

APPENDIX F: ESDD CONTAMINATED LAND SEARCH

Mr John O'Brien
SMEC Australia Pty Ltd
Suite 2, Level 1, 243 Northbourne Ave
Lyneham ACT 2602

RE: CONTAMINATED LAND SEARCH

Dear Mr O'Brien

Thank you for your search form request of 20/09/2013 enquiring about:

Blocks 1, 7 and 20 Section 102 Yarralumla Canberra Central

Records held by the Environment Protection Authority (EPA) for the above block(s) indicate the following:

The blocks are recorded on the EPA's contaminated sites management database and geographic information system.

There are records of an abandoned commercial brickworks on Blocks 1, 7 and 20 Section 102 Yarralumla.

The EPA has received a phase 1 environmental assessment report prepared by Cornell Wagner dated February 2001 for the former brickworks site. The report identified a number of areas of environmental concern which included underground fuel storage, coal storage, explosive storage, landfill areas and brickworks buildings and kilns and a list of possible contaminants which included: hydrocarbons, PAHs, PCBs, BTEX, heavy metals and asbestos.

The EPA supported the consultant's recommendations that further assessment, remediation and validation was required at the site and included that any further assessment would require independent audit by an EPA accredited environmental auditor.

The ANZECC 1992, Guidelines for the Assessment and Management of Contaminated Sites and the ACT EPA 2009, Contaminated Sites Environment Protection Policy (CSEPP) list fuel storage facilities, brickworks and landfilling as activities associated with land contamination.

A draft remedial action plan for the remediation of identified asbestos material in soil at the site was received by the EPA in 2007. The EPA has no records to indicate that these works were undertaken.

The EPA also received a contaminated land notification under the *Environment Protection Act 1997* from ACT Property Group in 2007 in relation to identified contamination at the site.

The ACT Government's "Strategic Plan for Contaminated Sites Management 1995" and the CSEPP specifically requires that potentially contaminated land be investigated at the earliest stages of the planning process to ensure a site is suitable for the proposed development.

Due to the large quantity of asbestos sheeting at the site and the likelihood of fuel storage you or your client should also contact WorkSafe ACT on (02) 6205 0200 regarding the status of any fuel storage facilities at the site and the status of any asbestos abatement work at the site.

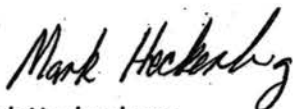
The EPA has not issued any environment protection orders under sections 91C (1), 91D (1) or 125 (4) of the *Environment Protection Act 1997* (the Act) over the sites and as a result the sites are not recorded on the Register of contaminated sites under section 21(A) of the Act.

The information detailed above only relates to records held by the EPA and may not represent the actual condition of the site.

At present the EPA has no information on contamination of the above block(s) other than as detailed above. However, this does not absolutely rule out the possibility of contamination and should not be interpreted as a warranty that there is no contamination.

I appreciate that this does not absolutely rule out the existence of contamination of the soils. If you or your clients wish to be completely sure you, or they, should arrange to conduct independent tests.

Yours sincerely



Mark Heckenberg
Project Officer
Environment Protection and Water Regulation

23/09/2013



ACT
Government

Environment and
Sustainable Development

File Ref: 97/5182; 97/5209; 97/19894

Mr John O'Brien
SMEC Australia Pty Ltd
Suite 2, Level 1, 243 Northbourne Ave
Lyneham ACT 2602

RE: CONTAMINATED LAND SEARCH

Dear Mr O'Brien

Thank you for your search form request of 20/09/2013 enquiring about:

Block 1 Section 75 Deakin Canberra Central

**Block 3 Section 94, Block 2 Section 103, Block 1 Section 113, Block 7 Section 121, and
Block 1 Section 127 Yarralumla Canberra Central**

Block 1 Section 123 Curtin Woden Valley

Records held by the Environment Protection Authority (EPA) for the above block(s) indicate the following:

The blocks are not recorded on the EPA's contaminated sites management database or geographic information system.

The EPA has not issued any environment protection orders under sections 91C (1), 91D (1) or 125 (4) of the *Environment Protection Act 1997* (the Act) over the sites and as a result the sites are not recorded on the Register of contaminated sites under section 21(A) of the Act.

At present the EPA has no information on contamination of the above block(s). However, this does not absolutely rule out the possibility of contamination and should not be interpreted as a warranty that there is no contamination.

I appreciate that this does not absolutely rule out the existence of contamination of the soils. If you or your clients wish to be completely sure, you, or they, should arrange to conduct independent tests.

Yours sincerely

Mark Heckenberg
Project Officer
Environment Protection and Water Regulation
23/09/2013



ACT
Government

Environment and
Sustainable Development

File Ref: 97/05209

Mr John O'Brien
SMEC Australia Pty Ltd
Suite 2, Level 1, 243 Northbourne Ave
Lyneham ACT 2602

RE: CONTAMINATED LAND SEARCH

Dear Mr O'Brien

Thank you for your search form request of 03/10/2013 enquiring about:

Block 4 Section 65 Deakin Canberra Central

Records held by the Environment Protection Authority (EPA) for the above block(s) indicate the following:

The block is not recorded on the EPA's contaminated sites management database or geographic information system.

EPA records indicate that the site is currently occupied by public playing fields. Whilst there is no recorded information on potential site contamination, public playing fields have been associated in the past with site contamination due to the application of certain chemicals for the control of weeds and pests and the placement of uncontrolled fill during the establishment of the fields. The storage of herbicides/pesticides may also have been undertaken at the site for the above purpose.

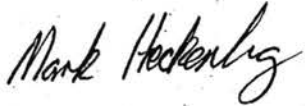
The EPA has not issued any environment protection orders under sections 91C (1), 91D (1) or 125 (4) of the Environment Protection Act 1997 (the Act) over the site and as a result the site is not recorded on the Register of contaminated sites under section 21(A) of the Act.

The information detailed above only relates to records held by the EPA and may not represent the actual condition of the site.

At present EPA has no information on contamination of the above block(s) other than as detailed above. However, this does not absolutely rule out the possibility of contamination and should not be interpreted as a warranty that there is no contamination.

I appreciate that this does not absolutely rule out the existence of contamination of the soils. If you or your clients wish to be completely sure you, or they, should arrange to conduct independent tests.

Yours sincerely

A handwritten signature in black ink that reads "Mark Heckenberg". The signature is written in a cursive style with a large, sweeping initial "M".

Mark Heckenberg
Project Officer
Environment Protection and Water Regulation

08/10/2013

0235



ACT
 Government
 Environment and
 Sustainable Development

TAX INVOICE

Date: 03/10/2013

Receipt Number: 1269112248

To:
 Mr John O'Brien
 SMEC Australia Pty Ltd
 Suite 2, Level 1, 243 Northbourne Ave
 Lyneham ACT 2602

Quantity	Description of Supply	Price	Total
	Contaminated Land Search		
1	Block 4, Section 65, Deakin, Canberra Central	\$39.90	\$39.90
TOTAL AMOUNT PAID			\$39.90

THE TOTAL PRICE INCLUDES GST

APPENDIX G: DANGEROUS GOODS

0234



OFFICE OF REGULATORY SERVICES
DEPARTMENT OF JUSTICE & COMMUNITY SAFETY

2 September 2013

John O'Brien
SMEC Australia Pty Ltd
Suite 2, Level 1
243 Northbourne Ave
LYNEHAM ACT 2602

Thank you for your application for a records search for the Block 1 and 7 Section 10 Old Canberra Brickworks, Denman Street Yarralumla ACT.

I have conducted a search of the Dangerous Substances Register and the Dangerous Goods Database and hold no records for the above block and section.

(Please note: Under the *Dangerous Goods Act 1975* (1975 to April 2004), tanks of 50,000 litres which contained Diesel were not required to be licenced with WorkCover, only if the capacity was over 50,000 litres).

If you have any questions in relation to this matter please do not hesitate in contacting me on 62076353 or email lisa.curran@act.gov.au.

Regards

Lisa Curran
Administration Officer
Dangerous Substances Licencing
WorkSafe ACT

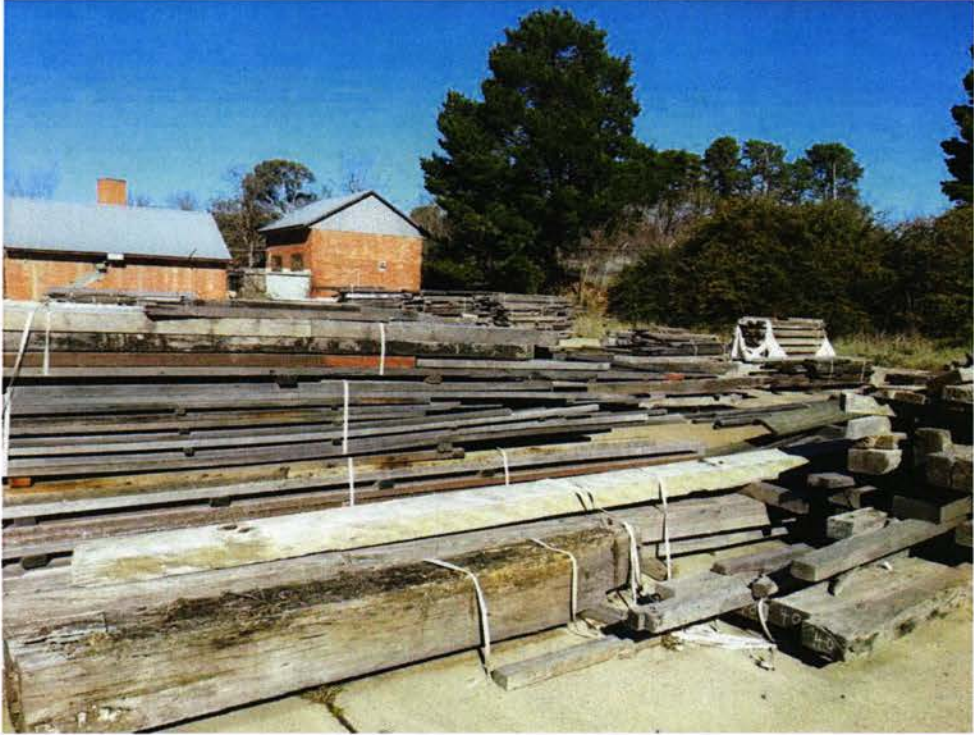

WORKSAFE ACT


LVL 3 CALLAM OFFICES EASTY STREET PHILLIP ACT 2606 |
GPO BOX 158 CANBERRA ACT 2601 |
PHONE 6207 3000 | FAX 6205 0336 |
WORKSAFE@ACT.GOV.AU | WORKSAFE.ACT.GOV.AU


APPENDIX H: SITE PHOTOGRAPHIC LOG

233

SITE PHOTOGRAPHIC LOG

CANBERRA BRICKWORKS	
<p>PHOTO ID: 1</p> <p>DATE: 2/10/13</p> <p>DESCRIPTION:</p> <p>The brickworks are currently used by Thor's Hammer for the storage of recycled wood</p>	
<p>PHOTO ID: 2</p> <p>DATE: 2/10/13</p> <p>DESCRIPTION:</p> <p>Remnant brick buildings, some showing signs of disrepair.</p>	

CANBERRA BRICKWORKS	
<p>PHOTO ID: 3</p> <p>DATE: 2/10/13</p> <p>DESCRIPTION:</p> <p>Sheen observed in drains at the rear of Machine Shed 1</p>	

CANBERRA BRICKWORKS	
<p>PHOTO ID: 4</p> <p>DATE: 2/10/13</p> <p>DESCRIPTION:</p> <p>Remnant structure of crusher plants. Several rusted oil drums (labelled lubrication oil) were also noted.</p>	

0232

PHOTO ID: 5

CANBERRA BRICKWORKS

DATE: 2/10/2013

DESCRIPTION:

General areas around the machinery sheds were littered with empty drums, scrap metal and other waste materials



PHOTO ID: 6

DATE: 20/8/2013

DESCRIPTION:

Remnant concrete footing of machinery used in the crushing and transporting of raw materials to the machinery shed.

The disused oil pressure/storage tank located left of the footings.

Crusher House 3 is located in the background.



PHOTO ID: 7

CANBERRA BRICKWORKS

DATE: 2/10/2013

DESCRIPTION:

Northern fill mound at the quarry.

Observed to comprise reworked natural soils, brick waste and quarry overburden.

Several fragments of ACM were observed.



PHOTO ID: 8

DATE: 2/10/2013

DESCRIPTION:

Remnant brick structure, pieces of brick, concrete and structural steel observed.



0281

PHOTO ID: 9

CANBERRA BRICKWORKS

DATE: 2/10/2013

DESCRIPTION:

Interceptor pit located adjacent to remnant brick structure.

Purpose is unclear. Likely used to receive domestic wash (oils, fats cleaning products).



PHOTO ID: 10

DATE: 2/10/2013

DESCRIPTION:

Abandoned vehicle overgrown with grass and black berry bushes.



PHOTO ID: 11

CANBERRA BRICKWORKS

DATE: 2/10/2013

DESCRIPTION:

Two concrete lined pits were located adjacent to remnants of an unnamed vehicle track (currently used by pedestrians



PHOTO ID: 12

DATE: 2/10/2013

DESCRIPTION:

The pits were empty with soil material, broken tiles and glass bottles observed at the base.



0230

PHOTO ID: 13

CANBERRA BRICKWORKS

DATE: 2/10/2013

DESCRIPTION:

The material comprised bricks, metal, and general waste and was approximated to be 10 m³.

Several fragments of ACM were also observed.



PHOTO ID: 12

DATE: 2/10/2013

DESCRIPTION:

The pits were empty with soil material, broken tiles and glass bottles observed at the base.



APPENDIX I: SOIL ANALYTICAL TABLES

0229

	DNT	HMX	2-MNT	3-MNT	4-MNT	NB	NG	PETN	RDX	Tetryl	1,3,5-TNB	TNT
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
EQL	0	0	0	0	0	0	0	0	0	0	0	0
CSM NEPM Residential A Soil												
CSM NEPM Residential B Soil												
CSM NEPM Recreational C Soil												
CSM NEPM Residential HSL A & B for Vapour Intrusion												
CSM NEPM P EIL												
Field_ID	Date	SDG										
TP01-0.0	10/09/2013	SE120709-1	-	-	-	-	-	-	-	-	-	-
TP02-0.0	10/09/2013	SE120709-1	-	-	-	-	-	-	-	-	-	-
TP03-0.0	10/09/2013	SE120709-1	-	-	-	-	-	-	-	-	-	-
TP04-0.0	10/09/2013	SE120709-1	-	-	-	-	-	-	-	-	-	-
TP05-0.0	9/09/2013	SE120709-1	-	-	-	-	-	-	-	-	-	-
TP06-0.0	9/09/2013	SE120709-1	-	-	-	-	-	-	-	-	-	-
TP07-0.0	9/09/2013	SE120709-1	-	-	-	-	-	-	-	-	-	-
TP08-0.0	9/09/2013	SE120709-1	-	-	-	-	-	-	-	-	-	-
TP09-0.0	9/09/2013	SE120709-1	-	-	-	-	-	-	-	-	-	-
TP10-0.0	10/09/2013	SE120709-1	-	-	-	-	-	-	-	-	-	-
TP11-0.0	10/09/2013	SE120709-1	-	-	-	-	-	-	-	-	-	-
TP12-0.0	10/09/2013	SE120709-1	-	-	-	-	-	-	-	-	-	-
TP13-0.0	10/09/2013	SE120709-1	-	-	-	-	-	-	-	-	-	-
TP14-0.0	9/09/2013	SE120709-1	-	-	-	-	-	-	-	-	-	-
TP15-0.0	9/09/2013	SE120709-1	-	-	-	-	-	-	-	-	-	-
TP16-0.0	9/09/2013	SE120709-1	-	-	-	-	-	-	-	-	-	-
TP17-0.0	9/09/2013	SE120709-1	-	-	-	-	-	-	-	-	-	-
TP18-0.0	10/09/2013	SE120709-1	-	-	-	-	-	-	-	-	-	-
TP19-0.0	11/09/2013	SE120709-1	n.d	n.d	n.d	n.d	n.d	n.d	n.d	n.d	n.d	n.d
TP20-0.0	11/09/2013	SE120709-1	-	-	-	-	-	-	-	-	-	-
TP20-0.5	11/09/2013	SE120709-1	-	-	-	-	-	-	-	-	-	-
TP21-0.5	11/09/2013	SE120709-1	-	-	-	-	-	-	-	-	-	-
TP21-1.0	11/09/2013	SE120709-1	-	-	-	-	-	-	-	-	-	-
TP22-0.5	11/09/2013	SE120709-1	-	-	-	-	-	-	-	-	-	-
TP22-1.0	11/09/2013	SE120709-1	-	-	-	-	-	-	-	-	-	-
TP23-0.5	11/09/2013	SE120709-1	-	-	-	-	-	-	-	-	-	-
TP23-2.0	11/09/2013	SE120709-1	-	-	-	-	-	-	-	-	-	-
TP24-0.0	11/09/2013	SE120709-1	-	-	-	-	-	-	-	-	-	-
TP25-0.5	11/09/2013	SE120709-1	-	-	-	-	-	-	-	-	-	-
TP25-2.0	11/09/2013	SE120709-1	-	-	-	-	-	-	-	-	-	-
TP26-0.5	11/09/2013	SE120709-1	-	-	-	-	-	-	-	-	-	-
TP26-2.0	11/09/2013	SE120709-1	-	-	-	-	-	-	-	-	-	-
TP27-0.0	11/09/2013	SE120709-1	-	-	-	-	-	-	-	-	-	-
TP28-0.5	11/09/2013	SE120709-1	-	-	-	-	-	-	-	-	-	-
TP28-2.0	11/09/2013	SE120709-1	-	-	-	-	-	-	-	-	-	-

EIL = Ecological Investigation Levels (residential/open s)
HSL = Health Screening Level
HIL = Health Based Investigation Limit
EQL = Estimated Quantitation Limit
n.d = Non-detect



SDG Field_ID Sampled_Date-Time			SE120709-1	SE120709-1	SE120709-1	SE120709-1	SE120709-1	Interlab_D	SE120709-1	Interlab_D		
			TP28-0.5 11/09/2013	QC 111 11/09/2013	RPD	TP21-1.0 11/09/2013	QC 112 11/09/2013	RPD	TP26-0.5 11/09/2013	QC110 11/09/2013	RPD	TP22-0.5 11/09/2013
Pesticides	Isodrin	mg/kg	0.1	<0.1	<0.1	0						
	Mirex	mg/kg	0.1	<0.1	<0.1	0						
	Parathion	mg/kg	0.2 (Primary); 0.5 (Interlab)	<0.2	<0.2	0			<0.2	<0.5	0	
Phenolics	Phenols	mg/kg	0.1	<0.1	0.1	0						
Polychlorinated	Arochlor 1016	mg/kg	0.2 (Primary); 0.5 (Interlab)	<0.2	<0.2	0			<0.2	<0.5	0	
	Arochlor 1221	mg/kg	0.2	<0.2	<0.2	0						
	Arochlor 1232	mg/kg	0.2 (Primary); 0.5 (Interlab)	<0.2	<0.2	0			<0.2	<0.5	0	
	Arochlor 1242	mg/kg	0.2 (Primary); 0.5 (Interlab)	<0.2	<0.2	0			<0.2	<0.5	0	
	Arochlor 1248	mg/kg	0.2 (Primary); 0.5 (Interlab)	<0.2	<0.2	0			<0.2	<0.5	0	
	Arochlor 1254	mg/kg	0.2 (Primary); 0.5 (Interlab)	<0.2	<0.2	0			<0.2	<0.5	0	
	Arochlor 1260	mg/kg	0.2 (Primary); 0.5 (Interlab)	<0.2	<0.2	0			<0.2	<0.5	0	
	Arochlor 1268	mg/kg	0.2	<0.2	<0.2	0						
	Arochlor 1262	mg/kg	0.2	<0.2	<0.2	0						
	PCBs (Sum of total)	mg/kg	1 (Primary); 0.5 (Interlab)	<1.0	<1.0	0			<1.0	<0.5	0	
TPH	C10-C16	mg/kg	25 (Primary); 50 (Interlab)	<25.0	<25.0	0	<25.0	<25.0	0	<25.0	<50.0	0
	C16-C34	mg/kg	50 (Primary); 100 (Interlab)	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<100.0	0
	C34-C40	mg/kg	120 (Primary); 100 (Interlab)	<120.0	<120.0	0	<120.0	<120.0	0	<120.0	<100.0	0
	C6 - C9	mg/kg	20	<20.0	<20.0	0	<20.0	<20.0	0	<20.0	<20.0	0
	C10 - C14	mg/kg	20	<20.0	<20.0	0	<20.0	<20.0	0	<20.0	<20.0	0
	C15 - C28	mg/kg	45 (Primary); 50 (Interlab)	<45.0	<45.0	0	<45.0	48.0	6	<45.0	<50.0	0
	C29-C36	mg/kg	45 (Primary); 50 (Interlab)	<45.0	<45.0	0	<45.0	<45.0	0	<45.0	<50.0	0
	C10 - C36 (Sum of total)	mg/kg	110 (Primary); 50 (Interlab)	<110.0	<110.0	0	<110.0	<110.0	0	<110.0	<50.0	0
	C10 - C40 (Sum of total)	mg/kg	210	<210.0	<210.0	0	<210.0	<210.0	0	<210.0	<50.0	0
	C6-C10	mg/kg	25 (Primary); 20 (Interlab)	<25.0	<25.0	0	<25.0	<25.0	0	<25.0	<20.0	0

*RPDs have only been considered where a concentration is greater than 1 times the EQL.

**High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: 80 (1-10 x EQL); 50 (10-30 x EQL); 30 (> 30 x EQL))

***Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary laboratory

APPENDIX J: TEST PIT LOGS

0325



EXCAVATION - GEOLOGICAL LOG

PIT NO : TP01
FILE / JOB NO : 3002369
SHEET : 1 OF 1

PROJECT : Old Canberra Brickworks **CLIENT :** Land Development Agency
LOCATION : Yarralumla ACT **FEATURE :** Geotechnical
POSITION : E: 689880.000, N: 6090395.000 (56 MGA94) **SURFACE ELEVATION :** 585.000 (AHD)
EQUIPMENT TYPE : 8-tonne Excavator **METHOD :** Test Pit
DATE EXCAVATED : 10/9/13 **LOGGED BY :** Kara Stariha **CHECKED BY :**
EXCAVATION DIMENSIONS : 2.00 m LONG 0.60 m WIDE

DRILLING				MATERIAL													
VE	E	F	H	SUPPORT	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	ELEVATION (RL) DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, Plasticity or Particle Characteristic, Colour, Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY	RELATIVE DENSITY	DYNAMIC CONE PENETROMETER	HAND PENETROMETER	STRUCTURE & Other Observations	
						TP01-0.0 (0.0-0.2)	585.0	0.0	ML	SILT low plasticity, dark brown, trace gravel, rootlets, no odour, no staining		F				X	0.17: HP In-situ =200 - >450 kPa
						0.30m TP01-0.5 (0.3-0.5)		0.37m	GW	Sandy GRAVEL medium grained, to 20 mm, well graded, sub-rounded, grey-brown, with silt, no odour, no staining		D				X	RESIDUAL SOIL 0.43: HP In-situ =375 - >450 kPa
						0.80m TP01-1.0 (0.8-1.0)		0.49m	CL	CLAY low plasticity, grey mottled orange, trace sand, rootlets, no odour, no staining		Fb				X	0.74: HP In-situ >450 kPa
								1.01m		DACITE coarse grained, porphyritic, massive, orange with red bands, extremely low strength, highly weathered, highly fractured, no odour, no staining						X	BEDROCK
								1.16m		EXCAVATION TP01 TERMINATED AT 1.16 m Refusal							
								1.5									
								2.0									
								2.5									
								3.0									

PHOTOGRAPHS NOTES YES NO

METHOD N Natural Exposure E Existing Excavation BH Backhoe Bucket B Bulldozer Blade R Ripper	PENETRATION  No Resistance WATER  10 Oct., 73 Water Level on Date shown water inflow water outflow	SAMPLES & FIELD TESTS U50 - Undisturbed Sample 50 mm diameter D - Disturbed Sample B - Bulk Disturbed Sample MC - Moisture Content HP - Hand Penetrometer (UCS kPa) VS - Vane Shear, P-Peak, R-Remoulded (uncorrected kPa) PBT - Plate Bearing Test	CLASSIFICATION SYMBOLS & SOIL DESCRIPTION Based on Unified Classification System MOISTURE D - Dry M - Moist W - Wet	CONSISTENCY/ RELATIVE DENSITY VS - Very Soft S - Soft F - Firm St - Stiff VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense
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See Explanatory Notes for details of abbreviations & basis of descriptions.

SMEC AUSTRALIA



UPDATED SMEC LIBRARY_AGS 3_1 RTA 1_1 LIB 08 WITH FENCE TOOL_15-05-2013.GLB Log SMEC EXCAVATION WITH DCP CANBERRA BRICKWORKS REV 2.GPJ <<DrawingFile>> 30/10/2013 13:54 8.30.003

EXCAVATION - GEOLOGICAL LOG

PIT NO : TP02

PROJECT : Old Canberra Brickworks
 LOCATION : Yarralumla ACT

CLIENT : Land Development Agency
 FEATURE : Geotechnical

FILE / JOB NO : 3002369
 SHEET : 1 OF 1

POSITION : E: 690061.000, N: 6090208.000 (56 MGA94)

SURFACE ELEVATION : 594.960 (AHD)

EQUIPMENT TYPE : 8-tonne Excavator

METHOD : Test Pit

DATE EXCAVATED : 10/9/13

LOGGED BY : Kara Stariha

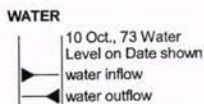
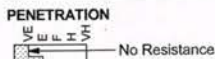
CHECKED BY :

EXCAVATION DIMENSIONS : 2.00 m LONG 0.60 m WIDE

DRILLING				MATERIAL											
VE	E	F	H	SUPPORT	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	ELEVATION (RL) DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, Plasticity or Particle Characteristic, Colour, Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY	DYNAMIC CONE PENETROMETER	HAND PENETROMETER	STRUCTURE & Other Observations
						TP02-0.0 (0.0-0.2)	595.0		CL	CLAY low plasticity, dark brown, with sand, with grass rootlets, no odour, no staining	D to M	St			TOPSOIL
						0.40m TP02-0.5 (0.4-0.6)	596.5		ML	SILT with cobbles low plasticity, dark orange-brown, with gravel, with bitumen, no odour, no staining	S				FILL
						1.00m TP02-1.0 (1.0-1.2)	596.0		MD	COBBLES coarse, to 400 mm, well graded, angular, grey, with gravel, with clay, no odour, no staining					
						1.20m TP02-1.3 (1.2-1.4)	596.5		SW	Gravelly SAND coarse grained, to 200 mm, well graded, angular, red-brown, with cobbles, with bitumen, bricks, no odour, no staining	D				1.20: HP In-situ = 425 - >450 kPa 1.30: bricks observed
						1.80m QC108 TP02-2.0 (1.8-2.0)	597.0		SW		D				1.90: asphalt observed
							2.10m			EXCAVATION TP02 TERMINATED AT 2.10 m Refusal on concrete - Possible abandoned pipe					

PHOTOGRAPHS NOTES YES NO

METHOD
 N Natural Exposure
 E Existing Excavation
 BH Backhoe Bucket
 B Bulldozer Blade
 R Ripper



SAMPLES & FIELD TESTS
 U50 - Undisturbed Sample
 50 mm diameter
 D - Disturbed Sample
 B - Bulk Disturbed Sample
 MC - Moisture Content
 HP - Hand Penetrometer (UCS kPa)
 VS - Vane Shear; P-Peak, R-Remoulded (uncorrected kPa)
 PBT - Plate Bearing Test

CLASSIFICATION SYMBOLS & SOIL DESCRIPTION
 Based on Unified Classification System

MOISTURE
 D - Dry
 M - Moist
 W - Wet

CONSISTENCY/ RELATIVE DENSITY
 VS - Very Soft
 S - Soft
 F - Firm
 St - Stiff
 VSt - Very Stiff
 H - Hard
 VL - Very Loose
 L - Loose
 MD - Medium Dense
 D - Dense
 VD - Very Dense

See Explanatory Notes for details of abbreviations & basis of descriptions.

SMEC AUSTRALIA



UPDATED SMEC LIBRARY_AGS_3_1.PTA_1_1.LIB_08 WITH FENCE TOOL_15-05-2013.GLB Log SMEC EXCAVATION WITH DCP CANBERRA BRICKWORKS REV 2.GPJ <<DrawingFile>> 30/10/2013 13:54 8.30.003

EXCAVATION - GEOLOGICAL LOG

PIT NO : TP03
FILE / JOB NO : 3002369
SHEET : 1 OF 1

PROJECT : Old Canberra Brickworks
LOCATION : Yarralumla ACT
POSITION : E: 690156.000, N: 6090198.000 (56 MGA94)

CLIENT : Land Development Agency
FEATURE : Geotechnical

SURFACE ELEVATION : 592.330 (AHD)

EQUIPMENT TYPE : 8-tonne Excavator

METHOD : Test Pit

DATE EXCAVATED : 10/9/13

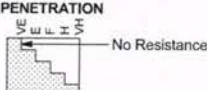
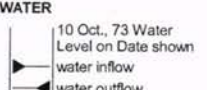
LOGGED BY : Kara Stariha

CHECKED BY :

EXCAVATION DIMENSIONS : 2.00 m LONG 0.60 m WIDE

DRILLING				MATERIAL								
VE	F	H	SUPPORT	ELEVATION (RL)	DEPTH (m)	MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	RELATIVE DENSITY	DYNAMIC CONE PENETROMETER	HAND PENETROMETER	STRUCTURE & Other Observations
Penetration	Existing Excavation	Backhoe Bucket	Bulldozer Blade	SAMPLES & FIELD TESTS	GRAPHIC LOG	Soil Type, Plasticity or Particle Characteristic, Colour, Secondary and Minor Components	D to M	S to F	Blows/150mm	100	200	
				CC107 TP03-0.0 (0.0-0.2)	0.0	CLAY low to medium plasticity, dark brown, with medium grained, well graded, sub-rounded gravel, with grass rootlets, no odour, no staining	D to M	S to F				TOPSOIL 0.12: HP In-situ =100 - 150 kPa
				0.30m TP03-0.5 (0.3-0.5)	0.24m	CLAY medium plasticity, grey mottled orange, with medium grained, well graded, sub-rounded gravel, no odour, no staining	M	St				ALLUVIUM 0.37: HP In-situ =175 - 75 kPa
				0.80m TP03-1.0 (0.8-1.0)	0.50m	Gravelly CLAY medium plasticity, orange mottled grey, with medium to fine grained, well graded, sub-angular gravel, no odour, no staining	W	VSt				0.58: HP In-situ =450 - >450 kPa
				1.80m TP03-2.0 (1.8-2.0)	0.65m	SILTSTONE fine grained, layered, grey weathered orange, medium strength, highly weathered, slightly fractured, no odour, iron staining in fractures	M					BEDROCK 1.65: Ripper used from 1.65 m
					2.00m	EXCAVATION TP03 TERMINATED AT 2.00 m Refusal						

PHOTOGRAPHS NOTES YES NO

METHOD N Natural Exposure E Existing Excavation BH Backhoe Bucket B Bulldozer Blade R Ripper	PENETRATION  WATER 10 Oct., 73 Water Level on Date shown 	SAMPLES & FIELD TESTS U50 - Undisturbed Sample 50 mm diameter D - Disturbed Sample B - Bulk Disturbed Sample MC - Moisture Content HP - Hand Penetrometer (UCS kPa) VS - Vane Shear; P-Peak, R-Remoulded (uncorrected kPa) PBT - Plate Bearing Test	CLASSIFICATION SYMBOLS & SOIL DESCRIPTION Based on Unified Classification System MOISTURE D - Dry M - Moist W - Wet	CONSISTENCY/ RELATIVE DENSITY VS - Very Soft S - Soft F - Firm St - Stiff VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense
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See Explanatory Notes for details of abbreviations & basis of descriptions.

SMC AUSTRALIA



UPDATED SMEC LIBRARY_AGS 3_1 RTA 1_1 LIB 08 WITH FENCE TOOL_15-05-2013.GLB Log SMEC EXCAVATION WITH DCP_CANNBERRA BRICKWORKS REV 2.GPJ <<DrawingFile>> 30/10/2013 13:54 8_30.003

EXCAVATION - GEOLOGICAL LOG

PIT NO : TP04

PROJECT : Old Canberra Brickworks
 LOCATION : Yarralumla ACT

CLIENT : Land Development Agency
 FEATURE : Geotechnical

FILE / JOB NO : 3002369
 SHEET : 1 OF 1

POSITION : E: 690384.000, N: 6090131.000 (56 MGA94)

SURFACE ELEVATION : 590.490 (AHD)

EQUIPMENT TYPE : 8-tonne Excavator

METHOD : Test Pit

DATE EXCAVATED : 10/9/13

LOGGED BY : Kara Stariha

CHECKED BY :

EXCAVATION DIMENSIONS : 2.00 m LONG 0.60 m WIDE

DRILLING				MATERIAL										
VE	E	F	H	SAMPLES & FIELD TESTS	ELEVATION (RL) DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, Plasticity or Particle Characteristic, Colour, Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY	RELATIVE DENSITY	DYNAMIC CONE PENETRO-METER	HAND PENETRO-METER	STRUCTURE & Other Observations
Penetration	Support	Groundwater Levels	Blows/150mm											
				TP04-0.0 (0.0-0.2)	0.0		ML	SILT low plasticity, brown, with coarse, angular gravel, with grass rootlets, non odour, non staining		SI				TOPSOIL 0.08: HP In-situ >450 - 325 kPa BEDROCK
				0.30m TP04-0.50 (0.3-0.45)	0.17m			SILTSTONE fine grained, layered, red brown, low strength, moderately weathered, highly fractured, no odour, iron staining in fractures	D					
					0.45m			EXCAVATION TP04 TERMINATED AT 0.45 m Refusal						
					0.5									
					1.0									
					1.5									
					2.0									
					2.5									
					3.0									

0923

PHOTOGRAPHS NOTES YES NO

METHOD N Natural Exposure E Existing Excavation BH Backhoe Bucket B Bulldozer Blade R Ripper SUPPORT T Timbering	PENETRATION No Resistance WATER 10 Oct., 73 Water Level on Date shown water inflow water outflow	SAMPLES & FIELD TESTS U50 - Undisturbed Sample 50 mm diameter D - Disturbed Sample B - Bulk Disturbed Sample MC - Moisture Content HP - Hand Penetrometer (UCS kPa) VS - Vane Shear; P-Peak, R-Remoulded (uncorrected kPa) PBT - Plate Bearing Test	CLASSIFICATION SYMBOLS & SOIL DESCRIPTION Based on Unified Classification System MOISTURE D - Dry M - Moist W - Wet	CONSISTENCY/ RELATIVE DENSITY VS - Very Soft S - Soft F - Firm St - Stiff VSst - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense
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See Explanatory Notes for details of abbreviations & basis of descriptions.

SMEC AUSTRALIA



UPDATED SMEC LIBRARY_ACS 3_1 RTA 1_1 LIB 08 WITH FENCE TOOL_15-05-2013.GLB Log SMEC EXCAVATION WITH DCP_CANNBERRA BRICKWORKS REV 2.GPJ <<DrawingFile>> 30/10/2013 13:54 8_30.003

EXCAVATION - GEOLOGICAL LOG

PIT NO : TP05
FILE / JOB NO : 3002369
SHEET : 1 OF 1

PROJECT : Old Canberra Brickworks
LOCATION : Yarralumla ACT

CLIENT : Land Development Agency
FEATURE : Geotechnical

POSITION : E: 690426.000, N: 6089969.000 (56 MGA94)

SURFACE ELEVATION : 596.650 (AHD)

EQUIPMENT TYPE : 8-tonne Excavator

METHOD : Test Pit

DATE EXCAVATED : 9/9/13

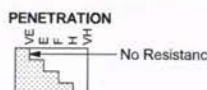
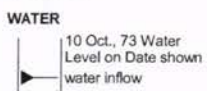
LOGGED BY : Claudia Rodriguez

CHECKED BY :

EXCAVATION DIMENSIONS : 2.00 m LONG 0.60 m WIDE

DRILLING				MATERIAL											
VE	E	F	H	SUPPORT	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	ELEVATION (RL) DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, Plasticity or Particle Characteristic, Colour, Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY	DYNAMIC CONE PENETROMETER	HAND PENETROMETER	STRUCTURE & Other Observations
						TP05-0.0 (0.0-0.2)	0.0	ML	ML	Clayey SILT low plasticity, dark brown, with clay, grass rootlets, no odour, no staining	D	S	100		TOPSOIL
						0.40m TP05-0.5 (0.4-0.6)	0.40	CL	CL	Silty CLAY low plasticity, red brown, no odour, no staining		H		X	RESIDUAL SOIL 0.53: HP In-situ =425 kPa
						0.80m TP05-1.0 (0.8-1.0)	0.80	SILTSTONE	SILTSTONE	SILTSTONE fine grained, layered, pale orange, extremely low strength, extremely weathered, highly fractured, no odour, iron staining				X	ROCK 0.75: HP In-situ >425 kPa
							1.15			EXCAVATION TP05 TERMINATED AT 1.15 m Refusal					
							1.5								
							2.0								
							2.5								
							3.0								

PHOTOGRAPHS NOTES YES NO

METHOD N Natural Exposure E Existing Excavation BH Backhoe Bucket B Bulldozer Blade R Ripper	PENETRATION  WATER 10 Oct., 73 Water Level on Date shown 	SAMPLES & FIELD TESTS U50 - Undisturbed Sample 50 mm diameter D - Disturbed Sample B - Bulk Disturbed Sample MC - Moisture Content HP - Hand Penetrometer (UCS kPa) VS - Vane Shear; P-Peak, R-Remoulded (uncorrected kPa) PBT - Plate Bearing Test	CLASSIFICATION SYMBOLS & SOIL DESCRIPTION Based on Unified Classification System MOISTURE D - Dry M - Moist W - Wet	CONSISTENCY/ RELATIVE DENSITY VS - Very Soft S - Soft F - Firm St - Stiff VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense
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See Explanatory Notes for details of abbreviations & basis of descriptions.

SMC AUSTRALIA



UPDATED SMC LIBRARY_AGS 3_1 RTA 1_1 LIB 08 WITH FENCE TOOL_15-05-2013.GLB Log SMC EXCAVATION WITH DCP CANBERRA BRICKWORKS REV 2.GPJ <<DrawingFile>> 30/10/2013 13:54 8.30.003

EXCAVATION - GEOLOGICAL LOG

PIT NO : TP06

PROJECT : Old Canberra Brickworks
 LOCATION : Yarralumla ACT

CLIENT : Land Development Agency
 FEATURE : Geotechnical

FILE / JOB NO : 3002369
 SHEET : 1 OF 1

POSITION : E: 690523.000, N: 6090005.000 (56 MGA94)

SURFACE ELEVATION : 598.770 (AHD)

EQUIPMENT TYPE : 8-tonne Excavator

METHOD : Test Pit

DATE EXCAVATED : 9/9/13

LOGGED BY : Claudia Rodriguez

CHECKED BY :

EXCAVATION DIMENSIONS : 2.00 m LONG 0.60 m WIDE

DRILLING				MATERIAL							
VE	E	F	H	ELEVATION (RL) DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION Soil Type, Plasticity or Particle Characteristic, Colour, Secondary and Minor Components	MOISTURE CONDITION CONSISTENCY RELATIVE DENSITY	DYNAMIC CONE PENETROMETER Blows/150mm	HAND PENETROMETER	STRUCTURE & Other Observations	
				TP06-0.0 (0.0-0.2)	0.0	ML	VS1	25	100	X	TOPSOIL
				0.40m TP06-0.5 (0.4-0.6)	0.4	GW	D	100	300	X	0.20: HP In-situ >450 kPa
				0.80m TP06-1.0 (0.8-1.0)	0.8	GW	D	100	300	X	ALLUVIUM
				1.50m TP06-1.7 (1.5-1.7)	1.5	SILTSTONE	D	100	300	X	0.75: HP In-situ >450 kPa
					1.6	becoming grey weathered orange in fractures					BEDROCK
					1.7	becoming grey, high strength, slightly weathered, slightly fractured					1.25: HP In-situ >450 kPa
					1.70	EXCAVATION TP06 TERMINATED AT 1.70 m Refusal					

PHOTOGRAPHS NOTES YES NO

METHOD N Natural Exposure E Existing Excavation BH Backhoe Bucket B Bulldozer Blade R Ripper	PENETRATION 	SAMPLES & FIELD TESTS U50 - Undisturbed Sample 50 mm diameter D - Disturbed Sample B - Bulk Disturbed Sample MC - Moisture Content HP - Hand Penetrometer (UCS kPa) VS - Vane Shear, P-Peak, R-Remoulded (uncorrected kPa) PBT - Plate Bearing Test	CLASSIFICATION SYMBOLS & SOIL DESCRIPTION Based on Unified Classification System MOISTURE D - Dry M - Moist W - Wet	CONSISTENCY/ RELATIVE DENSITY VS - Very Soft S - Soft F - Firm St - Stiff VS1 - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense
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See Explanatory Notes for details of abbreviations & basis of descriptions.

SMC AUSTRALIA



UPDATED SMC LIBRARY_AGS 3_1 RTA 1_1 LIB 08 WITH FENCE TOOL_15-05-2013.GLB Log SMC EXCAVATION WITH DCP CANBERRA BRICKWORKS REV 2.GPJ <<DrawingFile>> 30/10/2013 13:54 8.30.003

EXCAVATION - GEOLOGICAL LOG

PIT NO : TP07

PROJECT : Old Canberra Brickworks
 LOCATION : Yarralumla ACT

CLIENT : Land Development Agency
 FEATURE : Geotechnical

FILE / JOB NO : 3002369
 SHEET : 1 OF 1

POSITION : E: 690585.000, N: 6090029.000 (56 MGA94)

SURFACE ELEVATION : 593.470 (AHD)

EQUIPMENT TYPE : 8-tonne Excavator

METHOD : Test Pit

DATE EXCAVATED : 9/9/13

LOGGED BY : Claudia Rodriguez

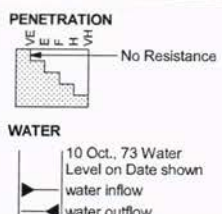
CHECKED BY :

EXCAVATION DIMENSIONS : 2.00 m LONG 0.60 m WIDE

DRILLING				MATERIAL								
VE E F H	SUPPORT	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	ELEVATION (RL) DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, Plasticity or Particle Characteristic, Colour, Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY	DYNAMIC CONE PENETROMETER	HAND PENETROMETER	STRUCTURE & Other Observations
			TP07-0.0 (0.0-0.2)	593.5 0.0		ML	SILT low plasticity, red brown mottled black, with fine grained gravel, with grass rootlets, no odour, no staining					TOPSOIL
			0.40m TP07-0.5 (0.4-0.6)	594.0 0.40m		CL	Gravelly CLAY low plasticity, light grey, well graded, sub-angular gravel, trace sand, no odour, no staining					0.20: HP In-situ >450 kPa
			0.80m TP07-1.0 (0.8-1.0)	594.5 1.00m		CL	CLAY low plasticity, pale brown mottled grey, no odour, no staining	H				FILL
			1.70m TP07-1.9 (1.7-1.9)	595.0 1.50m		CL	SANDSTONE medium to coarse grained, massive, grey weathered orange, extremely low strength, extremely weathered, no odour, iron staining	D				0.75: HP In-situ >450 kPa
				595.5 1.90m								RESIDUAL SOIL
				596.0 2.00m			EXCAVATION TP07 TERMINATED AT 1.90 m Refusal					1.25: HP In-situ >450 kPa
				596.5 2.50m								BEDROCK
				597.0 3.00m								1.60: Ripper from 1.6 m

PHOTOGRAPHS NOTES YES NO

- METHOD**
- N Natural Exposure
 - E Existing Excavation
 - BH Backhoe Bucket
 - B Bulldozer Blade
 - R Ripper
- SUPPORT**
- T Timbering



- SAMPLES & FIELD TESTS**
- U50 - Undisturbed Sample 50 mm diameter
 - D - Disturbed Sample
 - B - Bulk Disturbed Sample
 - MC - Moisture Content
 - HP - Hand Penetrometer (UCS kPa)
 - VS - Vane Shear; P-Peak, R-Remoulded (uncorrected kPa)
 - PBT - Plate Bearing Test

- CLASSIFICATION SYMBOLS & SOIL DESCRIPTION**
Based on Unified Classification System
- MOISTURE**
- D - Dry
 - M - Moist
 - W - Wet

- CONSISTENCY/RELATIVE DENSITY**
- VS - Very Soft
 - S - Soft
 - F - Firm
 - St - Stiff
 - VSt - Very Stiff
 - H - Hard
 - VL - Very Loose
 - L - Loose
 - MD - Medium Dense
 - D - Dense
 - VD - Very Dense

See Explanatory Notes for details of abbreviations & basis of descriptions.

SMEC AUSTRALIA



UPDATED SMEC LIBRARY_AGS 3_1 RTA 1_1 LB 08 WITH FENCE TOOL_15-05-2013.GLB Log SMEC EXCAVATION WITH DCP CANBERRA BRICKWORKS REV 2.CPJ <-DrawingFile--> 30/10/2013 13:54 8.30.003

EXCAVATION - GEOLOGICAL LOG

PIT NO : TP08

PROJECT : Old Canberra Brickworks
 LOCATION : Yarralumla ACT

CLIENT : Land Development Agency
 FEATURE : Geotechnical

FILE / JOB NO : 3002369
 SHEET : 1 OF 1

POSITION : E: 690677.000, N: 609064.000 (56 MGA94)

SURFACE ELEVATION : 595.930 (AHD)

EQUIPMENT TYPE : 8-tonne Excavator

METHOD : Test Pit

DATE EXCAVATED : 9/9/13

LOGGED BY : Claudia Rodriquez

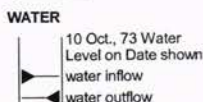
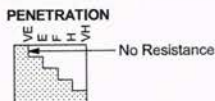
CHECKED BY :

EXCAVATION DIMENSIONS : 2.00 m LONG 0.60 m WIDE

DRILLING				MATERIAL											
VE	E	F	H	SUPPORT	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	ELEVATION (RL) DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, Plasticity or Particle Characteristic, Colour, Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY	DYNAMIC CONE PENETRO-METER	HAND PENETRO-METER	STRUCTURE & Other Observations
						TP08-0.0 (0.0-0.2)	0.0	[Symbol]	ML	SILT low plasticity, dark brown, trace sand, with grass rootlets, no odour, no staining		VSt			TOPSOIL
						0.40m TP08-0.5 (0.4-0.6)	0.45m	[Symbol]	CL	Sandy CLAY low plasticity, orange-brown, coarse sand, with fine, well graded, sub-rounded gravel, no odour, no staining		H			FILL 0.25: HP In-situ =250 - >450 kPa
						0.80m TP08-1.0 (0.8-1.0)	0.55m	[Symbol]	CI	Sandy Silty CLAY medium plasticity, red-brown, no odour, iron staining		H			RESIDUAL SOIL 0.60: Large patch of iron staining 0.75: HP In-situ >450 kPa
						1.00m TP08-1.5 (1.3-1.5)	1.00m	[Symbol]		DACITE coarse grained, porphyritic, massive, orange-brown, extremely low strength, extremely weathered, no odour, no staining		D			BEDROCK 1.10: Ripper used from 1.1 m
							1.30m	[Symbol]		becoming low strength, slightly weathered					
							1.50m	[Symbol]		EXCAVATION TP08 TERMINATED AT 1.50 m Refusal					

PHOTOGRAPHS NOTES YES NO

- METHOD**
- N Natural Exposure
 - E Existing Excavation
 - BH Backhoe Bucket
 - B Bulldozer Blade
 - R Ripper



- SUPPORT**
- T Timbering

- SAMPLES & FIELD TESTS**
- U50 - Undisturbed Sample 50 mm diameter
 - D - Disturbed Sample
 - B - Bulk Disturbed Sample
 - MC - Moisture Content
 - HP - Hand Penetrometer (UCS kPa)
 - VS - Vane Shear; P-Peak, R-Remoulded (uncorrected kPa)
 - PBT - Plate Bearing Test

CLASSIFICATION SYMBOLS & SOIL DESCRIPTION
Based on Unified Classification System

- MOISTURE**
- D - Dry
 - M - Moist
 - W - Wet

- CONSISTENCY/ RELATIVE DENSITY**
- VS - Very Soft
 - S - Soft
 - F - Firm
 - St - Stiff
 - VSt - Very Stiff
 - H - Hard
 - VL - Very Loose
 - L - Loose
 - MD - Medium Dense
 - D - Dense
 - VD - Very Dense

See Explanatory Notes for details of abbreviations & basis of descriptions.

SMEC AUSTRALIA



UPDATED SMEC LIBRARY_ACS_3_1 RTA 1_1 LIB 08 WITH FENCE TOOL_15-05-2013.GLB Log SMEC EXCAVATION WITH DCP CANBERRA BRICKWORKS REV 2.GPJ <<DrawingFile>> 30/10/2013 13:54 8.30.003

EXCAVATION - GEOLOGICAL LOG

PIT NO : TP09

PROJECT : Old Canberra Brickworks
 LOCATION : Yarralumla ACT

CLIENT : Land Development Agency
 FEATURE : Geotechnical

FILE / JOB NO : 3002369
 SHEET : 1 OF 1

POSITION : E: 690582.000, N: 6090185.000 (56 MGA94)

SURFACE ELEVATION : 592.450 (AHD)

EQUIPMENT TYPE : 8-tonne Excavator

METHOD : Test Pit

DATE EXCAVATED : 10/9/13

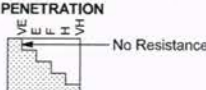

LOGGED BY : Kara

CHECKED BY :

EXCAVATION DIMENSIONS : 2.00 m LONG 0.60 m WIDE

DRILLING				MATERIAL						
VE	PENETRATION	SUPPORT	SAMPLES & FIELD TESTS	ELEVATION (RL) DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION Soil Type, Plasticity or Particle Characteristic, Colour, Secondary and Minor Components	MOISTURE CONDITION CONSISTENCY RELATIVE DENSITY	DYNAMIC CONE PENETROMETER	HAND PENETROMETER	STRUCTURE & Other Observations
			TP09-0.0 (0.0-0.2)	0.0	ML	SILT low plasticity, light brown, with fine grained sand, with grass rootlets, no odour, no staining	H	100 200 300 400	100 200 300 400	TOPSOIL 0.20: HP In-situ >450 kPa
			0.40m TP09-0.5 (0.4-0.6)	0.4	CL-CI	CLAY low to medium plasticity, orange-brown, trace fine grained sand, no odour, no staining	D			RESIDUAL SOIL 0.49: HP In-situ >450 kPa
			0.80m TP09-1.0 (0.8-1.0)	0.8	DACITE	DACITE coarse grained, porphyritic, massive, orange-brown, low strength, highly weathered, moderately fractured, no odour, iron staining particularly in fractures				BEDROCK
				1.0		becoming medium strength, highly weathered, moderately fractured				
				1.26		EXCAVATION TP09 TERMINATED AT 1.26 m Refusal				
				1.5						
				2.0						
				2.5						
				3.0						

PHOTOGRAPHS NOTES YES NO

METHOD N Natural Exposure E Existing Excavation BH Backhoe Bucket B Bulldozer Blade R Ripper	PENETRATION  WATER 10 Oct., 73 Water Level on Date shown 	SAMPLES & FIELD TESTS U50 - Undisturbed Sample 50 mm diameter D - Disturbed Sample B - Bulk Disturbed Sample MC - Moisture Content HP - Hand Penetrometer (UCS kPa) VS - Vane Shear; P-Peak, R-Remoulded (uncorrected kPa) PBT - Plate Bearing Test	CLASSIFICATION SYMBOLS & SOIL DESCRIPTION Based on Unified Classification System MOISTURE D - Dry M - Moist W - Wet	CONSISTENCY/RELATIVE DENSITY VS - Very Soft S - Soft F - Firm St - Stiff VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense
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See Explanatory Notes for details of abbreviations & basis of descriptions.

SMEC AUSTRALIA



UPDATED SMEC LIBRARY_AGS.3_1 RTA 1_1 LIB 08 WITH FENCE TOOL_15-05-2013.GLB Log SMEC EXCAVATION WITH DCP CANBERRA BRICKWORKS REV 2.GPJ <<DrawingFile>> 30/10/2013 13:54 8.30.003

EXCAVATION - GEOLOGICAL LOG

PIT NO : TP10

PROJECT : Old Canberra Brickworks
 LOCATION : Yarralumla ACT

CLIENT : Land Development Agency
 FEATURE : Geotechnical

FILE / JOB NO : 3002369
 SHEET : 1 OF 1

POSITION : E: 690692.000, N: 6090236.000 (56 MGA94)

SURFACE ELEVATION : 596.420 (AHD)

EQUIPMENT TYPE : 8-tonne Excavator

METHOD : Test Pit

DATE EXCAVATED : 10/9/13

LOGGED BY : Kara

CHECKED BY :

EXCAVATION DIMENSIONS : 2.00 m LONG 0.60 m WIDE

DRILLING				MATERIAL										
VE	Penetration E F H	SUPPORT	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	ELEVATION (RL) DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, Plasticity or Particle Characteristic, Colour, Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY	RELATIVE DENSITY	DYNAMIC CONE PENETRO-METER	HAND PENETRO-METER	STRUCTURE & Other Observations
				TP10-0.0 (0.0-0.2)	0.0		ML	SILT low plasticity, dark brown, with coarse, <20 mm gravel, with grass rootlets, no odour, no staining		St				TOPSOIL
				0.40m TP10-0.5 (0.4-0.6)	0.39m		CL	Silty CLAY low plasticity, light orange brown, no odour, no staining		VSt				FILL
				0.90m TP10-1.0 (0.9-1.1)	0.49m		CI	CLAY medium plasticity, light orange brown speckled black, trace sand, no odour, no staining		H				0.45: HP In-situ =325 - 450 kPa
					1.58m			EXCAVATION TP10 TERMINATED AT 1.58 m Refusal		Fb				0.85: HP In-situ =450 - >450 kPa
					1.58m									

0.220

PHOTOGRAPHS NOTES YES NO

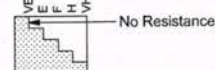
METHOD

- N Natural Exposure
- E Existing Excavation
- BH Backhoe Bucket
- B Bulldozer Blade
- R Ripper

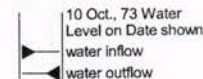
SUPPORT

- T Timbering

PENETRATION



WATER



SAMPLES & FIELD TESTS

- U50 - Undisturbed Sample 50 mm diameter
- D - Disturbed Sample
- B - Bulk Disturbed Sample
- MC - Moisture Content
- HP - Hand Penetrometer (UCS kPa)
- VS - Vane Shear; P-Peak, R-Remoulded (uncorrected kPa)
- PBT - Plate Bearing Test

CLASSIFICATION SYMBOLS & SOIL DESCRIPTION
Based on Unified Classification System

MOISTURE

- D - Dry
- M - Moist
- W - Wet

CONSISTENCY/ RELATIVE DENSITY

- VS - Very Soft
- S - Soft
- F - Firm
- St - Stiff
- VSt - Very Stiff
- H - Hard
- VL - Very Loose
- L - Loose
- MD - Medium Dense
- D - Dense
- VD - Very Dense

See Explanatory Notes for details of abbreviations & basis of descriptions.

SMC AUSTRALIA



UPDATED: SMC LIBRARY_AGS3_1 RTA 1_1 LIB 08 WITH FENCE TOOL_15-05-2013.GLB Log SMC EXCAVATION WITH DCP CANBERRA BRICKWORKS REV 2.GPJ <<DrawingFile>>_30/10/2013 13:54 8.30.000

EXCAVATION - GEOLOGICAL LOG

PIT NO : TP11
FILE / JOB NO : 3002369
SHEET : 1 OF 1

PROJECT : Old Canberra Brickworks
LOCATION : Yarralumla ACT

CLIENT : Land Development Agency
FEATURE : Geotechnical

POSITION : E: 690360.000, N: 6090237.000 (56 MGA94)

SURFACE ELEVATION : 584.110 (AHD)

EQUIPMENT TYPE : 8-tonne Excavator

METHOD : Test Pit

DATE EXCAVATED : 10/9/13

LOGGED BY : Kara

CHECKED BY :

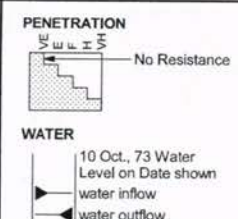
EXCAVATION DIMENSIONS : 2.00 m LONG 0.60 m WIDE

DRILLING				MATERIAL									
VE	E	F	H	SAMPLES & FIELD TESTS	ELEVATION (RL) DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, Plasticity or Particle Characteristic, Colour, Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY	DYNAMIC CONE PENETROMETER	HAND PENETROMETER	STRUCTURE & Other Observations
				TP11-0.0 (0.0-0.2)	0.0	ML	ML	Clayey SILT low plasticity, red-brown, with grass rootlets, no odour, no staining	VSI	VS	2.2	100	TOPSOIL
				0.40m TP11-0.5 (0.4-0.6)	584.5	D	D	SILTSTONE fine grained, layered, orange brown, low strength, highly weathered, highly fractured, no odour, iron staining in fractures	D	D	2.2	100	BEDROCK
				1.00m TP11-1.0 (1.0-1.2)	585.0	D	D	becoming medium strength, slightly weathered, highly fractured	D	D	2.2	100	0.78: Ripper from 0.78
					585.5			EXCAVATION TP11 TERMINATED AT 1.12 m Refusal					
					586.0								
					586.5								
					587.0								

PHOTOGRAPHS NOTES YES NO

METHOD
N Natural Exposure
E Existing Excavation
BH Backhoe Bucket
B Bulldozer Blade
R Ripper

SUPPORT
T Timbering



SAMPLES & FIELD TESTS

U50 - Undisturbed Sample 50 mm diameter
D - Disturbed Sample
B - Bulk Disturbed Sample
MC - Moisture Content
HP - Hand Penetrometer (UCS kPa)
VS - Vane Shear; P-Peak, R-Remoulded (uncorrected kPa)
PBT - Plate Bearing Test

CLASSIFICATION SYMBOLS & SOIL DESCRIPTION
Based on Unified Classification System

MOISTURE

D - Dry
M - Moist
W - Wet

CONSISTENCY/RELATIVE DENSITY

VS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

See Explanatory Notes for details of abbreviations & basis of descriptions.

SMC AUSTRALIA



UPDATED SMC LIBRARY_AGS 3_1 RTA 1_1 LIB 08 WITH FENCE TOOL_15-05-2013.GLB Log_SMEC EXCAVATION WITH DCP_CANBERRA BRICKWORKS REV2.CPJ <-DrawingFile>> 30/10/2013 13:54 8.30.003

EXCAVATION - GEOLOGICAL LOG

PIT NO : TP12

PROJECT : Old Canberra Brickworks
 LOCATION : Yarralumla ACT

CLIENT : Land Development Agency
 FEATURE : Geotechnical

FILE / JOB NO : 3002369
 SHEET : 1 OF 1

POSITION : E: 690156.000, N: 6090337.000 (56 MGA94)

SURFACE ELEVATION : 585.070 (AHD)

EQUIPMENT TYPE : 8-tonne Excavator

METHOD : Test Pit

DATE EXCAVATED : 10/9/13

LOGGED BY : Kara

CHECKED BY :

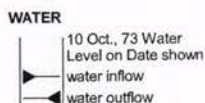
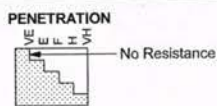
EXCAVATION DIMENSIONS : 2.00 m LONG 0.60 m WIDE

DRILLING				MATERIAL											
VE	E	F	H	SUPPORT	SAMPLES & FIELD TESTS	ELEVATION (RL) DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, Plasticity or Particle Characteristic, Colour, Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY	RELATIVE DENSITY	DYNAMIC CONE PENETROMETER	HAND PENETROMETER	STRUCTURE & Other Observations
						0.0 TP12-0.1 (0.0-0.2)	0.0	ML	Sandy SILT low plasticity, dark brown, well graded sand, no odour, no staining	D to M	F				TOPSOIL 0.15: HP In-situ =0 kPa
						0.40m TP12-0.5 (0.4-0.6)	0.31m	ML	Gravelly SILT to 400 mm, low plasticity, dark red-brown, well graded, sub-angular gravel, with cobbles, with boulders, no odour, no staining	D to M	F				FILL 0.45: HP In-situ =300 kPa
						586.0	0.60m		SILTSTONE fine grained, layered, orange brown, low strength, highly weathered, highly fractured, no odour, iron staining, particularly in fractures	D					BEDROCK 0.60: Bitumen observed BEDROCK
						588.0	1.20m		EXCAVATION TP12 TERMINATED AT 1.20 m Refusal						1.20: Note: Sample location likely to receive wash from surrounding area

PHOTOGRAPHS NOTES YES NO

METHOD
 N Natural Exposure
 E Existing Excavation
 BH Backhoe Bucket
 B Bulldozer Blade
 R Ripper

SUPPORT
 T Timbering



SAMPLES & FIELD TESTS
 U50 - Undisturbed Sample
 50 mm diameter
 D - Disturbed Sample
 B - Bulk Disturbed Sample
 MC - Moisture Content
 HP - Hand Penetrometer (UCS kPa)
 VS - Vane Shear; P-Peak, R-Remoulded (uncorrected kPa)
 PBT - Plate Bearing Test

CLASSIFICATION SYMBOLS & SOIL DESCRIPTION
 Based on Unified Classification System

MOISTURE
 D - Dry
 M - Moist
 W - Wet

CONSISTENCY/ RELATIVE DENSITY
 VS - Very Soft
 S - Soft
 F - Firm
 St - Stiff
 VSst - Very Stiff
 H - Hard
 VL - Very Loose
 L - Loose
 MD - Medium Dense
 D - Dense
 VD - Very Dense

See Explanatory Notes for details of abbreviations & basis of descriptions.

SMEC AUSTRALIA



UPDATED SMEC LIBRARY_AGS_3_1 RTA 1_1 LIB 08 WITH FENCE TOOL_15-05-2013.GLB Log SMEC EXCAVATION WITH DCP_CAMBERRA BRICKWORKS REV 2.GPJ <<DrawingFile>> 30/10/2013 13:54 8_30.003

EXCAVATION - GEOLOGICAL LOG

PIT NO : TP13
FILE / JOB NO : 3002369
SHEET : 1 OF 1

PROJECT : Old Canberra Brickworks
LOCATION : Yarralumla ACT
POSITION : E: 690045.000, N: 6090415.000 (56 MGA94)

CLIENT : Land Development Agency
FEATURE : Geotechnical
SURFACE ELEVATION : 583.820 (AHD)

EQUIPMENT TYPE : 8-tonne Excavator

METHOD : Test Pit

DATE EXCAVATED : 10/9/13

LOGGED BY : Kara

CHECKED BY :

EXCAVATION DIMENSIONS : 2.00 m LONG 0.60 m WIDE

DRILLING				MATERIAL											
VE	E	F	H	SUPPORT	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	ELEVATION (RL) DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, Plasticity or Particle Characteristic, Colour, Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY	DYNAMIC CONE PENETROMETER	HAND PENETROMETER	STRUCTURE & Other Observations
						TP13-0.0 (0.0-0.2)	0.0		ML	SILT low plasticity, brown, with clay, with grass rootlets, no odour, no staining		F			TOPSOIL
						0.40m TP13-0.5 (0.4-0.6)	0.32m		CL	CLAY low plasticity, red-brown, with sand, with gravel, no odour, no staining		H			RESIDUAL SOIL
						0.80m TP13-1.0 (0.8-1.0)	0.69m			SILTSTONE fine grained, amorphous, layered, grey weathered orange, high strength, fresh, moderately weathered, no odour, iron staining in fractures		D			BEDROCK
							1.30m			EXCAVATION TP13 TERMINATED AT 1.30 m Refusal					

PHOTOGRAPHS NOTES YES NO

METHOD N Natural Exposure E Existing Excavation BH Backhoe Bucket B Bulldozer Blade R Ripper SUPPORT T Timbering	PENETRATION WATER 10 Oct., 73 Water Level on Date shown 	SAMPLES & FIELD TESTS U50 - Undisturbed Sample 50 mm diameter D - Disturbed Sample B - Bulk Disturbed Sample MC - Moisture Content HP - Hand Penetrometer (UCS kPa) VS - Vane Shear, P-Peak, R-Remoulded (uncorrected kPa) PBT - Plate Bearing Test	CLASSIFICATION SYMBOLS & SOIL DESCRIPTION Based on Unified Classification System MOISTURE D - Dry M - Moist W - Wet	CONSISTENCY/ RELATIVE DENSITY VS - Very Soft S - Soft F - Firm St - Stiff VSst - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense
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See Explanatory Notes for details of abbreviations & basis of descriptions.

SMEC AUSTRALIA



UPDATED SMEC LIBRARY_AGS 3_1 RTA 1_1 LIB 08 WITH FENCE TOOL_15-05-2013.GLB Log CANBERRA BRICKWORKS REV 2.GPJ <<DrawingFile>> 30/10/2013 13:54 8.30.003

EXCAVATION - GEOLOGICAL LOG

PIT NO : TP14

PROJECT : Old Canberra Brickworks
 LOCATION : Yarralumla ACT

CLIENT : Land Development Agency
 FEATURE : Geotechnical

FILE / JOB NO : 3002369
 SHEET : 1 OF 1

POSITION : E: 690044.000, N: 6090417.000 (56 MGA94)

SURFACE ELEVATION : 597.420 (AHD)

EQUIPMENT TYPE : 8-tonne Excavator

METHOD : Test Pit

DATE EXCAVATED : 9/9/13


LOGGED BY : Claudia Rodriguez

CHECKED BY :

EXCAVATION DIMENSIONS : 2.00 m LONG 0.60 m WIDE

DRILLING				MATERIAL										
VE	E	F	H	SAMPLES & FIELD TESTS	ELEVATION (RL) DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, Plasticity or Particle Characteristic, Colour, Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY	RELATIVE DENSITY	DYNAMIC CONE PENETRO-METER	HAND PENETRO-METER	STRUCTURE & Other Observations
				TP14-0.0 (0.0-0.2)	0.0	0.0	ML	Clayey SILT low plasticity, dark brown, with grass rootlets, no odour, no staining						TOPSOIL
				0.40m TP14-0.5 (0.4-0.6)	597.5	0.25m	CL	Silty CLAY low plasticity, red brown, no odour, no staining						FILL 0.50: HP In-situ =125 - 350 kPa
				0.80m TP14-1.0 (0.8-1.0)	598.0	0.80m	SW	Gravelly SAND orange brown, fine to coarse grained, well graded, sub-rounded gravel, no odour, iron staining						RESIDUAL SOIL 1.00: HP In-situ =300 - >450 kPa
					598.5	1.15m		DACITE coarse grained, porphyritic, massive, orange brown, very low strength, highly weathered, no odour, iron staining						BEDROCK
					599.0	1.35m		EXCAVATION TP14 TERMINATED AT 1.35 m Refusal						
					600.0									

PHOTOGRAPHS NOTES YES NO

METHOD N Natural Exposure E Existing Excavation BH Backhoe Bucket B Bulldozer Blade R Ripper	PENETRATION  No Resistance	SAMPLES & FIELD TESTS U50 - Undisturbed Sample 50 mm diameter D - Disturbed Sample B - Bulk Disturbed Sample MC - Moisture Content HP - Hand Penetrometer (UCS kPa) VS - Vane Shear, P-Peak, R-Remoulded (uncorrected kPa) PBT - Plate Bearing Test	CLASSIFICATION SYMBOLS & SOIL DESCRIPTION Based on Unified Classification System MOISTURE D - Dry M - Moist W - Wet	CONSISTENCY/ RELATIVE DENSITY VS - Very Soft S - Soft F - Firm St - Stiff VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense
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See Explanatory Notes for details of abbreviations & basis of descriptions.

SMEC AUSTRALIA



UPDATED SMEC LIBRARY_ACS 3_1 RTA 1_1 LIB 08_WITH FENCE TOOL_15-05-2013.GLB Log SMEC EXCAVATION WITH DCP_CANBERRA BRICKWORKS REV 2.GPJ <<DrawingFile>> 30/10/2013 13:54 8.30.003

EXCAVATION - GEOLOGICAL LOG

PIT NO : TP15

PROJECT : Old Canberra Brickworks
 LOCATION : Yarralumla ACT

CLIENT : Land Development Agency
 FEATURE : Geotechnical

FILE / JOB NO : 3002369
 SHEET : 1 OF 1

POSITION : E: 690003.000, N: 6090627.000 (56 MGA94)

SURFACE ELEVATION : 595.880 (AHD)

EQUIPMENT TYPE : 8-tonne Excavator

METHOD : Test Pit

DATE EXCAVATED : 9/9/13

LOGGED BY : Claudia Rodriguez

CHECKED BY :

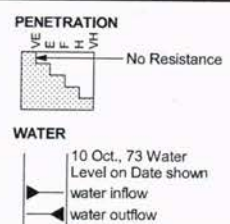
EXCAVATION DIMENSIONS : 2.00 m LONG 0.60 m WIDE

DRILLING				MATERIAL										
VE	E	F	H	SAMPLES & FIELD TESTS	ELEVATION (RL) DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, Plasticity or Particle Characteristic, Colour, Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY	RELATIVE DENSITY	DYNAMIC CONE PENETROMETER	HAND PENETROMETER	STRUCTURE & Other Observations
				QC103 QC104 TP15-0.0 (0.0-0.2)	0.0		ML	SILT low plasticity, dark brown, with sand, with medium grained, sub-angular gravel, with grass rootlets and bricks, no odour, no staining	D	F				TOPSOIL
				0.40m TP15-05 (0.4-0.6)	0.40		ML	SILT low plasticity, red-brown, with clay, with glass and charcoal, no odour, iron staining						0.15: HP In-situ =75 - 400 kPa FILL
				0.80m TP15-1.0 (0.8-1.0)	0.80		ML							0.60: HP In-situ =375 - >450 kPa
				1.80m TP15-2.0 (1.8-2.0)	1.80		CL	Silty CLAY low plasticity, orange mottled black, with sand, no odour, iron staining	D to M	H				RESIDUAL SOIL
					2.00			SILTSTONE fine grained, amorphous, layered, gray, low strength, moderately weathered, moderately fractured, no odour, iron staining in fractures						BEDROCK
					2.00			EXCAVATION TP15 TERMINATED AT 2.00 m Refusal						

PHOTOGRAPHS NOTES YES NO

METHOD
 N Natural Exposure
 E Existing Excavation
 BH Backhoe Bucket
 B Bulldozer Blade
 R Ripper

SUPPORT
 T Timbering



SAMPLES & FIELD TESTS

U50 - Undisturbed Sample
 50 mm diameter

D - Disturbed Sample

B - Bulk Disturbed Sample

MC - Moisture Content

HP - Hand Penetrometer (UCS kPa)

VS - Vane Shear; P-Peak, R-Remoulded (uncorrected kPa)

PBT - Plate Bearing Test

CLASSIFICATION SYMBOLS & SOIL DESCRIPTION
 Based on Unified Classification System

MOISTURE

D - Dry
 M - Moist
 W - Wet

CONSISTENCY/ RELATIVE DENSITY

VS - Very Soft
 S - Soft
 F - Firm
 St - Stiff
 VSt - Very Stiff
 H - Hard
 VL - Very Loose
 L - Loose
 MD - Medium Dense
 D - Dense
 VD - Very Dense

See Explanatory Notes for details of abbreviations & basis of descriptions.

SMC AUSTRALIA



UPDATED SMEC LIBRARY_AGS 3_1 RTA 1_1 LIB 08 WITH FENCE TOOL_15-05-2013.GLB Log SMEC EXCAVATION WITH DCP_CANNBERRA BRICKWORKS REV.2.GPJ <-DrawingFile>> 30/10/2013 13:54 8-30-003

EXCAVATION - GEOLOGICAL LOG

PIT NO : TP16
FILE / JOB NO : 3002369
SHEET : 1 OF 1

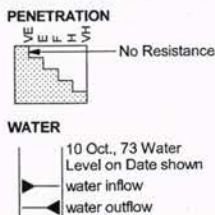
PROJECT : Old Canberra Brickworks
CLIENT : Land Development Agency
LOCATION : Yarralumla ACT
FEATURE : Geotechnical
POSITION : E: 690023.000, N: 6090573.000 (56 MGA94)
SURFACE ELEVATION : 593.710 (AHD)
EQUIPMENT TYPE : 8-tonne Excavator
METHOD : Test Pit
DATE EXCAVATED : 9/9/13
LOGGED BY : Claudia Rodriguez
CHECKED BY :
EXCAVATION DIMENSIONS : 2.00 m LONG 0.60 m WIDE

DRILLING				MATERIAL											
VE	E	F	H	SAMPLES & FIELD TESTS	ELEVATION (RL) (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, Plasticity or Particle Characteristic, Colour, Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY	RELATIVE DENSITY	DYNAMIC CONE PENETROMETER	HAND PENETROMETER	STRUCTURE & Other Observations
Penetration	Support	Ground Water Levels	Support												
				TP16-0.3 (0.0-0.2)	0.0	0.30m	GW		Silty GRAVEL coarse grained, well graded, sub-angular, dark brown, with cobbles, no odour, iron staining in gravel					X	TOPSOIL 0.15: HP In-situ =175 kPa
				0.40m TP16-0.5 (0.4-0.6)	0.40	0.75m	CL		Gravelly CLAY low plasticity, red-brown, natural sandstone, medium grained, subrounded gravel, with sand, no odour, iron staining in gravel					X	RESIDUAL SOIL 0.40: HP In-situ =300 - >450 kPa 0.60: HP In-situ =450 - >450 kPa
				0.75m TP16-1.0 (0.8-1.0)	0.75	1.15m			SANDSTONE medium to coarse grained, massive, red/orange brown, very low strength, extremely weathered, no odour, iron staining along fractures					X	BEDROCK
					1.15				EXCAVATION TP16 TERMINATED AT 1.15 m Refusal						
					1.50										
					2.00										
					2.50										
					3.00										

0217

PHOTOGRAPHS NOTES YES NO

- METHOD**
- N Natural Exposure
 - E Existing Excavation
 - BH Backhoe Bucket
 - B Bulldozer Blade
 - R Ripper
- SUPPORT**
- T Timbering



- SAMPLES & FIELD TESTS**
- U50 - Undisturbed Sample 50 mm diameter
 - D - Disturbed Sample
 - B - Bulk Disturbed Sample
 - MC - Moisture Content
 - HP - Hand Penetrometer (UCS kPa)
 - VS - Vane Shear; P-Peak, R-Remoulded (uncorrected kPa)
 - PBT - Plate Bearing Test

CLASSIFICATION SYMBOLS & SOIL DESCRIPTION
Based on Unified Classification System

- MOISTURE**
- D - Dry
 - M - Moist
 - W - Wet

- CONSISTENCY/ RELATIVE DENSITY**
- VS - Very Soft
 - S - Soft
 - F - Firm
 - St - Stiff
 - VSt - Very Stiff
 - H - Hard
 - VL - Very Loose
 - L - Loose
 - MD - Medium Dense
 - D - Dense
 - VD - Very Dense

See Explanatory Notes for details of abbreviations & basis of descriptions.

SMC AUSTRALIA



UPDATED SMEC LIBRARY_AGS_3_1 RTA 1_1 LIB 08 WITH FENCE TOOL_15-05-2013.GLB Log SMEC EXCAVATION WITH DCP_CANNBERRA BRICKWORKS REV 2.GPJ <<DrawingFile>> 30/10/2013 13:54 8.30.003

EXCAVATION - GEOLOGICAL LOG

PIT NO : TP17

PROJECT : Old Canberra Brickworks
 LOCATION : Yarralumla ACT

CLIENT : Land Development Agency
 FEATURE : Geotechnical

FILE / JOB NO : 3002369
 SHEET : 1 OF 1

POSITION : E: 690130.000, N: 6090548.000 (56 MGA94)

SURFACE ELEVATION : 591.270 (AHD)

EQUIPMENT TYPE : 8-tonne Excavator

METHOD : Test Pit

DATE EXCAVATED : 9/9/13

LOGGED BY : Claudia Rodriguez

CHECKED BY :

EXCAVATION DIMENSIONS : 2.00 m LONG 0.60 m WIDE

DRILLING				MATERIAL											
VE	E	F	H	SUPPORT	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	ELEVATION (RL) DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, Plasticity or Particle Characteristic, Colour, Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY	DYNAMIC CONE PENETROMETER	HAND PENETROMETER	STRUCTURE & Other Observations
						QC102 TP17-0.0 (0.0-0.2)	0.0		CL	Sandy CLAY low to medium plasticity, orange brown, with coarse, to 15 mm, well graded gravel, with grass rootlets, with bitumen and glass, no odour, no staining					TOPSOIL
						0.40m TP17-0.5 (0.4-0.6)	0.40		CL	Sandy CLAY coarse, to 15 mm, well graded, low to medium plasticity, orange brown, with gravel, with bitumen and glass, no odour, no staining	H				FILL 0.25: HP In-situ =425 - >450 kPa
						0.80m TP17-1.0 (0.8-1.0)	0.80			SILTSTONE fine grained, layered, grey weathered orange, very low strength, highly weathered, highly fractured, interspersed with fresh, grey, high strength shale corestones ~500 mm in diameter from ~ 0.6 m., no odour, iron staining in fractures	D				BEDROCK
							1.70			EXCAVATION TP17 TERMINATED AT 1.70 m Refusal					
							593.0								
							2.0								
							593.5								
							2.5								
							594.0								
							3.0								

PHOTOGRAPHS NOTES YES NO

METHOD N Natural Exposure E Existing Excavation BH Backhoe Bucket B Bulldozer Blade R Ripper	PENETRATION WATER 10 Oct., 73 Water Level on Date shown water inflow water outflow	SAMPLES & FIELD TESTS U50 - Undisturbed Sample 50 mm diameter D - Disturbed Sample B - Bulk Disturbed Sample MC - Moisture Content HP - Hand Penetrometer (UCS kPa) VS - Vane Shear; P-Peak, R-Remoulded (uncorrected kPa) PBT - Plate Bearing Test	CLASSIFICATION SYMBOLS & SOIL DESCRIPTION Based on Unified Classification System MOISTURE D - Dry M - Moist W - Wet	CONSISTENCY/ RELATIVE DENSITY VS - Very Soft S - Soft F - Firm St - Stiff VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense
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See Explanatory Notes for details of abbreviations & basis of descriptions.

SMC AUSTRALIA



UPDATED SMC LIBRARY_AGS 3.1 RTA 1.1 LIB 08 WITH FENCE TOOL_15-05-2013.GLB Log SMC EXCAVATION WITH DCP CANBERRA BRICKWORKS REV 2.GPJ <-DrawingFile--> 30/10/2013 13:54 8.30.003

EXCAVATION - GEOLOGICAL LOG

PIT NO : TP18
FILE / JOB NO : 3002369
SHEET : 1 OF 1

PROJECT : Old Canberra Brickworks **CLIENT :** Land Development Agency
LOCATION : Yarralumla ACT **FEATURE :** Geotechnical
POSITION : E: 690328.000, N: 6090431.000 (56 MGA94) **SURFACE ELEVATION :** 596.560 (AHD)
EQUIPMENT TYPE : 8-tonne Excavator **METHOD :** Test Pit
DATE EXCAVATED : 10/9/13 **LOGGED BY :** Kara **CHECKED BY :**
EXCAVATION DIMENSIONS : 2.00 m LONG 0.60 m WIDE

DRILLING				MATERIAL								
VE E F H	SUPPORT	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	ELEVATION (RL) DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, Plasticity or Particle Characteristic, Colour, Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY / RELATIVE DENSITY	DYNAMIC CONE PENETROMETER	HAND PENETROMETER	STRUCTURE & Other Observations
			TP18-0.0 (0.0-0.1)	0.0		SW	Clayey SAND medium grained, well graded, dark brown, trace gravel, with grass rootlets, no odour, no staining	MD				TOPSOIL
			0.40m TP18-0.5 (0.4-0.6)	0.4		CI	CLAY medium plasticity, red brown, trace gravel, no odour, no staining	St				RESIDUAL SOIL
			1.00m TP18-1.0 (1.0-1.2)	1.0			SILTSTONE fine grained, layered, orange mottled grey and red, extremely low strength, extremely weathered, highly fractured, no odour, iron staining particularly in fractures	D to M				BEDROCK
				1.37			EXCAVATION TP18 TERMINATED AT 1.37 m Refusal					

PHOTOGRAPHS NOTES YES NO

METHOD N Natural Exposure E Existing Excavation BH Backhoe Bucket B Bulldozer Blade R Ripper	PENETRATION WATER 10 Oct., 73 Water Level on Date shown water inflow water outflow	SAMPLES & FIELD TESTS U50 - Undisturbed Sample 50 mm diameter D - Disturbed Sample B - Bulk Disturbed Sample MC - Moisture Content HP - Hand Penetrometer (UCS kPa) VS - Vane Shear; P-Peak, R-Remoulded (uncorrected kPa) PBT - Plate Bearing Test	CLASSIFICATION SYMBOLS & SOIL DESCRIPTION Based on Unified Classification System MOISTURE D - Dry M - Moist W - Wet	CONSISTENCY/RELATIVE DENSITY VS - Very Soft S - Soft F - Firm St - Stiff VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense
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See Explanatory Notes for details of abbreviations & basis of descriptions.

SMC AUSTRALIA



UPDATED: SMCC LIBRARY_AGS 3_1 RTA 1_1 LIB 08 WITH FENCE TOOL_15-05-2013.GLB Log: SMCC EXCAVATION WITH DCP CANBERRA BRICKWORKS REV 2.GPJ <<DrawingFile>> 30/10/2013 13:54 8.30.003

EXCAVATION - GEOLOGICAL LOG

PIT NO : TP19

PROJECT : Old Canberra Brickworks
 LOCATION : Yarralumla ACT

CLIENT : Land Development Agency
 FEATURE : Geotechnical

FILE / JOB NO : 3002369
 SHEET : 1 OF 1

POSITION : E: 689935.000, N: 6090722.000 (56 MGA94)

SURFACE ELEVATION : 589.000 (AHD)

EQUIPMENT TYPE : 8-tonne Excavator

METHOD : Test Pit

DATE EXCAVATED : 11/9/13

LOGGED BY : Claudia Rodriguez

CHECKED BY :

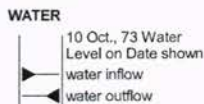
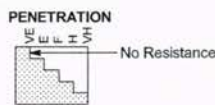
EXCAVATION DIMENSIONS : 2.00 m LONG 0.60 m WIDE

DRILLING				MATERIAL									
VE	PENETRATION	SUPPORT	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	ELEVATION (RL) DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, Plasticity or Particle Characteristic, Colour, Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY	DYNAMIC CONE PENETRO-METER	HAND PENETRO-METER	STRUCTURE & Other Observations
				TP19-0.0 (0.0-0.2)	589.0		CL	CLAY low plasticity, dark brown, with silt, with grass rootlets, no odour, no staining	D to M	F			TOPSOIL 0.00: ACM Fragments observed in vicinity TOPSOIL
				0.30m TP19-0.3 (0.3-0.5)			CI	CLAY medium plasticity, orange brown mottled grey, trace sand, trace well graded, sub-angular gravel, no odour, no staining	M	VSt			RESIDUAL SOIL
				0.50m TP19-1.0 (0.8-1.0)	589.5			DACITE coarse grained, porphyritic, massive, orange brown mottled red, extremely low strength, extremely weathered, no odour, iron staining					0.50: HP In-situ = 325 - >450 kPa
					0.98m			becoming low strength, highly weathered					0.60: Decomposed organic matter observed - possible tree root
					1.10m			EXCAVATION TP19 TERMINATED AT 1.10 m Refusal					BEDROCK
					1.50m								
					2.00m								
					2.50m								
					3.00m								

PHOTOGRAPHS NOTES YES NO

- METHOD**
- N Natural Exposure
 - E Existing Excavation
 - BH Backhoe Bucket
 - B Bulldozer Blade
 - R Ripper

- SUPPORT**
- T Timbering



- SAMPLES & FIELD TESTS**
- U50 - Undisturbed Sample 50 mm diameter
 - D - Disturbed Sample
 - B - Bulk Disturbed Sample
 - MC - Moisture Content
 - HP - Hand Penetrometer (UCS kPa)
 - VS - Vane Shear; P-Peak, R-Remoulded (uncorrected kPa)
 - PBT - Plate Bearing Test

CLASSIFICATION SYMBOLS & SOIL DESCRIPTION
Based on Unified Classification System

- MOISTURE**
- D - Dry
 - M - Moist
 - W - Wet

- CONSISTENCY/ RELATIVE DENSITY**
- VS - Very Soft
 - S - Soft
 - F - Firm
 - St - Stiff
 - VSt - Very Stiff
 - H - Hard
 - VL - Very Loose
 - L - Loose
 - MD - Medium Dense
 - D - Dense
 - VD - Very Dense

See Explanatory Notes for details of abbreviations & basis of descriptions.

SMEC AUSTRALIA



UPDATED SMEC LIBRARY_AGS_3_1 RTA 1_1 LIB 08 WITH FENCE TOOL_15-05-2013.GLB Log SMEC EXCAVATION WITH DCP CANBERRA BRICKWORKS REV 2.GPJ <<DrawingFile>> 30/10/2013 13:54 8.30.003

EXCAVATION - GEOLOGICAL LOG

PIT NO : TP20

PROJECT : Old Canberra Brickworks
 LOCATION : Yarralumla ACT

CLIENT : Land Development Agency
 FEATURE : Geotechnical

FILE / JOB NO : 3002369
 SHEET : 1 OF 1

POSITION : E: 690043.000, N: 6090659.000 (56 MGA94)

SURFACE ELEVATION : 583.000 (AHD)

EQUIPMENT TYPE : 8-tonne Excavator

METHOD : Test Pit

DATE EXCAVATED : 11/9/13

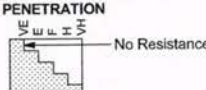
LOGGED BY : Claudia Rodriguez

CHECKED BY :

EXCAVATION DIMENSIONS : 2.00 m LONG 0.60 m WIDE

DRILLING				MATERIAL										
VE	E	F	H	SAMPLES & FIELD TESTS	ELEVATION (RL) DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, Plasticity or Particle Characteristic, Colour, Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY	RELATIVE DENSITY	DYNAMIC CONE PENETROMETER	HAND PENETROMETER	STRUCTURE & Other Observations
					TP20-0.0 (0.0-0.2)	583.0	GP	0.05m GRAVEL medium to coarse grained, to 20 mm, poorly graded, angular, grey, DGB, well compacted gravel sealed carpark, no odour, no staining						FILL
					0.40m TP20-0.5 (0.4-0.6)	583.5	Cl	0.27m CLAY medium plasticity, light brown, with coarse, to 20 mm, well graded, angular, shale and brick gravel, with bitumen and brick, no odour, no staining						BEDROCK
					1.00m TP20-1.0 (1.0-1.2)	584.0		0.47m SILTSTONE fine grained, amorphous, layered, grey weathered orange, low to medium strength, moderately weathered, highly fractured, no odour, iron staining in fractures becoming medium to high strength, slightly weathered, moderately fractured						
								1.20m	EXCAVATION TP20 TERMINATED AT 1.20 m Refusal					
						584.5								
						585.0								
						585.5								
						586.0								
						3.0								

PHOTOGRAPHS NOTES YES NO

<p>METHOD</p> <p>N Natural Exposure E Existing Excavation BH Backhoe Bucket B Bulldozer Blade R Ripper</p> <p>SUPPORT</p> <p>T Timbering</p>	<p>PENETRATION</p>  <p>WATER</p> <p>10 Oct., 73 Water Level on Date shown</p> <p>water inflow water outflow</p>	<p>SAMPLES & FIELD TESTS</p> <p>U50 - Undisturbed Sample 50 mm diameter D - Disturbed Sample B - Bulk Disturbed Sample MC - Moisture Content HP - Hand Penetrometer (UCS kPa) VS - Vane Shear; P-Peak, R-Remoulded (uncorrected kPa) PBT - Plate Bearing Test</p>	<p>CLASSIFICATION SYMBOLS & SOIL DESCRIPTION Based on Unified Classification System</p> <p>MOISTURE</p> <p>D - Dry M - Moist W - Wet</p>	<p>CONSISTENCY/RELATIVE DENSITY</p> <p>VS - Very Soft S - Soft F - Firm St - Stiff VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>
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See Explanatory Notes for details of abbreviations & basis of descriptions.

SMEC AUSTRALIA



UPDATED SMEC LIBRARY_AGS_3_1 RTA_1_1 LIB 08 WITH FENCE TOOL_15-05-2013.GLB Log SMEC EXCAVATION WITH DCP CANBERRA BRICKWORKS REV 2.GPJ <<DrawingFile>> 30/10/2013 13:54 8_30.003

EXCAVATION - GEOLOGICAL LOG

PIT NO : TP21
FILE / JOB NO : 3002369
SHEET : 1 OF 1

PROJECT : Old Canberra Brickworks
LOCATION : Yarralumla ACT
POSITION : E: 690222.000, N: 6090766.000 (56 MGA94)

CLIENT : Land Development Agency
FEATURE : Geotechnical

SURFACE ELEVATION : 588.000 (AHD)

EQUIPMENT TYPE : 8-tonne Excavator

METHOD : Test Pit

DATE EXCAVATED : 11/9/13

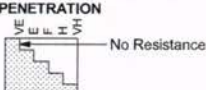
LOGGED BY : Claudia Rodriguez

CHECKED BY :

EXCAVATION DIMENSIONS : 2.00 m LONG 0.60 m WIDE

DRILLING				MATERIAL											
VE	E	F	H	SUPPORT	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	ELEVATION (RL) DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, Plasticity or Particle Characteristic, Colour, Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY	DYNAMIC CONE PENETROMETER	HAND PENETROMETER	STRUCTURE & Other Observations
							588.0 TP21-0.0 (0.0-0.2)	0.0	ML	Gravelly SILT low plasticity, dark brown, coarse, to 20 mm, well graded, sub-angular gravel, with grass rootlets, with brick, no odour, no staining	S	S	20 30 40 50 60 70 80 90 100 110 120 130 140 150	100 200 300 400	TOPSOIL
							588.5 TP21-0.5 (0.4-0.6)	0.40m	0.14m	Silty COBBLES coarse, to 400 mm, well graded, angular, red-brown, with boulders, combination of bricks, tiles, quarry refuse (shale), and white tuff fragments. Also ash, coal and bitumen observed, no odour, no staining	D	VL	160 170 180 190 200 210 220 230 240 250 260 270 280 290 300 310 320 330 340 350 360 370 380 390 400	300 400	FILL
							589.0 TP21-1.0 (0.8-1.0)	0.80m	1.56m	EXCAVATION TP21 TERMINATED AT 1.56 m Collapse					
							589.5	1.5							
							590.0	2.0							
							590.5	2.5							
							591.0	3.0							

PHOTOGRAPHS NOTES YES NO

METHOD N Natural Exposure E Existing Excavation BH Backhoe Bucket B Bulldozer Blade R Ripper	PENETRATION  No Resistance	SAMPLES & FIELD TESTS U50 - Undisturbed Sample 50 mm diameter D - Disturbed Sample B - Bulk Disturbed Sample MC - Moisture Content HP - Hand Penetrometer (UCS kPa) VS - Vane Shear, P-Peak, R-Remoulded (uncorrected kPa) PBT - Plate Bearing Test	CLASSIFICATION SYMBOLS & SOIL DESCRIPTION Based on Unified Classification System MOISTURE D - Dry M - Moist W - Wet	CONSISTENCY/RELATIVE DENSITY VS - Very Soft S - Soft F - Firm St - Stiff VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense
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See Explanatory Notes for details of abbreviations & basis of descriptions.

SMC AUSTRALIA



UPDATED SMC LIBRARY_AGS 3_1 RTA_1_1 LIB 08 WITH FENCE TOOL_15-05-2013.GLB Log SMC EXCAVATION WITH DCP CANBERRA BRICKWORKS REV 2.GPJ <<DrawingFile>> 30/10/2013 13:54 8.30.003

EXCAVATION - GEOLOGICAL LOG

PIT NO : TP22

PROJECT : Old Canberra Brickworks
 LOCATION : Yarralumla ACT

CLIENT : Land Development Agency
 FEATURE : Geotechnical

FILE / JOB NO : 3002369
 SHEET : 1 OF 1

POSITION : E: 690128.000, N: 6090800.000 (56 MGA94)

SURFACE ELEVATION : 586.000 (AHD)

EQUIPMENT TYPE : 8-tonne Excavator

METHOD : Test Pit

DATE EXCAVATED : 11/9/13

LOGGED BY : Claudia Rodriguez

CHECKED BY :

EXCAVATION DIMENSIONS : 2.00 m LONG 0.60 m WIDE

DRILLING				MATERIAL													
VE	E	F	H	SUPPORT	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	ELEVATION (RL)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, Plasticity or Particle Characteristic, Colour, Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY	RELATIVE DENSITY	DYNAMIC CONE PENETROMETER	HAND PENETROMETER	STRUCTURE & Other Observations
						TP22-0.0 (0.0-0.2)	586.0	0.0		CL	Sandy CLAY low plasticity, brown, with metal, with grass rootlets, no odour, no staining	D	St				TOPSOIL
								0.19m		SW	Gravelly SAND brown, medium grained, well graded, angular shale gravel, with clay, with ash and bitumen, no odour, no staining	D to M	MD				FILL
						0.40m QC113 TP22-0.5 (0.4-0.6)	586.5	0.5		GW	Sandy GRAVEL medium grained, well graded, angular, grey speckled white, with ash and bitumen, no odour, no staining						0.45: HP In-situ = 350 - >450 kPa
						0.80m TP22-1.0 (0.8-1.0)	587.0	1.0		CL	Sandy CLAY low plasticity, brown mottled red, with ash, bitumen and bricks, no odour, no staining	M	VSt				0.75: HP In-situ >450 kPa
								1.25m			SILTSTONE fine grained, amorphous, layered, grey, high strength, slightly weathered, moderately fractured, no odour, iron staining in fractures						BEDROCK
								1.30m			EXCAVATION TP22 TERMINATED AT 1.30 m Refusal						

PHOTOGRAPHS NOTES YES NO

<p>METHOD</p> <p>N Natural Exposure E Existing Excavation BH Backhoe Bucket B Bulldozer Blade R Ripper</p> <p>SUPPORT</p> <p>T Timbering</p>	<p>PENETRATION</p> <p>No Resistance</p> <p>WATER</p> <p>10 Oct., 73 Water Level on Date shown</p> <p>water inflow</p> <p>water outflow</p>	<p>SAMPLES & FIELD TESTS</p> <p>U50 - Undisturbed Sample 50 mm diameter</p> <p>D - Disturbed Sample</p> <p>B - Bulk Disturbed Sample</p> <p>MC - Moisture Content</p> <p>HP - Hand Penetrometer (UCS kPa)</p> <p>VS - Vane Shear, P-Peak, R-Remoulded (uncorrected kPa)</p> <p>PBT - Plate Bearing Test</p>	<p>CLASSIFICATION SYMBOLS & SOIL DESCRIPTION Based on Unified Classification System</p> <p>MOISTURE</p> <p>D - Dry M - Moist W - Wet</p>	<p>CONSISTENCY/ RELATIVE DENSITY</p> <p>VS - Very Soft S - Soft F - Firm St - Stiff VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>
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See Explanatory Notes for details of abbreviations & basis of descriptions.

SMEC AUSTRALIA



UPDATED SMEC LIBRARY_ACS 3_1 RTA 1_1 LIB 08 WITH FENCE TOOL_15-05-2013.GLB Log SMEC EXCAVATION WITH DCP_CANNBERRA BRICKWORKS REV 2.GPJ <<DrawingFile>> 30/10/2013 13:54 8.30.003

EXCAVATION - GEOLOGICAL LOG

PIT NO : TP23
FILE / JOB NO : 3002369
SHEET : 1 OF 1

PROJECT : Old Canberra Brickworks **CLIENT :** Land Development Agency
LOCATION : Yarralumla ACT **FEATURE :** Geotechnical
POSITION : E: 690166.000, N: 6090733.000 (56 MGA94) **SURFACE ELEVATION :** 605.500 (AHD)
EQUIPMENT TYPE : 8-tonne Excavator **METHOD :** Test Pit
DATE EXCAVATED : 11/9/13 **LOGGED BY :** Claudia Rodriguez **CHECKED BY :**
EXCAVATION DIMENSIONS : 2.00 m LONG 0.60 m WIDE

DRILLING				MATERIAL									
VE	E	F	H	SAMPLES & FIELD TESTS	ELEVATION (RL) DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, Plasticity or Particle Characteristic, Colour, Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY	DYNAMIC CONE PENETROMETER	HAND PENETROMETER	STRUCTURE & Other Observations
				TP23-0.0 (0.0-0.2)	606.5 0.0		ML	Sandy SILT low plasticity, brown, with grass rootlets, with brick, no odour, no staining		St			TOPSOIL 0.15: HP In-situ = 375 - 450 kPa
				0.40m TP23-0.5 (0.4-0.6)	606.0 0.5		CI	Sandy CLAY medium plasticity, brown, with coarse, to 300 mm, angular gravel, cobbles and boulders of fresh siltstone (quarry cuttings), brick, bitumen, no odour, no staining		St			FILL 0.50: HP In-situ = 350 - 450 kPa
				0.80m TP23-1.0 (0.6-1.0)	606.5 1.0		CI			St			
				1.80m TP23-2.0 (1.8-2.0)	607.0 1.5			SILTSTONE fine grained, amorphous, layered, orange-brown, medium strength, slightly weathered, highly fractured, no odour, iron staining particularly in fractures					BEDROCK
					607.5 2.0								
					608.0 2.5			EXCAVATION TP23 TERMINATED AT 2.37 m Refusal					2.37: No ACM observed
					608.5 3.0								

PHOTOGRAPHS NOTES YES NO

METHOD N Natural Exposure E Existing Excavation BH Backhoe Bucket B Bulldozer Blade R Ripper SUPPORT T Timbering	PENETRATION No Resistance WATER 10 Oct., 73 Water Level on Date shown water inflow water outflow	SAMPLES & FIELD TESTS U50 - Undisturbed Sample 50 mm diameter D - Disturbed Sample B - Bulk Disturbed Sample MC - Moisture Content HP - Hand Penetrometer (UCS kPa) VS - Vane Shear, P-Peak, R-Remoulded (uncorrected kPa) PBT - Plate Bearing Test	CLASSIFICATION SYMBOLS & SOIL DESCRIPTION Based on Unified Classification System MOISTURE D - Dry M - Moist W - Wet	CONSISTENCY/RELATIVE DENSITY VS - Very Soft S - Soft F - Firm St - Stiff VSst - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense
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See Explanatory Notes for details of abbreviations & basis of descriptions.



UPDATED SMC LIBRARY_AGS_3_1 RTA_1_1 LIB 08 WITH FENCE TOOL_15-05-2013.GLB Log_SMEC EXCAVATION WITH DCP_CANNBERRA BRICKWORKS REV 2.GPJ <<DrawingFile>> 30/10/2013 13:54 8_30.003

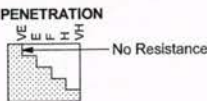
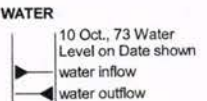
EXCAVATION - GEOLOGICAL LOG

PIT NO : TP24
FILE / JOB NO : 3002369
SHEET : 1 OF 1

PROJECT : Old Canberra Brickworks CLIENT : Land Development Agency
LOCATION : Yarralumla ACT FEATURE : Geotechnical
POSITION : E: 690226.000, N: 6090726.000 (56 MGA94) SURFACE ELEVATION : 597.500 (AHD)
EQUIPMENT TYPE : 8-tonne Excavator METHOD : Test Pit
DATE EXCAVATED : 11/9/13 LOGGED BY : Claudia Rodriquez CHECKED BY :
EXCAVATION DIMENSIONS : 2.00 m LONG 0.60 m WIDE

DRILLING				MATERIAL											
VE	E	F	H	SUPPORT	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	ELEVATION (RL) DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY	DYNAMIC CONE PENETROMETER	HAND PENETROMETER	STRUCTURE & Other Observations
						TP24-0.0 (0.0-0.2)	597.5	0.0	ML	Sandy SILT low plasticity, brown, with grass rootlets, bitumen and bricks, no odour, no staining	D	SI	25	100	TOPSOIL
								0.10m	CI	Gravelly CLAY medium plasticity, orange-brown, medium grained, to 200 mm, well graded, angular, possible DGB or quarry cuttings gravel, no odour, no staining	M	SI	25	200	FILL
						0.40m TP24-0.5 (0.4-0.5)		0.30m	CL	Gravelly CLAY low plasticity, light grey, medium grained, shale, to 100 mm, well graded, sub-rounded gravel, possible quarry cuttings, no odour, no staining	F	F	25	300	BEDROCK
								0.40m	CL	Gravelly CLAY low plasticity, light grey, medium grained, shale, to 100 mm, well graded, sub-rounded gravel, possible quarry cuttings, no odour, no staining			25	400	
							598.0	0.5		SILTSTONE fine grained, amorphous, layered, dark grey, high strength, slightly weathered, moderately fractured, no odour, iron staining in fractures EXCAVATION TP24 TERMINATED AT 0.50 m Refusal			25		
							598.5	1.0					25		
							599.0	1.5					25		
							599.5	2.0					25		
							600.0	2.5					25		
							600.5	3.0					25		

PHOTOGRAPHS NOTES YES NO

METHOD N Natural Exposure E Existing Excavation BH Backhoe Bucket B Bulldozer Blade R Ripper SUPPORT T Timbering	PENETRATION  WATER 10 Oct., 73 Water Level on Date shown 	SAMPLES & FIELD TESTS U50 - Undisturbed Sample 50 mm diameter D - Disturbed Sample B - Bulk Disturbed Sample MC - Moisture Content HP - Hand Penetrometer (UCS kPa) VS - Vane Shear, P-Peak, R-Remoulded (uncorrected kPa) PBT - Plate Bearing Test	CLASSIFICATION SYMBOLS & SOIL DESCRIPTION Based on Unified Classification System MOISTURE D - Dry M - Moist W - Wet	CONSISTENCY/ RELATIVE DENSITY VS - Very Soft S - Soft F - Firm St - Stiff VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense
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See Explanatory Notes for details of abbreviations & basis of descriptions.

SMEC AUSTRALIA



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0.13

EXCAVATION - GEOLOGICAL LOG

PROJECT : Old Canberra Brickworks
 LOCATION : Yarralumla ACT

CLIENT : Land Development Agency
 FEATURE : Geotechnical

PIT NO : TP25
 FILE / JOB NO : 3002369
 SHEET : 1 OF 1

POSITION : E: 690255.000, N: 6090627.000 (56 MGA94)

SURFACE ELEVATION : 601.000 (AHD)

EQUIPMENT TYPE : 8-tonne Excavator

METHOD : Test Pit

DATE EXCAVATED : 11/9/13

LOGGED BY : Claudia Rodriguez

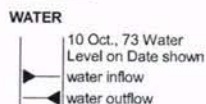
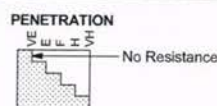
CHECKED BY :

EXCAVATION DIMENSIONS : 2.00 m LONG 0.60 m WIDE

DRILLING				MATERIAL											
VE	E	L	H	SUPPORT	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	ELEVATION (RL) DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, Plasticity or Particle Characteristic, Colour, Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY	DYNAMIC CONE PENETRO-METER Blows/150mm	HAND PENETRO-METER kPa	STRUCTURE & Other Observations
						TP25-0.0 (0.0-0.2)	601.0	0.10m	CI	CLAY medium plasticity, light brown, with coarse, well graded, angular gravel, with brick, glass and grass rootlets, no odour, no staining		St			TOPSOIL
						0.50m TP25-0.5 (0.4-0.6)	601.5			CLAYEY COBBLES coarse, well graded, angular, light brown and grey, with fresh to slightly weathered shale boulders, some bricks and glass, no odour, no staining, reworked natural material, possible quarry cuttings					FILL 0.10: reworked natural material, possible quarry cuttings 0.30: metal pipe observed
						1.00m TP25-1.0 (0.8-1.0)	602.0								
						2.00m TP25-2.0 (1.9-2.1)	603.0								2.00: rusted metal container - possibly old drum
						3.00m TP25-3.0 (2.8-3.0)	604.0								3.00: bitumen and ash observed
							3.00m			EXCAVATION TP25 TERMINATED AT 3.10 m Machine Limit					

PHOTOGRAPHS NOTES YES NO

METHOD
 N Natural Exposure
 E Existing Excavation
 BH Backhoe Bucket
 B Bulldozer Blade
 R Ripper



SAMPLES & FIELD TESTS
 U50 - Undisturbed Sample
 50 mm diameter
 D - Disturbed Sample
 B - Bulk Disturbed Sample
 MC - Moisture Content
 HP - Hand Penetrometer (UCS kPa)
 VS - Vane Shear, P-Peak, R-Remoulded (uncorrected kPa)
 PBT - Plate Bearing Test

CLASSIFICATION SYMBOLS & SOIL DESCRIPTION
 Based on Unified Classification System

MOISTURE
 D - Dry
 M - Moist
 W - Wet

CONSISTENCY/ RELATIVE DENSITY
 VS - Very Soft
 S - Soft
 F - Firm
 St - Stiff
 VSt - Very Stiff
 H - Hard
 VL - Very Loose
 L - Loose
 MD - Medium Dense
 D - Dense
 VD - Very Dense

See Explanatory Notes for details of abbreviations & basis of descriptions.

SMC AUSTRALIA



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EXCAVATION - GEOLOGICAL LOG

PIT NO : TP26

PROJECT : Old Canberra Brickworks
 LOCATION : Yarralumla ACT

CLIENT : Land Development Agency
 FEATURE : Geotechnical

FILE / JOB NO : 3002369
 SHEET : 1 OF 1

POSITION : E: 690222.000, N: 6090766.000 (56 MGA94)

SURFACE ELEVATION : 588.000 (AHD)

EQUIPMENT TYPE : 8-tonne Excavator

METHOD : Test Pit

DATE EXCAVATED : 11/9/13

LOGGED BY : Claudia Rodriguez

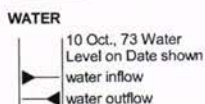
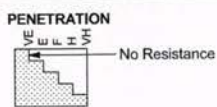
CHECKED BY :

EXCAVATION DIMENSIONS : 2.00 m LONG 0.60 m WIDE

DRILLING				MATERIAL											
VE	E	F	H	SAMPLES & FIELD TESTS	ELEVATION (RL)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, Plasticity or Particle Characteristic, Colour, Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY	RELATIVE DENSITY	DYNAMIC CONE PENETRO-METER	HAND PENETRO-METER	STRUCTURE & Other Observations
				TP26-0.0 (0.0-0.2)	588.0	0.0		ML	SILT low plasticity, dark brown, with sand, with glass, grass rootlets, no odour, no staining		St				TOPSOIL
				0.40m QC110 TP26-0.5 (0.4-0.6)	588.5	0.5		MD	COBBLES coarse, to 250 mm, poorly graded, angular, red-brown, whole bricks, with metal, ash, bitumen, no odour, no staining		MD				FILL
				0.80m TP26-1.0 (0.8-1.0)	589.0	1.0		Cl	CLAY medium plasticity, grey and brown, with silt, with bitumen, ash, no odour, no staining		St				
				1.80m TP26-2.0 (1.8-2.0)	589.5	1.5			COBBLES coarse, to 250 mm, poorly graded, angular, red-brown, whole bricks, metal, ash, bitumen, no odour, no staining						2.00: Metal engine part observed
				2.80m TP26-3.0 (2.8-3.0)	590.0	2.0			EXCAVATION TP26 TERMINATED AT 3.00 m Collapse						
					590.5	2.5									
					591.0	3.0									
					591.5	3.5									

PHOTOGRAPHS NOTES YES NO

- METHOD**
- N Natural Exposure
 - E Existing Excavation
 - BH Backhoe Bucket
 - B Bulldozer Blade
 - R Ripper



- SAMPLES & FIELD TESTS**
- U50 - Undisturbed Sample 50 mm diameter
 - D - Disturbed Sample
 - B - Bulk Disturbed Sample
 - MC - Moisture Content
 - HP - Hand Penetrometer (UCS kPa)
 - VS - Vane Shear, P-Peak, R-Remoulded (uncorrected kPa)
 - PBT - Plate Bearing Test

CLASSIFICATION SYMBOLS & SOIL DESCRIPTION
Based on Unified Classification System

- MOISTURE**
- D - Dry
 - M - Moist
 - W - Wet

- CONSISTENCY/ RELATIVE DENSITY**
- VS - Very Soft
 - S - Soft
 - F - Firm
 - St - Stiff
 - VSt - Very Stiff
 - H - Hard
 - VL - Very Loose
 - L - Loose
 - MD - Medium Dense
 - D - Dense
 - VD - Very Dense

See Explanatory Notes for details of abbreviations & basis of descriptions.

SMEC AUSTRALIA



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EXCAVATION - GEOLOGICAL LOG

PROJECT : Old Canberra Brickworks
 LOCATION : Yarralumla ACT

CLIENT : Land Development Agency
 FEATURE : Geotechnical

PIT NO : TP27
 FILE / JOB NO : 3002369
 SHEET : 1 OF 1

POSITION : E: 690250.000, N: 6090914.000 (56 MGA94)

SURFACE ELEVATION : 594.000 (AHD)

EQUIPMENT TYPE : 8-tonne Excavator

METHOD : Test Pit

DATE EXCAVATED : 11/9/13

LOGGED BY : Claudia Rodriguez

CHECKED BY :

EXCAVATION DIMENSIONS : 2.00 m LONG 0.60 m WIDE

DRILLING			MATERIAL							
VE E F H	SUPPORT	SAMPLES & FIELD TESTS	ELEVATION (RL) DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, Plasticity or Particle Characteristic, Colour, Secondary and Minor Components	MOISTURE CONDITION CONSISTENCY RELATIVE DENSITY	DYNAMIC CONE PENETROMETER Blows/150mm	HAND PENETROMETER kPa	STRUCTURE & Other Observations
		TP27-0.0 (0.0-0.7)	594.0 0.0		CL	Gravelly CLAY low plasticity, dark brown, coarse, angular gravel, with grass rootlets, no odour, no staining	SI			TOPSOIL
		0.40m TP27-0.5 (0.4-0.8)	594.5 0.5			COBBLES coarse, to 300 mm, well graded, angular, grey, with shale boulders, reworked natural material - probably quarry cuttings, overlying fine grained, fresh, high strength natural outcrops, no odour, no staining				FILL
		0.80m TP27-1.0 (0.8-1.0)	595.0 1.0			fill ending at 1.05 m, becoming unworked siltstone - high strength, fresh, moderately fractured				BEDROCK
			595.0 1.05m							
			596.0 1.30m			EXCAVATION TP27 TERMINATED AT 1.30 m Refusal				
			596.5 1.5							
			597.0 2.0							
			597.5 2.5							
			598.0 3.0							

PHOTOGRAPHS NOTES YES NO

METHOD N Natural Exposure E Existing Excavation BH Backhoe Bucket B Bulldozer Blade R Ripper	PENETRATION No Resistance	SAMPLES & FIELD TESTS U50 - Undisturbed Sample 50 mm diameter D - Disturbed Sample B - Bulk Disturbed Sample MC - Moisture Content HP - Hand Penetrometer (UCS kPa) VS - Vane Shear, P-Peak, R-Remoulded (uncorrected kPa) PBT - Plate Bearing Test	CLASSIFICATION SYMBOLS & SOIL DESCRIPTION Based on Unified Classification System	CONSISTENCY/ RELATIVE DENSITY VS - Very Soft S - Soft F - Firm St - Stiff VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense
SUPPORT T Timbering	WATER 10 Oct., 73 Water Level on Date shown water inflow water outflow	MOISTURE D - Dry M - Moist W - Wet		

See Explanatory Notes for details of abbreviations & basis of descriptions.

SMC AUSTRALIA



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EXCAVATION - GEOLOGICAL LOG

PIT NO : TP28

PROJECT : Old Canberra Brickworks
 LOCATION : Yarralumla ACT

CLIENT : Land Development Agency
 FEATURE : Geotechnical

FILE / JOB NO : 3002369
 SHEET : 1 OF 1

POSITION : E: 690321.000, N: 6090751.000 (56 MGA94)

SURFACE ELEVATION : 597.000 (AHD)

EQUIPMENT TYPE : 8-tonne Excavator

METHOD : Test Pit

DATE EXCAVATED : 11/9/13

LOGGED BY : Claudia Rodriguez

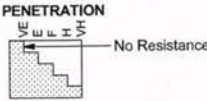
CHECKED BY :

EXCAVATION DIMENSIONS : 2.00 m LONG 0.60 m WIDE

DRILLING				MATERIAL										
VE	E	F	H	SAMPLES & FIELD TESTS	ELEVATION (RL) DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, Plasticity or Particle Characteristic, Colour, Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY	RELATIVE DENSITY	DYNAMIC CONE PENETROMETER	HAND PENETROMETER	STRUCTURE & Other Observations
					TP28-0.0 (0.0-0.2)	597.0	0.0	Cl	0.10m		St	15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100	100 200 300 400	TOPSOIL
					0.40m TP28-0.5 (0.4-0.6)	597.5	0.5				D			FILL
						598.0	1.0				L			
						598.5	1.5							
						599.0	2.0							
						599.5	2.5							
						600.0	3.0		3.00m					EXCAVATION TP28 TERMINATED AT 3.00 m Collapse
						600.5	3.5							

0311

PHOTOGRAPHS NOTES YES NO

METHOD N Natural Exposure E Existing Excavation BH Backhoe Bucket B Bulldozer Blade R Ripper	PENETRATION 	SAMPLES & FIELD TESTS U50 - Undisturbed Sample 50 mm diameter D - Disturbed Sample B - Bulk Disturbed Sample MC - Moisture Content HP - Hand Penetrometer (UCS kPa) VS - Vane Shear; P-Peak, R-Remoulded (uncorrected kPa) PBT - Plate Bearing Test	CLASSIFICATION SYMBOLS & SOIL DESCRIPTION Based on Unified Classification System MOISTURE D - Dry M - Moist W - Wet	CONSISTENCY/ RELATIVE DENSITY VS - Very Soft S - Soft F - Firm St - Stiff VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense
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See Explanatory Notes for details of abbreviations & basis of descriptions.

SMEC AUSTRALIA



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APPENDIX K: FIELD AND LABORATORY QAQC SUMMARY

QUALITY ASSURANCE / QUALITY CONTROL

QA/QC Objectives

The objective of the quality assurance / quality control program was to ensure representativeness, reliability, completeness and comparability of all data and conclusions obtained during the project. To achieve this objective, comprehensive QA/QC procedures were integrated into the sampling and analytical program.

The procedures included:

- decontamination, sample preparation and handling in accordance with best practice, Australian Standards and documented procedures during field work;
- use of experienced personnel and supervision by senior staff;
- collection and analysis of QC samples;
- use of NATA accredited laboratories and methods for all analyses undertaken; and
- internal laboratory QA/QC program.

Field QA/QC

Field Staff

The soil sampling component of the PSI was completed by John O'Brien a suitably qualified SMEC Environmental Scientist.

Field QAQC Documentation

All samples, including QA/QC samples, were transported to the laboratories with relevant chain of custody (CoC) documentation. The CoC detailed the following information:

- Site identification;
- Sampler(s);
- Nature of the sample – Soil, water or sediment;
- Collection time and date;
- Analyses to be performed; and
- Sample preservation method.

0210

Field Quality Control Samples

Field Replicates

Field replicated soil samples were collected from the same conditions as the primary sample (location, depth and strata) by splitting equal portions of soil into laboratory prepared sample jars.

The purpose of Intra-laboratory (Duplicate) field samples is to estimate the variability of the sampling material. Inter-laboratory (Triplicate) field duplicate samples are also collected and submitted to a secondary laboratory as a means to assess the accuracy of the primary laboratory. Duplicate samples were labelled to conceal their relationship to the primary sample. The sample plan required the rate of

collected and analysed replicates (both duplicate and triplicate) to be 1:20 in accordance with the NEPM (amended 2013) requirements.

The rate of replicate sample analysis is summarised below in Table 1:

Table 1 Replicate sample analysis

COC	No. Primary Samples	Duplicate Rate	Triplicate Rate
Asbestos	19	1 (1:19)	0
TPH	18	2 (1:9)	2 (1:9)
BTEX	18	2 (1:9)	2 (1:9)
PAH/Phenols	18	2 (1:9)	2 (1:9)
Metals	34	2 (1:12)	2 (1:12)
Explosive Suite	1	0	0
OCP/OPP	25	1 (1:25)	1 (1:25)
PCB	10	1 (1:10)	1 (1:10)

With the exception of asbestos and the explosive suite analysis the replicate rate of analysis met the required rate of 1:20 and are suitable for the purpose of the PSI

Field and Trip Blanks

Field prepared blanks were collected daily (QC101, QC105 and QC109), the purpose of the blanks were to assess the potential for cross contamination during sampling and holding in the field. Field prepared blanks were placed in esky utilised for each day of sampling.

A single laboratory prepared Trip Blank was kept with the sample batch during sample collection and transport.

Concentrations of contaminants of concern were below the laboratory detection limit in both the trip and field blank samples indicating that contamination did not occur during sampling.

Tabulated results of the blanks are presented in Table 3 of **Appendix I**.

Trip Blanks

A laboratory prepared trip blank (Trip Blank) was supplied to accompany samples during collection and transport until receipt at the analysing laboratory on the 11 September 2013. Trip blanks were analysed for TPH C₆-C₉ and BTEX compounds.

Concentrations of TPH and BTEX were below the laboratory detection limit indicating that cross contamination did not occur during sampling and transport.

Tabulated results of the blank are presented in Table 3 of **Appendix I**.

Trip Spikes

A single laboratory trip spike (Trip Spike) sample was utilised during the investigation on the 11 September 2013. The sample accompanied the primary samples scheduled for volatile analysis which were collected on the same day.

The primary aim of these samples was to determine the possibility of loss of volatile components during the sampling and transport procedure.

The results for the soil field matrix spikes (between 70% and 93%) indicate that in general volatiles have not been lost during the sampling and transport.

Field Sampling Methods

Test Pits

Samples were collected directly from undisturbed bulk samples from the centre of excavator bucket to minimise the potential for cross contamination. A new pair of nitrile gloves was used at each sample depth and location. GPS coordinates for each test pit was recorded on SMEC field sheets; similarly the sample depth was measured (tape measure) and recorded.

Sub surface conditions were logged in accordance with the Unified Soil Classification System (USCS); test pit logs are included in **Appendix J**.

Sample Receipt, Handling, Storage and Transportation

All soil samples were placed in laboratory prepared and supplied jars, before being placed in ice filled eskies and then transported to the laboratories with accompanying CoC documentation (refer to **Appendix L** for CoC documentation and Sample Receipt Notification).

Chain of Custody documentation was signed and dated stating that:

- All samples were received cool and in good order;
- All samples were presented in adequate sample containers;
- All samples submitted for volatiles were correctly contained with no headspace; and
- All samples were labelled appropriately to current quality field sampling protocols.

Laboratory QA/QC Procedures

Laboratories and Accreditation

The primary laboratory SGS (NATA Accreditation No. 2562, site No. 4354) is NATA accredited and used NATA accredited testing procedures. The secondary laboratory Eurofins/MGT (NATA Accreditation No. 1261, site No. 18217) also used NATA accredited testing procedures.

0209

Analytical Methods

The laboratory analytical methods were in accordance with NEPC APHA 20th and can be found in **Appendix L**. A summary of the laboratory analytical methods is provided below in Table 2.

Table 2 Laboratory Analytical Methods

PCOC	SGS Analytical Methods	MGT Analytical Methods
Asbestos	AS 4964-2004 (PLM, DS)	-
As, Cd, Cr, Cu, Ni, Pb, Zn	APHA 20th 3120-USEPA 6010C/APHA 21st 3120B	E022 Acid Extractable metals in Soils
Mercury	APHA 21st 3120B	E026 Acid Extractable metals in Soils Mercury
PCB	USEPA 8081/8082	GC-ECD E013.1 and E013.2
TPH C6-C9	USEPA 5030B/8260B	GC-MS techniques using in-house MGT 100A
TPH C10-C36	USEPA SW846-8015A	GC-FID using in-house LTM-ORG-2010
BTEX	USEPA 5030B/8260B	In house E029/E016
PAH	USEPA SW846-8270B	GC-MS in house
OCP	USEPA 8081/8082	GC-MS using in-house E013.1, E013.2, E014.1, E014.2, E017.1 and E017.2

Holding Times

The time lapse between sample collection and analyte extraction was kept minimal to reduce any biological, chemical or physical alteration of the analyte. NEPC (1999) prescribe recommended holding times for which a valid analytical results can be extracted. The relevant holding times for analytes applicable to the PSI are summarised below in Table 3.

Table 3 Recommend Holding Times

Analyte	Matrix	Recommended Holding Time
Asbestos	Soil	N/A
Metals (As,Cd, Cr, Cu, Ni, Pb, Zn)	Soil	6 Months
	Water	
Mercury	Soil	28 Days
	Water	
TPH	Soil	14 days
	Water	7 Days
BTEX, VOC	Soil	14 days
	Water	

PAH	Soil	14 days
	Water	7 Days
OCP, OPP, PCB	Soil	14 days
	Water	7 Days

SMEC completed a review of sample receipt notification and chain of custody documentation for the PSI. No holding time exceedances were reported.

Internal Laboratory Control Measures

To assess the accuracy of laboratory analysis the primary laboratory implemented the control measures detailed in Table 4.

Table 4 Laboratory Control Measures

QC Sample	Definition	Objective	Frequency	Acceptable Range
Laboratory Control Spike	Certified reference material.	To quality check laboratory preparation techniques.	1 per analytical batch per analytical method.	70-130% Recovery
Batch Duplicate	An intra-laboratory duplicate sample randomly selected from the sample batch.	To measure the precision in a given sample matrix.	1 every 10 samples per analytical method per matrix.	RPD < 50%

The acceptance targets for laboratory control samples and matrix spikes etc. is generally defined independently by each laboratory. The acceptance criteria used is that 80% of the precision and accuracy must fall within the laboratory control limits. Based on this the acceptance targets generally range between 60% and 130% recovery.

The laboratory internal standards, calibration blanks and mid-range calibration verifications were within acceptable range.

Laboratory QA/QC Results

Laboratory QC analytical results are summarised below:

- The percentage recovery for spiked samples calculated by the laboratory was within the acceptance limits for the methods used, for the majority of the analytes, for each of the testing laboratories;
- Percentage recovery results for laboratory control samples and surrogates were within acceptance limits for the majority of samples and exhibit a high percentage recovery;
- The laboratory internal standards, calibration blanks and mid-range calibration verifications were all within the acceptable range.
- The Interpretive Quality Control Reports for each laboratory are presented in Appendix H
- Laboratory blanks throughout the validation program were reported within the acceptance criteria, with no target analytes detected in any of the analysis blanks; and
- All samples were analysed within the prescribed holding time for each analyte (refer to **Appendix L – Laboratory Reports**).

Completeness

The following documentation has been included to demonstrate the completeness of valid measurements compared to the total number of measurements made:

- Chain of Custody forms;
- Sample receipt forms;
- All sample results reported;
- All laboratory duplicates reported and RPDs calculated;
- All surrogate spike data reported;
- All matrix spike (MS) data reported;
- Spike recovery acceptable limits reported; and
- National Association of Testing Authorities (NATA) stamp on reports.

This ensures the confident use of the collected data for site assessment.

Accuracy

Accuracy is the level of agreement between an experimental determination and the true value of the parameter being measured. Reference samples of matrix spikes were used to determine the accuracy of the analytical technique. The percentage recovery for spiked samples, calculated by the laboratory, is within the acceptance limits for the methods used [$\pm 30\%$]. Details are provided in the laboratory reports included within **Appendix L**.

SMEC considers that the laboratory results reported represents the true values of contaminants in situ and that bias has not been introduced:

- By chemicals during handling or transport;
- From contaminated equipment;
- From contaminated reagents; and
- During laboratory preparation and analysis.

Precision

Replicates from duplicate analyses are used to determine the precision or reproducibility of results. Precision is normally measured as the RPD between samples. The RPD should be within the recommended range of $\pm 50\%$.

Variation from the recommended range up to predefined control limits is considered acceptable. Data precision control limits adopted for the PSI is as follows:

Replicate RPDs:

- Should not exceed 50 %RPD at concentration levels greater than ten times the practical quantization limit (PQL) / estimated quantization limit (EQL) / limit of reporting (LOR).
- Should not exceed 75 %RPD at concentrations between five to ten times the PQL/ EQL/ LOR.

- Should not exceed 100 %RPD at concentration levels less than two times the PQL/ EQL/ LOR.

These Control Limits allow for higher RPDs between results of low absolute value (in comparison to LORs).

The RPD results of replicated samples generally met recommended range of $\pm 50\%$ with the exception of:

- TP28-0.5/QC111: RPDs for cobalt (44%), copper (75%) and nickel (59%);
- TP21-1.0/QC112: RPD for lead (31%);
- TP26-0.5/QC110: RPD for cobalt (57%), copper (67%), manganese (78%), nickel (67%) and zinc (47); and
- TP22-0.5/QC113: RPD for lead (34%).

The exceedances were attributed to sample heterogeneity of fill material sampled, it is noted that all detected concentrations were below the adopted assessment criteria.

SMEC considers that sufficient field and laboratory duplicates have been collected to provide a quantitative assessment of variability (or reproducibility) of data.

Sensitivity

The method detection limit is a measure of how sensitively the analytical technique / measurement quantify the concentration of the compound present. The detection limits achieved by the laboratories should be within criteria for each compound analysed. Therefore, sufficient confidence can be placed in the results obtained. The sensitivity is described as the Estimated Quantitation Limit (EQL), which is typically between 2 and 5 times the method detection limit.

Holding Times

The time between the field sampling and analyte result was as short as practicable in order to prevent any biological, chemical or physical alteration of the analyte. All samples were analysed within the prescribed holding time for each analyte (**Appendix L**).

Representativeness

Representativeness indicates how accurately and precisely the collected data represents the characteristics of a population, parameter variations at a sampling point or an environmental condition. SMEC consider that the samples collected were representative of the environmental media targeted during sampling.

QA/QC Decision Error Limits

For the purposes of this investigation, an overall error limit of 95% (i.e. 5% outside acceptable limits) was adopted in line with industry standards.

Summary QA/QC Assessment

A total population of 35 soil samples were analysed for contaminants of concern for soils. A total of two (2) duplicate samples were analysed by the primary laboratory (SGS) which is within the target

0207

ratio of 1:20. A total of two (2) triplicate samples were sent to the inter-laboratory (eurofins|mgt), which is within the target ratio of 1:20.

The reported results indicate that the accuracy and precision of the analysis was satisfactory and constitute an appropriate reflection of in-situ concentrations for soil and are thus suitable to form an adequate basis for the assessment of site conditions.

APPENDIX L: LABORATORY CERTIFICATES

0206



CHAIN OF CUSTODY FORM

1/10

SMEC OFFICE: <u>Canberra</u>		TURNAROUND REQUIREMENTS: <input checked="" type="checkbox"/> Standard - 5 day TAT		LAB: <u>SGS Australia</u>	
PROJECT: <u>OCB</u>		<input type="checkbox"/> Non Standard TAT (List due date):		ATTENTION:	
PROJECT NUMBER: <u>3002369</u>		LAB QUOTE NO: <u>ENVI-2A568E</u>	COC SEQUENCE NUMBER (Circle)		
PROJECT MANAGER: <u>Nathalie O'Toole</u>		CONTACT PH: <u>6234 1967</u>	COC: <u>(1) 2 3 4 5 6 7</u>	DISPATCH TO (ADDRESS & PHONE NO.):	
SAMPLED BY: <u>John O'Brien</u>			OF: 1 2 3 4 5 6 7	<u>16/33 Maddox st</u>	
DATE SAMPLED: <u>Nathalie.O'toole@smec.com</u>		RELINQUISHED BY: <u>John O'Brien</u>	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Email reports to (will default to PM if blank): <u>John.O'Brien@smec.com</u>		DATE/TIME: <u>11/9/2015</u>	DATE/TIME:	DATE/TIME:	DATE/TIME:
Email Invoice to (will default to PM if blank): <u>John O'Brien</u>					

Special Laboratory Instructions:

SAMPLE DETAILS						ANALYSIS REQUIRED						COMMENTS	
LAB ID	SAMPLE ID	DATE / TIME	SAMPLE MATRIX	CONTAINER TYPE & PRESERVATIVE	TOTAL NO. CONTAINERS	Hold	TRH	BTEX	13 Metals NEPM	OC/OPP			
	TP01-0-0	10/9/13	S	JAR	1				X	X			
	TP01-0-5	10/9/13	S		1	X							
	TP01-1-0	10/9/13	S		1	X							
	TP02-0-0	10/9/13			1				X	X			
	TP02-0-5	10/9/13			1	X							
	TP02-1-0	10/9/13			1	X							
	TP02-1-3	10/9/13			1	X							
	TP02-2-0	10/9/13			1	X							
	TP03-0-0	10/9/13			1				X	X			
	TP03-0-5	10/9/13			1	X							
	TP03-1-0	10/9/13	X		1	X							
TOTAL					11	8			3	3			

Notes: Low reporting limits required for groundwater as specified by SMEC Australia Pty Ltd.

Copies: WHITE: send to lab, YELLOW: to be placed in project file, PINK: to be retained in CoC book



CHAIN OF CUSTODY FORM

2/10

SMEC OFFICE: CANBERRA		TURNAROUND REQUIREMENTS: <input checked="" type="checkbox"/> Standard - 5 day TAT		LAB: SGS AUSTRALIA	
PROJECT: OCB		<input type="checkbox"/> Non Standard TAT (List due date):		ATTENTION:	
PROJECT NUMBER: 3002369		LAB QUOTE NO:	COC SEQUENCE NUMBER (Circle)		
PROJECT MANAGER: NATHALIE O'TOOLE		CONTACT PH: 62341967	COC: 1 2 3 4 5 6 7	DISPATCH TO (ADDRESS & PHONE NO.):	
SAMPLED BY: JOHN O'BRIEN		OF: 1 2 3 4 5 6 7	16/33 MADDOX ST.		
DATE SAMPLED: 10/12/13		RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Email reports to (will default to PM if blank): John.O'Brien@smec.com		DATE/TIME:	DATE/TIME:	DATE/TIME:	DATE/TIME:
Email Invoice to (will default to PM if blank): AS ABOVE					

Special Laboratory Instructions:

SAMPLE DETAILS						ANALYSIS REQUIRED						COMMENTS		
LAB ID	SAMPLE ID	DATE / TIME	SAMPLE MATRIX	CONTAINER TYPE & PRESERVATIVE	TOTAL NO. CONTAINERS	Holcy	TRH	BTEX	13 Metab	NEPM	OCF/OPP			
	TPO3-2-0	10/1/13	S	JAR	1	X								
	TPO4-0-0	10/9/13			1				X	X				
	TPO4-0-5	10/9/13			1	X								
	TPO5-0-0	9/10/13			1				X	X				
	TPO5-0-5	9/10/13			1	X								
	TPO5-1-0	9/9/13			1	X								
	TPO6-0-0	9/9/13			1				X	X				
	TPO6-0-5	9/9/13			1	X								
	TPO6-1-0	9/9/13			1	X								
	TPO6-1-7	9/9/13			1	X								
	TPO7-0-0	9/9/13			1				X	X				
					TOTAL	11	7		4	4				

Notes: Low reporting limits required for groundwater as specified by SMEC Australia Pty Ltd. Copies: WHITE: send to lab, YELLOW: to be placed in project file, PINK: to be retained in CoC book

0305



CHAIN OF CUSTODY FORM

3/10

0306

SMC OFFICE: CANBERRA PROJECT: OCB

TURNAROUND REQUIREMENTS: Standard - 5 day TXR Non Standard TXR (List due date):

PROJECT NUMBER: 3002309 LAB QUOTE NO: _____

PROJECT MANAGER: NATHALIE O'BRIEN CONTRACT PH: 62341967 COC SEQUENCE NUMBER (Circle):

SAMPLED BY: JOHN O'BRIEN RELINQUISHED BY: _____ RECEIVED BY: _____

DATE SAMPLED: Nathalie.O'Toole@Smec.com RELINQUISHED BY: _____ RECEIVED BY: _____

Email reports to (will default to PM if blank): JOHN.O'BRIEN@SMC.COM DATE/TIME: _____

Email invoice to (will default to PM if blank): AS ABOVE DATE/TIME: _____

Special Laboratory Instructions: _____

LAB: SGS AUSTRALIA

ATTENTION: _____

DISPATCH TO (ADDRESS & PHONE NO.): 16/33 MADDOX ST. ALEXANDRIA NSW 2015

SAMPLE DETAILS				ANALYSIS REQUIRED				COMMENTS	
LAB ID	SAMPLE ID	DATE / TIME	SAMPLE MATRIX	CONTAINER TYPE & PRESERVATIVE	TOTAL NO. CONTAINERS	TRH	BTEX	COCP/OPP	13 Metals NEPM
	T907-0.5	9/4/13	S	JAR	1	X			
	T907-1.0				1	X			
	T907-1.9				1	X			
	T908-0.0				1			X	
	T908-0.5				1	X			
	T908-1.0				1	X			
	T908-1.5				1	X			
	T909-0.0				1			X	
	T909-0.5				1	X			
	T909-1.0				1	X			
	T910-0.0	10/9/2013			1			X	
TOTAL					11	8		3	3

Notes: Low reporting limits required for groundwater as specified by SMC Australia Pty Ltd.

Copies: WHITE: send to lab, YELLOW: to be placed in project file, PINK: to be retained in Coc book



CHAIN OF CUSTODY FORM

4/10

SMEC OFFICE: CANBERRA		TURNAROUND REQUIREMENTS: <input checked="" type="checkbox"/> Standard - 5 day TAT		LAB: SGS AUSTRALIA	
PROJECT: CCB		<input type="checkbox"/> Non Standard TAT (List due date):		ATTENTION:	
PROJECT NUMBER: 3002569		LAB QUOTE NO:		DISPATCH TO (ADDRESS & PHONE NO.):	
PROJECT MANAGER: NATHAN O'TOOLE		CONTACT PH: 62341907		16/33 MADDOX ST.	
SAMPLED BY: JOHN O'BRIEN		COC SEQUENCE NUMBER (Circle)		ALEXANDRIA NSW 2015	
DATE SAMPLED: 10/9/2013 @ SMEC LOW		RELINQUISHED BY:		RECEIVED BY:	
Email reports to (will default to PM if blank): JOHN.OBRIEN@SMEC.COM		DATE/TIME: 10/9/13		DATE/TIME:	
Email Invoice to (will default to PM if blank): AS ABOVE		RECEIVED BY:		DATE/TIME:	
Special Laboratory Instructions:					

SAMPLE DETAILS					ANALYSIS REQUIRED						COMMENTS		
LAB ID	SAMPLE ID	DATE / TIME	SAMPLE MATRIX	CONTAINER TYPE & PRESERVATIVE	TOTAL NO. CONTAINERS	Holo	TRH	BTEX	OC/OPP	13 Metals	Negan	Asbestos	
	TP10 - 0.5	10/9/2013	S	JAR	1	X							
	TP10 - 1.0				1	X							
	TP11 - 0.0				1				X	X			
	TP11 - 0.5				1	X							
	TP11 - 1.0				1	X							
	TP12 - 0.0				1				X	X	X		
	TP12 - 0.5				1	X							
	TP13 - 0.0				1				X	X			
	TP13 - 0.5				1	X							
	TP13 - 1.0				1	X							
	TP14 - 0.0	9/9/13	T		1				X	X			
TOTAL					11	7			4	4	1		

Notes: Low reporting limits required for groundwater as specified by SMEC Australia Pty Ltd.

Copies: WHITE: send to lab, YELLOW: to be placed in project file, PINK: to be retained in CoC book

0204



CHAIN OF CUSTODY FORM

0308

5/10

SMEC OFFICE: CANBERRA TURNAROUND REQUIREMENTS: Standard - 5 day TAT Non Standard TAT (List due date):

PROJECT: OCB LAB QUOTE NO.:

PROJECT NUMBER: 3002369 CONTRACT NO.: 62341967

PROJECT MANAGER: NATHALIE OTOOLE COC SEQUENCE NUMBER (Circle):

SAMPLED BY: JOHN O'BRIEN OF: 1 2 3 4 5 6 7

DATE SAMPLED: Nathalie.Otoole@Smec.com.au RELINQUISHED BY: ALEXANDRA NSN 2015

Email reports to (will default to PM if blank): John.O'Brien@Smec.com.au RECEIVED BY: 16/33 MADDOX ST.

Email invoice to (will default to PM if blank): AS ABOVE DATE/TIME: 16/33 MADDOX ST.

Special Laboratory Instructions:

SAMPLE DETAILS					ANALYSIS REQUIRED							COMMENTS
LAB ID	SAMPLE ID	DATE / TIME	SAMPLE MATRIX	CONTAINER TYPE & PRESERVATIVE	TOTAL NO. CONTAINERS	Hold	TRH	BTEX	13 Metals NEPM	PAH	Asbestos	
	TP14-0.5	9/9/2013	S	JAR	1	X						
	TP14-1.0				1	X						
	TP15-0.0				1	X	X					
	TP15-0.5				1	X						
	TP15-1.0				1	X						
	TP15-2.0				1	X						
	TP16-0.0				1	X	X					
	TP16-0.5				1	X						
	TP16-1.0				1	X						
	TP17-0.0				1	X	X					
	TP17-0.5				1	X						
TOTAL					11	8	3	3	3	3	2	

Notes: Low reporting limits required for groundwater as specified by SMEC Australia Pty Ltd.

Copies: WHITE: send to lab, YELLOW: to be placed in project file, PINK: to be retained in CoC book

0309

CHAIN OF CUSTODY FORM

6/10



SMC OFFICE: CANBERRA
PROJECT: OCB
PROJECT NUMBER: 3002369
PROJECT MANAGER: NATHAN O'CONNOR
SAMPLED BY: JOHN O'BRIEN
TURNAROUND REQUIREMENTS: Standard - 5 day TAT
 Non Standard TAT (list due date):
LAB QUOTE NO:
CONTACT PH: 02341907
RELINQUISHED BY: [Signature]
DATE SAMPLED: [Signature]
 Email reports to (will default to PM if blank): www@smec.com
 Email invoice to (will default to PM if blank): AS ABOVE
 Special Laboratory Instructions:

LAB: SGS AUSTRALIA
ATTENTION:
 DISPATCH TO (ADDRESS & PHONE NO.):
 16/33 MADDOX ST.
 ALEXANDRIA NSW 2015
RECEIVED BY:
DATE/TIME:

COC SEQUENCE NUMBER (Circle):
 COC: 1 2 3 4 5 6 7
 OF: 1 2 3 4 5 6 7
RECEIVED BY:
DATE/TIME:

SAMPLE DETAILS		ANALYSIS REQUIRED						COMMENTS				
LAB ID	SAMPLE ID	DATE / TIME	SAMPLE MATRIX	CONTAINER TYPE & PRESERVATIVE	TOTAL NO. CONTAINERS	TRIT	BIEX	OC/OP	IS Metals	N/PM	PH	Explosive
	TP17 - 1.0	9/9/2013	S	JAR	1	X						
	TP18 - 0.0	10/9/2013			1			X				
	TP18 - 0.5				1	X						
	TP18 - 1.0				1	X						
	TP19 - 0.0	11/9/2013			1	X	X				X	
	TP19 - 0.5				1	X						
	TP19 - 1.0				1	X						
	TP21 - 0.0				1		X			X	X	
	TP21 - 0.5				1		X			X	X	
	TP21 - 1.0				1		X			X	X	
	TP25 - 0.0				1	X						
					TOTAL	11	3	3	1	3	3	1

Notes: Low reporting limits required for groundwater as specified by SMEC Australia Pty Ltd. Copies: WHITE: send to lab, YELLOW: to be placed in project file, PINK: to be retained in CoC book

0309



CHAIN OF CUSTODY FORM

7/10

SMEC OFFICE: CANBERRA		TURNAROUND REQUIREMENTS: <input checked="" type="checkbox"/> Standard - 5 day TAT		LAB: SGS AUSTRALIA	
PROJECT: OCB		<input type="checkbox"/> Non Standard TAT (List due date):		ATTENTION:	
PROJECT NUMBER: 3002369		LAB QUOTE NO:	COC SEQUENCE NUMBER (Circle)		
PROJECT MANAGER: NATHANIE O'TOOLE		CONTACT PH: 62341967	COC: 1 2 3 4 5 6 7		
SAMPLED BY: JOHN O'BRIEN		DISPATCH TO (ADDRESS & PHONE NO.):			DATE/TIME:
DATE SAMPLED: Nathalie O'Toole @ Smec .com		RECEIVED BY:			DATE/TIME:
Email reports to (will default to PM if blank): John.O'Brien @ Smec .com		REINQUISHED BY:			DATE/TIME:
Email Invoice to (will default to PM if blank): AS ABOVE		RECEIVED BY:			DATE/TIME:
Special Laboratory Instructions:					

SAMPLE DETAILS						ANALYSIS REQUIRED								COMMENTS
LAB ID	SAMPLE ID	DATE / TIME	SAMPLE MATRIX	CONTAINER TYPE & PRESERVATIVE	TOTAL NO. CONTAINERS	H/Cd	TRH	BTEX	13 Metals NEFM	PAH	OC/POB	PCB	Phenols	Asbestos
	TD 23 -0.5	11/9/2013	S	JAR	1		X	X	X	X	X	X	X	X
	TD 23 -1.0				1	X								
	TD 23 -2.0				1		X	X	X	X	X	X	X	X
	TD 24 -0.0				1		X	X	X	X	X	X	X	X
	TP 24 -0.5				1	X								
	TP 26 -0.0				1	X								
	TP 26 -0.5				1		X	X	X	X	X	X	X	X
	TP 26 -1.0				1	X								
	TP 26 -2.0				1		X	X	X	X	X	X	X	X
	TP 26 -3.0				1	X								
	TP 27 -0.0				1		X	X	X	X	X	X	X	X
TOTAL					11	5	6	6	6	6	6	6	6	6

Notes: Low reporting limits required for groundwater as specified by SMEC Australia Pty Ltd.

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CHAIN OF CUSTODY FORM

8/10



SMEC OFFICE: CANBERA
PROJECT: OCB
PROJECT NUMBER: 3002369
PROJECT MANAGER: NATHALIE O'ROLE
SAMPLED BY: JOHN O'BRIEN
DATE SAMPLED: Nathalie O'Roole @ SMEC.COM
 Email reports to (will default to PM if blank): john.obrien@smeccom
 Email invoice to (will default to PM if blank): AS ABOVE
 Special Laboratory Instructions:

TURNAROUND REQUIREMENTS: Standard - 5 day TAT
 Non Standard TAT (List due date):

LAB QUOTE NO: 62341967
CONTACT PH: 62341967

LAB: SGS AUSTRALIA
ATTENTION: DISPATCH TO (ADDRESS & PHONE NO.):
 16/33 MADDOX ST.
 ALEXANDRIA NSW 2015

RECEIVED BY: [Signature]
DATE/TIME: 11/9/2017

RELINQUISHED BY: John O'Brien
DATE/TIME: 11/9/2017

LAB ID	SAMPLE DETAILS			ANALYSIS REQUIRED							COMMENTS		
	SAMPLE ID	DATE / TIME	SAMPLE MATRIX	CONTAINER TYPE & PRESERVATIVE	TOTAL NO. CONTAINERS	Asbestos	PCBs	PAH	13 Metals	BTX		TRH	Asbestos
TP27 - 0.5	11/9/2013	S	JAR	-	1	X							
TP27 - 1.0				-		X							
TP28 - 0.0				-		X							
TP28 - 0.5				-		X							
TP25 - 0.0				-		X							
TP25 - 0.5				-		X							
TP25 - 1.0				-		X							
TP25 - 2.0				-		X							
TP25 - 3.0				-		X							
TP22 - 0.0				-		X							
TP22 - 0.5				-		X							
				TOTAL	11	7	4	4	4	4	3	3	5

Notes: Low reporting limits required for groundwater as specified by SMEC Australia Pty Ltd. Copies: WHITE: send to lab, YELLOW: to be placed in project file, PINK: to be retained in CoC book

0312



CHAIN OF CUSTODY FORM

9/10

SMC OFFICE: <u>CANBERRA</u>	TURNAROUND REQUIREMENTS: <input checked="" type="checkbox"/> Standard - 5 day TAT <input type="checkbox"/> Non Standard TAT (List due date):	LAB: <u>SGS AUSTRALIA</u>
PROJECT: <u>OCB</u>		ATTENTION:
PROJECT NUMBER: <u>300 23 69</u>	LAB QUOTE NO:	COC SEQUENCE NUMBER (Circle)
PROJECT MANAGER: <u>NATHALIE O'TOOLE</u>	CONTACT PH: <u>6234 1967</u>	GOC: 1 2 3 4 5 6 7
SAMPLED BY: <u>JOHN O'BRIEN</u>		OF: 1 2 3 4 5 6 7
DATE SAMPLED: <u>Nathalie.O'Toole@SMPC.com</u>	RELINQUISHED BY: <u>John O'Brien</u>	RECEIVED BY:
Email reports to (will default to PM if blank): <u>John.O'Brien@SMPC.com</u>	DATE/TIME: <u>11/9/2013</u>	DATE/TIME:
Email Invoice to (will default to PM if blank): <u>AS ABOVE</u>		DATE/TIME:
Special Laboratory Instructions:		

SAMPLE DETAILS						ANALYSIS REQUIRED								COMMENTS
LAB ID	SAMPLE ID	DATE / TIME	SAMPLE MATRIX	CONTAINER TYPE & PRESERVATIVE	TOTAL NO. CONTAINERS	TRH	BTEX	PAHs	PCB	OCPP	Phenols	Asbestos		
	TP22-1.0	11/9/2013	S	JAR	1	X	X	X	X			X		
	TP20-0.0				1			X				X		
	TP20-0.5				1			X						
	TP20-1.0				1	X								
	QC 101	9/9/2013			4	X	X	X	X	X	X			
	QC 102	9/9/2013			1	X								
	QC 103	9/9/2013			1	X								
	QC 104	9/9/2013			1	X								
	QC 105	10/9/2013			4	X	X	X	X	X	X			
	QC 106	10/9/2013			1	X								
	QC 107	10/9/2013			1	X								
TOTAL					17	6	3	3	5	3	2	2	2	

Notes: Low reporting limits required for groundwater as specified by SMC Australia Pty Ltd.

Copies: WHITE: send to lab, YELLOW: to be placed in project file, PINK: to be retained in CoC book

0313

CHAIN OF CUSTODY FORM

10/10



SMC OFFICE: CANBERRA
PROJECT: 0003
PROJECT NUMBER: 2002369
PROJECT MANAGER: NAIFAH OTOOLE
SAMPLED BY: JAIN CHEN
DATE SAMPLED: 10/9/2013
RELINQUISHED BY: JAIN CHEN
DATE/TIME: 10/9/2013

TURNAROUND REQUIREMENTS: Standard - 5 day TAT
 Non Standard TAT (List due date):
LAB QUOTE NO:
CONTACT PH: 62341967

LAB: 565 AUSTRALIA
ATTENTION:
DISPATCH TO (ADDRESS & PHONE NO.): 16/23 MADDER ST. ALEXANDRIA NSW 2015
RECEIVED BY:
DATE/TIME:

COC SEQUENCE NUMBER (Circle)
 COC: 1 2 3 4 5 6 7
 OF: 1 2 3 4 5 6 7

* Please FWD QC110 + QC113 to Eurofins Sydney, chilled condition

LAB ID	SAMPLE ID	DATE / TIME	SAMPLE MATRIX	CONTAINER TYPE & PRESERVATIVE	TOTAL NO. CONTAINERS	ANALYSIS REQUIRED							COMMENTS		
						TRH	BTEX	PAH	PCB	13 Metals	Phenols	OC/POP		Asbestos	TRH Cat 2
	QC 108	10/9/2013	S	JAR	1	X	X	X	X	X	X	X	X		
	QC 109	11/9/2013	W		1	X	X	X	X	X	X	X	X		
	QC 110	11/9/2013			1	X	X	X	X	X	X	X	X		
	QC 111	11/9/2013			1	X	X	X	X	X	X	X	X		
	QC 112	11/9/2013			1	X	X	X	X	X	X	X	X		
	QC 113	11/9/2013			1	X	X	X	X	X	X	X	X		
	TR 28 - 1-0	9/4/2013	W	Vial	2	X	X	X	X	X	X	X	X		
	TR 28 - 1-0	11/9/2013	S	Vial	1	X	X	X	X	X	X	X	X		
	TR 28 - 1-0	10/4/2013	S	Jar	1	X	X	X	X	X	X	X	X		
	TR 28 - 1-0	11/9/13	S	Jar	1	X	X	X	X	X	X	X	X		
	TR 28 - 2-0	11/9/13	S	Jar	1	X	X	X	X	X	X	X	X		
					TOTAL	14	3	7	8	6	4	4	5	1	1

Special Laboratory Instructions:
 Email reports to (will default to PM if blank):
 Email Invoice to (will default to PM if blank):

Notes: Low reporting limits required for groundwater as specified by SMEC Australia Pty Ltd. Copies: WHITE: send to lab, YELLOW: to be placed in project file, PINK: to be retained in CoC book



SAMPLE RECEIPT ADVICE

SE120709

CLIENT DETAILS

Contact Nathalie O'Toole
Client SMEC Australia Pty Ltd - ACT
Address Sun Micro Building
Suite 2, Level 1
243 Northbourne Avenue
LYNEHAM ACT 2602
Telephone 02 6234 1900
Facsimile 02 6234 1966
Email Nathalie.O'Toole@smec.com

Project **3002369 - OCB**
Order Number **0304-0313**
Samples 42

LABORATORY DETAILS

Manager Huong Crawford
Laboratory SGS Alexandria Environmental
Address Unit 16, 33 Maddox St
Alexandria NSW 2015
Telephone +61 2 8594 0400
Facsimile +61 2 8594 0499
Email au.environmental.sydney@sgs.com

Samples Received Thu 12/9/2013
Report Due Thu 19/9/2013
SGS Reference **SE120709**

SUBMISSION DETAILS

This is to confirm that 42 samples were received on Thursday 12/9/2013. Results are expected to be ready by Thursday 19/9/2013. Please quote SGS reference SE120709 when making enquiries. Refer below for details relating to sample integrity upon receipt.

Sample counts by matrix	38 Soils, 4 Waters	Type of documentation received	COC
Date documentation received	12/9/13@3:25pm	Samples received in good order	Yes
Samples received without headspace	Yes	Sample temperature upon receipt	3°C
Sample container provider	SGS	Turnaround time requested	Standard
Samples received in correct containers	Yes	Sufficient sample for analysis	Yes
Sample cooling method	Ice	Samples clearly labelled	Yes
Complete documentation received	Yes		

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

COMMENTS

For Explosives results refer SGS SE120709A.
Trip Spike analysed for BTEX only.
A separate portion was not supplied for Asbestos analysis. A sub-sample will be used from the jar provided.
66x samples have been placed on hold as no tests have been assigned for them by the client. These samples will not be processed.

To the extent not inconsistent with the other provisions of this document and unless specifically agreed otherwise in writing by SGS, all SGS services are rendered in accordance with the applicable SGS General Conditions of Service accessible at <http://www.sgs.com/en/Terms-and-Conditions/General-Conditions-of-Services-English.aspx> as at the date of this document. Attention is drawn to the limitations of liability and to the clauses of indemnification.

CLIENT DETAILS

Client **SMEC Australia Pty Ltd - ACT**

Project **3002369 - OCB**

SUMMARY OF ANALYSIS

No.	Sample ID	OC Pesticides in Soil	OP Pesticides in Soil	PAH (Polynuclear Aromatic Hydrocarbons) in	PCBs in Soil	Total Phenolics in Soil	TRH (Total Recoverable Hydrocarbons) in Soil	VOC's in Soil	Volatile Petroleum Hydrocarbons in Soil
001	TP01-0.0	28	13	-	-	-	-	-	-
002	TP02-0.0	28	13	-	-	-	-	-	-
003	TP03-0.0	28	13	-	-	-	-	-	-
004	TP04-0.0	28	13	-	-	-	-	-	-
005	TP05-0.0	28	13	-	-	-	-	-	-
006	TP06-0.0	28	13	-	-	-	-	-	-
007	TP07-0.0	28	13	-	-	-	-	-	-
008	TP08-0.0	28	13	-	-	-	-	-	-
009	TP09-0.0	28	13	-	-	-	-	-	-
010	TP10-0.0	28	13	-	-	-	-	-	-
011	TP11-0.0	28	13	-	-	-	-	-	-
012	TP12-0.0	28	13	-	-	-	-	-	-
013	TP13-0.0	28	13	-	-	-	-	-	-
014	TP14-0.0	28	13	-	-	-	-	-	-
015	TP15-0.0	-	-	23	-	-	9	12	8
016	TP16-0.0	-	-	23	-	-	9	12	8
017	TP17-0.0	-	-	23	-	-	9	12	8
018	TP18-0.0	28	13	-	-	-	-	-	-
019	TP19-0.0	-	-	23	-	-	9	12	8
020	TP21-0.5	-	-	23	-	-	9	12	8
021	TP21-1.0	-	-	23	-	-	9	12	8
022	TP23-0.5	28	13	23	11	1	9	12	8
023	TP23-2.0	28	13	23	11	1	9	12	8
024	TP24-0.0	28	13	23	11	1	9	12	8

0200

CONTINUED OVERLEAF

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CLIENT DETAILS

Client **SMEC Australia Pty Ltd - ACT**

Project **3002369 - OCB**

SUMMARY OF ANALYSIS

No.	Sample ID	OC Pesticides in Soil	OP Pesticides in Soil	PAH (Polynuclear Aromatic Hydrocarbons) in	PCBs in Soil	Total Phenolics in Soil	TRH (Total Recoverable Hydrocarbons) in Soil	VOC's in Soil	Volatile Petroleum Hydrocarbons in Soil
025	TP26-0.5	28	13	23	11	1	9	12	8
026	TP26-2.0	28	13	23	11	1	9	12	8
027	TP27-0.0	28	13	23	11	1	9	12	8
028	TP28-0.5	28	13	23	11	1	9	12	8
029	TP25-0.5	28	13	23	11	1	9	12	8
030	TP25-2.0	28	13	23	11	1	9	12	8
031	TP22-0.5	-	-	23	-	-	9	12	8
032	TP22-1.0	-	-	23	-	-	9	12	8
038	QC 111	28	13	23	11	1	9	12	8
039	QC 112	-	-	23	-	-	9	12	8
041	Trip Spike	-	-	-	-	-	-	12	-
042	TP28-2.0	28	13	23	11	1	9	12	8

CONTINUED OVERLEAF

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SAMPLE RECEIPT ADVICE

SE120709

CLIENT DETAILS

Client SMEC Australia Pty Ltd - ACT

Project 3002369 - OCB

SUMMARY OF ANALYSIS

No.	Sample ID	Fibre Identification in soil	Hexavalent Chromium in Soil UV/vis	Mercury in Soil	Moisture Content	Total Recoverable Metals in Soil by ICPOES from
001	TP01-0.0	-	1	1	1	11
002	TP02-0.0	-	1	1	1	11
003	TP03-0.0	-	1	1	1	11
004	TP04-0.0	-	1	1	1	11
005	TP05-0.0	-	1	1	1	11
006	TP06-0.0	-	1	1	1	11
007	TP07-0.0	-	1	1	1	11
008	TP08-0.0	-	1	1	1	11
009	TP09-0.0	-	1	1	1	11
010	TP10-0.0	-	1	1	1	11
011	TP11-0.0	-	1	1	1	11
012	TP12-0.0	2	1	1	1	11
013	TP13-0.0	-	1	1	1	11
014	TP14-0.0	-	1	1	1	11
015	TP15-0.0	2	1	1	1	11
016	TP16-0.0	2	1	1	1	11
017	TP17-0.0	2	1	1	1	11
018	TP18-0.0	-	1	1	1	11
019	TP19-0.0	-	-	-	1	-
020	TP21-0.5	-	1	1	1	11
021	TP21-1.0	-	1	1	1	11
022	TP23-0.5	2	1	1	1	11
023	TP23-2.0	2	1	1	1	11
024	TP24-0.0	2	1	1	1	11

0209

CONTINUED OVERLEAF

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CLIENT DETAILS

Client **SMEC Australia Pty Ltd - ACT**

Project **3002369 - OCB**

SUMMARY OF ANALYSIS

No.	Sample ID	Fibre Identification in soil	Hexavalent Chromium in Soil UV/Vis	Mercury in Soil	Moisture Content	Total Recoverable Metals in Soil by ICPOES from	VOCs in Water	Volatile Petroleum Hydrocarbons in Water
025	TP26-0.5	2	1	1	1	11	-	-
026	TP26-2.0	2	1	1	1	11	-	-
027	TP27-0.0	2	1	1	1	11	-	-
028	TP28-0.5	2	1	1	1	11	-	-
029	TP25-0.5	2	1	1	1	11	-	-
030	TP25-2.0	2	1	1	1	11	-	-
031	TP22-0.5	2	1	1	1	11	-	-
032	TP22-1.0	2	1	1	1	11	-	-
033	TP20-0.0	2	1	1	1	11	-	-
034	TP20-0.5	-	1	1	1	11	-	-
035	QC 101	-	-	-	-	-	12	8
036	QC 105	-	-	-	-	-	12	8
037	QC 109	-	-	-	-	-	12	8
038	QC 111	2	1	1	1	11	-	-
039	QC 112	2	1	1	1	11	-	-
040	Trip Blank	-	-	-	-	-	12	8
042	TP28-2.0	2	1	1	1	11	-	-

CONTINUED OVERLEAF

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



SAMPLE RECEIPT ADVICE

SE120709

CLIENT DETAILS

Client SMEC Australia Pty Ltd - ACT

Project 3002369 - OCB

SUMMARY OF ANALYSIS

No.	Sample ID	Hexavalent Chromium in water by Discrete Analyser	Mercury (dissolved) in Water	OC Pesticides in Water	OP Pesticides in Water	PAH (Polynuclear Aromatic Hydrocarbons) in	PCBs in Water	Total Phenolics in Water	Trace Metals (Dissolved) in Water by ICPMS	TRH (Total Recoverable Hydrocarbons) in Water
035	QC 101	1	1	28	13	22	11	1	11	9
036	QC 105	1	1	28	13	22	11	1	11	9
037	QC 109	1	1	28	13	22	11	1	11	9

0198

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

CLIENT DETAILS

Contact **Nathalie O'Toole**
 Client **SMEC Australia Pty Ltd - ACT**
 Address **Sun Micro Building
 Suite 2, Level 1
 243 Northbourne Avenue
 LYNEHAM ACT 2602**

Telephone **02 6234 1900**
 Facsimile **02 6234 1966**
 Email **Nathalie.O'Toole@smec.com**

Project **3002369 - OCB**
 Order Number **0304-0313**
 Samples **42**
 Date Received **12/9/2013**

LABORATORY DETAILS

Manager **Huong Crawford**
 Laboratory **SGS Alexandria Environmental**
 Address **Unit 16, 33 Maddox St
 Alexandria NSW 2015**

Telephone **+61 2 8594 0400**
 Facsimile **+61 2 8594 0499**
 Email **au.environmental.sydney@sgs.com**

SGS Reference **SE120709 R0**
 Report Number **0000065698**
 Date Reported **20/9/2013**

COMMENTS

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

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

Asbestos analysed by Approved Identifier Ravee Sivasubramaniam.

SIGNATORIES



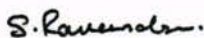
Andy Sutton
Senior Organic Chemist



Dong Liang
Metals/Inorganics Team Leader



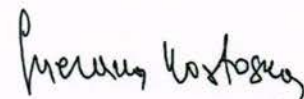
Kamrul Ahsan
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Ravee Sivasubramaniam
Asbestos Analyst



Sheila Lepasana
Senior Technician



Snezana Kostoska
2IC Inorganics Chemist



ANALYTICAL RESULTS

SE120709 R0

VOC's in Soil [AN433/AN434]

PARAMETER	UOM	LOR	TP15-0.0	TP16-0.0	TP17-0.0	TP19-0.0	TP21-0.5	TP21-1.0
			SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			9/9/2013 SE120709.015	9/9/2013 SE120709.016	9/9/2013 SE120709.017	11/9/2013 SE120709.019	11/9/2013 SE120709.020	11/9/2013 SE120709.021
Benzene	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Ethylbenzene	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
m/p-xylene	mg/kg	0.20	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
o-xylene	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Xylenes*	mg/kg	0.30	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Total BTEX*	mg/kg	0.60	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Naphthalene	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dibromofluoromethane (Surrogate)	%	-	74	74	93	76	71	71
d4-1,2-dichloroethane (Surrogate)	%	-	82	85	105	91	88	87
d8-toluene (Surrogate)	%	-	84	85	108	88	84	85
Bromofluorobenzene (Surrogate)	%	-	103	96	109	106	100	94

PARAMETER	UOM	LOR	TP23-0.5	TP23-2.0	TP24-0.0	TP26-0.5	TP26-2.0	TP27-0.0
			SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			11/9/2013 SE120709.022	11/9/2013 SE120709.023	11/9/2013 SE120709.024	11/9/2013 SE120709.025	11/9/2013 SE120709.026	11/9/2013 SE120709.027
Benzene	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Ethylbenzene	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
m/p-xylene	mg/kg	0.20	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
o-xylene	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Xylenes*	mg/kg	0.30	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Total BTEX*	mg/kg	0.60	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Naphthalene	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dibromofluoromethane (Surrogate)	%	-	70	73	78	86	85	86
d4-1,2-dichloroethane (Surrogate)	%	-	80	91	95	107	105	106
d8-toluene (Surrogate)	%	-	80	90	93	101	102	103
Bromofluorobenzene (Surrogate)	%	-	92	104	97	116	109	111

PARAMETER	UOM	LOR	TP28-0.5	TP25-0.5	TP25-2.0	TP22-0.5	TP22-1.0	QC 111
			SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			11/9/2013 SE120709.028	11/9/2013 SE120709.029	11/9/2013 SE120709.030	11/9/2013 SE120709.031	11/9/2013 SE120709.032	11/9/2013 SE120709.038
Benzene	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Ethylbenzene	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
m/p-xylene	mg/kg	0.20	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
o-xylene	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Xylenes*	mg/kg	0.30	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Total BTEX*	mg/kg	0.60	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Naphthalene	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dibromofluoromethane (Surrogate)	%	-	79	80	77	77	77	90
d4-1,2-dichloroethane (Surrogate)	%	-	103	102	98	100	101	116
d8-toluene (Surrogate)	%	-	101	96	95	95	99	115
Bromofluorobenzene (Surrogate)	%	-	111	100	99	96	103	118

0107

VOC's in Soil [AN433/AN434] (continued)

PARAMETER	UOM	LOR	QC 112	Trip Spike	TP28-2.0
			SOIL 11/9/2013 SE120709.039	SOIL 11/9/2013 SE120709.041	SOIL 11/9/2013 SE120709.042
Benzene	mg/kg	0.10	<0.1	[70%]	<0.1
Toluene	mg/kg	0.10	<0.1	[89%]	<0.1
Ethylbenzene	mg/kg	0.10	<0.1	[89%]	<0.1
m/p-xylene	mg/kg	0.20	<0.2	[93%]	<0.2
o-xylene	mg/kg	0.10	<0.1	[93%]	<0.1
Total Xylenes*	mg/kg	0.30	<0.3	-	<0.3
Total BTEX*	mg/kg	0.60	<0.6	-	<0.6
Naphthalene	mg/kg	0.10	<0.1	<0.1	<0.1
Dibromofluoromethane (Surrogate)	%	-	82	80	71
d4-1,2-dichloroethane (Surrogate)	%	-	108	105	90
d8-toluene (Surrogate)	%	-	104	105	85
Bromofluorobenzene (Surrogate)	%	-	103	107	88

Volatile Petroleum Hydrocarbons in Soil [AN433/AN434/AN410]

PARAMETER	UOM	LOR	TP15-0.0	TP16-0.0	TP17-0.0	TP19-0.0	TP21-0.5	TP21-1.0
			SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			9/9/2013 SE120709.015	9/9/2013 SE120709.016	9/9/2013 SE120709.017	11/9/2013 SE120709.019	11/9/2013 SE120709.020	11/9/2013 SE120709.021
TRH C6-C9	mg/kg	20	<20	<20	<20	<20	<20	<20
Benzene (F0)	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TRH C6-C10	mg/kg	25.0	<25	<25	<25	<25	<25	<25
TRH C6-C10 minus BTEX (F1)	mg/kg	25.0	<25	<25	<25	<25	<25	<25
Dibromofluoromethane (Surrogate)	%	-	74	74	93	76	71	71
d4-1,2-dichloroethane (Surrogate)	%	-	82	85	105	91	86	87
d8-toluene (Surrogate)	%	-	84	85	108	88	84	85
Bromofluorobenzene (Surrogate)	%	-	103	96	109	106	100	94

PARAMETER	UOM	LOR	TP23-0.5	TP23-2.0	TP24-0.0	TP26-0.5	TP26-2.0	TP27-0.0
			SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			11/9/2013 SE120709.022	11/9/2013 SE120709.023	11/9/2013 SE120709.024	11/9/2013 SE120709.025	11/9/2013 SE120709.026	11/9/2013 SE120709.027
TRH C6-C9	mg/kg	20	<20	<20	<20	<20	<20	<20
Benzene (F0)	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TRH C6-C10	mg/kg	25.0	<25	<25	<25	<25	<25	<25
TRH C6-C10 minus BTEX (F1)	mg/kg	25.0	<25	<25	<25	<25	<25	<25
Dibromofluoromethane (Surrogate)	%	-	70	73	78	86	85	86
d4-1,2-dichloroethane (Surrogate)	%	-	80	91	95	107	105	106
d8-toluene (Surrogate)	%	-	80	90	93	101	102	103
Bromofluorobenzene (Surrogate)	%	-	92	104	97	116	109	111

PARAMETER	UOM	LOR	TP28-0.5	TP25-0.5	TP25-2.0	TP22-0.5	TP22-1.0	QC 111
			SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			11/9/2013 SE120709.028	11/9/2013 SE120709.029	11/9/2013 SE120709.030	11/9/2013 SE120709.031	11/9/2013 SE120709.032	11/9/2013 SE120709.038
TRH C6-C9	mg/kg	20	<20	<20	<20	<20	<20	<20
Benzene (F0)	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TRH C6-C10	mg/kg	25.0	<25	<25	<25	<25	<25	<25
TRH C6-C10 minus BTEX (F1)	mg/kg	25.0	<25	<25	<25	<25	<25	<25
Dibromofluoromethane (Surrogate)	%	-	79	80	77	77	77	90
d4-1,2-dichloroethane (Surrogate)	%	-	103	102	98	100	101	116
d8-toluene (Surrogate)	%	-	101	96	95	95	99	115
Bromofluorobenzene (Surrogate)	%	-	111	100	99	96	103	118

PARAMETER	UOM	LOR	QC 112	TP28-2.0
			SOIL	SOIL
			11/9/2013 SE120709.039	11/9/2013 SE120709.042
TRH C6-C9	mg/kg	20	<20	<20
Benzene (F0)	mg/kg	0.10	<0.1	<0.1
TRH C6-C10	mg/kg	25.0	<25	<25
TRH C6-C10 minus BTEX (F1)	mg/kg	25.0	<25	<25
Dibromofluoromethane (Surrogate)	%	-	82	71
d4-1,2-dichloroethane (Surrogate)	%	-	108	90
d8-toluene (Surrogate)	%	-	104	85
Bromofluorobenzene (Surrogate)	%	-	103	88

898



ANALYTICAL RESULTS

SE120709 R0

TRH (Total Recoverable Hydrocarbons) in Soil [AN403]

PARAMETER	UOM	LOR	TP15-0.0	TP16-0.0	TP17-0.0	TP19-0.0	TP21-0.5	TP21-1.0
			SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			9/9/2013 SE120709.015	9/9/2013 SE120709.016	9/9/2013 SE120709.017	11/9/2013 SE120709.019	11/9/2013 SE120709.020	11/9/2013 SE120709.021
TRH C10-C14	mg/kg	20	<20	<20	<20	<20	<20	<20
TRH C15-C28	mg/kg	45.0	<45	<45	<45	<45	<45	<45
TRH C29-C36	mg/kg	45.0	<45	<45	<45	<45	<45	<45
TRH C37-C40	mg/kg	100	<100	<100	<100	<100	<100	<100
TRH >C10-C16 (F2)	mg/kg	25.0	<25	<25	<25	<25	<25	<25
TRH >C16-C34 (F3)	mg/kg	90	<90	<90	<90	<90	<90	<90
TRH >C34-C40 (F4)	mg/kg	120	<120	<120	<120	<120	<120	<120
TRH C10-C36 Total	mg/kg	110	<110	<110	<110	<110	<110	<110
TRH C10-C40 Total	mg/kg	210	<210	<210	<210	<210	<210	<210

PARAMETER	UOM	LOR	TP23-0.5	TP23-2.0	TP24-0.0	TP26-0.5	TP26-2.0	TP27-0.0
			SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			11/9/2013 SE120709.022	11/9/2013 SE120709.023	11/9/2013 SE120709.024	11/9/2013 SE120709.025	11/9/2013 SE120709.026	11/9/2013 SE120709.027
TRH C10-C14	mg/kg	20	<20	<20	<20	<20	<20	<20
TRH C15-C28	mg/kg	45.0	<45	<45	<45	<45	120	<45
TRH C29-C36	mg/kg	45.0	<45	<45	<45	<45	<45	<45
TRH C37-C40	mg/kg	100	<100	<100	<100	<100	<100	<100
TRH >C10-C16 (F2)	mg/kg	25.0	<25	<25	<25	<25	35	<25
TRH >C16-C34 (F3)	mg/kg	90	<90	<90	<90	<90	110	<90
TRH >C34-C40 (F4)	mg/kg	120	<120	<120	<120	<120	<120	<120
TRH C10-C36 Total	mg/kg	110	<110	<110	<110	<110	120	<110
TRH C10-C40 Total	mg/kg	210	<210	<210	<210	<210	<210	<210

PARAMETER	UOM	LOR	TP28-0.5	TP25-0.5	TP25-2.0	TP22-0.5	TP22-1.0	QC 111
			SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			11/9/2013 SE120709.028	11/9/2013 SE120709.029	11/9/2013 SE120709.030	11/9/2013 SE120709.031	11/9/2013 SE120709.032	11/9/2013 SE120709.038
TRH C10-C14	mg/kg	20	<20	<20	<20	<20	<20	<20
TRH C15-C28	mg/kg	45.0	<45	<45	<45	<45	<45	<45
TRH C29-C36	mg/kg	45.0	<45	<45	<45	<45	<45	<45
TRH C37-C40	mg/kg	100	<100	<100	<100	<100	<100	<100
TRH >C10-C16 (F2)	mg/kg	25.0	<25	<25	<25	<25	<25	<25
TRH >C16-C34 (F3)	mg/kg	90	<90	<90	<90	<90	<90	<90
TRH >C34-C40 (F4)	mg/kg	120	<120	<120	<120	<120	<120	<120
TRH C10-C36 Total	mg/kg	110	<110	<110	<110	<110	<110	<110
TRH C10-C40 Total	mg/kg	210	<210	<210	<210	<210	<210	<210

PARAMETER	UOM	LOR	QC 112	TP28-2.0
			SOIL	SOIL
			11/9/2013 SE120709.039	11/9/2013 SE120709.042
TRH C10-C14	mg/kg	20	<20	<20
TRH C15-C28	mg/kg	45.0	48	<45
TRH C29-C36	mg/kg	45.0	<45	<45
TRH C37-C40	mg/kg	100	<100	<100
TRH >C10-C16 (F2)	mg/kg	25.0	<25	<25
TRH >C16-C34 (F3)	mg/kg	90	<90	<90
TRH >C34-C40 (F4)	mg/kg	120	<120	<120
TRH C10-C36 Total	mg/kg	110	<110	<110
TRH C10-C40 Total	mg/kg	210	<210	<210

PAH (Polynuclear Aromatic Hydrocarbons) In Soil [AN420]

PARAMETER	UOM	LOR	TP15-0.0	TP16-0.0	TP17-0.0	TP19-0.0	TP21-0.5	TP21-1.0
			SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			9/9/2013 SE120709.015	9/9/2013 SE120709.016	9/9/2013 SE120709.017	11/9/2013 SE120709.019	11/9/2013 SE120709.020	11/9/2013 SE120709.021
Naphthalene	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2-methylnaphthalene	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
1-methylnaphthalene	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b&j)fluoranthene	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(k)fluoranthene	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a&h)anthracene	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total PAH	mg/kg	0.80	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
Carcinogenic PAHs (as BaP TEQ)*	TEQ	0.20	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
d5-nitrobenzene (Surrogate)	%	-	94	98	96	92	92	92
2-fluorobiphenyl (Surrogate)	%	-	92	92	92	88	90	90
d14-p-terphenyl (Surrogate)	%	-	108	116	108	112	106	106

PARAMETER	UOM	LOR	TP23-0.5	TP23-2.0	TP24-0.0	TP26-0.5	TP26-2.0	TP27-0.0
			SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			11/9/2013 SE120709.022	11/9/2013 SE120709.023	11/9/2013 SE120709.024	11/9/2013 SE120709.025	11/9/2013 SE120709.026	11/9/2013 SE120709.027
Naphthalene	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2-methylnaphthalene	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
1-methylnaphthalene	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b&j)fluoranthene	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(k)fluoranthene	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a&h)anthracene	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total PAH	mg/kg	0.80	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
Carcinogenic PAHs (as BaP TEQ)*	TEQ	0.20	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
d5-nitrobenzene (Surrogate)	%	-	94	86	90	88	94	94
2-fluorobiphenyl (Surrogate)	%	-	92	86	88	92	102	90
d14-p-terphenyl (Surrogate)	%	-	112	106	110	114	112	108

0195

PAH (Polynuclear Aromatic Hydrocarbons) In Soil [AN420] (continued)

PARAMETER	UOM	LOR	TP28-0.5	TP25-0.5	TP25-2.0	TP22-0.5	TP22-1.0	QC 111
			SOIL 11/9/2013 SE120709.028	SOIL 11/9/2013 SE120709.029	SOIL 11/9/2013 SE120709.030	SOIL 11/9/2013 SE120709.031	SOIL 11/9/2013 SE120709.032	SOIL 11/9/2013 SE120709.038
Naphthalene	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2-methylnaphthalene	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
1-methylnaphthalene	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.10	<0.1	<0.1	<0.1	0.1	<0.1	<0.1
Anthracene	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b&j)fluoranthene	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(k)fluoranthene	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a&h)anthracene	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total PAH	mg/kg	0.80	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
Carcinogenic PAHs (as BaP TEQ)*	TEQ	0.20	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
d5-nitrobenzene (Surrogate)	%	-	98	102	106	90	84	94
2-fluorobiphenyl (Surrogate)	%	-	102	96	106	98	86	94
d14-p-terphenyl (Surrogate)	%	-	108	104	114	110	104	102

PARAMETER	UOM	LOR	QC 112	TP28-2.0
			SOIL 11/9/2013 SE120709.039	SOIL 11/9/2013 SE120709.042
Naphthalene	mg/kg	0.10	<0.1	<0.1
2-methylnaphthalene	mg/kg	0.10	<0.1	<0.1
1-methylnaphthalene	mg/kg	0.10	<0.1	<0.1
Acenaphthylene	mg/kg	0.10	<0.1	<0.1
Acenaphthene	mg/kg	0.10	<0.1	<0.1
Fluorene	mg/kg	0.10	<0.1	<0.1
Phenanthrene	mg/kg	0.10	<0.1	<0.1
Anthracene	mg/kg	0.10	<0.1	<0.1
Fluoranthene	mg/kg	0.10	<0.1	<0.1
Pyrene	mg/kg	0.10	<0.1	<0.1
Benzo(a)anthracene	mg/kg	0.10	<0.1	<0.1
Chrysene	mg/kg	0.10	<0.1	<0.1
Benzo(b&j)fluoranthene	mg/kg	0.10	<0.1	<0.1
Benzo(k)fluoranthene	mg/kg	0.10	<0.1	<0.1
Benzo(a)pyrene	mg/kg	0.10	<0.1	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.10	<0.1	<0.1
Dibenzo(a&h)anthracene	mg/kg	0.10	<0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.10	<0.1	<0.1
Total PAH	mg/kg	0.80	<0.8	<0.8
Carcinogenic PAHs (as BaP TEQ)*	TEQ	0.20	<0.2	<0.2
d5-nitrobenzene (Surrogate)	%	-	88	92
2-fluorobiphenyl (Surrogate)	%	-	92	92
d14-p-terphenyl (Surrogate)	%	-	104	116

OC Pesticides in Soil [AN400/AN420]

PARAMETER	UOM	LOR	TP01-0.0	TP02-0.0	TP03-0.0	TP04-0.0	TP05-0.0	TP06-0.0
			SOIL 10/9/2013 SE120709.001	SOIL 10/9/2013 SE120709.002	SOIL 10/9/2013 SE120709.003	SOIL 10/9/2013 SE120709.004	SOIL 9/9/2013 SE120709.005	SOIL 9/9/2013 SE120709.006
Hexachlorobenzene (HCB)	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha BHC	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lindane	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Beta BHC	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Delta BHC	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor epoxide	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDE	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha Endosulfan	mg/kg	0.20	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Gamma Chlordane	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha Chlordane	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
trans-Nonachlor	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
p,p'-DDE	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	0.20	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Endrin	mg/kg	0.20	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
o,p'-DDD	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDT	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Beta Endosulfan	mg/kg	0.20	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
p,p'-DDD	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
p,p'-DDT	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan sulphate	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Ketone	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Isodrin	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Mirex	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Tetrachloro-m-xylene (TCMX)	%	-	101	105	123	109	101	101

OC Pesticides in Soil [AN400/AN420] (continued)

PARAMETER	UOM	LOR	TP07-0.0	TP08-0.0	TP09-0.0	TP10-0.0	TP11-0.0	TP12-0.0
			SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			9/9/2013 SE120709.007	9/9/2013 SE120709.008	9/9/2013 SE120709.009	10/9/2013 SE120709.010	10/9/2013 SE120709.011	10/9/2013 SE120709.012
Hexachlorobenzene (HCB)	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha BHC	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lindane	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Beta BHC	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Delta BHC	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor epoxide	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDE	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha Endosulfan	mg/kg	0.20	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Gamma Chlordane	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha Chlordane	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
trans-Nonachlor	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
p,p'-DDE	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	0.20	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Endrin	mg/kg	0.20	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
o,p'-DDD	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDT	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Beta Endosulfan	mg/kg	0.20	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
p,p'-DDD	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
p,p'-DDT	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan sulphate	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Ketone	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Isodrin	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Mirex	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Tetrachloro-m-xylene (TCMX)	%	-	105	109	107	109	113	107

OC Pesticides in Soil [AN400/AN420] (continued)

PARAMETER	UOM	LOR	TP13-0.0	TP14-0.0	TP18-0.0	TP23-0.5	TP23-2.0	TP24-0.0
			SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			10/9/2013 SE120709.013	9/9/2013 SE120709.014	10/9/2013 SE120709.018	11/9/2013 SE120709.022	11/9/2013 SE120709.023	11/9/2013 SE120709.024
Hexachlorobenzene (HCB)	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha BHC	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lindane	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Beta BHC	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Delta BHC	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor epoxide	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDE	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha Endosulfan	mg/kg	0.20	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Gamma Chlordane	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha Chlordane	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
trans-Nonachlor	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
p,p'-DDE	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	0.20	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Endrin	mg/kg	0.20	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
o,p'-DDD	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDT	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Beta Endosulfan	mg/kg	0.20	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
p,p'-DDD	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
p,p'-DDT	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan sulphate	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Ketone	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Isodrin	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Mirex	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Tetrachloro-m-xylene (TCMX)	%	-	105	102	111	75	99	108

0193

OC Pesticides in Soil [AN400/AN420] (continued)

PARAMETER	UOM	LOR	TP26-0.5	TP26-2.0	TP27-0.0	TP28-0.5	TP25-0.5	TP25-2.0
			SOIL 11/9/2013 SE120709.025	SOIL 11/9/2013 SE120709.026	SOIL 11/9/2013 SE120709.027	SOIL 11/9/2013 SE120709.028	SOIL 11/9/2013 SE120709.029	SOIL 11/9/2013 SE120709.030
Hexachlorobenzene (HCB)	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha BHC	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lindane	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Beta BHC	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Delta BHC	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor epoxide	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDE	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha Endosulfan	mg/kg	0.20	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Gamma Chlordane	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha Chlordane	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
trans-Nonachlor	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
p,p'-DDE	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	0.20	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Endrin	mg/kg	0.20	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
o,p'-DDD	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDT	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Beta Endosulfan	mg/kg	0.20	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
p,p'-DDD	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
p,p'-DDT	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan sulphate	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Ketone	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Isodrin	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Mirex	mg/kg	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Tetrachloro-m-xylene (TCMX)	%	-	95	111	107	108	113	107

OC Pesticides in Soil [AN400/AN420] (continued)

PARAMETER	UOM	LOR	QC 111	TP28-2.0
			SOIL 11/9/2013 SE120709.038	SOIL 11/9/2013 SE120709.042
Hexachlorobenzene (HCB)	mg/kg	0.10	<0.1	<0.1
Alpha BHC	mg/kg	0.10	<0.1	<0.1
Lindane	mg/kg	0.10	<0.1	<0.1
Heptachlor	mg/kg	0.10	<0.1	<0.1
Aldrin	mg/kg	0.10	<0.1	<0.1
Beta BHC	mg/kg	0.10	<0.1	<0.1
Delta BHC	mg/kg	0.10	<0.1	<0.1
Heptachlor epoxide	mg/kg	0.10	<0.1	<0.1
o,p'-DDE	mg/kg	0.10	<0.1	<0.1
Alpha Endosulfan	mg/kg	0.20	<0.2	<0.2
Gamma Chlordane	mg/kg	0.10	<0.1	<0.1
Alpha Chlordane	mg/kg	0.10	<0.1	<0.1
trans-Nonachlor	mg/kg	0.10	<0.1	<0.1
p,p'-DDE	mg/kg	0.10	<0.1	<0.1
Dieldrin	mg/kg	0.20	<0.2	<0.2
Endrin	mg/kg	0.20	<0.2	<0.2
o,p'-DDD	mg/kg	0.10	<0.1	<0.1
o,p'-DDT	mg/kg	0.10	<0.1	<0.1
Beta Endosulfan	mg/kg	0.20	<0.2	<0.2
p,p'-DDD	mg/kg	0.10	<0.1	<0.1
p,p'-DDT	mg/kg	0.10	<0.1	<0.1
Endosulfan sulphate	mg/kg	0.10	<0.1	<0.1
Endrin Aldehyde	mg/kg	0.10	<0.1	<0.1
Methoxychlor	mg/kg	0.10	<0.1	<0.1
Endrin Ketone	mg/kg	0.10	<0.1	<0.1
Isodrin	mg/kg	0.10	<0.1	<0.1
Mirex	mg/kg	0.10	<0.1	<0.1
Tetrachloro-m-xylene (TCMX)	%	-	115	118

0192

OP Pesticides in Soil [AN400/AN420]

PARAMETER	UOM	LOR	TP01-0.0	TP02-0.0	TP03-0.0	TP04-0.0	TP05-0.0	TP06-0.0
			SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			10/9/2013 SE120709.001	10/9/2013 SE120709.002	10/9/2013 SE120709.003	10/9/2013 SE120709.004	9/9/2013 SE120709.005	9/9/2013 SE120709.006
Dichlorvos	mg/kg	0.50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dimethoate	mg/kg	0.50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Diazinon (Dimpylate)	mg/kg	0.50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Fenitrothion	mg/kg	0.20	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Malathion	mg/kg	0.20	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.20	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Parathion-ethyl (Parathion)	mg/kg	0.20	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Bromophos Ethyl	mg/kg	0.20	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Methidathion	mg/kg	0.50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Ethion	mg/kg	0.20	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Azinphos-methyl (Guthion)	mg/kg	0.20	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
2-fluorobiphenyl (Surrogate)	%	-	106	108	120	104	110	112
d14-p-terphenyl (Surrogate)	%	-	108	112	122	110	116	116

PARAMETER	UOM	LOR	TP07-0.0	TP08-0.0	TP09-0.0	TP10-0.0	TP11-0.0	TP12-0.0
			SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			9/9/2013 SE120709.007	9/9/2013 SE120709.008	9/9/2013 SE120709.009	10/9/2013 SE120709.010	10/9/2013 SE120709.011	10/9/2013 SE120709.012
Dichlorvos	mg/kg	0.50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dimethoate	mg/kg	0.50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Diazinon (Dimpylate)	mg/kg	0.50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Fenitrothion	mg/kg	0.20	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Malathion	mg/kg	0.20	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.20	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Parathion-ethyl (Parathion)	mg/kg	0.20	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Bromophos Ethyl	mg/kg	0.20	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Methidathion	mg/kg	0.50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Ethion	mg/kg	0.20	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Azinphos-methyl (Guthion)	mg/kg	0.20	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
2-fluorobiphenyl (Surrogate)	%	-	110	102	110	102	120	112
d14-p-terphenyl (Surrogate)	%	-	118	106	114	104	126	116

PARAMETER	UOM	LOR	TP13-0.0	TP14-0.0	TP18-0.0	TP23-0.5	TP23-2.0	TP24-0.0
			SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			10/9/2013 SE120709.013	9/9/2013 SE120709.014	10/9/2013 SE120709.018	11/9/2013 SE120709.022	11/9/2013 SE120709.023	11/9/2013 SE120709.024
Dichlorvos	mg/kg	0.50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dimethoate	mg/kg	0.50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Diazinon (Dimpylate)	mg/kg	0.50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Fenitrothion	mg/kg	0.20	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Malathion	mg/kg	0.20	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.20	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Parathion-ethyl (Parathion)	mg/kg	0.20	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Bromophos Ethyl	mg/kg	0.20	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Methidathion	mg/kg	0.50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Ethion	mg/kg	0.20	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Azinphos-methyl (Guthion)	mg/kg	0.20	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
2-fluorobiphenyl (Surrogate)	%	-	106	104	100	92	86	88
d14-p-terphenyl (Surrogate)	%	-	110	108	104	112	106	110

OP Pesticides in Soil [AN400/AN420] (continued)

PARAMETER	UOM	LOR	TP26-0.5	TP26-2.0	TP27-0.0	TP28-0.5	TP25-0.5	TP25-2.0
			SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			11/9/2013 SE120709.025	11/9/2013 SE120709.026	11/9/2013 SE120709.027	11/9/2013 SE120709.028	11/9/2013 SE120709.029	11/9/2013 SE120709.030
Dichlorvos	mg/kg	0.50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dimethoate	mg/kg	0.50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Diazinon (Dimpylate)	mg/kg	0.50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Fenitrothion	mg/kg	0.20	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Malathion	mg/kg	0.20	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.20	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Parathion-ethyl (Parathion)	mg/kg	0.20	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Bromophos Ethyl	mg/kg	0.20	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Methidathion	mg/kg	0.50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Ethion	mg/kg	0.20	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Azinphos-methyl (Guthion)	mg/kg	0.20	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
2-fluorobiphenyl (Surrogate)	%	-	92	102	90	102	96	106
d14-p-terphenyl (Surrogate)	%	-	114	112	108	108	104	114

PARAMETER	UOM	LOR	QC 111	TP28-2.0
			SOIL	SOIL
			11/9/2013 SE120709.038	11/9/2013 SE120709.042
Dichlorvos	mg/kg	0.50	<0.5	<0.5
Dimethoate	mg/kg	0.50	<0.5	<0.5
Diazinon (Dimpylate)	mg/kg	0.50	<0.5	<0.5
Fenitrothion	mg/kg	0.20	<0.2	<0.2
Malathion	mg/kg	0.20	<0.2	<0.2
Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.20	<0.2	<0.2
Parathion-ethyl (Parathion)	mg/kg	0.20	<0.2	<0.2
Bromophos Ethyl	mg/kg	0.20	<0.2	<0.2
Methidathion	mg/kg	0.50	<0.5	<0.5
Ethion	mg/kg	0.20	<0.2	<0.2
Azinphos-methyl (Guthion)	mg/kg	0.20	<0.2	<0.2
2-fluorobiphenyl (Surrogate)	%	-	94	92
d14-p-terphenyl (Surrogate)	%	-	102	116

0191



ANALYTICAL RESULTS

SE120709 R0

PCBs in Soil [AN400/AN420]

PARAMETER	UOM	LOR	TP23-0.5	TP23-2.0	TP24-0.0	TP26-0.5	TP26-2.0	TP27-0.0
			SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			11/9/2013	11/9/2013	11/9/2013	11/9/2013	11/9/2013	11/9/2013
			SE120709.022	SE120709.023	SE120709.024	SE120709.025	SE120709.026	SE120709.027
Arochlor 1016	mg/kg	0.20	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1221	mg/kg	0.20	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1232	mg/kg	0.20	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1242	mg/kg	0.20	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1248	mg/kg	0.20	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1254	mg/kg	0.20	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1260	mg/kg	0.20	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1262	mg/kg	0.20	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1268	mg/kg	0.20	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Total PCBs (Arochlors)	mg/kg	1.0	<1	<1	<1	<1	<1	<1
Tetrachloro-m-xylene (TCMX)	%	-	75	99	108	95	111	107

PARAMETER	UOM	LOR	TP28-0.5	TP25-0.5	TP25-2.0	QC 111	TP28-2.0
			SOIL	SOIL	SOIL	SOIL	SOIL
			11/9/2013	11/9/2013	11/9/2013	11/9/2013	11/9/2013
			SE120709.028	SE120709.029	SE120709.030	SE120709.038	SE120709.042
Arochlor 1016	mg/kg	0.20	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1221	mg/kg	0.20	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1232	mg/kg	0.20	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1242	mg/kg	0.20	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1248	mg/kg	0.20	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1254	mg/kg	0.20	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1260	mg/kg	0.20	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1262	mg/kg	0.20	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1268	mg/kg	0.20	<0.2	<0.2	<0.2	<0.2	<0.2
Total PCBs (Arochlors)	mg/kg	1.0	<1	<1	<1	<1	<1
Tetrachloro-m-xylene (TCMX)	%	-	108	113	107	115	118



ANALYTICAL RESULTS

SE120709 R0

Total Phenolics in Soil [AN289]

			TP23-0.5	TP23-2.0	TP24-0.0	TP26-0.5	TP26-2.0	TP27-0.0
			SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			11/9/2013	11/9/2013	11/9/2013	11/9/2013	11/9/2013	11/9/2013
PARAMETER	UOM	LOR	SE120709.022	SE120709.023	SE120709.024	SE120709.025	SE120709.026	SE120709.027
Total Phenols	mg/kg	0.10	0.1	<0.1	0.2	<0.1	<0.1	0.3

			TP28-0.5	TP25-0.5	TP25-2.0	QC 111	TP28-2.0
			SOIL	SOIL	SOIL	SOIL	SOIL
			11/9/2013	11/9/2013	11/9/2013	11/9/2013	11/9/2013
PARAMETER	UOM	LOR	SE120709.028	SE120709.029	SE120709.030	SE120709.038	SE120709.042
Total Phenols	mg/kg	0.10	<0.1	<0.1	<0.1	0.1	<0.1

0190

Hexavalent Chromium in Soil UV/Vis [AN075/AN201]

			TP01-0.0	TP02-0.0	TP03-0.0	TP04-0.0	TP05-0.0	TP06-0.0
			SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			10/9/2013	10/9/2013	10/9/2013	10/9/2013	9/9/2013	9/9/2013
PARAMETER	UOM	LOR	SE120709.001	SE120709.002	SE120709.003	SE120709.004	SE120709.005	SE120709.006
Hexavalent Chromium, Cr6+	mg/kg	0.50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5

			TP07-0.0	TP08-0.0	TP09-0.0	TP10-0.0	TP11-0.0	TP12-0.0
			SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			9/9/2013	9/9/2013	9/9/2013	10/9/2013	10/9/2013	10/9/2013
PARAMETER	UOM	LOR	SE120709.007	SE120709.008	SE120709.009	SE120709.010	SE120709.011	SE120709.012
Hexavalent Chromium, Cr6+	mg/kg	0.50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5

			TP13-0.0	TP14-0.0	TP15-0.0	TP16-0.0	TP17-0.0	TP18-0.0
			SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			10/9/2013	9/9/2013	9/9/2013	9/9/2013	9/9/2013	10/9/2013
PARAMETER	UOM	LOR	SE120709.013	SE120709.014	SE120709.015	SE120709.016	SE120709.017	SE120709.018
Hexavalent Chromium, Cr6+	mg/kg	0.50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5

			TP21-0.5	TP21-1.0	TP23-0.5	TP23-2.0	TP24-0.0	TP26-0.5
			SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			11/9/2013	11/9/2013	11/9/2013	11/9/2013	11/9/2013	11/9/2013
PARAMETER	UOM	LOR	SE120709.020	SE120709.021	SE120709.022	SE120709.023	SE120709.024	SE120709.025
Hexavalent Chromium, Cr6+	mg/kg	0.50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5

			TP26-2.0	TP27-0.0	TP28-0.5	TP25-0.5	TP25-2.0	TP22-0.5
			SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			11/9/2013	11/9/2013	11/9/2013	11/9/2013	11/9/2013	11/9/2013
PARAMETER	UOM	LOR	SE120709.026	SE120709.027	SE120709.028	SE120709.029	SE120709.030	SE120709.031
Hexavalent Chromium, Cr6+	mg/kg	0.50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5

			TP22-1.0	TP20-0.0	TP20-0.5	QC 111	QC 112	TP28-2.0
			SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			11/9/2013	11/9/2013	11/9/2013	11/9/2013	11/9/2013	11/9/2013
PARAMETER	UOM	LOR	SE120709.032	SE120709.033	SE120709.034	SE120709.038	SE120709.039	SE120709.042
Hexavalent Chromium, Cr6+	mg/kg	0.50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5

Total Recoverable Metals in Soil by ICPOES from EPA 200.8 Digest [AN040/AN320]

PARAMETER	UOM	LOR	TP01-0.0	TP02-0.0	TP03-0.0	TP04-0.0	TP05-0.0	TP06-0.0
			SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			10/9/2013 SE120709.001	10/9/2013 SE120709.002	10/9/2013 SE120709.003	10/9/2013 SE120709.004	9/9/2013 SE120709.005	9/9/2013 SE120709.006
Arsenic, As	mg/kg	3.0	3	<3	9	<3	6	5
Beryllium, Be	mg/kg	0.30	0.5	0.7	1.1	0.6	0.7	0.4
Boron, B	mg/kg	5.0	<5	<5	<5	<5	<5	<5
Cadmium, Cd	mg/kg	0.30	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Cobalt, Co	mg/kg	0.30	8.4	4.4	15	6.2	8.4	5.2
Copper, Cu	mg/kg	0.50	10	6.5	16	8.6	14	10
Lead, Pb	mg/kg	1.0	19	18	35	15	39	54
Manganese, Mn	mg/kg	0.30	620	250	1200	310	720	900
Nickel, Ni	mg/kg	0.50	7.8	4.3	13	11	11	6.2
Selenium, Se	mg/kg	2.0	<2	<2	<2	<2	<2	<2
Zinc, Zn	mg/kg	0.50	41	22	49	45	68	56

PARAMETER	UOM	LOR	TP07-0.0	TP08-0.0	TP09-0.0	TP10-0.0	TP11-0.0	TP12-0.0
			SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			9/9/2013 SE120709.007	9/9/2013 SE120709.008	9/9/2013 SE120709.009	10/9/2013 SE120709.010	10/9/2013 SE120709.011	10/9/2013 SE120709.012
Arsenic, As	mg/kg	3.0	8	5	6	4	7	4
Beryllium, Be	mg/kg	0.30	0.8	0.6	0.5	0.8	0.8	0.5
Boron, B	mg/kg	5.0	<5	<5	<5	<5	<5	<5
Cadmium, Cd	mg/kg	0.30	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Cobalt, Co	mg/kg	0.30	12	8.7	6.7	18	13	6.3
Copper, Cu	mg/kg	0.50	15	12	11	23	16	7.1
Lead, Pb	mg/kg	1.0	93	47	52	62	23	15
Manganese, Mn	mg/kg	0.30	830	530	410	1500	820	360
Nickel, Ni	mg/kg	0.50	8.8	8.8	7.9	9.0	20	8.3
Selenium, Se	mg/kg	2.0	<2	<2	<2	<2	<2	<2
Zinc, Zn	mg/kg	0.50	50	49	75	34	46	110

PARAMETER	UOM	LOR	TP13-0.0	TP14-0.0	TP15-0.0	TP16-0.0	TP17-0.0	TP18-0.0
			SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			10/9/2013 SE120709.013	9/9/2013 SE120709.014	9/9/2013 SE120709.015	9/9/2013 SE120709.016	9/9/2013 SE120709.017	10/9/2013 SE120709.018
Arsenic, As	mg/kg	3.0	11	<3	6	7	8	8
Beryllium, Be	mg/kg	0.30	0.6	0.4	0.6	0.6	0.6	1.1
Boron, B	mg/kg	5.0	<5	<5	<5	<5	<5	<5
Cadmium, Cd	mg/kg	0.30	<0.3	<0.3	0.6	<0.3	<0.3	<0.3
Cobalt, Co	mg/kg	0.30	6.8	6.0	7.8	17	8.2	30
Copper, Cu	mg/kg	0.50	8.2	8.1	32	13	9.6	17
Lead, Pb	mg/kg	1.0	21	17	130	110	25	49
Manganese, Mn	mg/kg	0.30	650	880	800	1200	390	1900
Nickel, Ni	mg/kg	0.50	6.5	6.8	8.8	9.8	12	19
Selenium, Se	mg/kg	2.0	<2	<2	<2	<2	<2	2
Zinc, Zn	mg/kg	0.50	27	30	260	95	49	18

Total Recoverable Metals in Soil by ICPOES from EPA 200.8 Digest [AN040/AN320] (continued)

PARAMETER	UOM	LOR	TP21-0.5	TP21-1.0	TP23-0.5	TP23-2.0	TP24-0.0	TP26-0.5
			SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			11/9/2013 SE120709.020	11/9/2013 SE120709.021	11/9/2013 SE120709.022	11/9/2013 SE120709.023	11/9/2013 SE120709.024	11/9/2013 SE120709.025
Arsenic, As	mg/kg	3.0	5	11	9	8	4	6
Beryllium, Be	mg/kg	0.30	0.6	0.6	0.8	0.7	0.4	0.7
Boron, B	mg/kg	5.0	<5	30	<5	<5	<5	<5
Cadmium, Cd	mg/kg	0.30	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Cobalt, Co	mg/kg	0.30	5.5	7.2	9.9	15	5.6	12
Copper, Cu	mg/kg	0.50	30	25	19	14	7.6	22
Lead, Pb	mg/kg	1.0	34	37	28	29	10	25
Manganese, Mn	mg/kg	0.30	350	270	460	730	210	1100
Nickel, Ni	mg/kg	0.50	12	21	19	20	7.5	18
Selenium, Se	mg/kg	2.0	<2	<2	<2	<2	<2	<2
Zinc, Zn	mg/kg	0.50	93	71	55	66	24	53

PARAMETER	UOM	LOR	TP26-2.0	TP27-0.0	TP28-0.5	TP25-0.5	TP25-2.0	TP22-0.5
			SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			11/9/2013 SE120709.026	11/9/2013 SE120709.027	11/9/2013 SE120709.028	11/9/2013 SE120709.029	11/9/2013 SE120709.030	11/9/2013 SE120709.031
Arsenic, As	mg/kg	3.0	5	10	6	12	10	7
Beryllium, Be	mg/kg	0.30	0.7	0.7	0.8	0.7	0.8	1.1
Boron, B	mg/kg	5.0	<5	<5	<5	<5	7	8
Cadmium, Cd	mg/kg	0.30	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Cobalt, Co	mg/kg	0.30	11	11	11	12	13	8.8
Copper, Cu	mg/kg	0.50	39	12	22	21	20	17
Lead, Pb	mg/kg	1.0	24	23	14	31	32	51
Manganese, Mn	mg/kg	0.30	740	520	970	720	640	400
Nickel, Ni	mg/kg	0.50	19	17	22	22	24	19
Selenium, Se	mg/kg	2.0	<2	<2	<2	<2	<2	<2
Zinc, Zn	mg/kg	0.50	65	45	49	74	79	96

PARAMETER	UOM	LOR	TP22-1.0	TP20-0.0	TP20-0.5	QC 111	QC 112	TP28-2.0
			SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			11/9/2013 SE120709.032	11/9/2013 SE120709.033	11/9/2013 SE120709.034	11/9/2013 SE120709.038	11/9/2013 SE120709.039	11/9/2013 SE120709.042
Arsenic, As	mg/kg	3.0	13	4	<3	4	9	7
Beryllium, Be	mg/kg	0.30	1.0	<0.3	<0.3	0.5	0.6	0.8
Boron, B	mg/kg	5.0	11	6	<5	<5	46	<5
Cadmium, Cd	mg/kg	0.30	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Cobalt, Co	mg/kg	0.30	10	3.1	1.8	7.0	6.7	12
Copper, Cu	mg/kg	0.50	27	70	3.2	10	28	20
Lead, Pb	mg/kg	1.0	29	160	10	10	27	11
Manganese, Mn	mg/kg	0.30	630	160	73	730	250	620
Nickel, Ni	mg/kg	0.50	37	9.4	3.1	12	20	24
Selenium, Se	mg/kg	2.0	<2	<2	<2	<2	<2	<2
Zinc, Zn	mg/kg	0.50	150	44	7.9	48	60	38

Mercury in Soil [AN312]

PARAMETER	UOM	LOR	TP01-0.0	TP02-0.0	TP03-0.0	TP04-0.0	TP05-0.0	TP06-0.0
			SOIL 10/9/2013 SE120709.001	SOIL 10/9/2013 SE120709.002	SOIL 10/9/2013 SE120709.003	SOIL 10/9/2013 SE120709.004	SOIL 9/9/2013 SE120709.005	SOIL 9/9/2013 SE120709.006
Mercury	mg/kg	0.010	0.02	0.02	0.01	0.01	0.02	0.02

PARAMETER	UOM	LOR	TP07-0.0	TP08-0.0	TP09-0.0	TP10-0.0	TP11-0.0	TP12-0.0
			SOIL 9/9/2013 SE120709.007	SOIL 9/9/2013 SE120709.008	SOIL 9/9/2013 SE120709.009	SOIL 10/9/2013 SE120709.010	SOIL 10/9/2013 SE120709.011	SOIL 10/9/2013 SE120709.012
Mercury	mg/kg	0.010	0.03	0.02	0.02	0.03	0.02	0.02

PARAMETER	UOM	LOR	TP13-0.0	TP14-0.0	TP15-0.0	TP16-0.0	TP17-0.0	TP18-0.0
			SOIL 10/9/2013 SE120709.013	SOIL 9/9/2013 SE120709.014	SOIL 9/9/2013 SE120709.015	SOIL 9/9/2013 SE120709.016	SOIL 9/9/2013 SE120709.017	SOIL 10/9/2013 SE120709.018
Mercury	mg/kg	0.010	0.02	0.01	0.19	0.02	0.01	0.02

PARAMETER	UOM	LOR	TP21-0.5	TP21-1.0	TP23-0.5	TP23-2.0	TP24-0.0	TP26-0.5
			SOIL 11/9/2013 SE120709.020	SOIL 11/9/2013 SE120709.021	SOIL 11/9/2013 SE120709.022	SOIL 11/9/2013 SE120709.023	SOIL 11/9/2013 SE120709.024	SOIL 11/9/2013 SE120709.025
Mercury	mg/kg	0.010	0.02	0.02	0.02	0.01	0.01	0.01

PARAMETER	UOM	LOR	TP26-2.0	TP27-0.0	TP28-0.5	TP25-0.5	TP25-2.0	TP22-0.5
			SOIL 11/9/2013 SE120709.026	SOIL 11/9/2013 SE120709.027	SOIL 11/9/2013 SE120709.028	SOIL 11/9/2013 SE120709.029	SOIL 11/9/2013 SE120709.030	SOIL 11/9/2013 SE120709.031
Mercury	mg/kg	0.010	<0.01	0.04	0.01	0.03	0.04	0.03

PARAMETER	UOM	LOR	TP22-1.0	TP20-0.0	TP20-0.5	QC 111	QC 112	TP28-2.0
			SOIL 11/9/2013 SE120709.032	SOIL 11/9/2013 SE120709.033	SOIL 11/9/2013 SE120709.034	SOIL 11/9/2013 SE120709.038	SOIL 11/9/2013 SE120709.039	SOIL 11/9/2013 SE120709.042
Mercury	mg/kg	0.010	0.01	0.01	0.01	<0.01	0.01	<0.01

0183

Fibre Identification in soil [AN602]

			TP12-0.0	TP15-0.0	TP16-0.0	TP17-0.0	TP23-0.5	TP23-2.0
			SOIL 10/9/2013	SOIL 9/9/2013	SOIL 9/9/2013	SOIL 9/9/2013	SOIL 11/9/2013	SOIL 11/9/2013
PARAMETER	UOM	LOR	SE120709.012	SE120709.015	SE120709.016	SE120709.017	SE120709.022	SE120709.023
Asbestos Detected	No unit	-	No	No	No	No	No	No
Estimated Fibres	%w/w	0.010	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

			TP24-0.0	TP26-0.5	TP26-2.0	TP27-0.0	TP28-0.5	TP25-0.5
			SOIL 11/9/2013	SOIL 11/9/2013	SOIL 11/9/2013	SOIL 11/9/2013	SOIL 11/9/2013	SOIL 11/9/2013
PARAMETER	UOM	LOR	SE120709.024	SE120709.025	SE120709.026	SE120709.027	SE120709.028	SE120709.029
Asbestos Detected	No unit	-	No	No	No	No	No	No
Estimated Fibres	%w/w	0.010	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

			TP25-2.0	TP22-0.5	TP22-1.0	TP20-0.0	QC 111	QC 112
			SOIL 11/9/2013	SOIL 11/9/2013	SOIL 11/9/2013	SOIL 11/9/2013	SOIL 11/9/2013	SOIL 11/9/2013
PARAMETER	UOM	LOR	SE120709.030	SE120709.031	SE120709.032	SE120709.033	SE120709.038	SE120709.039
Asbestos Detected	No unit	-	No	No	No	No	No	No
Estimated Fibres	%w/w	0.010	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

			TP28-2.0
			SOIL 11/9/2013
PARAMETER	UOM	LOR	SE120709.042
Asbestos Detected	No unit	-	No
Estimated Fibres	%w/w	0.010	<0.01

Moisture Content [AN002]

			TP01-0.0	TP02-0.0	TP03-0.0	TP04-0.0	TP05-0.0	TP06-0.0
			SOIL 10/9/2013	SOIL 10/9/2013	SOIL 10/9/2013	SOIL 10/9/2013	SOIL 9/9/2013	SOIL 9/9/2013
PARAMETER	UOM	LOR	SE120709.001	SE120709.002	SE120709.003	SE120709.004	SE120709.005	SE120709.006
% Moisture	%	0.50	11.7	15.3	24.3	7.0	22.4	15.2

			TP07-0.0	TP08-0.0	TP09-0.0	TP10-0.0	TP11-0.0	TP12-0.0
			SOIL 9/9/2013	SOIL 9/9/2013	SOIL 9/9/2013	SOIL 10/9/2013	SOIL 10/9/2013	SOIL 10/9/2013
PARAMETER	UOM	LOR	SE120709.007	SE120709.008	SE120709.009	SE120709.010	SE120709.011	SE120709.012
% Moisture	%	0.50	18.0	22.3	19.7	18.8	15.4	24.7

			TP13-0.0	TP14-0.0	TP15-0.0	TP16-0.0	TP17-0.0	TP18-0.0
			SOIL 10/9/2013	SOIL 9/9/2013	SOIL 9/9/2013	SOIL 9/9/2013	SOIL 9/9/2013	SOIL 10/9/2013
PARAMETER	UOM	LOR	SE120709.013	SE120709.014	SE120709.015	SE120709.016	SE120709.017	SE120709.018
% Moisture	%	0.50	13.5	14.2	13.4	27.8	7.5	14.7

			TP19-0.0	TP21-0.5	TP21-1.0	TP23-0.5	TP23-2.0	TP24-0.0
			SOIL 11/9/2013	SOIL 11/9/2013	SOIL 11/9/2013	SOIL 11/9/2013	SOIL 11/9/2013	SOIL 11/9/2013
PARAMETER	UOM	LOR	SE120709.019	SE120709.020	SE120709.021	SE120709.022	SE120709.023	SE120709.024
% Moisture	%	0.50	11.3	17.0	25.3	17.4	8.1	23.0

			TP26-0.5	TP26-2.0	TP27-0.0	TP28-0.5	TP25-0.5	TP25-2.0
			SOIL 11/9/2013	SOIL 11/9/2013	SOIL 11/9/2013	SOIL 11/9/2013	SOIL 11/9/2013	SOIL 11/9/2013
PARAMETER	UOM	LOR	SE120709.025	SE120709.026	SE120709.027	SE120709.028	SE120709.029	SE120709.030
% Moisture	%	0.50	12.6	11.3	9.6	13.3	10.5	10.6

			TP22-0.5	TP22-1.0	TP20-0.0	TP20-0.5	QC 111	QC 112
			SOIL 11/9/2013	SOIL 11/9/2013	SOIL 11/9/2013	SOIL 11/9/2013	SOIL 11/9/2013	SOIL 11/9/2013
PARAMETER	UOM	LOR	SE120709.031	SE120709.032	SE120709.033	SE120709.034	SE120709.035	SE120709.039
% Moisture	%	0.50	17.7	19.0	1.9	4.7	12.3	18.0

			TP28-2.0
			SOIL 11/9/2013
PARAMETER	UOM	LOR	SE120709.042
% Moisture	%	0.50	14.6

0287

Volatile Petroleum Hydrocarbons in Water [AN433/AN434/AN410]

PARAMETER	UOM	LOR	QC 101	QC 105	QC 109	Trip Blank
			WATER 9/9/2013 SE120709.035	WATER 10/9/2013 SE120709.036	WATER 11/9/2013 SE120709.037	WATER 9/9/2013 SE120709.040
Benzene (F0)	µg/L	0.50	<0.5	<0.5	<0.5	<0.5
TRH C6-C9	µg/L	40	<40	<40	<40	<40
TRH C6-C10	µg/L	50	<50	<50	<50	<50
TRH C6-C10 minus BTEX (F1)	µg/L	50	<50	<50	<50	<50
Dibromofluoromethane (Surrogate)	%	-	103	106	106	107
d4-1,2-dichloroethane (Surrogate)	%	-	111	115	115	117
d8-toluene (Surrogate)	%	-	106	108	106	106
Bromofluorobenzene (Surrogate)	%	-	100	99	100	100

VOCs in Water [AN433/AN434]

PARAMETER	UOM	LOR	QC 101	QC 105	QC 109	Trip Blank
			WATER 9/9/2013 SE120709.035	WATER 10/9/2013 SE120709.036	WATER 11/9/2013 SE120709.037	WATER 9/9/2013 SE120709.040
Benzene	µg/L	0.50	<0.5	<0.5	<0.5	<0.5
Toluene	µg/L	0.50	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	µg/L	0.50	<0.5	<0.5	<0.5	<0.5
m/p-xylene	µg/L	1.0	<1	<1	<1	<1
o-xylene	µg/L	0.50	<0.5	<0.5	<0.5	<0.5
Naphthalene	µg/L	0.50	<0.5	<0.5	<0.5	<0.5
Total Xylenes	µg/L	1.50	<1.5	<1.5	<1.5	<1.5
Total BTEX	µg/L	3.0	<3	<3	<3	<3
Dibromofluoromethane (Surrogate)	%	-	103	106	106	107
d4-1,2-dichloroethane (Surrogate)	%	-	111	115	115	117
d8-toluene (Surrogate)	%	-	106	108	106	106
Bromofluorobenzene (Surrogate)	%	-	100	99	100	100

0186

TRH (Total Recoverable Hydrocarbons) in Water [AN403]

PARAMETER	UOM	LOR	QC 101	QC 105	QC 109
			WATER 9/9/2013 SE120709.035	WATER 10/9/2013 SE120709.036	WATER 11/9/2013 SE120709.037
TRH C10-C14	µg/L	50	<50	<50	<50
TRH C15-C28	µg/L	200	<200	<200	<200
TRH C29-C36	µg/L	200	<200	<200	<200
TRH C37-C40	µg/L	200	<200	<200	<200
TRH >C10-C16 (F2)	µg/L	60	<60	<60	<60
TRH >C16-C34 (F3)	µg/L	500	<500	<500	<500
TRH >C34-C40 (F4)	µg/L	500	<500	<500	<500
TRH C10-C36	µg/L	450	<450	<450	<450
TRH C10-C40	µg/L	650	<650	<650	<650

PAH (Polynuclear Aromatic Hydrocarbons) in Water [AN420]

PARAMETER	UOM	LOR	QC 101	QC 105	QC 109
			WATER 9/9/2013 SE120709.035	WATER 10/9/2013 SE120709.036	WATER 11/9/2013 SE120709.037
Naphthalene	µg/L	0.10	<0.1	<0.1	<0.1
2-methylnaphthalene	µg/L	0.10	<0.1	<0.1	<0.1
1-methylnaphthalene	µg/L	0.10	<0.1	<0.1	<0.1
Acenaphthylene	µg/L	0.10	<0.1	<0.1	<0.1
Acenaphthene	µg/L	0.10	<0.1	<0.1	<0.1
Fluorene	µg/L	0.10	<0.1	<0.1	<0.1
Phenanthrene	µg/L	0.10	<0.1	<0.1	<0.1
Anthracene	µg/L	0.10	<0.1	<0.1	<0.1
Fluoranthene	µg/L	0.10	<0.1	<0.1	<0.1
Pyrene	µg/L	0.10	<0.1	<0.1	<0.1
Benzo(a)anthracene	µg/L	0.10	<0.1	<0.1	<0.1
Chrysene	µg/L	0.10	<0.1	<0.1	<0.1
Benzo(b&j)fluoranthene	µg/L	0.10	<0.1	<0.1	<0.1
Benzo(k)fluoranthene	µg/L	0.10	<0.1	<0.1	<0.1
Benzo(a)pyrene	µg/L	0.10	<0.1	<0.1	<0.1
Indeno(1,2,3-cd)pyrene	µg/L	0.10	<0.1	<0.1	<0.1
Dibenzo(a&h)anthracene	µg/L	0.10	<0.1	<0.1	<0.1
Benzo(ghi)perylene	µg/L	0.10	<0.1	<0.1	<0.1
Total PAH (18)	µg/L	1.0	<1	<1	<1
d5-nitrobenzene (Surrogate)	%	-	76	84	96
2-fluorobiphenyl (Surrogate)	%	-	88	96	104
d14-p-terphenyl (Surrogate)	%	-	116	124	120

0185

OC Pesticides in Water [AN400/AN420]

PARAMETER	UOM	LOR	QC 101	QC 105	QC 109
			WATER 9/9/2013 SE120709.035	WATER 10/9/2013 SE120709.036	WATER 11/9/2013 SE120709.037
Alpha BHC	µg/L	0.10	<0.1	<0.1	<0.1
Hexachlorobenzene (HCB)	µg/L	0.10	<0.1	<0.1	<0.1
Beta BHC	µg/L	0.10	<0.1	<0.1	<0.1
Lindane (gamma BHC)	µg/L	0.10	<0.1	<0.1	<0.1
Delta BHC	µg/L	0.10	<0.1	<0.1	<0.1
Heptachlor	µg/L	0.10	<0.1	<0.1	<0.1
Aldrin	µg/L	0.10	<0.1	<0.1	<0.1
Heptachlor epoxide	µg/L	0.10	<0.1	<0.1	<0.1
Gamma Chlordane	µg/L	0.10	<0.1	<0.1	<0.1
Alpha Chlordane	µg/L	0.10	<0.1	<0.1	<0.1
Alpha Endosulfan	µg/L	0.10	<0.1	<0.1	<0.1
o,p'-DDE	µg/L	0.10	<0.1	<0.1	<0.1
p,p'-DDE	µg/L	0.10	<0.1	<0.1	<0.1
Dieldrin	µg/L	0.10	<0.1	<0.1	<0.1
Endrin	µg/L	0.10	<0.1	<0.1	<0.1
Beta Endosulfan	µg/L	0.10	<0.1	<0.1	<0.1
o,p'-DDD	µg/L	0.10	<0.1	<0.1	<0.1
p,p'-DDD	µg/L	0.10	<0.1	<0.1	<0.1
Endosulfan sulphate	µg/L	0.10	<0.1	<0.1	<0.1
o,p'-DDT	µg/L	0.10	<0.1	<0.1	<0.1
p,p'-DDT	µg/L	0.10	<0.1	<0.1	<0.1
Endrin ketone	µg/L	0.10	<0.1	<0.1	<0.1
Methoxychlor	µg/L	0.10	<0.1	<0.1	<0.1
trans-Nonachlor	µg/L	0.10	<0.1	<0.1	<0.1
Endrin aldehyde	µg/L	0.10	<0.1	<0.1	<0.1
Isodrin	µg/L	0.10	<0.1	<0.1	<0.1
Mirex	µg/L	0.10	<0.1	<0.1	<0.1
Tetrachloro-m-xylene (TCMX)	%	-	68	71	68

OP Pesticides in Water [AN400/AN420]

PARAMETER	UOM	LOR	QC 101	QC 105	QC 109
			WATER 9/9/2013 SE120709.035	WATER 10/9/2013 SE120709.036	WATER 11/9/2013 SE120709.037
Dichlorvos	µg/L	0.50	<0.5	<0.5	<0.5
Dimethoate	µg/L	0.50	<0.5	<0.5	<0.5
Diazinon (Dimpylate)	µg/L	0.50	<0.5	<0.5	<0.5
Fenitrothion	µg/L	0.20	<0.2	<0.2	<0.2
Malathion	µg/L	0.20	<0.2	<0.2	<0.2
Chlorpyrifos (Chlorpyrifos Ethyl)	µg/L	0.20	<0.2	<0.2	<0.2
Parathion-ethyl (Parathion)	µg/L	0.20	<0.2	<0.2	<0.2
Bromophos Ethyl	µg/L	0.20	<0.2	<0.2	<0.2
Methidathion	µg/L	0.50	<0.5	<0.5	<0.5
Ethion	µg/L	0.20	<0.2	<0.2	<0.2
Azinphos-methyl	µg/L	0.20	<0.2	<0.2	<0.2
2-fluorobiphenyl (Surrogate)	%	-	88	96	104
d14-p-terphenyl (Surrogate)	%	-	116	124	120

PCBs in Water [AN400/AN420]

PARAMETER	UOM	LOR	QC 101	QC 105	QC 109
			WATER 9/9/2013 SE120709.035	WATER 10/9/2013 SE120709.036	WATER 11/9/2013 SE120709.037
Arochlor 1016	µg/L	1.0	<1	<1	<1
Arochlor 1221	µg/L	1.0	<1	<1	<1
Arochlor 1232	µg/L	1.0	<1	<1	<1
Arochlor 1242	µg/L	1.0	<1	<1	<1
Arochlor 1248	µg/L	1.0	<1	<1	<1
Arochlor 1254	µg/L	1.0	<1	<1	<1
Arochlor 1260	µg/L	1.0	<1	<1	<1
Arochlor 1262	µg/L	1.0	<1	<1	<1
Arochlor 1268	µg/L	1.0	<1	<1	<1
Total Arochlors*	µg/L	5.0	<5	<5	<5
Tetrachloro-m-xylene (Surrogate)	%	-	68	71	68

Total Phenolics in Water [AN289]

PARAMETER	UOM	LOR	QC 101	QC 105	QC 109
			WATER 9/9/2013 SE120709.035	WATER 10/9/2013 SE120709.036	WATER 11/9/2013 SE120709.037
Total Phenols	mg/L	0.010	<0.01	<0.01	<0.01

183

Trace Metals (Dissolved) in Water by ICPMS [AN318]

PARAMETER	UOM	LOR	QC 101	QC 105	QC 109
			WATER 9/9/2013 SE120709.035	WATER 10/9/2013 SE120709.036	WATER 11/9/2013 SE120709.037
Arsenic, As	µg/L	1.0	<1	<1	<1
Beryllium, Be	µg/L	1.0	<1	<1	<1
Boron, B	µg/L	5.0	<5	<5	<5
Cadmium, Cd	µg/L	0.10	<0.1	<0.1	<0.1
Cobalt, Co	µg/L	1.0	<1	<1	<1
Copper, Cu	µg/L	1.0	<1	<1	<1
Lead, Pb	µg/L	1.0	<1	<1	<1
Manganese, Mn	µg/L	1.0	<1	<1	<1
Nickel, Ni	µg/L	1.0	<1	<1	<1
Selenium, Se	µg/L	1.0	<1	<1	<1
Zinc, Zn	µg/L	5.0	<5	<5	7



ANALYTICAL RESULTS

SE120709 R0

Hexavalent Chromium in water by Discrete Analyser [AN283]

PARAMETER	UOM	LOR	QC 101	QC 105	QC 109
			WATER 9/9/2013 SE120709.035	WATER 10/9/2013 SE120709.036	WATER 11/9/2013 SE120709.037
Hexavalent Chromium, Cr6+	mg/L	0.0050	<0.005	<0.005	<0.005

0182

Mercury (dissolved) in Water [AN311/AN312]

PARAMETER	UOM	LOR	QC 101	QC 105	QC 109
			WATER 9/9/2013 SE120709.035	WATER 10/9/2013 SE120709.036	WATER 11/9/2013 SE120709.037
Mercury	mg/L	0.00010	<0.0001	<0.0001	<0.0001

METHOD

METHODOLOGY SUMMARY

- AN002** The test is carried out by drying (at either 40°C or 105°C) a known mass of sample in a weighed evaporating basin. After fully dry the sample is re-weighed. Samples such as sludge and sediment having high percentages of moisture will take some time in a drying oven for complete removal of water.
- AN020** Unpreserved water sample is filtered through a 0.45µm membrane filter and acidified with nitric acid similar to APHA3030B.
- AN040** A portion of sample is digested with Nitric acid to decompose organic matter and Hydrochloric acid to complete the digestion of metals and then filtered for analysis by ASS or ICP as per USEPA Method 200.8.
- AN040/AN320** A portion of sample is digested with nitric acid to decompose organic matter and hydrochloric acid to complete the digestion of metals. The digest is then analysed by ICP OES with metals results reported on the dried sample basis. Based on USEPA method 200.8 and 6010C.
- AN075** This method uses an alkaline digestion to solubilise both water-soluble and water-insoluble forms of hexavalent chromium in solids. The solution is then pH adjusted and the hexavalent chromium concentration in solution determined colourimetrically.
- AN083** Separatory funnels are used for aqueous samples and extracted by transferring an appropriate volume (mass) of liquid into a separatory funnel and adding 3 serial aliquots of dichloromethane. Samples receive a single extraction at pH 7 to recover base / neutral analytes and two extractions at pH < 2 to recover acidic analytes. QC samples are prepared by spiking organic free water with target analytes and extracting as per samples.
- AN088** Orbital rolling for Organic pollutants are extracted from soil/sediment by transferring an appropriate mass of sample to a clear soil jar and extracting with 1:1 Dichloromethane/Acetone. Orbital Rolling method is intended for the extraction of semi-volatile organic compounds from soil/sediment samples, and is based somewhat on USEPA method 3570 (Micro Organic extraction and sample preparation). Method 3700.
- AN201** Cr6+ is determined colourimetrically by reaction with diphenylcarbazide in acid solution. A red-violet colour of unknown composition is produced.
- AN283** Hexavalent Chromium via Aquakem DA: Soluble hexavalent chromium forms a red/violet colour with diphenylcarbazide in acidic solution. This procedure is very sensitive and nearly specific for Cr6+. If total chromium is also measured the trivalent form of chromium Cr3+ can be calculated from the difference (Total Cr - Cr6+). Reference APHA3500CrB.
- AN289** Analysis of Total Phenols in Soil Sediment and Water: Steam distillable phenols react with 4-aminoantipyrine at pH 7.9±0.1 in the presence of potassium ferricyanide to form a coloured antipyrine dye analysed by Discrete Analyser. Reference APHA 5530 B/D.
- AN311/AN312** Mercury by Cold Vapour AAS in Waters: Mercury ions are reduced by stannous chloride reagent in acidic solution to elemental mercury. This mercury vapour is purged by nitrogen into a cold cell in an atomic absorption spectrometer or mercury analyser. Quantification is made by comparing absorbances to those of the calibration standards. Reference APHA 3112/3500.
- AN312** Mercury by Cold Vapour AAS in Soils: After digestion with nitric acid, hydrogen peroxide and hydrochloric acid, mercury ions are reduced by stannous chloride reagent in acidic solution to elemental mercury. This mercury vapour is purged by nitrogen into a cold cell in an atomic absorption spectrometer or mercury analyser. Quantification is made by comparing absorbances to those of the calibration standards. Reference APHA 3112/3500
- AN318** Determination of elements at trace level in waters by ICP-MS technique, in accordance with USEPA 6020A.
- AN400** OC and OP Pesticides by GC-ECD: The determination of organochlorine (OC) and organophosphorus (OP) pesticides and polychlorinated biphenyls (PCBs) in soils, sludges and groundwater. (Based on USEPA methods 3510, 3550, 8140 and 8080.)
- AN403** Total Recoverable Hydrocarbons: Determination of Hydrocarbons by gas chromatography after a solvent extraction. Detection is by flame ionisation detector (FID) that produces an electronic signal in proportion to the combustible matter passing through it. Total Recoverable Hydrocarbons (TRH) are routinely reported as four alkane groupings based on the carbon chain length of the compounds: C6-C9, C10-C14, C15-C28 and C29-C36 and in recognition of the Draft NEPM 2011, >C10-C16 (F2), >C16-C34 (F3) and >C34-C40 (F4). F2 is not corrected for Naphthalene.
- AN420** (SVOCs) including OC, OP, PCB, Herbicides, PAH, Phthalates and Speciated Phenols (etc) in soils, sediments and waters are determined by GCMS/ECD technique following appropriate solvent extraction process (Based on USEPA 3500C and 8270D).
- AN433/AN434** VOCs and C6-C9 Hydrocarbons by GC-MS P&T: VOC's are volatile organic compounds. The sample is presented to a gas chromatograph via a purge and trap (P&T) concentrator and autosampler and is detected with a Mass Spectrometer (MSD). Solid samples are initially extracted with methanol whilst liquid samples are processed directly. References: USEPA 5030B, 8020A, 8260.
- AN433/AN434/AN410** VOCs and C6-C9/C6-C10 Hydrocarbons by GC-MS P&T: VOC's are volatile organic compounds. The sample is presented to a gas chromatograph via a purge and trap (P&T) concentrator and autosampler and is detected with a Mass Spectrometer (MSD). Solid samples are initially extracted with methanol whilst liquid samples are processed directly. References: USEPA 5030B, 8020A, 8260.

AN602

Qualitative identification of chrysotile, amosite and crocidolite in bulk samples by polarised light microscopy (PLM) in conjunction with dispersion staining (DS). AS4964 provides the basis for this document. Unequivocal identification of the asbestos minerals present is made by obtaining sufficient diagnostic 'clues', which provide a reasonable degree of certainty, dispersion staining is a mandatory 'clue' for positive identification. If sufficient 'clues' are absent, then positive identification of asbestos is not possible. This procedure requires removal of suspect fibres/bundles from the sample which cannot be returned.

FOOTNOTES

*	Analysis not covered by the scope of accreditation.	-	Not analysed.	UOM	Unit of Measure.
**	Indicative data, theoretical holding time exceeded.	NVL	Not validated.	LOR	Limit of Reporting.
^	Performed by outside laboratory.	IS	Insufficient sample for analysis.	↑↓	Raised/lowered Limit of Reporting.
		LNR	Sample listed, but not received.		

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

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

The QC criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here: <http://www.sgs.com.au/pv.sgsv3/-/media/Local/Australia/Documents/Technical%20Documents/MP-AU-ENV-QU-022%20QA%20QC%20Plan.pdf>

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