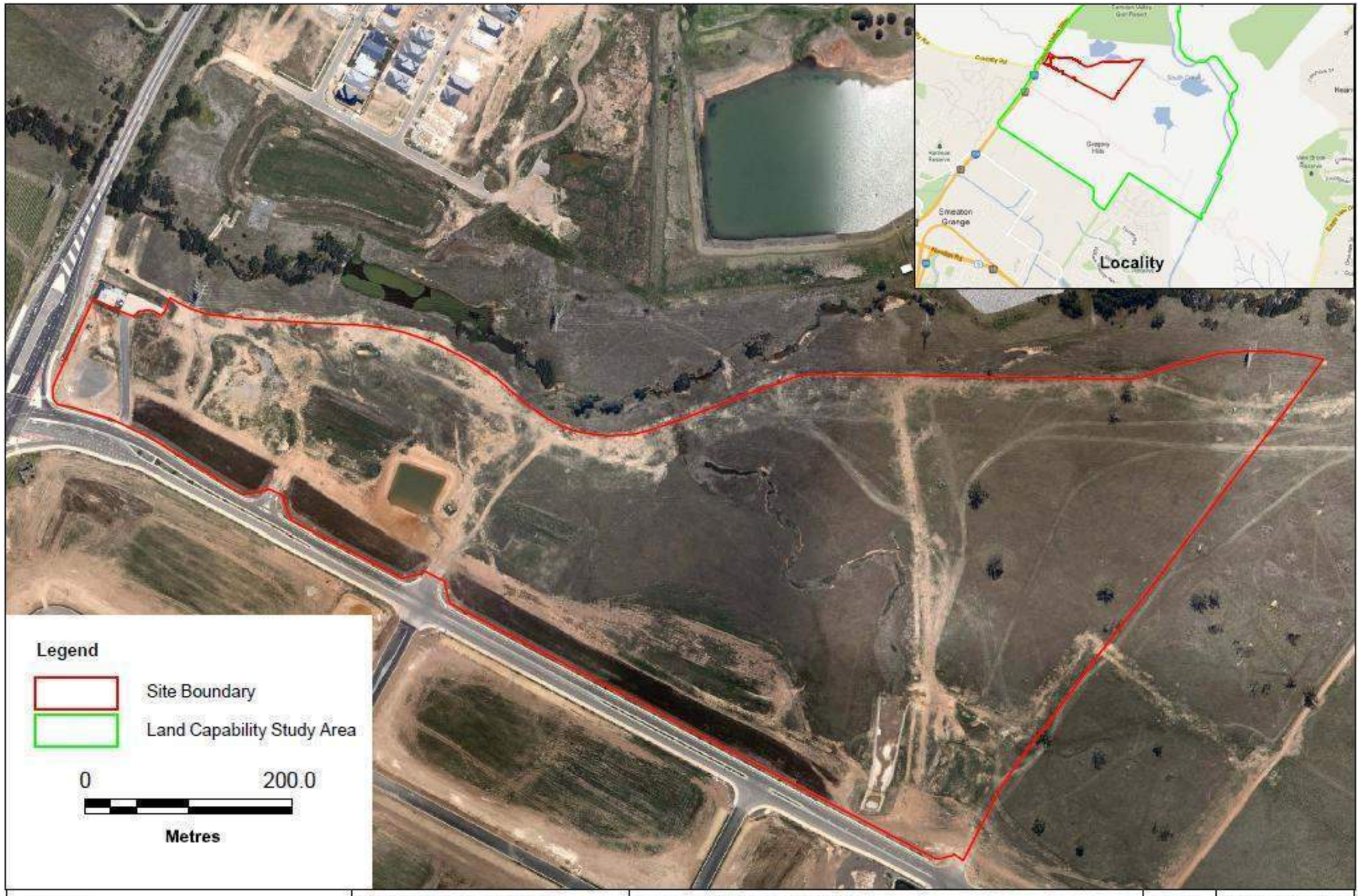
APPENDIX G – DRAWING 1



Douglas Partners Geotechnics / Environment / Groundwater	CLIENT: Gregory Hills Corporate Park	TITLE: Site Boundary, Site Locality Phase 2 Contamination Assessment Lot 701, Deposited Plan 1154772, Gregory Hills Drive, Gledswood Hills	PROJECT No: 76510.01
	OFFICE: Campbelltown DRAWN BY: BAH		DRAWING No: 1
	SCALE: As shown DATE: 09.01.2012	MGA	REVISION: A

APPENDIX VI – ASSOCIATED DOCUMENTS

Genesis

Dial A Dump Industries P/L

A.B.N 75 131 565 583

Premier Recycling Facility

PO BOX 1040

MASCOT NSW 1460

Phone: (02) 9832 3333

Docket : GEN213439

Date: 14/04/2015

Time in: 09:46:23 am

Time Out: 10:07:33 am

Customer

Bouyges Macmahon NSRU Procurement

Vehicle : TIPR4U Order No : 2000197754

==========

Qty Remaining : -16,194.10

Type	Qty
Asbestos Soils	**27.08T**

==========

Gross	:	43.06
Tare	:	15.98
Net	:	27.08T

Printed on Date: 28/01/2016at 01:38:33 pm

Signature:

Statement of Compliance:
Asbestos containing materials are not accepted in the Recycling Facility.

26th February 2015

To whom it may concern,

Re: Gregory Hills Corporate Park

A.D. Envirotech was engaged by Gregory Hills Development Company in November 2013 to provide GITA Level 1 supervision and environmental testing at Gregory Hills Corporate Park.

As per the Gregory Hills Corporate Park Fill Management Protocol – ADE Report #6908 FMP1, one 'gate check' sample was collected and chemically analysed per 90 truck and trailer (1000m³) from each source site. 8695-WAC6 sampled on 12/02/2015 from Rahme Campbelltown was found to be below that of the site assessment criteria with a pH of 4. This material was blended on site with material of a higher pH.

A further five samples were taken for validation after the material was blended, and all results fell within the satisfactory range as per the site assessment criteria.

Yours sincerely,

Clifton Thompson,

Geotechnical Engineer
A.D. Envirotech Pty Ltd
c.thompson@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-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	**Yes**
Samples were preserved in correct manner	**Yes**
Sample containers for volatile analysis were received with minimal headspace	**Yes**
Samples were analysed within holding time	**Yes**
Some samples have been subcontracted	**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 *.

**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 contect 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.

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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-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

Lab ID	PQL (mg/kg)	8695-C8	8695-C9	8695-C10	8695-C11	8695-C12
Sample Name		8695-pH1	8695-pH2	8695-pH3	8695-pH4	8695-pH5
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	**Yes**
Samples were preserved in correct manner	**Yes**
Sample containers for volatile analysis were received with minimal headspace	**Yes**
Samples were analysed within holding time	**Yes**
Some samples have been subcontracted	**No**

1. All samples are tested in batches of 20.
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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
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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
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**Methods Number Description:

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ESA-MP-06	Digestion of air filters
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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

ADECONSULTINGGROUP
SOLUTIONS THROUGH INNOVATION

5th February 2015

To whom it may concern,

Re: Gregory Hills Corporate Park

A.D. Envirotech was engaged by Gregory Hills Development Company in November 2013 to provide GITA Level 1 supervision and environmental testing at Gregory Hills Corporate Park.

As per the Gregory Hills Corporate Park Fill Management Protocol – ADE Report #6908 FMP1, one 'gate check' sample was collected and chemically analysed per 90 truck and trailer (1000m³) from each source site. 8622-WAC1 sampled on 19/01/2015 from the Lend Lease (Northern Road Upgrade) site was found to be below that of the site assessment criteria with a pH of 4.9. A review of the original waste classification report by Cardno dated the 8th September, 2014 indicates that the material pH is generally above 5.5 pH units. This material was blended on site with material of a higher pH from the sources of the ETTT Project (pH 9.4), Mainland Civil (pH 8) and John Holland North Strathfield Rail Underpass Project (pH 8.4). As such, the pH unit of 4.9 is not considered significant due to the thorough mixing of material and source history.

Yours sincerely,

Karl Finnerty,

Engineering Geologist
A.D. Envirotech Pty Ltd
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Waste Analysis and Waste Classification Report

Lot 612, Corner of Regents Street and Santana Road, Campbelltown NSW

Prepared for: Rahme Civil Pty Ltd

7887 / WAC1
v1. final
1st August 2014

ADE CONSULTING GROUP
SOLUTIONS THROUGH INNOVATION

Waste Analysis and Waste Classification Report

Lot 612, Corner of Regents Street and Santana Road, Campbelltown NSW

Prepared for:

Rahme Civil Pty Ltd

Version	Details	Date
v1 final	Prepared by J.Eccles	Friday, 1st August 2014
	On behalf of K.Finnerty	Friday, 1st August 2014

Report No: 7887 / WAC1 / v1 final

Date: Friday, 1st August 2014

Prepared by: Justin Eccles
M. Sci. Tech (Environmental)

Reviewed and authorised by: Karl Finnerty
B. Sci. (Geology)

Waste Analysis and Waste Classification Report
7887 / WAC1 / v1 final

Date of Inspection:	23.07.2014
Date of Report:	01.08.2014
Address:	Lot 612, Corner of Regents St and Santana Road, Campbelltown NSW
Client	Rahme Civil Pty Ltd
Subject Area:	Rahme construction site, soil materials from 0.0 – 3.0 metres below ground level (m BGL)(Refer to Appendix I – Aerial Photograph & Test Pit Locations)

1. INTRODUCTION

1.1. General

A.D. Envirotech Australia Pty Ltd (ADE) was commissioned by Rahme Civil Pty Ltd (Rahme) to undertake an in-situ Waste Analysis Classification, Sampling and Analytical program of the subject area located within Lot 612, Corner of Regents Street and Santana Road, Campbelltown NSW.

ADE was provided a report by the client detailing former investigative works undertaken at the site by Aargus Pty Ltd (Aargus) on the 1st July 2014, which classified the soil materials as Virgin Excavated Natural Material (VENM). Due to a change in the depth of cut and therefore total volume (increase from 2,000 m^3 to 6,000 m^3), ADE was requested by the client to determine if the additional soil materials were suitable for classification as 'Virgin Excavate Natural Material' (VENM), and suitable for offsite disposal to the Gregory Hills Corporate Park (GHCP) in accordance with the GHCP Fill Management Protocol (GHCP FMP)(Further details are provided in Section 2 of this report).

The site inspection, sampling and field works were conducted by ADE on the 23rd of July 2014. This report should be read in conjunction with the following reports:

- ADE Report 6908/FMP1/v1 final (GHCP FMP) '*Fill Management Protocol, Gregory Hills Corporate Park Pty Ltd, Proposed Commercial Subdivision, Lot701, DP1154772, Gregory Hills Drive, Gledswood Hills NSW*' dated 29th November 2013.
- Aargus Report ES5918 '*VENM Report, Lot 612 DP1141214, Corner Regents Street & Santana Road, Campbelltown NSW*' dated 14th July 2014.

1.2. Site Information

Table 1 summarises site information and project details.

Table 1 - Summary of site information and project information

Site and Project Details	
Client:	Rahme Civil Pty Ltd
ADE Project No:	7887 / WAC1 / v1 final
Site location:	Lot 612, Corner of Regents Street and Santana Road, Campbelltown NSW
Date of field work:	23.07.2014

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Table 1 Continued…

Site and Project Details	
Date of report:	01.08.2014
Approximate volume:	6,000 m^3 (in-situ); 8,000 m^3 (with 33% bulking factor)
Approximate size:	1,900 m^2
Sample size:	Six discrete samples for chemical characterisation of soil materials; Six discrete samples for analysis of asbestos; Four samples for analysis of chlorides and sulfates; and Six samples for analysis of electrical conductivity (ECe), pH and textural classification.
Inspection details:	Light brown clay with silt; underlain by red-white clay with fractions of grey shale. Paint chips, sulphidic ores, asbestos containing materials and foreign materials were not observed in any soils inspected.

2. BACKGROUND

The Protection of the Environment Operations Act 1997 (POEO 1997) defines VENM as: *'natural material (such as clay, gravel, sand, soil or rock fines):* that has been excavated or quarried from areas that are not contaminated with manufactured chemicals or process residues, as a result of industrial, commercial, mining or agricultural activities; and that does not contain any sulfidic ores or soils or any other waste.'

2.1. Summary of former reports

Former investigative works were performed by Aargus and summarized in Report No. VENM ES1958 released on the 14th of July, 2014, which classified 2,000 m^3 of soil material (excluding topsoil) as Virgin Excavated Natural Material (VENM)(Refer to Appendix IV – Supporting Documents).

A summary of the Aargus Report 'VENM ES1958' provided to ADE is as follows:

"Aargus Pty Ltd was appointed by Rahme Civil Pty Ltd to conduct a visual and analytical assessment of natural soil to be excavated as Virgin Excavated Natural Material (VENM) from the property located at Lot 612 in DP1141214 on the corner of Regents Street & Santana Road, Campbelltown NSW (the site")."

"Aargus staff inspected the site on 1st July 2014. The inspection and sampling was conducted on the in-situ soils at the above mentioned address. Topsoil material was observed on the site during the inspection; this material does not form part of this report and are to be disposed of appropriately. Aargus has been informed that approximately 2,000 m3 of natural material will be transported off-site."

"Aargus staff recovered two (2) samples from the in-situ natural. This VENM certificate does not apply to the topsoil material located within the property. This VENM report refers to the natural underlying material from the site only."

"The Geological Map of Wollongong-Port Hacking (Geological Series Sheet 9029- 9129, Scale 1:100,000, 1985), published by the Department of Mineral Resources indicates that site is underlain by Middle Triassic

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Age Bringelly Shale of the Wianamatta Group. Bringelly Shale generally includes shale, carbonaceous claystone, laminite, coal."

"The soil profile at the site was consistent with the Geological Survey. In general the material was observed to be SHALE, medium strength, dark grey, slightly weathered. Given the geological profile, it is expected that shale material will extend to the maximum depth of excavations."

"No UST's or AST's were visible. No staining or odours were visible at the time of the inspection. There was no evidence of localised oil or chemical spills on any sealed or unsealed areas and this issue does not warrant any concern. Trees and shrubs surrounding the site appeared generally healthy and free from stress. No visible fibro cement pieces were observed on the surfaces of the site that were inspected. It should be noted that foreign materials may also be present buried within the soil materials that could not be accessed as part of the inspection."

"Considering the topography, geology and soil profile of the site, it is considered the risk of encountering naturally occurring acid sulfate soils on site is negligible."

"Two (2) samples (TP1 0.2-0.4 m and TP2 0.2-0.4m) were submitted for laboratory analysis. The samples were analysed for heavy metals (As, Cd, Cr, Cu, Pb, Hg, Ni, Zn), Total Petroleum Hydrocarbons (TRH), Benzene, Toluene, Ethylbenzene, Xylene (BTEX), Polycyclic Aromatic Hydrocarbons (PAH), Organochlorine Pesticides (OCP), Polychlorinated Biphenyl's (PCB), Phenols, Cyanide, Asbestos, pH, Electrical Conductivity, Sulphate and Chloride."

"With respect to the NSW DECC "Waste Classification Guidelines, Part 1: Classifying Waste" (2009), concentrations are below the CT1 criteria as indicated in the Tables above. Furthermore asbestos fibres where not detected within any of the soil samples recovered."

"With reference to AS2159-2009 "Piling-Design and Installation", the soils are considered to be non-aggressive to concrete and steel in low permeability soils."

"Conclusions - With reference to a site walkover, following the laboratory analysis and with reference to NSW EPA guidelines, the natural materials have concentrations that were below the threshold values for "Waste Classification Guidelines, Part 1: Classifying Waste" NSW DECC (2009). The natural soil in question can be classified as ***VENM*** *(Virgin Excavated Natural Material) with reference to the above NSW EPA guidelines. As a result of this classification the material can be reused on site or to be disposed of as per Schedule 1 Part 3 of the Protection of the Environment Operations Act 1997."*

The results of the investigation undertaken by Aargus have been included in the data set of this report. Following the initial investigation undertaken by Aargus, the final use of soil to be excavated was revised i.e. directed to GHCP instead of landfill. Furthermore, ADE was advised by the client that the volume of soil material to be excavated was to increase from 2,000 m^3 to 6,000 m^3 (8,000 m^3 with 33% bulking factor). As such, further soil sampling and assessment for contamination, salinity and aggressivity was conducted by ADE on the 23rd of July 2014 to determine whether the soil materials from the site meet the POEO 1997 definition of 'VENM', and if the soils meet the minimum criteria outlined with the 'GHCP FMP'.

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3. OBJECTIVES

The objectives of the works were to determine whether the soil materials from the site meet the criteria for VENM in accordance with the *'Waste Classification Guidelines, Part 1: Classifying Waste' NSW DECC (2009)* and the GHCP FMP.

4. SCOPE OF WORK

The scope of work required to achieve the objectives of the investigation involved the following:

- Completion of a Safety, Health & Environment and Safe Work Method Statement prior to undertaking works;
- Review of Aargus Report No. VENM ES1958
- Inspection of the subject area;
- Collection of six discrete samples for waste classification;
- Collection of six discrete samples for analysis of asbestos;
- Collection of four samples for analysis of soil aggressivity;
- Collection of six samples for testing of salinity;
- Cold storage of all samples collected;
- Submission to a laboratory for analysis under chain of custody conditions;
- Laboratory analysis of samples for Total Recoverable Hydrocarbons (TRH); Benzene, Toluene, Ethylbenzene, Xylene (BTEX); Polycyclic Aromatic Hydrocarbons (PAHs), Organochlorine Pesticides (OCPs), Organophosphorus Pesticides (OPPs), Heavy Metals (Hg, Cd, Pb, As, Cr, Cu, Ni, and Zn), Electrical Conductivity (ECe), asbestos, textural analysis, sulfates and chlorides;
- Evaluation of analyte concentrations against the *"Waste Classification Guidelines, Part 1: Classifying Waste" NSW DECC (2009)* criteria and NSW EPA Waste Classification criteria for off-site disposal;
- Evaluation of analyte concentrations against the GHCP FMP; and
- Preparation of a report outlining the investigation methodology, interpretation of the site data (results), classification and conclusions.

5. SAMPLING PLAN, METHODOLOGY, FIELD INVESTIGATIONS AND INVESTIGATION PATTERN

ADE was advised by the client that the material to be sampled within the subject area was approximately 6,000 m^3 (8,000 m^3 with 33% bulking factor) situated on a lot of 1,900 m^2.

A summary of the sampling undertaken is as follows:

- A total of two soil samples were collected from two test pits for chemical analysis by Aargus.
- A further six soil samples were collected by ADE from three test pits for chemical analysis.
- Six soil samples were collected for salinity from two test pits.
- Four soil samples were collected from two test pits for aggressivity analysis.

All samples were collected based on a judgmental sampling pattern.

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5.1. Equipment Decontamination

ADE's standard decontamination procedures were undertaken before collecting each of the samples to avoid the possibility of cross-contamination. The soil sampling equipment and items likely to come into contact with soil samples were thoroughly washed, followed by rinsing with phosphate-free detergent and deionised water before the collection of samples. Due care was taken with the disposal of any washings and residues from such cleaning operations.

5.2. Documentation

A field observation log was kept by sampling personnel. Details recorded in the log included:

- Location and sample number;
- Soil profile notes;
- Sampling method;
- Sample identification;
- Sample description; and
- Sample point measurements.

A comprehensive master sample register was maintained. As samples were received, they were given a unique sequential number from the sample register into which details from the labels were entered. Before packing and dispatch of samples for analysis, a Chain of Custody form was completed. This form recorded details of the individual samples being dispatched and the type of analysis required for each sample.

Samples collected by ADE on the 23rd July 2014 for analysis of contamination and salinity assessment were submitted to ADE's own Environmental and OH&S Laboratory a NATA accredited laboratory for analytical testing. Samples collected by ADE on 23rd July 2014 for analysis of aggressivity to steel and concrete (i.e. sulfates and chlorides) were sent to Eurofins / MGT, a NATA accredited laboratory for analytical testing. Former waste classification samples collected by Aargus on the 1st of July 2014, were submitted to ALS Environmental, a NATA accredited laboratory for analytical testing.

Copies of the completed Chain of Custody forms were retained on the Central Filing System and the original was sent to the analytical laboratory together with the samples.

5.3. Sampling Density

GCHP FMP Table C1 - Sampling and Analytical Requirements for VENM validation

As per 'Table C1' of the GHCP FMP, the sampling density required for 5,000 – 50,000 m^3 of soil materials to be assessed for validation as VENM is one sample per 5,000 m^3, with a minimum of eight samples required. Two samples for chemical characterisation were collected by Aargus on the 1st of July 2014, with an additional six samples collected by ADE on the 23rd of July 2014.

As the results from the former investigation by Aargus are being used in the data set of this report, the eight samples for assessment of 6,000 m^3 of soil material is considered to meet the minimum sampling density as per the GHCP FMP.

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GHCP FMP Table C3 - Sampling and Analytical Requirements for Salinity and Aggressivity

The site is considered to be located within an area of no known salinity. As per 'Table C3' of the GHCP FMP two bores or test pits are required per hectare for:

- Salinity (EC, pH and textural classification) - Samples at 0.2 m, 0.5 m and 1.0 m intervals or change in strata to depth of excavation or refusal; and
- Aggressivity (chlorides and sulphates) – Samples at 0.5 m, 1.0 m and 2.0 m

Two samples for salinity were collected from two test pits by Aargus on the 1st of July 2014, with an additional six samples collected by ADE on the 23rd of July 2014 (refer to **Table 2** for laboratory sample number and depth).

Two samples for aggressivity were collected from two test pits by Aargus on the 1st of July 2014, with an additional four samples collected by ADE on the 23rd of July 2014 (refer to **Table 2** for sample depth).

As the results from the former investigation by Aargus are being used in the data set of this report, the samples for assessment of salinity and aggressivity are considered to meet the minimum sampling density as per the GHCP FMP.

5.4. Sampling

Soils were collected using a clean hand trowel. Field activities were conducted by an experienced environmental scientist. The samples were placed in sterile glass jars with Teflon lined lids.

Each sample jar was well protected by packaging material. Ice packs were inserted in the cooler box to maintain the samples at a temperature below approximately 4^0C. The original Chain of Custody form was enclosed in the cooler box that was then sealed and dispatched to a NATA accredited analytical laboratory.

Table 2 - Summary of sample descriptions and locations collected by ADE on the 23rd July 2014.

Laboratory Sample No.	**Soil Description**	**Sample Location** (Refer to Appendix I – Aerial Photograph and Test Pit locations)	**Depth**
7887.EC1	Light brown clay with silt	Test Pit 1	0.5 m BGL
7887.WAC1; 7887.EC2; 7887.SC1; 7887.Asb1	Light brown clay with silt	Test Pit 1	1.0 m BGL
7887.WAC2; 7887.EC3; 7887.SC2; 7887.Asb2	Red-white clay / grey shale	Test Pit 1	2.0 m BGL
7887.WAC3; 7887.Asb3	Red-white clay / grey shale	Test Pit 2	1.0 m BGL
7887.WAC4; 7887.Asb4	Red-white clay / grey shale	Test Pit 2	2.0 m BGL
7887.EC4	Light brown clay with silt	Test Pit 3	0.5 m BGL
7887.WAC5; 7887.EC5; 7887.SC3; 7887.Asb5	Light brown clay with silt	Test Pit 3	1.0 m BGL

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Table 2 Continued…

Laboratory Sample No.	Soil Description	Sample Location (Refer to Appendix I – Aerial Photograph and Test Pit locations)	Depth
7887.WAC6; 7887.EC6; 7887.SC4; 7887.Asb6	Red-white clay / grey shale	Test Pit 3	2 m BGL

6. Regional Geology

The 1:100000 geological map of Sydney (Map 9130, 1:100000 Soil Conservation Services of NSW) indicates the site to be underlain by Wianamatta Group, which is divided into two formations: the Ashfield shale (black to dark grey siltstone and laminite) and the overlying Bringelly Shale (shale, carbonaceous claystone, laminite and fine to medium grained lithic sandstone).

6.1. Soil

The site is located on the Blacktown soil landscape (bt) as indicated on the Wollongong – Port Hacking 1:100000 soil landscape map, 9029-9129, prepared by the Soil Conservation Services of NSW.

The topsoil (A1 horizon) is described as being a friable brownish-black loam to clay loam with moderately pedal sub-angular blocky structure and rough-faced porous ped fabric. The pH ranges from slightly acidic (5.5) to neutral (7.0). Rounded iron indurated fine gravel-sized shale fragments and charcoal fragments are sometimes present. Roots are common.

Below the topsoil there is a hardsetting brown clay loam to silty clay loam with apedal massive to weakly pedal structure and slowly porous earthy fabric. It commonly occurs as an A2 horizon. The pH ranges from moderately acidic (pH 5.0) to slightly acidic (pH 6.5). Platy ironstone gravel sized shale fragments are common. Charcoal fragments and roots are rarely present.

The B horizon is a brown light to medium clay with strong pedal polyhedral or subangular blocky structure and smooth faced dense ped fabric. The pH ranges from strongly acidic (pH 4.5) to slightly acidic (pH 6.5). Fine to coarse gravel-sized shale fragments are common and widespread and often occur in stratified bands. Both roots and charcoal fragments are rare.

The sediments are underlain by the Wianamatta Group formation – Ashfield Shale consisting of laminite and dark grey siltstone and Bringelly Shale which consists of shale, with occasional calcareous claystone, laminite and coal.

The soil materials observed during investigative works undertaken by were consistent with the soil landscape map for the area. It must be noted that shallow fill materials/topsoil was removed by the client prior to site inspection by ADE, and thus is not included within the scope of this report.

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7. SUMMARY OF RESULTS

7.1. VENM Assessment

The details of the analysis results are summarised in **Table 3**. Explanatory notes are given at the end of the tables. The laboratory reports and chain of custody can be found in **Appendix III – Analytical Results**.

The laboratory summary of results:

- The concentrations of metals (As, Cd, Cr, Cu, Hg, Ni, Pb and Zn) were detected below the limit of reporting (LOR) and/or within background ranges in the soil samples collected;
- The concentration of TRH were detected below the LOR in the soil samples collected;
- The concentration of BTEX were detected below the LOR in the soil samples collected;
- The concentration of PAHs were detected below the LOR in the soil samples collected;
- The concentration of OCP and OPPs were detected below the LOR in the soil samples collected; and
- Asbestos containing materials were not detected in any of the soil samples collected.

The soil samples collected from the subject area meet the adopted site assessment criteria for classification as **VENM.**

7.2. Gregory Hills Corporate Park Fill Management Protocol

7.2.1. Contamination Assessment

As per Section 7.1, the soil material in the specified subject area is considered suitable for classification as VENM. Furthermore, as outlined in **Table 3** the soil materials are below the assessment criteria outlined in Table B1 of the GHCP FMP, 'Health Based Investigation Values for Commercial/Industrial Land use (HILD)' derived from the Assessment of Site Contamination, National Environment Protection (Assessment of Site Contamination) Measure, 1999, 2013 Amendment (NEPM 2013).

As such, the soils materials are considered the meet the GHCP FMP in regards to contamination assessment.

7.2.2. Salinity /Aggressivity

The soil materials are considered non-saline and non-aggressive (average concentration) as per Table B4 and B5 of the GHCP FMP.

7.2.3. Geo-technical requirements

Section 3.2 of GHCP FMP states in relation to geotechnical requirements that:

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);

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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 of any of the unsuitable materials as listed in Appendix D.

ADE was not commissioned by the client to undertake geotechnical assessment of the soil materials. As such, it is up to the sole discretion of GHCP to accept or reject the soils for importation into GHCP without the geotechnical assessment being undertaken.

Inspection of the subject material revealed none of the unsuitable materials outlined in Appendix D of the GHCP FMP.

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Table 3 - Summary of analytical results for subject area

Site Assessment Criteria (SAC)			Results	Conclusion	
Analytes	**Commercial / Industrial (HIL D) (mg/kg dry soil)**	**Background Ranges[3]**	**Maximum Total Concentration Detected, mg/kg**	**Virgin Excavated Natural Material (VENM)**	**Commercial / Industrial (HIL D)**
Arsenic	3000	1-50	17	Acceptable	Acceptable
Cadmium	900	1	ND	Acceptable	Acceptable
Chromium	3600	5-1000	9	Acceptable	Acceptable
Copper	240 000	2-100	89	Acceptable	Acceptable
Lead	1500	2-200	20	Acceptable	Acceptable
Mercury	730	0.03	ND	Acceptable	Acceptable
Nickel	6000	5-500	25	Acceptable	Acceptable
Zinc	400 000	10-300	130	Acceptable	Acceptable
Electrical Conductivity (ds/m)	-	-	0.12	Acceptable	Acceptable
pH[1]	-	-	Min: 5.35 Max: 9.2	Acceptable	Acceptable
TPH Fraction $C_6 – C_{10}$	700[2]	-	ND	Acceptable	Acceptable
TPH Fraction C_{10}- C_{40}	NA	-	ND	Acceptable	Acceptable
TPH Fraction C_{10}-C_{16}	1000[2]	-	ND	Acceptable	Acceptable
TPH Fraction C_{16}-C_{34}	3500[2]	-	ND	Acceptable	Acceptable
TPH Fraction C_{34}-C_{40}	10 000[2]	-	ND	Acceptable	Acceptable
DDT + DDD + DDE	3600	-	ND	Acceptable	Acceptable
Aldrin + Dieldrin	45	-	ND	Acceptable	Acceptable
Chlordane	530	-	ND	Acceptable	Acceptable
Endosulfan	NA	-	ND	Acceptable	Acceptable
Benzene	NA	-	ND	Acceptable	Acceptable
Toluene	NA	-	ND	Acceptable	Acceptable
Ethyl-benzene	NA	-	ND	Acceptable	Acceptable
Xylenes (total)	NA	-	ND	Acceptable	Acceptable
Benzo(a)pyrene	NA	-	ND	Acceptable	Acceptable
Carcinogenic PAHs (as BaP TEQ)[2]	40	-	ND	Acceptable	Acceptable
PAH total	4000	-	ND	Acceptable	Acceptable

Notes to table

ND – Not detected/below Practical Quantitation Limit (PQL)

NA – Not Applicable

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

[2] Carcinogenic PAHs: HIL is based on the 8 carcinogenic PAHs and their Toxic Equivalency Factor (TEFs) (potency relative to B(a)P). The B(a)P TEQ (Toxic Equivalency Quantity) is calculated by multiplying the concentration of each carcinogenic PAH in the sample by its B(a)P TEF.

[3] Coarse soil texture was adopted as per NEPM 1999 'Management Limits for TPH fractions F1-F4 in soil'

[4] Background ranges, are taken from the Field Geologist's Manual, compiled by D A Berkman, Third Edition 1989. Publisher – The Australasian Institute of Mining & Metallurgy.

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

Table 4 - Salinity Scale

Salinity	Electrical Conductivity (ECe)	Results
Non Saline	<2 dS/m	Maximum concentration = 0.75 dS/m > Non Saline
Slightly Saline	2 – 4 dS/m	
Moderately Saline	4 – 8 dS/m	
Highly Saline	8 – 16 dS/m	

Table 5 - Criteria For Non-Aggressive Soils

Assessment Criteria					Results			Conclusion
Soil Type	**Soil Use**	**Chlorides (max concentration)**	**Sulphates (max concentration)**	**pH**	**Chlorides (max concentration)**	**Sulphates (max concentration)**	**pH**	
High permeability	Above the water table	≤0.5%	≤0.5%	≥5.5	ND	0.004	Minimum - 5.4; **Average – 6.6** Maximum – 9.2	Non Aggressive as per AS 2159 2009
High permeability *	Below the water table	N/A	N/A	N/A				
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)

ND - Not Detected

N/A – Not Applicable

8. CONCLUSION

Based on the data and evidence collected in the course of the investigation, it is the opinion of A.D. Envirotech Australia Pty Ltd that:

Subject area:

- The in-situ soil material collected from the subject area is suitable for classification as **Virgin Excavated Natural Material (VENM).**

- The soil material collected from the subject area meets the Gregory Hills Corporate Park 'Fill Material Protocol, May 2012' requirements in regards to contamination, salinity and aggressivity assessment.

- As no geotechnical investigation was undertaken, the client will require approval from Gregory Hill Corporate Park Pty Ltd prior to soils being deemed suitable for importation into the Gregory Hills Corporate Park (receiving site). It is the sole discretion of Gregory Hill Corporate Park Pty Ltd to accept or reject the soils without a geotechnical assessment being undertaken prior to import and use at the Gregory Hills Corporate Park.

9. WASTE CLASSIFICATION

Waste Description:	Light brown clay with silt; underlain by red-white clay with fractions of grey shale. Paint chips, sulphidic ores, asbestos containing materials and foreign materials were not observed in any soils inspected.
Waste Volume:	6,000 m^3 (in-situ); 8,000 m^3 (with 33% bulking factor)
Waste Classification:	**Virgin Excavated Natural Material (VENM)**

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

10. REFERENCES

- *Waste Classification Guidelines - Part 1: Classifying Waste*, NSW OEH, December 2009.
- *Guidelines for the NSW Site Auditor Scheme*, NSW DEC (NSW DECC), Second Edition, April 2006.
- Australian Standard AS 4482.1 *Guide to the sampling and investigation of potentially contaminated soil. Part 1: Non-volatile and semi-volatile compounds.*
- *ADE Report 6908 'Fill management protocol'* Proposed Commercial Subdivision Lot 701, DP1154772, Gregory Hills Drive Gledswood Hills *November 2013.*
- Aargus Report ES5918 '*VENM Report, Lot 612 DP1141214, Corner Regents Street & Santana Road, Campbelltown NSW'* dated 14th July 2014.
- Assessment of Site Contamination, National Environment Protection (Assessment of Site Contamination) Measure, 1999, 2013 Amendment (NEPM 2013).
- Australian Standard AS2159-2009. Piling – Design and Installation.

11. LIMITATIONS

This report has been prepared for the exclusive use of the client. ADE has used a degree of care and skill ordinarily exercised in similar investigations by reputable members of the environmental industry in Australia. No other warranty, expressed or implied, is made or intended. No one section or part of a section, of this report should be taken as giving an overall idea of this report. Each section must be read in conjunction with the whole of this report, including its appendixes and attachments.

Any other party should satisfy themselves that the scope of work conducted and report herein meets their specific needs. ADE cannot be held liable for third party reliance on this document, as ADE is not aware of the specific needs of the third party.

The subsurface environment can present substantial uncertainty due to it complex heterogeneity. The conclusions presented in this report are based on limited investigation of conditions at specific sampling locations chosen to be as representative as possible under the given circumstances. However, it is possible that this investigation may not have encountered all areas of contamination at the site due to the limited sampling and testing program undertaken.

ADE's professional opinions are based upon its professional judgement, 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 its investigation to the scope agreed upon with its client.

APPENDIX I AERIAL PHOTOGRAPH AND TEST PIT LOCATIONS

Photograph 1. Aerial photograph of the subject area, Lot 612, Corner of Regents St and Santana Road, Campbelltown NSW. Outline of site boundary and approximate test pit location. Map adapted: '*Google Earth 2014, date accessed 01.08.2014'.*

APPENDIX II PHOTOGRAPHS

Photograph 1 - Soil profile of test pit 3 undertaken by ADE on the 23rd of July 2014.

APPENDIX III ANALYTICAL REPORTS

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: 7887

Customer: A. D. Envirotech Australia Pty. Ltd.
Attention: Justin Eccles

Sample Log In Details

Your reference:	7887
No. of Samples:	12
Date Received:	24.07.2014
Date completed instructions received:	24.07.2014
Date of analysis:	24.07-25.07.2014

Report Details

Report Date: 25.07.2014
Method number:**
ESA-MP-01
ESA-MP-02
ESA-P-ORG3
ESA-P-ORG07
ESA-P-ORG08
ESA-P-ORG09
ESA-P-ORG11
ESA-P-ORG12
AS 1289.4.3.1
*ElectroConductivity testing with Aqua CPA Conduct./pH meter
*Texture Assessment

Results Authorised By:

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

Lab ID	PQL (mg/kg)	7887-C1	7887-C2	7887-C3	7887-C4	7887-C5	7887-C6
Sample Name		7887-WAC01	7887-WAC02	7887-WAC03	7887-WAC04	7887-WAC05	7887-WAC06
PAH							
Acenaphthene	0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Acenaphthylene	0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Anthracene	0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Benzo[a]anthracene	0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Benzo[a]pyrene	0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Benzo[b]fluoranthene	0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Benzo[g,h,i]perylene	0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Benzo[k]fluoranthene	0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Chrysene	0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Dibenzo[a,h]anthracene	0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Fluoranthene	0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Fluorene	0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Indeno(1,2,3-cd)pyrene	0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Naphthalene	0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Phenanthrene	0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Pyrene	0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
p-Terphenyl-d14	surr.	87%	86%	86%	88%	93%	89%
OCPs							
aldrin	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
a-BHC	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
b-BHC	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
d-BHC	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
g-BHC (lindane)	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
cis-chlordane	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
trans-chlordane	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
4,4'-DDD	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
4,4'-DDE	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
4,4'-DDT	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
dieldrin	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
endosulfan I	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
endosulfan II	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
endosulfan sulfate	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
endrin	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
endrin aldehyde	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
endrin ketone	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
heptachlor	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
heptachlor epoxide	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
hexachlorobenzene	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
methoxychlor	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TCMX	surr.	109%	107%	107%	113%	117%	115%
OPPs							
chlorpyrifos	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
chlorpyrifos methyl	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
diazinon	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
fenchlorphos	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
methyl parathion	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
prophos	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
tributylphosphorotrithioite	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

Lab ID	PQL (mg/kg)	7887-C1	7887-C2	7887-C3	7887-C4	7887-C5	7887-C6
Sample Name		7887-WAC01	7887-WAC02	7887-WAC03	7887-WAC04	7887-WAC05	7887-WAC06
TRH							
>C6-C10	35	<35	<35	<35	<35	<35	<35
>C10-C16	50	<50	<50	<50	<50	<50	<50
>C16-C34	100	<100	<100	<100	<100	<100	<100
>C34-C40	100	<100	<100	<100	<100	<100	<100
BTEX							
Benzene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Toluene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	1	<1	<1	<1	<1	<1	<1
m, p- Xylene(s)	2	<2	<2	<2	<2	<2	<2
o-Xylene	1	<1	<1	<1	<1	<1	<1
Fluorobenzene	surr.	106%	98%	118%	134%	107%	100%
Metals							
Arsenic	2	17	5.6	7.5	16	5.0	3.5
Cadmium	0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Chromium	5	6.9	<5	5.5	<5	6.5	<5
Copper	5	23	30	36	89	16	17
Lead	10	<10	<10	18	20	17	16
Mercury	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Nickel	10	<10	<10	24	25	11	<10
Zinc	5	28	51	130	130	38	35
Moisture	%	13%	10%	9%	9%	8%	8%
pH		NT	NT	NT	NT	NT	NT
EC	[dS/m]	NT	NT	NT	NT	NT	NT
Soil Texture Group		NT	NT	NT	NT	NT	NT
Approximate Clay		NT	NT	NT	NT	NT	NT
EC1:5 to ECe conversion factor		NT	NT	NT	NT	NT	NT

Lab ID	PQL (mg/kg)	7887-C7	7887-C8	7887-C9	7887-C10	7887-C11	7887-C12
Sample Name		7887-EC1	7887-EC2	7887-EC3	7887-EC4	7887-EC5	7887-EC6
PAH							
Acenaphthene	0.3	NT	NT	NT	NT	NT	NT
Acenaphthylene	0.3	NT	NT	NT	NT	NT	NT
Anthracene	0.3	NT	NT	NT	NT	NT	NT
Benzo[a]anthracene	0.3	NT	NT	NT	NT	NT	NT
Benzo[a]pyrene	0.3	NT	NT	NT	NT	NT	NT
Benzo[b]fluoranthene	0.3	NT	NT	NT	NT	NT	NT
Benzo[g,h,i]perylene	0.3	NT	NT	NT	NT	NT	NT
Benzo[k]fluoranthene	0.3	NT	NT	NT	NT	NT	NT
Chrysene	0.3	NT	NT	NT	NT	NT	NT
Dibenzo[a,h]anthracene	0.3	NT	NT	NT	NT	NT	NT
Fluoranthene	0.3	NT	NT	NT	NT	NT	NT
Fluorene	0.3	NT	NT	NT	NT	NT	NT
Indeno(1,2,3-cd)pyrene	0.3	NT	NT	NT	NT	NT	NT
Naphthalene	0.3	NT	NT	NT	NT	NT	NT
Phenanthrene	0.3	NT	NT	NT	NT	NT	NT
Pyrene	0.3	NT	NT	NT	NT	NT	NT
p-Terphenyl-d14	surr.	NT	NT	NT	NT	NT	NT
OCPs							
aldrin	0.1	NT	NT	NT	NT	NT	NT
a-BHC	0.1	NT	NT	NT	NT	NT	NT
b-BHC	0.1	NT	NT	NT	NT	NT	NT
d-BHC	0.1	NT	NT	NT	NT	NT	NT
g-BHC (lindane)	0.1	NT	NT	NT	NT	NT	NT
cis-chlordane	0.1	NT	NT	NT	NT	NT	NT
trans-chlordane	0.1	NT	NT	NT	NT	NT	NT
4,4'-DDD	0.1	NT	NT	NT	NT	NT	NT
4,4'-DDE	0.1	NT	NT	NT	NT	NT	NT
4,4'-DDT	0.1	NT	NT	NT	NT	NT	NT
dieldrin	0.1	NT	NT	NT	NT	NT	NT
endosulfan I	0.2	NT	NT	NT	NT	NT	NT
endosulfan II	0.2	NT	NT	NT	NT	NT	NT
endosulfan sulfate	0.1	NT	NT	NT	NT	NT	NT
endrin	0.2	NT	NT	NT	NT	NT	NT
endrin aldehyde	0.1	NT	NT	NT	NT	NT	NT
endrin ketone	0.1	NT	NT	NT	NT	NT	NT
heptachlor	0.1	NT	NT	NT	NT	NT	NT
heptachlor epoxide	0.1	NT	NT	NT	NT	NT	NT
hexachlorobenzene	0.1	NT	NT	NT	NT	NT	NT
methoxychlor	0.1	NT	NT	NT	NT	NT	NT
TCMX	surr.	NT	NT	NT	NT	NT	NT
OPPs							
chlorpyrifos	0.1	NT	NT	NT	NT	NT	NT
chlorpyrifos methyl	0.1	NT	NT	NT	NT	NT	NT
diazinon	0.1	NT	NT	NT	NT	NT	NT
fenchlorphos	0.1	NT	NT	NT	NT	NT	NT
methyl parathion	0.1	NT	NT	NT	NT	NT	NT
prophos	0.1	NT	NT	NT	NT	NT	NT
tributylphosphorotrithioite	0.1	NT	NT	NT	NT	NT	NT

Lab ID	PQL (mg/kg)	7887-C7	7887-C8	7887-C9	7887-C10	7887-C11	7887-C12
Sample Name		7887-EC1	7887-EC2	7887-EC3	7887-EC4	7887-EC5	7887-EC6
TRH							
>C6-C10	35	NT	NT	NT	NT	NT	NT
>C10-C16	50	NT	NT	NT	NT	NT	NT
>C16-C34	100	NT	NT	NT	NT	NT	NT
>C34-C40	100	NT	NT	NT	NT	NT	NT
BTEX							
Benzene	0.5	NT	NT	NT	NT	NT	NT
Toluene	0.5	NT	NT	NT	NT	NT	NT
Ethylbenzene	1	NT	NT	NT	NT	NT	NT
m, p- Xylene(s)	2	NT	NT	NT	NT	NT	NT
o-Xylene	1	NT	NT	NT	NT	NT	NT
Fluorobenzene	surr.	NT	NT	NT	NT	NT	NT
Metals							
Arsenic	2	NT	NT	NT	NT	NT	NT
Cadmium	0.3	NT	NT	NT	NT	NT	NT
Chromium	5	NT	NT	NT	NT	NT	NT
Copper	5	NT	NT	NT	NT	NT	NT
Lead	10	NT	NT	NT	NT	NT	NT
Mercury	0.2	NT	NT	NT	NT	NT	NT
Nickel	10	NT	NT	NT	NT	NT	NT
Zinc	5	NT	NT	NT	NT	NT	NT
Moisture	%	NT	NT	NT	NT	NT	NT
pH		5.84	5.57	5.53	6.19	5.35	5.72
EC	[dS/m]	0.03	0.03	0.03	0.03	0.02	0.03
Soil Texture Group		***Medium & Heavy Clays	***Medium & Heavy Clays	***Medium & Heavy Clays	***Medium & Heavy Clays	***Medium & Heavy Clays	***Medium & Heavy Clays
Approximate Clay		>45	>45	>45	>45	>45	>45
EC1:5 to ECe conversion factor		7	7	7	7	7	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	91%	93%	<0.3	<0.3	ACCEPT
Acenaphthylene	0.3	<0.3	NT	NT	<0.3	<0.3	ACCEPT
Anthracene	0.3	<0.3	93%	95%	<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	93%	96%	<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	91%	93%	<0.3	<0.3	ACCEPT
Phenanthrene	0.3	<0.3	95%	96%	<0.3	<0.3	ACCEPT
Pyrene	0.3	<0.3	89%	92%	<0.3	<0.3	ACCEPT
p-Terphenyl-d14	surr.		92%	93%	86%	86%	N/A
OCPs							
aldrin	0.1	<0.1	96%	98%	<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	62%	FAIL	<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	96%	97%	<0.1	<0.1	ACCEPT
methoxychlor	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
TCMX	surr.		88%	90%	107%	111%	N/A
OPPs							
chlorpyrifos	0.1	<0.1	86%	86%	<0.1	<0.1	ACCEPT
chlorpyrifos methyl	0.1	<0.1	NT	NT	<0.1	<0.1	ACCEPT
diazinon	0.1	<0.1	90%	89%	<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

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	86%	89%	<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	85%	100%	<0.5	<0.5	ACCEPT
Toluene	0.5	<0.5	86%	107%	<0.5	<0.5	ACCEPT
Ethylbenzene	1	<1	87%	106%	<1	<1	ACCEPT
m, p- Xylene(s)	2	<2	87%	107%	<2	<2	ACCEPT
o-Xylene	1	<1	88%	108%	<1	<1	ACCEPT
Fluorobenzene	surr.		85%	99%	98%	96%	N/A
Metals							
Arsenic	2	<2	99%	106%	5.6	15	ACCEPT
Cadmium	0.3	<0.3	113%	113%	<0.3	<0.3	ACCEPT
Chromium	5	<5	98%	106%	<5	<5	ACCEPT
Copper	5	<5	98%	103%	30	47	ACCEPT
Lead	10	<10	102%	107%	<10	<10	ACCEPT
Mercury	0.2	<0.2	92%	101%	<0.2	<0.2	ACCEPT
Nickel	10	<10	98%	106%	<10	12	ACCEPT
Zinc	5	<5	98%	93%	51	77	ACCEPT
Moisture	%						
pH							
EC	[dS/m]						
Soil Texture Group							
Approximate Clay							
EC1:5 to ECe conversion factor							

Comments:
*N/A - Not Applicable
**NT - Not Tested
***Medium & Heavy Clays
****FAIL caused by inhomogenous matrix

General Comments and Glossary

Samples are analysed on "as received" basis.	
Samples were delivered chilled	**Yes**
Samples were preserved in correct manner	**Yes**
Sample containers for volatile analysis were received with minimal headspace	**Yes**
Samples were analysed within holding time	**Yes**
Some samples have been subcontracted	**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%.

**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 contect 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"

*ElectroConductivity testing with Aqua CPA Conduct./pH meter

Certificate of Analysis

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

NATA Accredited
Accreditation Number 1261
Site Number 18217

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: **K.Finnerty**

Report **426202-S**
Client Reference 7887
Received Date Jul 24, 2014

Client Sample ID			**7887-SC1**	**7887-SC2**	**7887-SC3**	**7887-SC4**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S14-Jl21183**	**S14-Jl21184**	**S14-Jl21185**	**S14-Jl21186**
Date Sampled			**Jul 23, 2014**	**Jul 23, 2014**	**Jul 23, 2014**	**Jul 23, 2014**
Test/Reference	LOR	Unit				
Chloride	10	mg/kg	< 10	< 10	< 10	< 10
Sulphate (as S)	10	mg/kg	19	< 10	< 10	< 10
% Moisture	0.1	%	16	8.2	11	6.7

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	Jul 24, 2014	28 Day
- Method: E033 /E045 /E047 Chloride			
Sulphate (as S)	Sydney	Jul 24, 2014	28 Day
- Method: E045 Sulphate			
% Moisture	Sydney	Jul 24, 2014	28 Day
- Method: E005 Moisture Content			

eurofins | mgt

ABN – 50 005 085 521 e.mail : EnviroSales@eurofins.com.au web : www.eurofins.com.au

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3-5 Kingston Town Close
Oakleigh VIC 3166
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F6, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Company Name:	AD Envirotech Aust Pty Ltd	**Order No.:**		**Received:**	Jul 24, 2014 2:30 PM
Address:	Unit 4/ 10-11 Millenium Court Silverwater NSW 2128	**Report #:**	426202	**Due:**	Jul 25, 2014
		Phone:	02 9400 7711	**Priority:**	1 Day
		Fax:	02 9401 0097	**Contact Name:**	K.Finnerty
Client Job No.:	7887				

Eurofins | mgt Client Manager: Mary Makarios

Sample Detail					% Moisture	Chloride	Sulphate (as S)
Laboratory where analysis is conducted							
Melbourne Laboratory - NATA Site # 1254 & 14271							
Sydney Laboratory - NATA Site # 18217					X	X	X
Brisbane Laboratory - NATA Site # 20794							
External Laboratory							
Sample ID	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**			
7887-SC1	Not Provided		Soil	S14-Jl21183	X	X	X
7887-SC2	Not Provided		Soil	S14-Jl21184	X	X	X
7887-SC3	Not Provided		Soil	S14-Jl21185	X	X	X
7887-SC4	Not Provided		Soil	S14-Jl21186	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 PQLs are matrix dependant. Quoted PQLs 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 Acknowledgment.

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

mg/l: milligrams per litre

ug/l: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100ml: Organisms per 100 millilitres

NTU: Units

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

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	
Sulphate (as S)	mg/kg	< 10			10	Pass	
LCS - % Recovery							
Chloride	%	110			70-130	Pass	
Sulphate (as S)	%	108			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
				Result 1					
Chloride	S14-Jl21183	CP	%	102			70-130	Pass	
Sulphate (as S)	S14-Jl21183	CP	%	109			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1	Result 2	RPD	Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Chloride	S14-Jl21183	CP	mg/kg	< 10	< 10	<1	30%	Pass	
Sulphate (as S)	S14-Jl21183	CP	mg/kg	19	22	18	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Organic samples had Teflon liners	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	Client Services
Bob Symons	Senior Analyst-Inorganic (NSW)

Dr. Bob Symons
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

ADECONSULTINGGROUP
SOLUTIONS THROUGH INNOVATION

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

Analysis report: 7887 ASB 1

Date Received:	24.07.2014
Date Analysed:	24.07.2014
Report Date:	25.07.2014
Client:	Earth Fill
Job Location:	Regents Street, Campbelltown 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 aproved asbestos identifier

Results Authorised By:

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

NATA
WORLD RECOGNISED ACCREDITATION

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
7887-Asb1	Soil	69 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
7887-Asb2	Soil	69 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
7887-Asb3	Soil	78 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
7887-Asb4	Soil	71 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
7887-Asb5	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
7887-Asb6	Soil	72 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.
Samplig 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 specroscopy, X-ray diffraction, scanning or transmission electron microscopy is advised.

APPENDIX IV SUPPORTING DOCUMENTS

Aargus
AUSTRALIA

Environmental - Remediation - Engineering - Laboratories - Drilling

14th July 2014

Our Ref: ES5918

Rahme Civil Pty Ltd

PO Box 2752

Parramatta NSW 1750

By Email: info@rahmecivil.com.au

CC: Rhonda@rahmecivil.com.au

Dear Rabih,

Re: VENM Report

Site: Lot 612 DP1141214

Corner Regents Street & Santana Road, Campbelltown NSW

Aargus Pty Ltd was appointed by Rahme Civil Pty Ltd to conduct a visual and analytical assessment of natural soil to be excavated as Virgin Excavated Natural Material (VENM) from the property located at Lot 612 in DP1141214 on the corner of Regents Street & Santana Road, Campbelltown NSW (the site").

To assess the waste classification of materials to be disposed off-site, the NSW Environmental Protection Authority (EPA) refers to the "*Waste Classification Guidelines, Part 1: Classifying Waste"* NSW DECC (2009).

Aargus staff inspected the site on 1st July 2014. The inspection and sampling was conducted on the *in-situ* soils at the above mentioned address. Topsoil material was observed on the site during the inspection; this material does not form part of this report and are to be disposed of appropriately. Aargus has been informed that approximately 2,000 m^3 of natural material will be transported off-site.

Aargus staff recovered two (2) samples from the *in-situ* natural. This VENM certificate does not apply to the topsoil material located within the property. This VENM report refers to the natural underlying material from the site only.

The Protection of the Environment Operations Act 1997 defines VENM as: *'natural material (such as clay, gravel, sand, soil or rock fines):*

- that has been excavated or quarried from areas that are not contaminated with manufactured chemicals or process residues, as a result of industrial, commercial, mining or agricultural activities, and
- that does not contain any sulfidic ores or soils or any other waste.'

No other criteria for VENM have been approved. By definition, VENM cannot be 'made' from processed soils. Excavated material that has been stored or processed in any way cannot be classified as VENM.

Site Information

As part of this VENM report, Aargus undertook a walkover of the site and took into consideration the following where applicable:

- Description and quality of the building structure & materials;
- Current operations;
- Waste Management Practices & trade waste;
- Above ground storage tanks;
- Underground Storage Tanks;
- Odours;

- Site vegetation & sealed surfaces;
- Historical operations (if known);
- Former raw materials & transportation (if known);
- Surface water;
- Groundwater (if known); and
- Site Surrounding and their operations.

From inspection of the above details, information was gathered with regards to the property.

The Geological Map of Wollongong-Port Hacking (Geological Series Sheet 9029-9129, Scale 1:100,000, 1985), published by the Department of Mineral Resources indicates that site is underlain by Middle Triassic Age Bringelly Shale of the Wianamatta Group. Bringelly Shale generally includes *shale, carbonaceous claystone, laminite, coal*.

The soil profile at the site was consistent with the Geological Survey. In general the material was observed to be SHALE, medium strength, dark grey, slightly weathered. Given the geological profile, it is expected that shale material will extend to the maximum depth of excavations.

No UST's or AST's were visible. No staining or odours were visible at the time of the inspection. There was no evidence of localised oil or chemical spills on any sealed or unsealed areas and this issue does not warrant any concern. Trees and shrubs surrounding the site appeared generally healthy and free from stress. No visible fibro cement pieces were observed on the surfaces of the site that were inspected. It should be noted that foreign materials may also be present buried within the soil materials that could not be accessed as part of the inspection.

The site was previously vacant land and is to be redevloped into a medium density residential dwelling. The site is surrounded by:

- North-east: Regents Street, then low density residential dwellings
- North-west: Santana Road, then low density residential dwellings
- South-east: vacant land
- South-west: medium density residential dwelling (under construction during time of inspection)

To determine whether there is a potential for acid sulphate soils to be present within a site, reference was made to the NSW Department of Land & Water Conservation (DLWC) *Acid Sulfate Soil Risk Maps* (Edition Two, December 1997, Scale 1:250,000). No maps are available for the site location. Considering the topography, geology and soil profile of the site, it is considered the risk of encountering naturally occurring acid sulfate soils on site is negligible.

Laboratory Analysis

Two (2) samples (TP1 0.2-0.4 m and TP2 0.2-0.4m) were submitted for laboratory analysis. The samples were analysed for heavy metals (As, Cd, Cr, Cu, Pb, Hg, Ni, Zn), Total Petroleum Hydrocarbons (TRH), Benzene, Toluene, Ethylbenzene, Xylene (BTEX), Polycyclic Aromatic Hydrocarbons (PAH), Organochlorine Pesticides (OCP), Polychlorinated Biphenyl's (PCB), Phenols, Cyanide, Asbestos, pH, Electrical Conductivity, Sulphate and Chloride.

The full laboratory certificates are attached with a summary of the chemical analyses provided in the tables below.

TABLE A

HEAVY METALS TEST RESULTS

Analyte / Sample Location	Depth (m)	HEAVY METALS (mg/kg) ARSENIC	CADMIUM	CHROMIUM	COPPER	NICKEL	LEAD	ZINC	MERCURY
TP1	0.2 - 0.4	11	<1	9	33	16	13	69	<0.1
TP2	0.2 - 0.4	14	<1	8	44	21	14	82	<0.1
Practical Quantitation Limits (PQL)		5	1	2	5	2	5	5	0.1
Waste Criteria - Total Concentration (w/o TCLP)									
CT1 - General Solid Waste		100	20	100	-	40	100	-	4
CT2 - Restricted Solid Waste		400	80	400	-	160	400	-	16
Waste Criteria - Total Concentration (with TCLP)									
SCC1 - General Solid Waste		500	100	1900	-	1050	1500	-	50
SCC2 - Restricted Solid Waste		2000	400	7600	-	4200	6000	-	200

Notes
1 CT1, CT2 : Total concentrations used for defining General Solid Waste and Restricted Solid Waste respectively (without TCLP)
2 SCC1, SCC2 : Total Concentration used for defining General Solid Waste and Restricted Solid Waste respectively (in conjunction with TCLP)
3 Concentrations in **bold** exceed the CT1 criteria
4 Concentrations in **bold and underlined** exceed the CT2 criteria

As shown in Table A, the heavy metals concentrations were below their respective CT1 criteria.

TABLE B
TOTAL PETROLEUM HYDROCARBONS (TPH) AND BTEX TEST RESULTS

Analyte / Sample Location	Depth (m)	TPH (mg/kg)					BTEX (mg/kg)			
		C6-C9	C10-C14	C15-C28	C29-C36	C10-C36[a]	BENZENE	TOLUENE	ETHYL BENZENE	TOTAL XYLENES
TP1	0.2 - 0.4	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5
TP2	0.2 - 0.4	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5
Practical Quantitation Limits (PQL)		10	50	100	100	50	0.2	0.5	0.5	0.5
Waste Criteria - Total Concentration (w/o TCLP)										
CT1 - General Solid Waste		NA	-	-	-	NA	10	288	600	1000
CT2 - Restricted Solid Waste		NA	-	-	-	NA	40	1152	2400	4000
Waste Criteria - Total Concentration (with TCLP)										
SCC1 - General Solid Waste		650	-	-	-	10000	18	518	1080	1800
SCC2 - Restricted Solid Waste		2600	-	-	-	40000	72	2073	4320	7200

Notes
1 CT1, CT2 : Total concentrations used for defining General Solid Waste and Restricted Solid Waste respectively (without TCLP).
2 SCC1, SCC2 : Total Concentration used for defining General Solid Waste and Restricted Solid Waste respectively (in conjunction with TCLP)
3 Concentrations in **bold** exceed the SCC1 criteria
4 Concentrations in **bold and underlined** exceed the SCC2 criteria
NA: Not Applicable

As shown in Table B, the TPH and/or BTEX concentrations were below their respective CT1 criteria.

TABLE C
BENZO(a)PYRENE, POLYCYCLIC AROMATIC HYDROCARBONS (PAH), ORGANOCHLORINE PESTICIDES (OCP), POLYCHLORINATED BIPHENYLS (PCB), TOTAL CYANIDE AND PHENOL TEST RESULTS

Analyte / Sample Location	Depth (m)	PAH (mg/kg) BENZO(a)PYRENE (mg/kg)	PAH (mg/kg) TOTAL PAH (mg/kg)	TOTAL ENDOSULFAN[5] (mg/kg)	Other OCPs (mg/kg)	TOTAL PCB (mg/kg)	TOTAL CYANIDE (mg/kg)	PHENOL (NON-HALOGENATED) (mg/kg)
TP1	0.2 - 0.4	<0.5	<0.5	<0.05	<0.2	<1.3	<1	<0.5
TP2	0.2 - 0.4	<0.5	<0.5	<0.05	<0.2	<1.0	<1	<0.5
Practical Quantitation Limits (PQL)		0.5	0.5	0.05	0.2	1	1	0.5
Waste Criteria - Total Concentration (w/o TCLP)								
CT1 - General Solid Waste		0.8	NA	60	NA	NA	320	288
CT2 - Restricted Solid Waste		3.2	NA	240	NA	NA	1280	1152
Waste Criteria - Total Concentration (with TCLP)								
SCC1 - General Solid Waste		10	200	108	<50**	<50	5900	518
SCC2 - Restricted Solid Waste		23	800	432	<50**	<50	23600	2073

Notes
1 CT1, CT2 : Total concentrations used for defining General Solid Waste and Restricted Solid Waste respectively (without TCLP)
2 SCC1, SCC2 : Total Concentration used for defining General Solid Waste and Restricted Solid Waste respectively (in conjunction with TCLP)
3 Concentrations in **bold** exceed the CT1 criteria
4 Concentrations in **bold and underlined** exceed the CT2 criteria
5 Total Endosulfan = Endosulfan I, Endosulfan II and Endosulfan Sulphate
** Scheduled Waste - classified against SCC criteria without TCLP
NA Not Applicable

As shown in Table C, the benzo(a)pyrene, Total PAH, Total Endosulfan, other OCPs, Total PCB, Total Cyanide & Phenol concentrations were below their respective CT1 criteria.

TABLE D
ASBESTOS TEST RESULTS

Analyte / Sample Location	Depth (m)	Field Observations*	Laboratory Results Asbestos Type Present / Absent	Laboratory Results Asbestos %w/w
TP1	0.2 - 0.4	No fibro-cement fragments observed	No asbestos detected	-
TP2	0.2 - 0.4	No fibro-cement fragments observed	No asbestos detected	-
WA Guidelines for the Assessment, Remediation and Management of Asbestos - Contaminated Sites in Western Australia - May 2009				
National Environment Protection (Assessment of Site Contamination) Measure 2013 Schedule B1				
%w/w asbestos for FA and AF				0.001%
%w/w asbestos for ACM - Residential use, childcare centres, preschools etc.				0.01%
%w/w asbestos for ACM - Residential, minimal soil access (fully sealed surfaces)				0.04%
%w/w asbestos for ACM - Parks, public open spaces, playing fields etc.				0.02%
%w/w asbestos for ACM - Commercial / Industrial				0.05%

Note:
ACM = Asbestos Containing Materials >7mm x 7mm (visible by eye)
FA = Friable and Fibrous Asbestos Materials >7mm x 7mm (visible by eye)
AF = Asbestos Fines <7mm x 7mm ACM including free fibres (visible by microscope only)
* Field Observations: All fibro-cement fragments observed are assumed to contain Asbestos until otherwise tested and recorded as such.
NT = Not Tested

As shown in Table D, asbestos was not detected in the recovered samples analysed.

With respect to the *NSW DECC* "*Waste Classification Guidelines, Part 1: Classifying Waste"* (2009), concentrations are below the CT1 criteria as indicated in the Tables above. Furthermore asbestos fibres where not detected within any of the soil samples recovered.

Salinity

The salinity component was carried out with reference to the following Department of Land & Water Conservation (DLWC), now the Department Natural Resources (DNR) publications:

- "*Site Investigations for Urban Salinity*" – 2002
- "*Building in a Saline Environment*" – 2003
- "*Map of Salinity Potential*" – 2002

A summary of chemical analyses is provided with the guidelines in Tables E and F.

TABLE E
ELECTRICAL CONDUCTIVITY TEST RESULTS

Sample location	Depth(m)	Electrical Conductivity (dS/m) EC	Multiplication Factor [a]	Electrical Conductivity of Saturated Extract (dS/m) EC_e	Soil Type
TP1	0.2 - 0.4	0.125	6	0.75	Shale Rock
TP2	0.2 - 0.4	0.105	6	0.63	Shale Rock
Environmental Planning & Assessment Regulation 1994				Saline at >4 dS/m	
Dryland Salinity (1993)				Non-saline <2 dS/m Slightly saline 2-4 dS/m Moderately saline 4-8 dS/m Very saline 8-16 dS/m Highly saline >16 dS/m	

a. Sourced from Department of Land and Water Conservation (2002), *Site Investigations for Urban Salinity.*
Multiplication factor of 6 is relevant for "Heavy Clay". Shale commonly erodes into Clay, high-plasticity.

EC_e is representative of the actual salinity level that the plant roots are exposed to and as such provides an indication of the toxicity of the soils to various plant species. Through introduction of a multiplying factor to the test results, as stipulated in the Department of Natural Resources (DNR) publication "*Site Investigations for Urban Salinity*" – 2002, the average resultant electrical conductivity of saturated extracts (EC_e) indicates that the soils are non-saline.

TABLE F
pH, CHLORIDE AND SULPHATE TEST RESULTS

Sample location	Depth(m)	pH	Chloride in Soil (mg/kg)	Sulphate in Soil (mg/kg)
TP1	0.2 - 0.4	9.2	<10	30
TP2	0.2 - 0.4	9.0	<10	40
AS2159-2009				
Piling - Design and Installation				
Reinforced Concrete Piles				
High Permeability Soils				
non-aggressive		>5.5		<5000
mild		4.5 - 5.5		5000 - 10000
moderately aggressive		4 - 4.5		10000 - 20000
severely aggressive		<4		>20000
Low Permeability Soils				
non-aggressive		>5		<5000
mild		4.5 - 5		5000 - 10000
moderately aggressive		4 - 4.5		10000 - 20000
severely aggressive		<4		>20000
Steel Piles				
High Permeability Soils				
non-aggressive		>5	<20000	
mild		4.0 - 5.0	20000 - 50000	
moderately aggressive		3.0 - 4.0	20000 - 50000	
severe		<3	>50000	
Low Permeability Soils				
non-aggressive		>5	<20000	
non-aggressive		4.0 - 5.0	20000 - 50000	
mild		3.0 - 4.0	20000-50000	
moderately aggressive		<3	>50000	

Note: *High Permeability soils (e.g,, sands and gravels) that are in groundw ater
*Low Permeability soils (e.g,, silts and clay) or all soils that are above groundw ater

The soil pH, chloride, and sulphate test results are presented in Table F. With reference to AS2159-2009 “Piling-Design and Installation”, the soils are considered to be non-aggressive to concrete and steel in low permeability soils.

Conclusions

With reference to a site walkover, following the laboratory analysis and with reference to NSW EPA guidelines, the natural materials have concentrations that were below the threshold values for "*Waste Classification Guidelines, Part 1: Classifying Waste"* NSW DECC (2009). The natural soil in question can be classified as ***VENM*** (Virgin Excavated Natural Material) with reference to the above NSW EPA guidelines. As a result of this classification the material can be reused on site or to be disposed of as per Schedule 1 Part 3 of the *Protection of the Environment Operations Act 1997*.

Land Use – NEPM 2013

For the natural materials located within the site that are to be retained on site or re-used on another site, the criteria stated with the *National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013* guidelines must be met. Reference may be made to the attached NEPM 2013 Summary Tables for a comparison of the analytical data against these guidelines. As shown in Tables A to D, the concentrations of the selected analytes were well below the HIL 'A', ESL, HSL 'A', and Management Limits. In addition asbestos was not detected in the recovered soil samples analysed.

Should the natural materials be required to be used in areas designated for plant growth and/or landscaping then further sampling and analysis may be required to determine the suitability of the material for these uses.

Land Use – NEPM 1999

For the natural materials located within the site that are to be re-used at Spring Farm, the criteria stated with the *National Environment Protection (Assessment of Site Contamination) Amendment Measure 1999* guidelines, in particular the HIL 'A' and PPBIL, as well as the NSW EPA Service Station guidelines must be met. Reference may be made to the attached NEPM 1999 Summary Tables for a comparison of the analytical data against these guidelines. As shown in Tables A to D, the concentrations

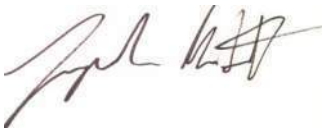
of the selected analytes were well below the HIL 'A', the PPBIL and the Service Station guidelines. In addition asbestos was not detected in the recovered soil samples analysed.

Therefore, all samples meet the sampling and analytical requirements for VENM as set out in Douglas Partners Report on Fill Management Protocol: Proposed Filling Works – Lot 2, DP1175936, Springs Road, Spring Farm (Project 76540.03, September 2013).

If any areas of environmental concern are uncovered during the excavation process, this office should be notified immediately for further assessment. We would be pleased to provide further information on any aspects of this report.

For and on behalf of

Aargus Pty Ltd



Joseph McDermott
Environmental Scientist

Reviewed By

Mark Kelly
Environmental Manager

Attachments;

- *Laboratory Certificates*
- *Site Plan*
- *Site Photographs*
- *NEPM 2013 Summary Tables*
- *NEPM 1999 Summary Tables*

LIMITATIONS OF ASSESSMENT

The Aargus assessment is based on the result of limited site investigations and sample testing. Neither Aargus, nor any other reputable consultant, can provide unqualified warranties nor does Aargus assume any liability for site conditions not observed or accessible during the time of the investigations.

Despite all reasonable care and diligence, the materials encountered and concentrations of contaminants measured may not be representative of conditions between the locations sampled and investigated. In addition, site characteristics may change at any time in response to variations in natural conditions, chemical reactions and other events, e.g. groundwater movement and or spillages of contaminating substances. These changes may occur subsequent to Aargus investigations and assessment.

This report and associated documentation and the information herein have been prepared solely for the use of the client and interested parties at the time and is valid (for the purposes of transport of material) for a period of one month only from the date of issue. Any other reliance assumed by third parties on this report shall be at such parties' own risk. Any ensuing liability resulting from use of the report by third parties cannot be transferred to Aargus.

Please note that Part 5.6, Section 143 of the Protection of the Environment Operations (POEO) Act 1997 states that is an offence for waste to be transported to a place that cannot lawfully be used as a facility to accept that waste. It is the duty of the owner and transporter of the waste to ensure that the waste is disposed of appropriately. Aargus accepts no liability for the unlawful disposal of waste materials from any site. Aargus does not accept any responsibility for the material tracking, loading, management, transport or disposal of waste from the site. Before disposal of the material to a licensed landfill is undertaken, the waste producer will need to obtain prior consent from the landfill. The receiving site should check to ensure that the material received matches the description provided in the report.

Opinions are judgements, which are based on our understanding and interpretation of current regulatory standards, and should not be construed as legal opinions.