanning or transmission electron microscopy is advised.



Accreditation No.14664.

Accredited for compliance with ISO/IEC 17025.

The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Tests not covered by NATA are denoted with *.



Environmental and OH&S Laboratory

A division of A. D. Envirotech Australia Pty Ltd
Unit 4/10-11 Millennium Court,
Silverwater 2128

A.C.N. 093 452 950

Analysis report: 8622 ASB 2

Date Received: 27.01.2015
Date Analysed: 28.01.2015
Report Date: 29.01.2015
Client: Gregory Hills Development Company Pty Ltd
Job Location: Gregory Hills NSW
Analytical method: Polarised Light Microscopy with dispersion staining (ADE method ABI)

Analysis performed by:

Dr Dominika Wojtalewicz (MRACI CCHEM)
Laboratory Manager/Principal Chemist
NATA approved asbestos identifier

Results Authorised By:

Dr Dominika Wojtalewicz (MRACI CCHEM)
Laboratory Manager/Principal Chemist
NATA signatory



Accreditation No.14664.

Accredited for compliance with ISO/IEC 17025.

The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Tests not covered by NATA are denoted with *.

Laboratory Sample No.	Sample Description/Matrix	Sample Dimensions (cm) unless stated otherwise	Result	Comments
8622-Asb3	Soil	80 grams	No Chrysotile asbestos found at reporting limit of 0.1 g/kg.	Nil
			No Amosite asbestos found at reporting limit of 0.1 g/kg.	Nil
			No Crocidolite asbestos found at reporting limit of 0.1 g/kg.	Nil
			No Synthetic Mineral Fibres found	Nil
			Organic fibres found	Nil
8622-Asb4	Soil	128 grams	No Chrysotile asbestos found at reporting limit of 0.1 g/kg.	Nil
			No Amosite asbestos found at reporting limit of 0.1 g/kg.	Nil
			No Crocidolite asbestos found at reporting limit of 0.1 g/kg.	Nil
			No Synthetic Mineral Fibres found	Nil
			Organic fibres found	Nil

General Comments:

All samples are analysed as received.

Sampling performed by AD Envirotech is not covered by NATA scope.

Samples are stored for period of 3 months.

Due to the difficulty of estimating the load on the swab the test is carried out for presence or absence of asbestos only.

¹ Independent confirming technique such as infrared spectroscopy, X-ray diffraction, scanning or transmission electron microscopy is advised.



Accreditation No.14664.

Accredited for compliance with ISO/IEC 17025.

The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Tests not covered by NATA are denoted with *.



Environmental and OH&S Laboratory

A division of A. D. Envirotech Australia Pty Ltd
Unit 4/10-11 Millennium Court,
Silverwater 2128

A.C.N. 093 452 950

Analysis report: 8937 ASB 2

Date Received: 13.04.2015
Date Analysed: 20.04.2015
Report Date: 20.04.2015
Client: Gregory Hills Development Company Pty Ltd
Job Location: Gregory Hills NSW
Analytical method: Polarised Light Microscopy with dispersion staining (ADE method ABI)

Analysis performed by:

Dr Dominika Wojtalewicz (MRACI CCHEM)
Laboratory Manager/Principal Chemist
NATA approved asbestos identifier

Results Authorised By:

Dr Dominika Wojtalewicz (MRACI CCHEM)
Laboratory Manager/Principal Chemist
NATA signatory



Accreditation No.14664.

Accredited for compliance with ISO/IEC 17025.

The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Tests not covered by NATA are denoted with *.

Laboratory Sample No.	Sample Description/Matrix	Sample Dimensions (cm) unless stated otherwise	Result	Comments
8937-Asb3	Soil	76 grams	No Chrysotile asbestos found at reporting limit of 0.1 g/kg.	Nil
			No Amosite asbestos found at reporting limit of 0.1 g/kg.	Nil
			No Crocidolite asbestos found at reporting limit of 0.1 g/kg.	Nil
			No Synthetic Mineral Fibres found	Nil
			Organic fibres found	Nil
8937-Asb4	Soil	98 grams	No Chrysotile asbestos found at reporting limit of 0.1 g/kg.	Nil
			No Amosite asbestos found at reporting limit of 0.1 g/kg.	Nil
			No Crocidolite asbestos found at reporting limit of 0.1 g/kg.	Nil
			No Synthetic Mineral Fibres found	Nil
			Organic fibres found	Nil
8937-Asb5	Soil	86 grams	No Chrysotile asbestos found at reporting limit of 0.1 g/kg.	Nil
			No Amosite asbestos found at reporting limit of 0.1 g/kg.	Nil
			No Crocidolite asbestos found at reporting limit of 0.1 g/kg.	Nil
			No Synthetic Mineral Fibres found	Nil
			Organic fibres found	Nil

General Comments:

All samples are analysed as received.

Sampling performed by AD Envirotech is not covered by NATA scope.

Samples are stored for period of 3 months.

Due to the difficulty of estimating the load on the swab the test is carried out for presence or absence of asbestos only.

¹ Independent confirming technique such as infrared spectroscopy, X-ray diffraction, scanning or transmission electron microscopy is advised.



Accreditation No.14664.

Accredited for compliance with ISO/IEC 17025.

The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Tests not covered by NATA are denoted with *.



Environmental and OH&S Laboratory

A division of A. D. Envirotech Australia Pty Ltd
Unit 4/10-11 Millennium Court,
Silverwater 2128

A.C.N. 093 452 950

Analysis report: 8937 ASB 1

Date Received: 01-02.04.2015
Date Analysed: 15.04.2015
Report Date: 20.04.2015
Client: Gregory Hills Development Company Pty Ltd
Job Location: Gregory Hills NSW
Analytical method: Polarised Light Microscopy with dispersion staining (ADE method ABI)

Analysis performed by:

Dr Dominika Wojtalewicz (MRACI CCHEM)
Laboratory Manager/Principal Chemist
NATA approved asbestos identifier

Results Authorised By:

Dr Dominika Wojtalewicz (MRACI CCHEM)
Laboratory Manager/Principal Chemist
NATA signatory



Accreditation No.14664.

Accredited for compliance with ISO/IEC 17025.

The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Tests not covered by NATA are denoted with *.

Laboratory Sample No.	Sample Description/Matrix	Sample Dimensions (cm) unless stated otherwise	Result	Comments
8937-Asb1	Soil	83 grams	No Chrysotile asbestos found at reporting limit of 0.1 g/kg.	Nil
			No Amosite asbestos found at reporting limit of 0.1 g/kg.	Nil
			No Crocidolite asbestos found at reporting limit of 0.1 g/kg.	Nil
			No Synthetic Mineral Fibres found	Nil
			Organic fibres found	Nil
8937-Asb2	Soil	70 grams	No Chrysotile asbestos found at reporting limit of 0.1 g/kg.	Nil
			No Amosite asbestos found at reporting limit of 0.1 g/kg.	Nil
			No Crocidolite asbestos found at reporting limit of 0.1 g/kg.	Nil
			No Synthetic Mineral Fibres found	Nil
			Organic fibres found	Nil

General Comments:

All samples are analysed as received.

Sampling performed by AD Envirotech is not covered by NATA scope.

Samples are stored for period of 3 months.

Due to the difficulty of estimating the load on the swab the test is carried out for presence or absence of asbestos only.

¹ Independent confirming technique such as infrared spectroscopy, X-ray diffraction, scanning or transmission electron microscopy is advised.



Accreditation No.14664.

Accredited for compliance with ISO/IEC 17025.

The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Tests not covered by NATA are denoted with *.

Certificate of Analysis

AD Envirotech Aust Pty Ltd
Unit 4/ 10-11 Millenium Court
Silverwater
NSW 2128



NATA Accredited
Accreditation Number 1261
Site Number 1254

Accredited for compliance with ISO/IEC 17025.
The results of the tests, calibrations and/or
measurements included in this document are traceable
to Australian/national standards.

Attention: Clifton Thompson

Report 453872-S
Project name 8937
Received Date Apr 14, 2015

Client Sample ID			8937-SAL1	8937-SAL2	8937-SAL3	8937-SAL4
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			S15-Ap08903	S15-Ap08904	S15-Ap08905	S15-Ap08906
Date Sampled			Apr 01, 2015	Apr 02, 2015	Apr 13, 2015	Apr 13, 2015
Test/Reference	LOR	Unit				
Chloride	5	mg/kg	< 5	180	< 5	7.2
Phenolics (total)	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Sulphate (as SO ₄)	30	mg/kg	550	230	78	240
% Moisture	0.1	%	19	12	18	19

Client Sample ID			8937-SAL5
Sample Matrix			Soil
Eurofins mgt Sample No.			S15-Ap08907
Date Sampled			Apr 13, 2015
Test/Reference	LOR	Unit	
Chloride	5	mg/kg	97
Phenolics (total)	0.1	mg/kg	< 0.1
Sulphate (as SO ₄)	30	mg/kg	100
% Moisture	0.1	%	16

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.

A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Chloride	Melbourne	Apr 16, 2015	28 Day
- Method: MGT 1100A			
Phenolics (total)	Melbourne	Apr 16, 2015	14 Day
- Method: APHA 5530B & D Phenols			
Sulphate (as SO ₄)	Melbourne	Apr 16, 2015	28 Day
- Method: APHA 4500-SO ₄ Sulfate by FIA			
% Moisture	Melbourne	Apr 14, 2015	14 Day
- Method: LTM-GEN-7080 Moisture			

Company Name: AD Envirotech Aust Pty Ltd
Address: Unit 4/ 10-11 Millenium Court
Silverwater
NSW 2128
Project Name: 8937

Order No.:
Report #: 453872
Phone: 02 9400 7711
Fax: 02 9401 0097

Received: Apr 14, 2015 2:40 PM
Due: Apr 21, 2015
Priority: 5 Day
Contact Name: Clifton Thompson

Eurofins | mgt Client Manager: Mary Makarios

Sample Detail					Chloride	Phenolics (total)	Sulphate (as SO4)	Moisture Set
Laboratory where analysis is conducted								
Melbourne Laboratory - NATA Site # 1254 & 14271					X	X	X	X
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794								
External Laboratory								
Sample ID	Sample Date	Sampling Time	Matrix	LAB ID				
8937-SAL1	Apr 01, 2015		Soil	S15-Ap08903	X	X	X	X
8937-SAL2	Apr 02, 2015		Soil	S15-Ap08904	X	X	X	X
8937-SAL3	Apr 13, 2015		Soil	S15-Ap08905	X	X	X	X
8937-SAL4	Apr 13, 2015		Soil	S15-Ap08906	X	X	X	X
8937-SAL5	Apr 13, 2015		Soil	S15-Ap08907	X	X	X	X

Eurofins | mgt Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
4. Results are uncorrected for matrix spikes or surrogate recoveries.
5. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
6. Samples were analysed on an 'as received' basis. 7. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Advice.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

****NOTE:** pH duplicates are reported as a range NOT as RPD

UNITS

mg/kg: milligrams per Kilogram

ug/l: micrograms per litre

ppb: Parts per billion

org/100ml: Organisms per 100 millilitres

MPN/100mL: Most Probable Number of organisms per 100 millilitres

mg/l: milligrams per litre

ppm: Parts per million

%: Percentage

NTU: Nephelometric Turbidity Units

TERMS

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery
CRM	Certified Reference Material - reported as percent recovery
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands. In the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
Batch Duplicate	A second piece of analysis from a sample outside of the clients batch of samples but run within the laboratory batch of analysis.
Batch SPIKE	Spike recovery reported on a sample from outside of the clients batch of samples but run within the laboratory batch of analysis.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
ASLP	Australian Standard Leaching Procedure (AS4439.3)
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within
TEQ	Toxic Equivalency Quotient

QC - ACCEPTANCE CRITERIA

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries : Recoveries must lie between 50-150% - Phenols 20-130%.

QC DATA GENERAL COMMENTS

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxophene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxophene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Arochlor 1260 in Matrix Spikes and LCS's.
9. For Matrix Spikes and LCS results a dash " - " in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPD's are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank									
Chloride			mg/kg	< 5			5	Pass	
Sulphate (as SO ₄)			mg/kg	< 30			30	Pass	
LCS - % Recovery									
Chloride			%	93			70-130	Pass	
Phenolics (total)			%	101			70-130	Pass	
Sulphate (as SO ₄)			%	118			70-130	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
				Result 1					
Chloride	B15-Ap09647	NCP	%	94			70-130	Pass	
Sulphate (as SO ₄)	M15-Ap08323	NCP	%	103			70-130	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
				Result 1	Result 2	RPD			
Chloride	B15-Ap09646	NCP	mg/kg	< 5	< 5	<1	30%	Pass	
Phenolics (total)	S15-Ap05707	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Sulphate (as SO ₄)	M15-Ap08322	NCP	mg/kg	1400	1300	8.7	30%	Pass	
% Moisture	M15-Ap08948	NCP	%	14	13	7.0	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Authorised By

Mary Makarios	Analytical Services Manager
Emily Rosenberg	Senior Analyst-Metal (VIC)
Huong Le	Senior Analyst-Inorganic (VIC)



Glenn Jackson

National Laboratory Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Uncertainty data is available on request

Eurofins | mgt shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins | mgt be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

Certificate of Analysis

AD Envirotech Aust Pty Ltd
Unit 4/ 10-11 Millenium Court
Silverwater
NSW 2128



NATA Accredited
Accreditation Number 1261
Site Number 1254

Accredited for compliance with ISO/IEC 17025.
The results of the tests, calibrations and/or
measurements included in this document are traceable
to Australian/national standards.

Attention: C Thompson

Report 446185-S
Project name 8695
Received Date Feb 03, 2015

Client Sample ID			8695-SAL1	8695-SAL2	8695-SAL3	8695-SAL4
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			S15-Fe01408	S15-Fe01409	S15-Fe01410	S15-Fe01411
Date Sampled			Feb 02, 2015	Feb 02, 2015	Feb 02, 2015	Feb 02, 2015
Test/Reference	LOR	Unit				
Chloride	10	mg/kg	120	< 10	12	150
Phenolics (total)	0.1	mg/kg	< 0.1	0.5	< 0.1	< 0.1
Sulphate (as S)	10	mg/kg	< 10	19	< 10	52
% Moisture	0.1	%	15	13	20	7.9

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.

A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Chloride	Sydney	Feb 05, 2015	28 Day
- Method: E033 /E045 /E047 Chloride			
Phenolics (total)	Sydney	Feb 05, 2015	14 Day
- Method: E041 /E055 Total Phenolics			
Sulphate (as S)	Sydney	Feb 05, 2015	28 Day
- Method: E045 Sulphate			
% Moisture	Sydney	Feb 03, 2015	14 Day
- Method: LTM-GEN-7080 Moisture			

Company Name: AD Envirotech Aust Pty Ltd
Address: Unit 4/ 10-11 Millenium Court
Silverwater
NSW 2128
Project Name: 8695

Order No.:
Report #: 446185
Phone: 02 9400 7711
Fax: 02 9401 0097

Received: Feb 3, 2015 1:38 PM
Due: Feb 10, 2015
Priority: 5 Day
Contact Name: C Thompson

Eurofins | mgt Client Manager: Mary Makarios

Sample Detail					Chloride	Phenolics (total)	Sulphate (as S)	Moisture Set
Laboratory where analysis is conducted								
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217					X	X	X	X
Brisbane Laboratory - NATA Site # 20794								
External Laboratory								
Sample ID	Sample Date	Sampling Time	Matrix	LAB ID				
8695-SAL1	Feb 02, 2015		Soil	S15-Fe01408	X	X	X	X
8695-SAL2	Feb 02, 2015		Soil	S15-Fe01409	X	X	X	X
8695-SAL3	Feb 02, 2015		Soil	S15-Fe01410	X	X	X	X
8695-SAL4	Feb 02, 2015		Soil	S15-Fe01411	X	X	X	X

Eurofins | mgt Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
4. Results are uncorrected for matrix spikes or surrogate recoveries.
5. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
6. Samples were analysed on an 'as received' basis. 7. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Advice.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

****NOTE:** pH duplicates are reported as a range NOT as RPD

UNITS

mg/kg: milligrams per Kilogram

ug/l: micrograms per litre

ppb: Parts per billion

org/100ml: Organisms per 100 millilitres

MPN/100mL: Most Probable Number of organisms per 100 millilitres

mg/l: milligrams per litre

ppm: Parts per million

%: Percentage

NTU: Nephelometric Turbidity Units

TERMS

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery
CRM	Certified Reference Material - reported as percent recovery
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands. In the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
Batch Duplicate	A second piece of analysis from a sample outside of the clients batch of samples but run within the laboratory batch of analysis.
Batch SPIKE	Spike recovery reported on a sample from outside of the clients batch of samples but run within the laboratory batch of analysis.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
ASLP	Australian Standard Leaching Procedure (AS4439.3)
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within
TEQ	Toxic Equivalency Quotient

QC - ACCEPTANCE CRITERIA

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries : Recoveries must lie between 50-150% - Phenols 20-130%.

QC DATA GENERAL COMMENTS

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxophene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxophene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Arochlor 1260 in Matrix Spikes and LCS's.
9. For Matrix Spikes and LCS results a dash " - " in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPD's are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test				Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank										
Chloride				mg/kg	< 10			10	Pass	
Phenolics (total)				mg/kg	< 0.1			0.1	Pass	
Sulphate (as S)				mg/kg	< 10			10	Pass	
LCS - % Recovery										
Chloride				%	102			70-130	Pass	
Phenolics (total)				%	96			70-130	Pass	
Sulphate (as S)				%	105			70-130	Pass	
Test	Lab Sample ID	QA Source		Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery										
					Result 1					
Chloride	S15-Fe01408	CP		%	106			70-130	Pass	
Phenolics (total)	S15-Fe01405	NCP		%	85			70-130	Pass	
Test	Lab Sample ID	QA Source		Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate										
					Result 1	Result 2	RPD			
Chloride	S15-Fe01408	CP		mg/kg	120	120	<1	30%	Pass	
Phenolics (total)	S15-Fe01404	NCP		mg/kg	0.20	0.20	<1	30%	Pass	
Sulphate (as S)	S15-Fe01408	CP		mg/kg	< 10	< 10	<1	30%	Pass	
Duplicate										
					Result 1	Result 2	RPD			
% Moisture	S15-Fe01411	CP		%	7.9	8.1	3.0	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Authorised By

Mary Makarios	Analytical Services Manager
Bob Symons	Senior Analyst-Inorganic (NSW)
Ivan Taylor	Senior Analyst-Metal (NSW)



Glenn Jackson

National Laboratory Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Uncertainty data is available on request

Eurofins | mgt shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins | mgt be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

Certificate of Analysis

AD Envirotech Aust Pty Ltd
Unit 4/ 10-11 Millenium Court
Silverwater
NSW 2128



NATA Accredited
Accreditation Number 1261
Site Number 1254

Accredited for compliance with ISO/IEC 17025.
The results of the tests, calibrations and/or
measurements included in this document are traceable
to Australian/national standards.

Attention: Clifton Thompson

Report 448726-S

Project name

Project ID 8695

Received Date Feb 25, 2015

Client Sample ID			8695-SAL6	8695-SAL7
Sample Matrix			Soil	Soil
Eurofins mgt Sample No.			S15-Fe19317	S15-Fe19318
Date Sampled			Feb 12, 2015	Feb 12, 2015
Test/Reference	LOR	Unit		
Chloride	10	mg/kg	54	110
Phenolics (total)	0.1	mg/kg	0.3	< 0.1
Sulphate (as S)	10	mg/kg	< 10	96
% Moisture	0.1	%	12	13

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.

A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Chloride	Sydney	Feb 26, 2015	28 Day
- Method: E033 /E045 /E047 Chloride			
Phenolics (total)	Sydney	Feb 26, 2015	14 Day
- Method: E041 /E055 Total Phenolics			
Sulphate (as S)	Sydney	Feb 26, 2015	28 Day
- Method: E045 Sulphate			
% Moisture	Sydney	Feb 25, 2015	14 Day
- Method: LTM-GEN-7080 Moisture			

Company Name: AD Envirotech Aust Pty Ltd
Address: Unit 4/ 10-11 Millenium Court
Silverwater
NSW 2128

Project Name:
Project ID: 8695

Order No.:
Report #: 448726
Phone: 02 9400 7711
Fax: 02 9401 0097

Received: Feb 25, 2015 3:52 PM
Due: Mar 4, 2015
Priority: 5 Day
Contact Name: Clifton Thompson

Eurofins | mgt Client Manager: Mary Makarios

Sample Detail					Chloride	Phenolics (total)	Sulphate (as S)	Moisture Set
Laboratory where analysis is conducted								
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217					X	X	X	X
Brisbane Laboratory - NATA Site # 20794								
External Laboratory								
Sample ID	Sample Date	Sampling Time	Matrix	LAB ID				
8695-SAL6	Feb 12, 2015		Soil	S15-Fe19317	X	X	X	X
8695-SAL7	Feb 12, 2015		Soil	S15-Fe19318	X	X	X	X

Eurofins | mgt Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
4. Results are uncorrected for matrix spikes or surrogate recoveries.
5. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
6. Samples were analysed on an 'as received' basis. 7. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Advice.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

****NOTE:** pH duplicates are reported as a range NOT as RPD

UNITS

mg/kg: milligrams per Kilogram

ug/l: micrograms per litre

ppb: Parts per billion

org/100ml: Organisms per 100 millilitres

MPN/100mL: Most Probable Number of organisms per 100 millilitres

mg/l: milligrams per litre

ppm: Parts per million

%: Percentage

NTU: Nephelometric Turbidity Units

TERMS

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery
CRM	Certified Reference Material - reported as percent recovery
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands. In the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
Batch Duplicate	A second piece of analysis from a sample outside of the clients batch of samples but run within the laboratory batch of analysis.
Batch SPIKE	Spike recovery reported on a sample from outside of the clients batch of samples but run within the laboratory batch of analysis.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
ASLP	Australian Standard Leaching Procedure (AS4439.3)
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within
TEQ	Toxic Equivalency Quotient

QC - ACCEPTANCE CRITERIA

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries : Recoveries must lie between 50-150% - Phenols 20-130%.

QC DATA GENERAL COMMENTS

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxophene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxophene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Arochlor 1260 in Matrix Spikes and LCS's.
9. For Matrix Spikes and LCS results a dash " - " in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPD's are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank									
Chloride			mg/kg	< 10			10	Pass	
Phenolics (total)			mg/kg	< 0.1			0.1	Pass	
Sulphate (as S)			mg/kg	< 10			10	Pass	
LCS - % Recovery									
Chloride			%	109			70-130	Pass	
Phenolics (total)			%	81			70-130	Pass	
Sulphate (as S)			%	95			70-130	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
				Result 1					
Chloride	S15-Fe19307	NCP	%	105			70-130	Pass	
Sulphate (as S)	S15-Fe19307	NCP	%	108			70-130	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
				Result 1	Result 2	RPD			
Chloride	S15-Fe19307	NCP	mg/kg	600	610	1.0	30%	Pass	
Phenolics (total)	S15-Fe18239	NCP	mg/kg	1.3	1.3	1.0	30%	Pass	
Sulphate (as S)	S15-Fe19307	NCP	mg/kg	160	160	1.0	30%	Pass	
% Moisture	S15-Fe16971	NCP	%	3.1	3.1	1.0	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	No
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Authorised By

Mary Makarios	Analytical Services Manager
Bob Symons	Senior Analyst-Inorganic (NSW)
Ivan Taylor	Senior Analyst-Metal (NSW)



Glenn Jackson

National Laboratory Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Uncertainty data is available on request

Eurofins | mgt shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins | mgt be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

Certificate of Analysis

AD Envirotech Aust Pty Ltd
Unit 4/ 10-11 Millenium Court
Silverwater
NSW 2128



NATA Accredited
Accreditation Number 1261
Site Number 1254

Accredited for compliance with ISO/IEC 17025.
The results of the tests, calibrations and/or
measurements included in this document are traceable
to Australian/national standards.

Attention: Nick Mirsepasi

Report 447200-S
Project name 8695
Received Date Feb 10, 2015

Client Sample ID			8695-SAL5
Sample Matrix			Soil
Eurofins mgt Sample No.			M15-Fe08620
Date Sampled			Feb 06, 2015
Test/Reference	LOR	Unit	
Chloride	5	mg/kg	140
Phenolics (total)	0.1	mg/kg	< 0.1
Sulphate (as S)	10	mg/kg	38
% Moisture	0.1	%	12
Heavy Metals			
Arsenic	2	mg/kg	3.5
Cadmium	0.4	mg/kg	< 0.4
Chromium	5	mg/kg	57
Copper	5	mg/kg	6.8
Lead	5	mg/kg	6.0
Mercury	0.1	mg/kg	< 0.1
Nickel	5	mg/kg	30
Zinc	5	mg/kg	19

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.

A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Chloride	Melbourne	Feb 17, 2015	28 Day
- Method: MGT 1100A			
Phenolics (total)	Melbourne	Feb 12, 2015	14 Day
- Method: APHA 5530B & D Phenols			
Sulphate (as S)	Melbourne	Feb 12, 2015	28 Day
- Method: In house MGT1110A (SO4 by Discrete Analyser)			
Metals M8	Melbourne	Feb 12, 2015	28 Day
- Method: USEPA 6010/6020 Heavy Metals & USEPA 7470/71 Mercury			
% Moisture	Melbourne	Feb 12, 2015	14 Day
- Method: LTM-GEN-7080 Moisture			

Company Name: AD Envirotech Aust Pty Ltd
Address: Unit 4/ 10-11 Millenium Court
Silverwater
NSW 2128
Project Name: 8695

Order No.:
Report #: 447200
Phone: 02 9400 7711
Fax: 02 9401 0097

Received: Feb 10, 2015 3:25 PM
Due: Feb 17, 2015
Priority: 5 Day
Contact Name: N Mirsepasi

Eurofins | mgt Client Manager: Mary Makarios

Sample Detail					Chloride	Phenolics (total)	Sulphate (as S)	Metals M8	Moisture Set
Laboratory where analysis is conducted									
Melbourne Laboratory - NATA Site # 1254 & 14271					X	X	X	X	X
Sydney Laboratory - NATA Site # 18217									
Brisbane Laboratory - NATA Site # 20794									
External Laboratory									
Sample ID	Sample Date	Sampling Time	Matrix	LAB ID					
8695-SAL5	Feb 06, 2015		Soil	M15-Fe08620	X	X	X	X	X

Eurofins | mgt Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
4. Results are uncorrected for matrix spikes or surrogate recoveries.
5. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
6. Samples were analysed on an 'as received' basis. 7. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Advice.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

****NOTE:** pH duplicates are reported as a range NOT as RPD

UNITS

mg/kg: milligrams per Kilogram

ug/l: micrograms per litre

ppb: Parts per billion

org/100ml: Organisms per 100 millilitres

MPN/100mL: Most Probable Number of organisms per 100 millilitres

mg/l: milligrams per litre

ppm: Parts per million

%: Percentage

NTU: Nephelometric Turbidity Units

TERMS

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery
CRM	Certified Reference Material - reported as percent recovery
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands. In the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
Batch Duplicate	A second piece of analysis from a sample outside of the clients batch of samples but run within the laboratory batch of analysis.
Batch SPIKE	Spike recovery reported on a sample from outside of the clients batch of samples but run within the laboratory batch of analysis.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
ASLP	Australian Standard Leaching Procedure (AS4439.3)
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within
TEQ	Toxic Equivalency Quotient

QC - ACCEPTANCE CRITERIA

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries : Recoveries must lie between 50-150% - Phenols 20-130%.

QC DATA GENERAL COMMENTS

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxophene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxophene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Arochlor 1260 in Matrix Spikes and LCS's.
9. For Matrix Spikes and LCS results a dash " - " in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPD's are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank									
Chloride			mg/kg	< 5			5	Pass	
Phenolics (total)			mg/kg	< 0.1			0.1	Pass	
Sulphate (as S)			mg/kg	< 10			10	Pass	
Method Blank									
Heavy Metals									
Arsenic			mg/kg	< 2			2	Pass	
Cadmium			mg/kg	< 0.4			0.4	Pass	
Chromium			mg/kg	< 5			5	Pass	
Copper			mg/kg	< 5			5	Pass	
Lead			mg/kg	< 5			5	Pass	
Mercury			mg/kg	< 0.1			0.1	Pass	
Nickel			mg/kg	< 5			5	Pass	
Zinc			mg/kg	< 5			5	Pass	
LCS - % Recovery									
Chloride			%	101			70-130	Pass	
Phenolics (total)			%	102			70-130	Pass	
Sulphate (as S)			%	106			70-130	Pass	
LCS - % Recovery									
Heavy Metals									
Arsenic			%	83			80-120	Pass	
Cadmium			%	100			80-120	Pass	
Chromium			%	105			80-120	Pass	
Copper			%	106			80-120	Pass	
Lead			%	108			80-120	Pass	
Mercury			%	97			75-125	Pass	
Nickel			%	107			80-120	Pass	
Zinc			%	113			80-120	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
				Result 1					
Sulphate (as S)	M15-Fe10436	NCP	%	109			70-130	Pass	
Spike - % Recovery									
				Result 1					
Arsenic	M15-Fe07262	NCP	%	88			75-125	Pass	
Cadmium	M15-Fe08881	NCP	%	81			75-125	Pass	
Chromium	M15-Fe08881	NCP	%	82			75-125	Pass	
Copper	M15-Fe08881	NCP	%	97			75-125	Pass	
Lead	M15-Fe08881	NCP	%	87			75-125	Pass	
Mercury	M15-Fe08881	NCP	%	87			70-130	Pass	
Nickel	M15-Fe08881	NCP	%	82			75-125	Pass	
Zinc	M15-Fe08881	NCP	%	89			75-125	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
				Result 1	Result 2	RPD			
Chloride	B15-Fe09986	NCP	mg/kg	170	180	4.7	30%	Pass	
Sulphate (as S)	M15-Fe09013	NCP	mg/kg	130	130	<1	30%	Pass	

Duplicate								
Heavy Metals				Result 1	Result 2	RPD		
Arsenic	M15-Fe08868	NCP	mg/kg	4.9	4.8	2.0	30%	Pass
Cadmium	M15-Fe08868	NCP	mg/kg	< 0.4	< 0.4	<1	30%	Pass
Chromium	M15-Fe08868	NCP	mg/kg	12	10	18	30%	Pass
Copper	M15-Fe08868	NCP	mg/kg	45	36	22	30%	Pass
Lead	M15-Fe08868	NCP	mg/kg	10	9.6	7.0	30%	Pass
Mercury	M15-Fe08881	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Nickel	M15-Fe08868	NCP	mg/kg	12	11	14	30%	Pass
Zinc	M15-Fe08868	NCP	mg/kg	60	52	14	30%	Pass

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	No
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Authorised By

Mary Makarios	Analytical Services Manager
Emily Rosenberg	Senior Analyst-Metal (VIC)
Huong Le	Senior Analyst-Inorganic (VIC)



Glenn Jackson

National Laboratory Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Uncertainty data is available on request

Eurofins | mgt shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins | mgt be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

Certificate of Analysis

AD Envirotech Aust Pty Ltd
Unit 4/ 10-11 Millenium Court
Silverwater
NSW 2128



NATA Accredited
Accreditation Number 1261
Site Number 1254

Accredited for compliance with ISO/IEC 17025.
The results of the tests, calibrations and/or
measurements included in this document are traceable
to Australian/national standards.

Attention: C Thompson

Report 446183-S
Project name 8622
Received Date Feb 03, 2015

Client Sample ID			8622-SAL1	8622-SAL2	8622-SAL3	8622-SAL4
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			S15-Fe01404	S15-Fe01405	S15-Fe01406	S15-Fe01407
Date Sampled			Jan 19, 2015	Jan 19, 2015	Jan 23, 2015	Jan 23, 2015
Test/Reference	LOR	Unit				
Chloride	10	mg/kg	550	10	< 10	29
Phenolics (total)	0.1	mg/kg	0.2	0.3	< 0.1	0.2
Sulphate (as S)	10	mg/kg	33	41	13	34
% Moisture	0.1	%	8.8	12	8.8	9.5

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.

A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Chloride	Sydney	Feb 05, 2015	28 Day
- Method: E033 /E045 /E047 Chloride			
Phenolics (total)	Sydney	Feb 05, 2015	14 Day
- Method: E041 /E055 Total Phenolics			
Sulphate (as S)	Sydney	Feb 05, 2015	28 Day
- Method: E045 Sulphate			
% Moisture	Sydney	Feb 03, 2015	14 Day
- Method: LTM-GEN-7080 Moisture			

Company Name: AD Envirotech Aust Pty Ltd
Address: Unit 4/ 10-11 Millenium Court
Silverwater
NSW 2128
Project Name: 8622

Order No.:
Report #: 446183
Phone: 02 9400 7711
Fax: 02 9401 0097

Received: Feb 3, 2015 1:38 PM
Due: Feb 10, 2015
Priority: 5 Day
Contact Name: C Thompson

Eurofins | mgt Client Manager: Mary Makarios

Sample Detail					Chloride	Phenolics (total)	Sulphate (as S)	Moisture Set
Laboratory where analysis is conducted								
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217					X	X	X	X
Brisbane Laboratory - NATA Site # 20794								
External Laboratory								
Sample ID	Sample Date	Sampling Time	Matrix	LAB ID				
8622-SAL1	Jan 19, 2015		Soil	S15-Fe01404	X	X	X	X
8622-SAL2	Jan 19, 2015		Soil	S15-Fe01405	X	X	X	X
8622-SAL3	Jan 23, 2015		Soil	S15-Fe01406	X	X	X	X
8622-SAL4	Jan 23, 2015		Soil	S15-Fe01407	X	X	X	X

Eurofins | mgt Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
4. Results are uncorrected for matrix spikes or surrogate recoveries.
5. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
6. Samples were analysed on an 'as received' basis. 7. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Advice.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

****NOTE:** pH duplicates are reported as a range NOT as RPD

UNITS

mg/kg: milligrams per Kilogram

ug/l: micrograms per litre

ppb: Parts per billion

org/100ml: Organisms per 100 millilitres

MPN/100mL: Most Probable Number of organisms per 100 millilitres

mg/l: milligrams per litre

ppm: Parts per million

%: Percentage

NTU: Nephelometric Turbidity Units

TERMS

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery
CRM	Certified Reference Material - reported as percent recovery
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands. In the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
Batch Duplicate	A second piece of analysis from a sample outside of the clients batch of samples but run within the laboratory batch of analysis.
Batch SPIKE	Spike recovery reported on a sample from outside of the clients batch of samples but run within the laboratory batch of analysis.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
ASLP	Australian Standard Leaching Procedure (AS4439.3)
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within
TEQ	Toxic Equivalency Quotient

QC - ACCEPTANCE CRITERIA

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries : Recoveries must lie between 50-150% - Phenols 20-130%.

QC DATA GENERAL COMMENTS

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxophene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxophene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Arochlor 1260 in Matrix Spikes and LCS's.
9. For Matrix Spikes and LCS results a dash " - " in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPD's are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test				Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank										
Chloride				mg/kg	< 10			10	Pass	
Phenolics (total)				mg/kg	< 0.1			0.1	Pass	
Sulphate (as S)				mg/kg	< 10			10	Pass	
LCS - % Recovery										
Chloride				%	102			70-130	Pass	
Phenolics (total)				%	96			70-130	Pass	
Sulphate (as S)				%	105			70-130	Pass	
Test	Lab Sample ID	QA Source		Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery										
					Result 1					
Chloride	S15-Fe01408	NCP		%	106			70-130	Pass	
Spike - % Recovery										
					Result 1					
Phenolics (total)	S15-Fe01405	CP		%	85			70-130	Pass	
Test	Lab Sample ID	QA Source		Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate										
					Result 1	Result 2	RPD			
Chloride	S15-Fe01408	NCP		mg/kg	120	120	<1	30%	Pass	
Phenolics (total)	S15-Fe01404	CP		mg/kg	0.2	0.2	<1	30%	Pass	
Sulphate (as S)	S15-Fe01408	NCP		mg/kg	< 10	< 10	<1	30%	Pass	
% Moisture	S15-Ja07962	NCP		%	12	12	2.0	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Authorised By

Mary Makarios	Analytical Services Manager
Bob Symons	Senior Analyst-Inorganic (NSW)
Ivan Taylor	Senior Analyst-Metal (NSW)



Glenn Jackson

National Laboratory Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Uncertainty data is available on request

Eurofins | mgt shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins | mgt be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

APPENDIX V – GREGORY HILLS FMP

New South Wales Office:
A. D. Envirotech Australia Pty Ltd
Unit 4, 10-11 Millennium Court
Silverwater, NSW 2128

Queensland Office:
A. D. Envirotech Australia Pty Ltd
P.O. Box 288
Upper Coomera, QLD 4209

Telephone:
NSW: (02) 9648 6669
QLD: (07) 5519 4610

Internet:
site: www.ADenvirotech.com.au
e-mail: info@ADenvirotech.com.au



ADE
CONSULTING
GROUP

Fill Management Protocol

Prepared for:

Gregory Hills Corporate Park Pty Ltd

Proposed Commercial Subdivision
Lot 701, DP1154772, Gregory Hills Drive
Gledswood Hills NSW

6908 / FMP1
v1. final
29th November 2013





TABLE OF CONTENTS

FILL MANAGEMENT PROTOCOL.....	3
1. INTRODUCTION	3
1.1.Site Details.....	4
2. CONTAMINATION ISSUES	5
2.1.Relevant Legislation and Guidelines	5
2.2.Imported Material Acceptance Criteria	5
3. GEOTECHNICAL AND SALINITY ISSUES	7
3.1.Relevant Guidelines.....	7
3.2.Geotechnical Material Acceptance Criteria	7
3.3.Salinity Acceptance Criteria	8
4. FILL MANAGEMENT PROTOCOL	8
5. APPROVAL/ASSESSMENT.....	9
5.1.Assessment/Approval of Source Site	9
5.2.Gate Records and Check Sampling.....	9
6. NON-COMPLIANCE	10
7. FINAL VALIDATION OF IMPORTED FILL.....	11
8. LIMITATIONS	12
 APPENDIX A – FORMS FOR MATERIALS SUPPLIED TO SITE.....	 13
APPENDIX B – THRESHOLD VALUES	17
APPENDIX C – SAMPLING DENSITIES.....	22
APPENDIX D – MATERIALS GIVEN RISE TO LOAD REJECTION	26
APPENDIX E – FORMS FOR RECEIVING SITE	28
APPENDIX F – EXCAVATED NATURAL MATERIAL EXEMPTION 2012	32
APPENDIX G – DRAWING 1	33



FILL MANAGEMENT PROTOCOL

ADE Report No. 6908 / FMP1 / v1 final

Date of Report: 29.11.2013
Client: Gregory Hills Corporate Park Pty Ltd
Site Address: Proposed Commercial Subdivision, Lot 701 DP1154772, Gregory Hills Drive, Gledswood Hills NSW

1. INTRODUCTION

This document provides a protocol for the assessment of imported fill (the Protocol) to Lot 701 DP1154772, Gregory Hills Drive, Gledswood Hills (the Site). This document was commissioned by Mr Richard Harris of Gregory Hills Corporate Park Pty Ltd. The Protocol is applicable for assessing the suitability of soil/rock materials to be imported onto the Site as part of a commercial/industrial redevelopment.

It is understood that the proposed development will include a commercial/industrial subdivision with associated infrastructure (stormwater, sewer, power etc). The proposed redevelopment would also include the construction of supporting roadways. The development will require the importation of material from outside sources.

The purpose of the Protocol is to set out the requirements for imported materials with respect to contamination, geotechnical and salinity issues. Application of this Protocol to all soil/ rock materials to be imported onto the Site will provide a consistent approach to the management of materials with respect to their suitability for use as part of the development works.

It is understood that the Site proposes to accept approximately 330,000 m³ of material classified as virgin excavated natural material (VENM) or materials classified under either a general or specific resource recovery exemption.

ADE considers that it is the responsibility of Gregory Hills Corporate Park or their nominated representative to ensure compliance with this Protocol. It is recommended that the filling material suppliers are issued with a copy of this Protocol. The suppliers will be requested to provide supporting information/ evidence to verify that the subject material complies with this Protocol, and that the required documentation (including appropriate supporting documentation) is supplied and is complete and correct. Gregory Hills Corporate Park has the right to make the final decision on the suitability or otherwise of any material for importation onto the Site.



1.1. Site Details

The Site is identified as Lot 701 in DP1154772, located on the corner of Camden Valley Way and Gregory Hills Drive in the suburb of Gledswood Hills. The site has an irregular shape and covers an area of some 29 ha. The Site location and boundaries are shown on Drawing 1, Appendix F.

Reference to the 1:100 000 Wollongong – Port Hacking Geological Series Sheet indicates that the site is underlain by Bringelly Shale of the Wianamatta Group of Triassic age which, in the vicinity of the site, includes an unnamed, fine to medium grained quartz-lithic sandstone member. The Bringelly Shale typically comprises shale, siltstone, claystone and laminite with coal bands, all of which weather to form clays of high plasticity.

McNally (2005) describes some general features of the hydrogeology of Western Sydney which are relevant to this Site. The shale terrain of much of Western Sydney is known for saline groundwater, resulting either from the release of connate salt in shales of marine origin or from the accumulation of windblown sea salt. Seasonal groundwater level changes of 1 – 2 m can occur in a shallow regolith aquifer or a deeper shale aquifer due to natural influences.

Former groundwater investigations undertaken by Douglas Partners (DP) in the Camden area and previous studies of areas underlain by the Wianamatta Group and Quaternary river alluvium indicate that:

- The shales have a very low intrinsic permeability, hence groundwater flow is likely to be dominated by fracture flow with resultant low yields (typically < 1 L/s) in bores; and
- The groundwater in the Wianamatta Group is typically brackish to saline with total dissolved solids (TDS) in the range 4000 – 5000 mg/L (but with cases of TDS up to 31750 mg/L being reported). The dominant ions are typically sodium and chloride and the water being generally unsuitable for livestock or irrigation.

Review of the Wollongong-Port Hacking 1:100,000 Soils Landscape Sheet indicates that the Site is located within an area that is mapped as the Blacktown Soil Landscape. The Blacktown group of soil landscape form on gently undulating rises on Wianamatta Group shales and Hawkesbury shale with local relief of up to 30 m. The types of soils encountered are typically yellow podzolic soils and soloths and brown podzolic soils. The typical limitations of this soil group include moderate reactivity and highly plastic sub soil, low soil fertility and poor soil drainage.



2. CONTAMINATION ISSUES

2.1. Relevant Legislation and Guidelines

Importation of materials onto the Site must fully abide by the provisions of relevant NSW environmental legislation, including, inter alia, the *Contaminated Land Management Act (1997)* and *Protection of the Environment Operations Act (1997)*.

The following environmental guidelines are considered to be relevant:

- DECCW Waste Classification Guidelines (2008), December 2009 Revision;
- NSW EPA Contaminated Sites *Guidelines for the NSW Site Auditor Scheme* (2006) [The Auditors Guidelines];
- NEPC (1999). National Environmental Protection (Assessment of Site Contamination) Measure 1999, 2013 Revision. Schedule B(1) Guideline on Investigation Levels for Soil and Groundwater;
- Australian and New Zealand Environment and Conservation Council/National Health and Medical Research Council (ANZECC/NHMRC): Australian and New Zealand Guidelines for the Assessment and Management of Contaminated Sites (1992), Environmental Soil Quality Guidelines Background A [ANZECC A];
- *Guidelines on Resource Recovery Exemption (Land Application of Waste Materials as Fill)* EPA Feb 2011;
- Protection of the Environment Operations (Waste) Regulation (2005) – General Exemption Under Part 6, Clause 51 and 51A - The excavated natural material exemption 2012;
- Any specific exemption issued under the Protection of the Environment Operations (Waste) Regulation (2005) by the NSW EPA;
- Camden Council “Imported Fill Condition”; and
- Camden Council Engineering Construction Specification (2009).

2.2. Imported Material Acceptance Criteria

Materials imported to the Site must satisfy the minimum requirements detailed below. All materials to be imported must be accompanied by appropriate reports from qualified environmental/geotechnical consultants verifying the status of the material with respect to contamination, salinity and relevant geotechnical parameters. The Forms included in Appendix A and B must be completed, and approved by Gregory Hills Corporate Park and the Environmental Consultant prior to acceptance of the material.



- All imported soil/rock material must be verified to be either **VIRGIN EXCAVATED NATURAL MATERIAL (VENM)** (imported natural materials), **EXCAVATED NATURAL MATERIAL (ENM)** (as defined under NSW EPA) Waste Classification Guidelines 2009 or materials classified under a specific exemption granted by the EPA. All source sites are subject to approval by Gregory Hills Corporate Park on a case by case basis.
- For specific purposes other certified materials such as quarry run materials and gravels will be acceptable provided that the materials are accompanied with supporting certification documentation to demonstrate their source and suitability.
- Recycled products (such as recycled concrete) are not considered suitable from a contamination risk standpoint as the quality of the materials can be difficult to guarantee.
- All VENM material must be accompanied by a VENM validation report from a suitably qualified environmental consultant. The validation assessment should include appropriate levels of sample analyses to be conducted at the sampling density as specified in Table C1, Appendix C. As The NSW Environment Protection Authority (EPA) has no specific VENM assessment criteria, VENM material should be reviewed on the basis of the source site history, “observation” and property of the material, and with reference to relevant guidelines/thresholds viz. the published Australian Background Soil Levels (NEPM Schedule B(1) and/ or ANZECC 1992 (see extract in Table B3, Appendix B) and, with respect to organic analytes, their analytical practical quantitation limits;
- All ENM material must be verified in accordance with the sampling methodology and density specified in the *Protection of the Environment Operations (Waste) Regulation 2005 - General Exemption Under Part 6, Clause 51 and 51A for Excavated Natural Materials*. The requirements are summarised in Table C1, Appendix C. In addition, the relevant “chemical and other attributes” in the ENM material must be verified to comply with the concentration threshold values specified in Table 2 of the General Exemption for Excavated Natural Material Exemption 2012. These concentrations are reproduced in Table B2, Appendix B, with the full ENM guidelines provided in Appendix F.
- In addition to the above requirements, all materials must be validated to be suitable, from a site contamination standpoint, for use on commercial/industrial sites. In this regard, the material must meet the assessment criteria specified in the National Environmental Protection (Assessment of Site Contamination) Measure 1999, 2013 Revision, Schedule B(1) Guideline on Investigation Levels for Soil and Groundwater, for **Commercial / Industrial Sites (HIL-D)**. For the top 0.5 m of site soils in landscape areas, the material used should comprise of ENM and VENM soils only. An extract of guideline values for common contaminants is provided in Table B1, Appendix B.

New South Wales Office:

A. D. Envirotech Australia Pty Ltd
Unit 4, 10-11 Millennium Court
Silverwater, NSW 2128

Queensland Office:

A. D. Envirotech Australia Pty Ltd
P.O. Box 288
Upper Coomera, QLD 4209

Telephone:

NSW: (02) 9648 6669
QLD: (07) 5519 4610

Internet:

site: www.ADenvirotech.com.au
e-mail: info@ADenvirotech.com.au



- With regard to the assessment testing, all laboratory analysis must be conducted by a laboratory that holds NATA accreditation for the test methods performed.

3. GEOTECHNICAL AND SALINITY ISSUES

3.1. Relevant Guidelines

The following geotechnical guidelines are considered relevant to the assessment of the geotechnical suitability of the imported materials:

- Australian Standards AS3798: Guidelines on Earthworks for Commercial & Residential Developments (1998) [AS3798];
- Department of Land and Water Conservation (DLWC) Site Investigations for Urban Salinity (2002);
- Camden Council “Imported Fill Condition”; and
- Camden Council Engineering Construction Specification (2009).

3.2. Geotechnical Material Acceptance Criteria

The geotechnical/engineering requirements for the imported material are as follows;

- The **maximum particle size** (mps) of the imported material must not exceed **150 mm**. The mps of greater than 150 mm is acceptable if the material can readily breakdown under normal compaction conditions (eg compaction of layers of ≤ 300 mm using an 8 – 10 tonne vibrating roller – this must be proven by trial prior to import);
- Imported material should have a **liquid limit** (obtained by Atterberg Limit test) of less than **50%**. Material with a Liquid Limit up to 50% will be acceptable if Shrink Swell Index test certificates show that shrink swell index is ≤ 2.0 (refer to Table B6, Appendix B). The number of tests conducted should be in accordance with Table C2, Appendix C.
- The imported material should have a CBR of at least 5% and should not contain any unsuitable material as listed in Section 4 of AS3798. The number of CBR tests conducted should be in accordance with Table C2, Appendix C; and
- The materials are not, or do not contain any of the unsuitable materials as listed in Appendix D.



3.3. Salinity Acceptance Criteria

The Site is in an area of known moderate salinity (with some areas classified as very saline), therefore source sites should have a classification of moderate salinity or better. The salinity testing and selection criteria are as follows:

- The imported materials must be analysed for E_{Ce}, pH, chlorides and sulphates in accordance with the sampling density specified in Table C3, Appendix C. The Protocol specifies variable sampling densities for materials sourced from area of known salinity and areas of no known salinity hazard;
- Imported materials should be moderately saline or better, based on E_{Ce}, the electrical conductivity of saturated pore water (Refer to Table B4, Appendix B for salinity scale);
- A stockpile will be considered non-saline to slightly saline if at least 90% of the tested samples are non-saline to slightly saline;
- Materials should be non-aggressive based on the scale given in Table B5; and
- Materials of higher salinity and aggressivity may be accepted if they can be demonstrated to be consistent with the local background conditions at the Site or an area within the Site (Refer to DP *Report on Salinity Investigation and Management Plan, Proposed Subdivision, Lot 701 in Deposited Plan 1154772, Gledswood Hills, Project Number 76510.00* dated May 2012) or if appropriate salinity management procedures or appropriate engineering practices are in place to handle such materials. Such materials will only be accepted at the discretion of Gregory Hills Corporate Park and the environmental consultant.

4. Fill Management Protocol

Documentation required to verify the quality / status of any material for importation onto the Site includes:

1. Satisfactory completion of the “Material Suppliers Application Form” and “Material Questionnaire Form” by the material supply site (Tables A1 and A2, Appendix A);
2. Preparation and supply of all supporting documentation (eg VENM report, ENM reports, geotechnical/ salinity assessment reports conducted by a suitably qualified consultant and including NATA Laboratory Reports);
3. Completion of the “Fill Approval Checklist” (Table E1, Appendix E) by Gregory Hills Corporate Park or their representative assessing the adequacy of the documents provided in step 2;
4. Provide seven days’ notice to council of the intention to commence the import of materials;



5. Collate trucking records (as per Section 5.2);
6. Records of the location of materials imported onto the Site including photographs, drawings and survey documentation (for volumes if the material is stockpiled);
7. Inspection records and description of the materials imported by site personnel (an example site record form is provided in Appendix E).

All documentation should be supplied to Gregory Hills Corporate Park or their representative for approval. All records will be kept by Gregory Hills Corporate Park for future reference.

5. APPROVAL/ASSESSMENT

Prior to acceptance of material from a source site, assessment of the source site should be undertaken to verify the general acceptability of material from that Site. In addition material tracking records and inspection of the materials imported to the site should be undertaken to verify that the materials being imported are consistent with those approved for importation.

5.1. Assessment/Approval of Source Site

Materials will be judged as suitable or otherwise by Gregory Hills Corporate Park or their representative based on the provided documentation, the apparent reliability or otherwise of the documentation and its conformance with this Protocol.

Gregory Hills Corporate Park site personnel responsible for accepting/ rejecting materials entering the site will have completed copies of the “Material Suppliers Application Form” and “Material Questionnaire Form” for materials currently being imported, and will compare each load with the material description provided by the source site.

Any materials deemed ‘not to comply’ or ‘yet to comply’ with this protocol should **not** be imported onto the site. If doubt arises with respect to any materials already imported onto the site, the materials shall remain stockpiled, fenced and signposted in a clearly defined area pending final assessment. If materials at the site are deemed unacceptable for use for the development works, a specific management plan for these materials should be developed by a suitably qualified consultant.

5.2. Gate Records and Check Sampling

A record of truck movements should be maintained for trucks carrying material imported to the Site providing the following information:



- The date and time of truck arrival;
- The source location of the material;
- The truck registration details;
- Material type;
- The approximate volume of material per load;
- Visual assessment of material at gate;
- Record of load acceptance/rejection;
- The approximate location of material placement (on a daily basis not per truck load); and
- The amount of material remaining to be imported based on the volume supplied in the original assessment report.

Gregory Hills Corporate Park will reject any materials entering the Site which are not deemed to be consistent with the supporting documentation, which has been previously supplied and accepted based on a visual assessment of the material at the gate. Similarly they will reject source sites which have imported to site more material than allowed for in the original assessment (a supplementary assessment may be made by the source site's consultant to allow for the additional assessment, but this must be submitted for review).

As an additional level of control it is recommended that check samples be collected at the gate. Sampling rates and analytical scope for check samples of ENM (or other material covered by a specific exemption) and VENM are provided in Table C4, Appendix C. If check samples indicate non-conformance with this protocol then further review/assessment of the source site may be required.

6. NON-COMPLIANCE

Any material imported to site that is found to be non-compliant (discovered during check testing or during general site activities) will be isolated and assessed by Gregory Hills Corporate Park or their representative. If the non-compliant material is found to be incompatible with the site it will be removed at the cost of the source site. This decision rests with Gregory Hills Corporate Park. A bond system is recommended to address such matters. The cost of remediation and validation will be borne by the source site.



7. FINAL VALIDATION OF IMPORTED FILL

At the completion of importation of the materials to the Site and prior to the commencement of constructions work a validation report should be prepared (by a suitably qualified environmental/geotechnical consultant) to ensure that all materials imported to the site meet the requirements of the Protocol. The validation report should include the following:

- A review of source site documentation;
- Copies of the completed forms from Appendix A and E;
- A review of gate keeping records (the consultant preparing the Final validation should undertake the gate keeping role);
- A review of site drawings/surveys identifying where imported materials were placed within the site;
- A review of and discussion of check sampling undertaken at the gate in accordance with Section 5.2;
- Records of non-conformances with this Protocol; and
- Assessment of the overall compliance with the Protocol.

If there are data gaps or incomplete records of gate keeping then additional check sampling of the imported materials may be required. The scope of such works would need to be determined at the time by a suitably qualified consultant.

A summary report shall be provided to Council on a monthly basis detailing both accepted and rejected sites. The final validation report will also be submitted to Camden Council to demonstrate adherence to the Protocol.



8. LIMITATIONS

This report has been prepared for use by the client who has commissioned the works in accordance with the project brief only and has been based on information provided by the client. The advice herein relates only to this project and all results, conclusions and recommendations made should be reviewed by a competent and experienced person with experience in environmental investigations, before being used for any other purpose. A.D. Envirotech Australia Pty Ltd (ADE) accepts no liability for use or interpretation by any person or body other than the client who commissioned the works. This report should not be reproduced or amended in any way without prior approval by the client or ADE and should not be relied upon by any other party, who should make their own independent enquiries.

This report does not provide an assessment of the environmental status of the site and it is limited to the scope defined herein. Should information become available regarding conditions at the site including previously unknown sources of contamination, ADE reserves the right to review the report in the context of the additional information.

ADE's professional opinions are based upon its professional judgment, experience, training and results from analytical data. In some cases further testing and analysis may be required, thus producing different results and/or opinions. ADE has limited investigation to the scope agreed upon with its client.

ADE has used a degree of care and skill ordinarily exercised in similar investigations by reputable members of the Environmental Industry within Australia. No other warranty, expressed or implied, is made or intended.

Ross Nefodov (Principal)

B. Appl. Sci. (Environmental)

M. PE (Civil Engineering)

New South Wales Office:

A. D. Envirotech Australia Pty Ltd
Unit 4, 10-11 Millennium Court
Silverwater, NSW 2128

Queensland Office:

A. D. Envirotech Australia Pty Ltd
P.O. Box 288
Upper Coomera, QLD 4209

Telephone:

NSW: (02) 9648 6669
QLD: (07) 5519 4610

Internet:

site: www.ADenvirotech.com.au
e-mail: info@ADenvirotech.com.au



APPENDIX A – FORMS FOR MATERIALS SUPPLIED TO SITE

New South Wales Office:

A. D. Envirotech Australia Pty Ltd
Unit 4, 10-11 Millennium Court
Silverwater, NSW 2128

Queensland Office:

A. D. Envirotech Australia Pty Ltd
P.O. Box 288
Upper Coomera, QLD 4209

Telephone:

NSW: (02) 9648 6669
QLD: (07) 5519 4610

Internet:

site: www.ADenvirotech.com.au
e-mail: info@ADenvirotech.com.au



Table A1 – Material Suppliers Application Form

Suppliers Details	
Supplier's Name:	_____ (organisation)
Supplier's Address:	_____
Suburb:	_____
Contact Person:	_____ (representative)
Position:	_____
Phone Number:	_____ Fax Number: _____
Mobile Number:	_____ Application Date: _____
Source Site Details	
Site Address:	_____
Suburb:	_____
Nearest Cross Street:	_____
Current Land Use:	_____
Previous Land Use:	_____
Surrounding Land Use:	North: _____ South: _____ East: _____ West: _____
Material Details	
Regional Geology:	Wianamatta Shale / Narrabeen Group / Hawkesbury Sandstone / Quaternary Sediments (Please circle) comments: _____
General material	(Profile 1) _____ (Natural/Fill)
Descriptors:	(Profile 2) _____ (Natural/Fill) (Profile 3) _____ (Natural/Fill)
Maximum Particle Size:	_____ (mm)
Estimated Volumes:	natural _____ (m ³); filling _____ (m ³) in-situ _____ (m ³); Stockpiled _____ (m ³)
Method of Excavation:	_____
Availability:	_____ (date)
Delivery Frequency:	_____ (trucks or m ³ /day)
Declaration	
Application Made By:	Name: _____ Signature: _____



Table A2 – Material Questionnaire Form Page 1 of 2

Suppliers Details			
Supplier's Name:	_____ (organisation)		
Contact Person:	_____ (representative)		
Phone Number:	_____	Date:	_____
Source Site Details			
Site Address:	_____		
Suburb:	_____		
Define Excavation Area/ location of stockpiles:	_____	_____ (attach plan and photographs)	
Environmental Details	(Please circle)		(Please circle)
Is site history information documented?	YES / NO	(are details attached?)	YES / NO
Do any contamination reports exist for this site?	YES / NO	(are all reports attached?)	YES / NO
Is a Waste Classification Report available?	YES / NO	(are all reports attached?)	YES / NO
What is the material classification?	VENM / ENM / Other		
What is the estimated volume of material:	_____		
No of samples tested:	_____		
<i>total:</i>	_____		
<i>Heavy Metals:</i>	_____		
<i>TRH/ BTEX:</i>	_____		
<i>PAH:</i>	_____		
<i>phenol:</i>	_____		
<i>PCB:</i>	_____		
<i>OCP:</i>	_____		
<i>asbestos:</i>	_____		
<i>TCLP heavy metals:</i>	_____		
<i>TCLP PAH:</i>	_____		
<i>Other:</i>	_____		
Does waste classification assessment comply with:			
Table C1 (sample density)?	YES / NO		
Tables B1 and B2 (ENM or other exemption)?	YES / NO		
Tables B1 and B3 (VENM)?	YES / NO		



Table A2 – Material Questionnaire form Page 2 of 2

Geotechnical Details	(Please circle)		(Please circle)
Do any geotechnical reports exist for this site?	YES / NO	(are all reports attached?)	YES / NO
Have geotechnical tests been performed?	YES / NO	(are details attached?)	YES / NO
What is the moisture condition of the material?	_____		
Does the fill contain demolition / foreign inclusions?	YES / NO	If yes, provide details: _____	_____
Does the material contain topsoil or vegetation matter?	YES / NO	(are details attached?)	YES / NO
Is the maximum particle size (mps) of the fill material less than 150 mm?	YES / NO	(are details attached?)	YES / NO
If mps is greater than 150 mm will the material breakdown under normal compaction conditions?	YES / NO	(are details attached?)	YES / NO
What is the portion of fines (<0.075mm)?	_____		
If <30% fines can the material be blended prior to delivery?	_____		
Comments:			
Is the material is clay:	YES / NO		
What is the liquid limit of the material?	_____		
what is the shrink swell index (if liquid limit>50%):	_____		
Does the liquid limit/ shrink swell comply with Table B6?	YES / NO		
Does the testing density confirm with Table C2	YES / NO		
Salinity Details	(Please circle)		(Please circle)
Has a salinity assessment been conducted?	YES / NO	(are all reports attached?)	YES / NO
Does the sampling density meet the requirements in Table C3?	YES / NO		
Are the materials non-saline to slightly saline?	YES / NO		
Comments regarding limited use of saline material:	_____ NA		
Is the material non-aggressive as per Table B6?	YES / NO	(are all reports attached?)	YES / NO
Declaration			
Questionnaire completed by: Name: _____ Signature: _____			



APPENDIX B – THRESHOLD VALUES

New South Wales Office:

A. D. Envirotech Australia Pty Ltd
Unit 4, 10-11 Millennium Court
Silverwater, NSW 2128

Queensland Office:

A. D. Envirotech Australia Pty Ltd
P.O. Box 288
Upper Coomera, QLD 4209

Telephone:

NSW: (02) 9648 6669
QLD: (07) 5519 4610

Internet:

site: www.ADenvirotech.com.au
e-mail: info@ADenvirotech.com.au



Table B1 – Threshold Contaminant Values For Commercial / Industrial Landuse. Applies Screening Values to All Imported Materials (Including VENM and ENM)

Contaminant	Site Assessment Criteria (SAC) (mg/kg)	Source
TPH		NEPC (1999), 2013 Amendment. SAC derived from 'Table 1B(7) – Management Limits for TPH fractions F1-F4 in soil'. Coarse soil texture adopted.
C ₆ -C ₁₀	700	
C ₁₀ -C ₁₆	1,000	
C ₁₆ -C ₃₄	3,500	
C ₃₄ -C ₄₀	10,000	
BTEX		*Protection of the Environment Operations (Waste) Regulation (2005) – General Exemption Under Part 6, Clause 51 and 51A - The excavated natural material exemption 2012 (Refer to Appendix F)
Benzene	1	
Toluene	0.5	
Ethylbenzene	65	
Xylene	25	
Metals		NEPC (1999), 2013 Amendment. SAC derived from 'Table 1A(1) – Health investigation levels for soil contaminants'. Commercial/industrial D criteria adopted.
Arsenic	3,000	
Cadmium	900	
Chromium (VI)	3,600	
Copper	240,000	
Lead	1,500	
Mercury (inorganic)	730	
Nickel	6,000	
Zinc	400,000	
Phenols #		
Phenol	240,000	
PAHs		
Total PAHs	4,000	
Carcinogenic PAHs (as BaP TEQ)	40	
OCPs		
Aldrin + dieldrin	45	
Chlordane	530	
Endosulfan	2,000	
DDT+DDE+DDD	3,600	
Heptachlor	50	
OPPs		
Chlorpyrifos	2,000	
Other Organics #		
PCBs	7	
Asbestos	No asbestos found in soil	No current NSW EPA endorsed guideline levels were available

– Required if there is the potential for the contaminant to occur on or adjacent to the source site, as determined by a suitably qualified Environmental Engineer/Scientist/Consultant employed by the governing body at the source site.

* – As no vapour intrusion modeling has been undertaken at GHCP, levels for BTEX in soils have been adopted as per the NSW EPA's Excavated Natural Material Exemption 2012.



Table B2 – Threshold Contaminant Values For ENM[#]

Column 1	Column 2	Column 3	Column 4
Chemicals and other attributes	Maximum average concentration for characterisation (mg/kg 'dry weight' unless otherwise specified)	Absolute maximum concentration (mg/kg 'dry weight' unless otherwise specified)	Test method specified within Section
1. Mercury	0.5	1	12.1
2. Cadmium	0.5	1	12.2
3. Lead	50	100	12.2
4. Arsenic	20	40	12.2
5. Chromium (total)	75	150	12.2
6. Copper	100	200	12.2
7. Nickel	30	60	12.2
8. Zinc	150	300	12.2
9. Electrical Conductivity	1.5 dS/m	3 dS/m	12.3
10. pH *	5 to 9	4.5 to 10	12.3
11. Total Polycyclic Aromatic Hydrocarbons (PAHs)	20	40	12.4
12. Benzo(a)pyrene	0.5	1	12.4
13. Benzene	NA	0.5	12.5
14. Toluene	NA	65	12.5
15. Ethyl-benzene	NA	25	12.5
16. Xylene	NA	15	12.5
17. Total Petroleum Hydrocarbons C ₁₀ -C ₃₆	250	500	12.6
18. Rubber, plastic, bitumen, paper, cloth, paint and wood	0.05%	0.10%	12.7

* The ranges given for pH are for the minimum and maximum acceptable pH values in the excavated natural material.

Refer to Appendix F – Excavated Natural Material Exemption 2012 for full guidelines including sampling densities and testing method.



Table B3 – Reference Contaminant Values For Virgin Excavated Natural Material (VENM) Apply to Imported Natural Materials

Contaminant	NEPC ¹	ANZECC ²
TPH C ₆ -C ₁₀ C ₁₀ -C ₁₆ C ₁₆ -C ₃₄ C ₃₄ -C ₄₀	For all organic analytes, the analytical practical quantitation limits are used as the reference levels for VENM assessment.	
BTEX Benzene Toluene Ethylbenzene Xylene	- - - -	0.05-1 0.1-1 - -
Metals Arsenic (total) Cadmium Chromium (III) Copper Lead Mercury Nickel Zinc	1-50 1 5-1000 2-100 2-200 0.03 5-500 10-300	0.2-30 0.04-2 0.5-110 1-190 <2-200 0.001-0.1 2-400 2-180
Total Phenols #	For all organic analytes, the analytical practical quantitation limits are used as the reference levels for VENM assessment.	
PAH Total PAHs Benzo(a)Pyrene		
PCB #		
OCP/ OPP aldrin + dieldrin chlordane DDD, DDE, DDT Heptachlor Chlorprifos Methyl parathion		

Notes:

- NEPC (1999). National Environmental Protection (Assessment of Site Contamination) Measure Schedule B(1) Guidelines on the Investigation Levels for Soil and Groundwater, Background Ranges.
 - Australian and New Zealand Environment and Conservation Council/National Health and Medical Research Council (ANZECC/NHMRC): Australian and New Zealand Guidelines for the Assessment and Management of Contaminated Sites (1992), Environmental Soil Quality Guidelines Background A [ANZECC A].
- # Required if there is the potential for the contaminant to occur on or adjacent to the source site, as determined by a suitably qualified Environmental Engineer/Scientist/Consultant employed by the governing body at the source site.



Table B4 – Salinity Scale

Salinity	Electrical conductivity (ECe)
Non Saline	<2 dS/m
Slightly Saline	2 – 4 dS/m
Moderately Saline	4 – 8 dS/m
Highly Saline	8 – 16 dS/m

Table B5 – Criteria For Non-Aggressive Soils

Soil Type	Soil Use	chlorides	sulphates	pH
high permeability	above the water table	≤0.5%	≤0.5%	≥5.5
high permeability*	below the water table	NA	NA	NA
low permeability	above the water table	≤2%	≤0.5%	≥5.5
low permeability	below the water table	≤2%	≤0.5%	≥5.5

Source: AS 2159 2009

* high permeability soils which are in groundwater (soil condition A are by definition a minimum of mildly aggressive)

Table B6 – Liquid Limit Requirements for Clays

Liquid Limit (Atterberg Test)	Assessment
<50%	Acceptable
>50%	Reject



APPENDIX C – SAMPLING DENSITIES

New South Wales Office:

A. D. Envirotech Australia Pty Ltd
Unit 4, 10-11 Millennium Court
Silverwater, NSW 2128

Queensland Office:

A. D. Envirotech Australia Pty Ltd
P.O. Box 288
Upper Coomera, QLD 4209

Telephone:

NSW: (02) 9648 6669
QLD: (07) 5519 4610

Internet:

site: www.ADenvirotech.com.au
e-mail: info@ADenvirotech.com.au



TABLE C1 – Sampling and Analytical Requirements for ENM and VENM ⁴

Filling/ Natural	Material Quantity ⁴ (m ³)	Minimum Sample number/ Frequency	Minimum analyte suite to include ^{1,2}	Additional analysis as required ^{2,3}
VENM	<5000	1 per 1000 m ³ (Minimum of 3 samples)	- Heavy metals - PAH - TPH - BTEX	- Any contaminant considered potentially present in the material based on site information
	5000-50,000	1 per 5000 m ³ (Minimum of 8 samples)	- Phenol (If suggested by site history)	
	>50,000	1 per 5,000 m ³ (Minimum of 8 samples)	- PCB (If suggested by site history) - OCP/OPPs - Asbestos	
	For alignments of > 5 km	At least 1 per km*	- Field Oxidation and/or SPOCAS (If within area with potential Acid Sulphate Soils)	
Natural material (in- situ or freshly excavated)	Any volume	As per ENM Exemption 2012 - Refer to Appendix F	Mercury, cadmium, lead, arsenic, chromium (total), copper, nickel, zinc, electrical conductivity, pH, PAHs, TPH (C ₁₀ - C ₃₆), Rubber plastic bitumen paper cloth paint and wood.	- Asbestos/OCP/OPP plus any contaminant considered potentially present in the material based on site information
Specific Exemption	Reviewed on a case by case basis			

Notes:

- Note not all samples necessarily require testing for all analytes.
- Heavy metals = arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc. BTEX = benzene, toluene, ethyl benzene, total xylenes OCP = Organochlorine Pesticides (a scheduled chemical).PAH = Polycyclic Aromatic Hydrocarbons.PCB = Polychlorinated Biphenyls.TRH = Total Recoverable Hydrocarbons (including Total Petroleum Hydrocarbons).SPOCAS = Suspension Peroxide Oxidation Combined Acidity and Sulphate method.
- Based on advice from a qualified consultant
- Based on material volumes per site, i.e. if 5000 m³ or less from source site then frequency 1 applies, 5000-50000 from source site then frequency 2 applies etc, not on total volume being imported from all sites.

VENM = Virgin Excavated Natural Material

Composite samples mean a sample that combines 5 discrete sub-samples into a single sample for the purpose of analysis.

* Higher frequency of testing should be adopted in areas of higher contamination potential.

New South Wales Office:

A. D. Envirotech Australia Pty Ltd
Unit 4, 10-11 Millennium Court
Silverwater, NSW 2128

Queensland Office:

A. D. Envirotech Australia Pty Ltd
P.O. Box 288
Upper Coomera, QLD 4209

Telephone:

NSW: (02) 9648 6669
QLD: (07) 5519 4610

Internet:

site: www.ADenvirotech.com.au
e-mail: info@ADenvirotech.com.au



TABLE C2 – Sampling Requirements for CBR and Geotechnical Tests

Material	Quantity (m ³)	Minimum Sampling Frequency
Filling	<5000	1 Per 2500 m ³ 1 per 250 m for alignments
	>5000	1 Per 5000 m ³ 1 per 500 m for alignments
Natural	Any Volume	1 per 5000 m ² (area) 1 per 500 m for alignments
Clays		Atterberg test - 1/1000 m ³
		Shrink swell index - 1/5000 m ³

TABLE C3 – Sampling and Analytical Requirements for Salinity

Assessment	Minimum Sample Frequency	Depth of Sample	Minimum analyte suite
Areas of no Known Salinity			
Stockpile	1 sample per 2500 m ³	-	ECe, pH, sulphates, chlorides, textural classification.
In situ	2 bores or test pits per ha or 2 bores per 1 km for alignments*	Samples at 0.2 m, 0.5 m and 1.0 m intervals or change in strata to depth of excavation or refusal.	ECe, pH, textural classification.
		Samples 0.5 m, 1.0 m and 2.0 m	Chlorides & sulphates.
Areas of Known Salinity			
Stockpile	1 sample per 1000 m ³	-	ECe, pH, sulphates, chlorides, textural classification.
In situ	2 bores or test pits per ha or 5 bores per 1 km for alignments*	Samples at 0.2 m, 0.5 m and 1.0 m intervals or change in strata to depth of excavation or refusal.	ECe, pH, textural classification.
		Samples 0.5 m, 1.0 m and 2.0 m	Chlorides & sulphates.

* Assumes alignment of 5 km or greater. Additional bores may be required for short alignments (Minimum of eight (8) boreholes for any alignment).



TABLE C4 – Sampling Requirements for Check Samples at Gate

Material	Minimum Sampling Frequency*	Analytical Requirement
Filling (Exemptions)	1 per 1000 m ³	Contamination - heavy metals, PAH, TRH, BTEX, phenol, PCB, OCP/OPPs, and asbestos Salinity – EC, pH, Chloride and sulphate Geotechnical – CBR (4 day soak)
Natural (VENM)	1 per 5000 m ³	Contamination - heavy metals, PAH, TRH, BTEX, phenol, PCB, OCP/OPPs, and asbestos Salinity – EC, pH, Chloride and sulphate Geotechnical – CBR (4 day soak)

* Sampling frequency may be increased based on visual assessment at gate.



APPENDIX D – MATERIALS GIVEN RISE TO LOAD REJECTION

New South Wales Office:

A. D. Envirotech Australia Pty Ltd
Unit 4, 10-11 Millennium Court
Silverwater, NSW 2128

Queensland Office:

A. D. Envirotech Australia Pty Ltd
P.O. Box 288
Upper Coomera, QLD 4209

Telephone:

NSW: (02) 9648 6669
QLD: (07) 5519 4610

Internet:

site: www.ADenvirotech.com.au
e-mail: info@ADenvirotech.com.au



Unsuitable Materials List

The following list contains materials that are unsuitable for use as fill. Any materials containing the following will be rejected. The list is not exhaustive.

- Acid sulphate soils;
- Asbestos (fibre and bonded);
- Biocides;
- Chemical storage containers;
- Contaminated material;
- Demolition rubble;
- Excessively wet soils (greater than 3% of optimal moisture content);
- Explosives;
- Fibro;
- Food waste;
- Fungicides;
- Herbicides;
- High plasticity clay;
- Household domestic waste;
- Large rock fragments;
- Liquid waste;
- Metals;
- Non-validated materials;
- Oil filters and rags;
- Paint;
- Pesticides;
- Plastics and PVC;
- Radioactive waste;
- Sanitary waste;
- Timber;
- Treated timber;
- Tyres;
- Vegetative waste; and
- All other potentially contaminating materials.



APPENDIX E – FORMS FOR RECEIVING SITE

New South Wales Office:

A. D. Envirotech Australia Pty Ltd
Unit 4, 10-11 Millennium Court
Silverwater, NSW 2128

Queensland Office:

A. D. Envirotech Australia Pty Ltd
P.O. Box 288
Upper Coomera, QLD 4209

Telephone:

NSW: (02) 9648 6669
QLD: (07) 5519 4610

Internet:

site: www.ADenvirotech.com.au
e-mail: info@ADenvirotech.com.au



TABLE E1 – APPROVAL CHECKLIST Page 1 of 2

Suppliers Details		
Supplier's Name:	_____ (organisation)	
Contact Person:	_____ (representative)	
Phone Number:	_____	Date: _____
Source Site Details		
Site Address:	_____	
Suburb:	_____	
Environmental Assessment	(Please circle)	(Please circle)
Have the supplied contamination reports been reviewed?	YES / NO	Satisfactory / Unsatisfactory
Comments?	_____	_____
	_____	_____
	_____	_____
Are the supplied Waste Classification report/s satisfactory?	YES / NO	Satisfactory / Unsatisfactory
What has the material been classified as (circle)?		
	VENM	see below
	Exempt Material (eg ENM)	see below
<u>For VENM:</u>	Other	Satisfactory / Unsatisfactory
has sufficient site history information been supplied?	YES / NO	Satisfactory / Unsatisfactory
does the assessment comply with Tables:		
• C1 – Density of testing	YES / NO	Satisfactory / Unsatisfactory
• B1 – Site Acceptance Criteria (HIL Col 4)	YES / NO	Satisfactory / Unsatisfactory
• B3 – Australian Soils Natural Background	YES / NO	Satisfactory / Unsatisfactory
<u>For Exemptions:</u>		
has sufficient site history information been supplied?	YES / NO	Satisfactory / Unsatisfactory
does the assessment comply with Tables:		
• C1 – Density of testing	YES / NO	Satisfactory / Unsatisfactory
• B1 – Site Acceptance Criteria (HIL Col 4)	YES / NO	Satisfactory / Unsatisfactory
• B2 – Threshold Contaminant Concentrations	YES / NO	Satisfactory / Unsatisfactory
<u>ENVIRONMENTAL ASSESSMENT RESULT</u>	REJECTED	APPROVED



TABLE E1 – APPROVAL CHECKLIST Page 2 of 2

Geotechnical Assessment	(Please circle)	(Please circle)
Are the supplied geotechnical report/s satisfactory?	YES / NO	Satisfactory / Unsatisfactory
Does the material contain any of the inclusions listed in Appendix D?	YES / NO	Satisfactory / Unsatisfactory
Are the supplied reports and test results satisfactory?	YES / NO / NA	
Does the liquidity limit/ shrink swell of clay materials comply with Table B4?	YES / NO / NA	Satisfactory / Unsatisfactory
Comments:		
Does the material contain topsoil or vegetation matter?	YES / NO	Satisfactory / Unsatisfactory
Is the particle size acceptable?	YES / NO	Satisfactory / Unsatisfactory
Does the material require blending prior to use?	YES / NO	Satisfactory / Unsatisfactory
Comments:		
Is ongoing excavation control required (eg both suitable and non suitable materials present on-site and separation required)?	YES / NO	Satisfactory / Unsatisfactory
<u>GEOTECHNICAL ASSESSMENT RESULT</u>	REJECTED	APPROVED
Salinity Assessment	(Please circle)	(Please circle)
Is the salinity assessment satisfactory?		Satisfactory / Unsatisfactory
Is the material suitable for unlimited use with regard to salinity (ie non-saline to slightly saline)?	YES / NO	Satisfactory / Unsatisfactory
Comments regarding limited use of saline material:		limit use / Unsatisfactory / NA
Is the material non-aggressive as per Table B6?	YES / NO	Satisfactory / Unsatisfactory
<u>SALINITY ASSESSMENT RESULT</u>	REJECTED	APPROVED
FINAL ASSESSMENT	REJECTED	APPROVED
Comments:		
Completed by:	_____ (name)	_____ (company)
	_____ (signature)	_____ (date)



TABLE E2 – MATERIALS ACCEPTANCE CHECKLIST

FILL ACCEPTANCE CHECKLIST	
Completed By: _____ Date: _____	
Material/ Suppliers Details Supplier's Name: Source Site Address:	_____ _____ _____ _____ (organisation)
Materials described in application/ approval documentation:	_____ _____ _____
Description of materials arriving at site:	_____ _____ _____
Do material descriptions match?	Yes / No accept / reject
Location placed on-site:	_____
Sketch attached:	Yes / No
Number of loads received:	



APPENDIX F – EXCAVATED NATURAL MATERIAL EXEMPTION 2012

New South Wales Office:

A. D. Envirotech Australia Pty Ltd
Unit 4, 10-11 Millennium Court
Silverwater, NSW 2128

Queensland Office:

A. D. Envirotech Australia Pty Ltd
P.O. Box 288
Upper Coomera, QLD 4209

Telephone:

NSW: (02) 9648 6669
QLD: (07) 5519 4610

Internet:

site: www.ADenvirotech.com.au
e-mail: info@ADenvirotech.com.au

Protection of the Environment Operations (Waste) Regulation 2005 – General Exemption Under Part 6, Clause 51 and 51A

The excavated natural material exemption 2012

Name

1. This exemption is to be known as 'The excavated natural material exemption 2012'.

Commencement

2. This exemption commences on 19 October 2012. 'The excavated natural material exemption 2008' which commenced 25 July 2008 is revoked from 19 October 2012.

Duration

3. This exemption is valid until revoked by the Environment Protection Authority (EPA) by notice published in the Government Gazette.

Legislation

4. Under the *Protection of the Environment Operations (Waste) Regulation 2005* (the Regulation):
 - 4.1. Clause 51 (2) authorises the EPA to grant an exemption in relation to any matter or thing including an activity or class of activities, and
 - 4.2. Clause 51A authorises the EPA to exempt a person from any of the following provisions in relation to an activity or class of activities relating to certain waste that is to be land applied or used as a fuel:
 - the provisions of sections 47 to 49 and 88 of the *Protection of the Environment Operations Act 1997* (the Act),
 - the provisions of Schedule 1 to the Act, either in total or as they apply to a particular activity, and
 - the provisions of Part 3 and clauses 45 and 47 of the Regulation.

Exemption

5. In this Notice of Exemption:
 - 5.1. The responsible person listed in Column 1 of Table 1 is exempt from the provision/s listed in Column 2 of that table but only:
 - in relation to activities involving the relevant waste, and
 - where the responsible person complies with the conditions referred to in Column 3 of the table, and
 - in the case of a consumer, in relation to the premises where the waste is applied to land as permitted by clause 7.2.

However, this Notice of Exemption does not exempt the responsible person from the provisions specified in Column 2 where the relevant waste is received at premises that are, despite this exemption, required to be licensed for waste disposal (application to land) activities under the provisions of the Act.

- 5.2. Where a responsible person complies with the conditions of this Notice of Exemption, the activity referred to in Schedule 1 from which that person is exempt is taken to be a non-scheduled activity for the purposes of the Act.

Table 1

Column 1	Column 2	Column 3
Responsible person	Provisions from which the responsible person is exempt	Conditions to be met by the responsible person
Generator	section 48 of the Act in respect of clause 39 of Schedule 1 to the Act	all requirements specified in section 7 and 8
Consumer	section 48 of the Act in respect of clauses 39 and 42 of Schedule 1 to the Act section 88 of the Act clause 47 of the Regulation	all requirements specified in section 7 and 9

This Notice of Exemption is a general exemption for the purposes of clause 51(3) of the Regulation.

Definitions

6. In this Notice of Exemption:

Bgl means below ground level, referring to soil at depth beneath the ground surface.

Characterisation means sampling and testing that must be conducted on the material for the range of chemicals and other attributes listed in Column 1 of Table 2.

Composite sample means a sample that combines 5 sub-samples of equal size into a single sample for the purpose of analysis.

Consumer means a person who applies, causes, or permits the application to land of excavated natural material within the definitions of “application to land” in accordance with the Act. The consumer may be the landholder responsible for the land to which excavated natural material is applied.

Discrete sample means a sample collected and analysed individually that will not be composited.

Excavated natural material is naturally occurring rock and soil (including but not limited to materials such as sandstone, shale, clay and soil) that has:

- a) been excavated from the ground, and
- b) contains at least 98% (by weight) natural material, and
- c) does not meet the definition of Virgin Excavated Natural Material in the Act.

Excavated natural material does not include material located in a hotspot; that has been processed; or that contains asbestos, Acid Sulfate Soils (ASS), Potential Acid Sulfate soils (PASS) or sulfidic ores.

Generator means a person who generates excavated natural material for supply to a consumer.

Hotspot means a cylindrical volume which extends through the soil profile from the ground surface to the proposed depth of excavation, where the level of any contaminant listed in Column 1 of Table 2 is greater than the absolute maximum concentration in Column 3 of Table 2.

In situ material means material that exists on or below the ground level. It does not include stockpiled material.

In situ sampling means sampling undertaken on *in situ* material.

Relevant waste means excavated natural material that meets the requirements of Section 7.

Stockpiled material means material that has been excavated from the ground and temporarily stored on the ground prior to use.

Systematic sampling means sampling at points that are selected at even intervals and are statistically unbiased.

Validation means ensuring that test results comply with the conditions of this exemption prior to material being supplied to a consumer.

General conditions

7. This Notice of Exemption is subject to the following conditions:

- 7.1. The chemical concentration or other attribute of the excavated natural material listed in Column 1 of Table 2 must not exceed any of the following:
 - 7.1.1. For characterisation tests, the maximum average (based on the arithmetic mean) concentration or value listed in Column 2 of Table 2, and
 - 7.1.2. The absolute maximum concentration or value listed in Column 3 of Table 2.
- 7.2. The excavated natural material can only be applied to land as engineering fill or used in earthworks.

Generator responsibilities

8. The following conditions must be met by the generator for this exemption to apply:

- 8.1. The generator must prepare a written sampling plan which includes information on sample preparation and storage. The plan must be kept for a period of three years;
- 8.2. The generator must undertake sampling and analysis of the material for Acid Sulfate Soil (ASS) and Potential Acid Sulfate Soil (PASS), in accordance with the *NSW Acid Sulfate Soil Manual*, Acid Sulfate Soils Management Advisory Council, 1998 and the updated *Laboratory Methods Guidelines version 2.1 – June 2004* where:
 - 8.2.1. the pH measured in the material is below 5, and/or
 - 8.2.2. the review of the applicable Acid Sulfate Soil Risk Maps (published by the former Department of Land and Water Conservation and available at <http://www.environment.nsw.gov.au/acidsulfatesoil/riskmaps.htm>) indicates the potential presence of Acid Sulfate Soils (ASS).
- 8.3. For stockpiled material, the generator must:
 - 8.3.1. undertake sampling in accordance with Australian Standard 1141.3.1-1996 *Methods for sampling and testing aggregates* – Sampling – Aggregates (or equivalent);
 - 8.3.2. undertake characterisation according to the requirements listed in Columns 1 and 2 of Table 3 for the range of chemicals and other attributes listed in Column 1 of Table 2; and
 - 8.3.3. store the excavated natural material appropriately until the characterisation test results are validated (i.e. obtained and assessed as compliant with this exemption).
- 8.4. For *in situ* material, the generator must:
 - 8.4.1. undertake characterisation for the range of chemicals and other attributes listed in Column 1 of Table 2 according to the requirements listed in Columns 1, 2, and 3 of Table 4. When the ground surface is not comprised of soil (e.g. concrete slab), samples must be taken at the depth at which the soil commences.
 - 8.4.2. undertake sampling at depth according to Column 1 of Table 5.
 - 8.4.3. collect additional soil samples (and analyse them for the range of chemicals and other attributes listed in Column 1 of Table 2), at any

depth exhibiting discolouration, staining, odour or other indicators of contamination inconsistent with soil samples collected at the depth intervals indicated in Table 5.

- 8.4.4. segregate and exclude hotspots identified in accordance with Table 4, from material excavated for reuse under this exemption.
- 8.5. For both stockpiled and *in situ* material the generator must:
 - 8.5.1. keep a written record of all characterisation test results, volume of excavated material, and detected hotspot material for a period of three years; and
 - 8.5.2. provide a written statement of compliance to the consumer with each transaction, certifying that the excavated natural material complies with the relevant conditions of this exemption.

Consumer responsibilities

9. The following conditions must be met by the consumer for this exemption to apply:

- 9.1. The consumer must ensure that the excavated natural material is fit for purpose and poses minimal risk of harm to human health or the environment.
- 9.2. The consumer must keep records of the quantity of the excavated natural material received as well as the suppliers' name and address, for a period of three years.
- 9.3. The consumer must land apply the relevant waste within a reasonable period of time.

Chemical and other material property requirements

10. This Notice of Exemption only applies to excavated natural material where the chemical and other attributes listed in Column 1 of Table 2 comply with the chemical concentrations and other values listed in Column 2 and Column 3 of Table 2, when analysed according to test methods specified in Column 4 of Table 2.

Table 2

Column 1	Column 2	Column 3	Column 4
Chemicals and other attributes	Maximum average concentration for characterisation (mg/kg 'dry weight' unless otherwise specified)	Absolute maximum concentration (mg/kg 'dry weight' unless otherwise specified)	Test method specified within Section
1. Mercury	0.5	1	12.1
2. Cadmium	0.5	1	12.2
3. Lead	50	100	12.2
4. Arsenic	20	40	12.2
5. Chromium (total)	75	150	12.2
6. Copper	100	200	12.2
7. Nickel	30	60	12.2
8. Zinc	150	300	12.2
9. Electrical Conductivity	1.5 dS/m	3 dS/m	12.3
10. pH *	5 to 9	4.5 to 10	12.3
11. Total Polycyclic Aromatic Hydrocarbons	20	40	12.4

Column 1	Column 2	Column 3	Column 4
Chemicals and other attributes	Maximum average concentration for characterisation (mg/kg 'dry weight' unless otherwise specified)	Absolute maximum concentration (mg/kg 'dry weight' unless otherwise specified)	Test method specified within Section
(PAHs)			
12. Benzo(a)pyrene	0.5	1	12.4
13. Benzene	NA	0.5	12.5
14. Toluene	NA	65	12.5
15. Ethyl-benzene	NA	25	12.5
16. Xylene	NA	15	12.5
17. Total Petroleum Hydrocarbons C ₁₀ -C ₃₆	250	500	12.6
18. Rubber, plastic, bitumen, paper, cloth, paint and wood	0.05%	0.10%	12.7

* The ranges given for pH are for the minimum and maximum acceptable pH values in the excavated natural material.

Sampling requirements

11. This Notice of Exemption only applies to excavated natural material sampled according to the requirements in Tables 3, 4 and 5.

11.1. Stockpiled excavated natural material must be sampled as per the requirements in Table 3.

11.1.1. Composite sampling must be undertaken for analysis of attributes 1 to 10 and 18 in Column 1 of Table 2. Discrete sampling must be undertaken for analysis of attributes 11 to 17 in Column 1 of Table 2.

11.1.2. Sampling must be undertaken in a manner that ensures all parts of the stockpile are equally accessible for representative sampling.

11.1.3. For stockpiles greater than 4,000 tonnes the number of samples described in Table 3 must be repeated.

Table 3

Sampling of Stockpiled Material		
Column 1	Column 2	Column 3
Quantity (tonnes)	Number of samples	Validation
<500	3	Required
500 – 1,000	4	
1,000 – 2,000	5	
2,000 – 3,000	7	
3,000 – 4,000	10	

11.2. *In situ* material must be sampled by collecting discrete samples as per the requirements of Tables 4 and 5.

11.2.1. Sites larger than 50,000 m² should be subdivided into smaller areas and sampled as per Table 4.

Table 4

<i>In Situ Sampling at surface</i>				
Column 1	Column 2	Column 3	Column 4	Column 5
Size of <i>in situ</i> area (m ²)	Number of systematic sampling points recommended	Distance between two sampling points (m)	Diameter of the hot spot that can be detected with 95% confidence (m)	Validation
500	5	10.0	11.8	Required
1000	6	12.9	15.2	
2000	7	16.9	19.9	
3000	9	18.2	21.5	
4000	11	19.1	22.5	
5000	13	19.6	23.1	
6000	15	20.0	23.6	
7000	17	20.3	23.9	
8000	19	20.5	24.2	
9000	20	21.2	25.0	
10,000	21	21.8	25.7	
15,000	25	25.0	28.9	
20,000	30	25.8	30.5	
25,000	35	26.7	31.5	
30,000	40	27.5	32.4	
35,000	45	27.9	32.9	
40,000	50	28.3	33.4	
45,000	52	29.3	34.6	
50,000	55	30.2	35.6	

Table 4 has been taken from NSW EPA 1995, *Contaminated Sites Sampling Design Guidelines*, NSW Environment Protection Authority.

Table 5

<i>In Situ Sampling at Depth</i>	
Column 1	Column 2
Sampling Requirements *	Validation
1 soil sample at 1.0 m bgl from each surface sampling point followed by 1 soil sample for every metre thereafter. From 1.0 m bgl, sample at the next metre interval until the proposed depth of excavation of the material is reached. If the proposed depth of excavation is between 0.5 to 0.9 m after the last metre interval, sample at the base of the proposed depth of excavation.	Required if the depth of excavation is equal to or greater than 1.0 m bgl

* Refer to Notes for examples

Test method

12. All testing must be undertaken by analytical laboratories accredited by the National Association of Testing Authorities (NATA), or equivalent. All chemicals and other attributes listed in Column 1 of Table 2 must be measured in accordance with the test methods specified below:

- 12.1. Test methods for measuring the mercury concentration.
 - 12.1.1. Particle size reduction & sample splitting may be required.
 - 12.1.2. Analysis using USEPA SW-846 Method 7471B Mercury in solid or semisolid waste (manual cold vapour technique), or an equivalent analytical method with a detection limit < 20% of the stated absolute maximum concentration in Column 3 of Table 2 (i.e. 0.20 mg/kg dry weight).
 - 12.1.3. Report as mg/kg dry weight.
- 12.2. Test methods for measuring chemicals 2 to 8 in Column 1 of Table 2.
 - 12.2.1. Particle size reduction & sample splitting may be required.
 - 12.2.2. Sample preparation by digesting using USEPA SW-846 Method 3051A Microwave assisted acid digestion of sediments, sludges, soils, and oils (or an equivalent analytical method).
 - 12.2.3. Analysis using USEPA SW-846 Method 6010C Inductively coupled plasma - atomic emission spectrometry, or an equivalent analytical method with a detection limit < 10% of the stated absolute maximum concentration in Column 3 of Table 2, (e.g. 10 mg/kg dry weight for lead).
 - 12.2.4. Report as mg/kg dry weight.
- 12.3. Test methods for measuring electrical conductivity and pH.
 - 12.3.1. Sample preparation by mixing 1 part excavated natural material with 5 parts distilled water.
 - 12.3.2. Analysis using Method 103 (pH) and 104 (Electrical Conductivity). *In* Schedule B (3): Guideline on Laboratory Analysis of Potentially Contaminated Soils, National Environment Protection (Assessment of Site Contamination) Measure 1999 (or an equivalent analytical method).
 - 12.3.3. Report electrical conductivity in deciSiemens per metre (dS/m).
- 12.4. Test method for measuring Polynuclear Aromatic Hydrocarbons (PAHs) and benzo(a)pyrene.
 - 12.4.1. Analysis using USEPA SW-846 Method 8100 Polynuclear Aromatic Hydrocarbons (or an equivalent analytical method).
 - 12.4.2. Calculate the sum of all 16 PAHs for total PAHs.
 - 12.4.3. Report total PAHs as mg/kg dry weight.
 - 12.4.4. Report benzo(a)pyrene as mg/kg.
- 12.5. Test method for measuring benzene, toluene, ethylbenzene and xylenes (BTEX).
 - 12.5.1. Method 501 (Volatile Alkanes and Monocyclic Aromatic Hydrocarbons). *In* Schedule B (3): Guideline on Laboratory Analysis of Potentially Contaminated Soils, National Environment Protection (Assessment of Site Contamination) Measure 1999 (or an equivalent analytical method).
 - 12.5.2. Report BTEX as mg/kg.

- 12.6. Test method for measuring Total Petroleum Hydrocarbons (TPH).
 - 12.6.1. Method 506 (Petroleum Hydrocarbons). In Schedule B (3): Guideline on Laboratory Analysis of Potentially Contaminated Soils, National Environment Protection (Assessment of Site Contamination) Measure 1999 (or an equivalent analytical method).
 - 12.6.2. Report as mg/kg dry weight.
- 12.7. Test method for measuring rubber, plastic, bitumen, paper, cloth, paint and wood.
 - 12.7.1. NSW Roads & Traffic Authority Test Method T276 Foreign Materials Content of Recycled Crushed Concrete (or an equivalent method).
 - 12.7.2. Report as percent.

Exemption Granted

Christopher McElwain
Manager Waste and Resource Strategy
Environment Protection Authority
by delegation

Notes

The EPA may amend or revoke this exemption at any time. It is the responsibility of the generator and the consumer to ensure that they comply with all relevant requirements of the most current exemption. The current version of an exemption will be available on the EPA website: www.epa.nsw.gov.au.

In gazetting this general exemption, the EPA is exempting the relevant waste from the specific requirements of the Act and Regulations as stated in this exemption. The EPA is not in any way endorsing the use of this substance or guaranteeing that the substance will confer benefit.

The use of exempted material remains subject to other relevant environmental regulations within the Act and Regulations. For example, a person who pollutes land (s142A) or water (s120), or does not meet the special requirements for asbestos waste (clause 42), regardless of having an exemption, is guilty of an offence and subject to prosecution.

For the purposes of arrangements between a generator and a consumer, a 'transaction' is taken to mean the contractual agreement between the two parties which specifies the exchange of waste material from one party to another. A 'statement of compliance' must be in writing and be provided with each transaction.

The conditions set out in this exemption are designed to minimise the risk of potential harm to the environment, human health or agriculture, however, neither this exemption nor these conditions guarantee that the environment, human health or agriculture will not be harmed.

The consumer should assess whether or not the exempted material is fit for the purpose for which the material is proposed to be used and whether this use will cause harm. The consumer may need to seek expert engineering or technical advice.

This exemption does not apply to any material received at premises that are required to be licensed for waste disposal (application to land) activities under the provisions of the Act. This exemption does not remove the need for a site at which processing occurs to be licensed, if required under Schedule 1 of the Act.

This exemption does not alter the requirements of any other relevant legislation that must be met in utilising this material, including for example, the need to prepare a Material Safety Data Sheet (MSDS).

Regardless of any exemption provided by the EPA, the person who causes or permits the application of the substance to land must ensure that the action is lawful and consistent with the development consent requirements of the land.

All records required to be kept under this exemption must be made available to authorised officers of the EPA upon request.

Failure to comply with the conditions of this Notice of Exemption may constitute an offence under clause 51 of the Regulation and the responsible person will be required to comply with the normal regulatory provisions.

Examples

In situ sampling at depth

Example 1.

If the proposed depth of ENM excavation is between 1 m bgl and 1.4 m bgl, then:

- 1 sample on surface (as per the requirements of Table 4).
- 1 sample at 1 m bgl.
- No further depth sampling after 1 m bgl, unless required under section 8.4.3.

Example 2.

If the proposed depth of ENM excavation is at 1.75 m bgl, then:

- 1 sample on surface (as per the requirements of Table 4).
- 1 sample at 1 m bgl.
- 1 sample at 1.75 m bgl.
- No further depth sampling after 1.75 m bgl, unless required under section 8.4.3.

Example 3.

If the proposed depth of ENM excavation is at 2.25 m bgl, then:

- 1 sample on surface (as per the requirements of Table 4).
- 1 sample at 1 m bgl.
- 1 sample at 2 m bgl.
- No further depth sampling after 2 m bgl, unless required under section 8.4.3.