GRAPHIC LOG SYMBOLS FOR SOIL AND ROCKS

SOIL


FILL


TOPSOIL


CLAY (CL, CH)


SILT (ML, MH)


SAND (SP, SW)


GRAVEL (GP, GW)


SANDY CLAY (CL, CH)


SILTY CLAY (CL, CH)


CLAYEY SAND (SC)


SILTY SAND (SM)


GRAVELLY CLAY (CL, CH)


CLAYEY GRAVEL (GC)


SANDY SILT (ML)


PEAT AND ORGANIC SOILS

ROCK


CONGLOMERATE


SANDSTONE


SHALE


SILTSTONE, MUDSTONE, CLAYSTONE


LIMESTONE


PHYLLITE, SCHIST


TUFF


GRANITE, GABBRO


DOLERITE, DIORITE


BASALT, ANDESITE


QUARTZITE

DEFECTS AND INCLUSIONS


CLAY SEAM


SHEARED OR CRUSHED SEAM


BRECCIATED OR SHATTERED SEAM/ZONE


IRONSTONE GRAVEL


ORGANIC MATERIAL

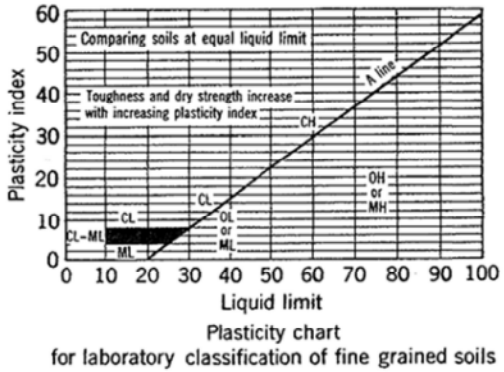
OTHER MATERIALS


CONCRETE


BITUMINOUS CONCRETE, COAL


COLLUVIUM

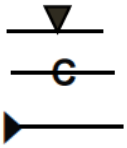
Field Identification Procedures (Excluding particles larger than 75 μm and basing fractions on estimated weights)						Group Symbols [a]	Typical Names	Information Required for Describing Soils	Laboratory Classification Criteria
Coarse-grained soils More than half of material is *larger* than 75 μm sieve size[b] (The 75 μm sieve size is about the smallest particle visible to naked eye)	Gravels More than half of coarse fraction is larger than 4 mm sieve size	Clean gravels (little or no fines)	Wide range in grain size and substantial amounts of all intermediate particle sizes			*GW*	Well graded gravels, gravel-sand mixtures, little or no fines	Give typical name; indicate approximate percentages of sand and gravel; maximum size; angularity, surface condition, and hardness of the coarse grains; local or geologic name and other pertinent descriptive information; and symbols in parentheses For undisturbed soils add information on stratification, degree of compactness, cementation, moisture conditions and drainage characteristics Example: *Silty sand*, gravelly; about 20% hard, angular gravel particles 12 mm maximum size; rounded and subangular sand grains coarse to fine, about 15% non-plastic fines with low dry strength; well compacted and moist in place; alluvial sand; (*SM*)	Use grain size curve in identifying the fractions as given under field identification Determine percentages of gravel and sand from grain size curve Depending on percentage of fines (fraction smaller than 75 μm sieve size) coarse grained soils are classified as follows: Less than 5% *GW, GP, SW, SP* More than 12% *GM, GC, SM, SC* 5% to 12% *Borderline* cases requiring use of dual symbols $C_U = \frac{D_{60}}{D_{10}}$ Greater than 4 $C_C = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ Between 1 and 3 Not meeting all gradation requirements for *GW* Atterberg limits below "A" line, or *PI* less than 4 — Above "A" line with *PI* between 4 and 7 are *borderline* cases requiring use of dual symbols Atterberg limits above "A" line, with *PI* greater than 7
			Predominantly one size or a range of sizes with some intermediate sizes missing			*GP*	Poorly graded gravels, gravel-sand mixtures, little or no fines		
		Gravels with fines (appreciable amount of fines)	Nonplastic fines (for identification procedures see *ML* below)			*GM*	Silty gravels, poorly graded gravel-sand-silt mixtures		
			Plastic fines (for identification procedures, see *CL* below)			*GC*	Clayey gravels, poorly graded gravel-sand-clay mixtures		
	Sands More than half of coarse fraction is smaller than 4 mm sieve size	Clean sands (little or no fines)	Wide range in grain sizes and substantial amounts of all intermediate particle sizes			*SW*	Well graded sands, gravelly sands, little or no fines		$C_U = \frac{D_{60}}{D_{10}}$ Greater than 6 $C_C = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ Between 1 and 3 Not meeting all gradation requirements for *SW* Atterberg limits below "A" line or *PI* less than 5 — Above "A" line with *PI* between 4 and 7 are *borderline* cases requiring use of dual symbols Atterberg limits below "A" line with *PI* greater than 7
			Predominantly one size or a range of sizes with some intermediate sizes missing			*SP*	Poorly graded sands, gravelly sands, little or no fines		
		Sands with fines (appreciable amount of fines)	Nonplastic fines (for identification procedures, see *ML* below)			*SM*	Silty sands, poorly graded sand-silt mixtures		
			Plastic fines (for identification procedures, see *CL* below)			*SC*	Clayey sands, poorly graded sand-clay mixtures		
Fine-grained soils More than half of material is *smaller* than 75 μm sieve size	Identification Procedures on Fraction Smaller than 380 μm Sieve Size		Dry Strength (crushing characteristics)	Dilatancy (reaction to shaking)	Toughness (consistency near plastic limit)				
	Silts and clays liquid limit less than 50		None to slight	Quick to slow	None	*ML*	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands with slight plasticity	Give typical name; indicate degree and character of plasticity, amount and maximum size of coarse grains; colour in wet condition, odour if any, local or geologic name, and other pertinent descriptive information, and symbol in parentheses For undisturbed soils add information on structure, stratification, consistency in undisturbed and remoulded states, moisture and drainage conditions Example: *Clayey silt*, brown; slightly plastic; small percentage of fine sand; numerous vertical root holes; firm and dry in place; loess; (*ML*)	
			Medium to high	None to very slow	Medium	*CL*	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays		
			Slight to medium	Slow	Slight	*OL*	Organic silts and organic silt-clays of low plasticity		
	Silts and clays liquid limit greater than 50		Slight to medium	Slow to none	Slight to medium	*MH*	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts		
			High to very high	None	High	*CH*	Inorganic clays of high plasticity, fat clays		
			Medium to high	None to very slow	Slight to medium	*OH*	Organic clays of medium to high plasticity		
Highly Organic Soils			Readily identified by colour, odour, spongy feel and frequently by fibrous texture			*Pt*	Peat and other highly organic soils		



Plasticity chart
for laboratory classification of fine grained soils

Note: 1 Soils possessing characteristics of two groups are designated by combinations of group symbols (eg. GW-GC, well graded gravel-sand mixture with clay fines).
2 Soils with liquid limits of the order of 35 to 50 may be visually classified as being of medium plasticity.

LOG SYMBOLS

LOG COLUMN	SYMBOL	DEFINITION
Groundwater Record		Standing water level. Time delay following completion of drilling may be shown. Extent of borehole collapse shortly after drilling. Groundwater seepage into borehole or excavation noted during drilling or excavation.
Samples	ES U50 DB DS ASB ASS SAL	Soil sample taken over depth indicated, for environmental analysis. Undisturbed 50mm diameter tube sample taken over depth indicated. Bulk disturbed sample taken over depth indicated. Small disturbed bag sample taken over depth indicated. Soil sample taken over depth indicated, for asbestos screening. Soil sample taken over depth indicated, for acid sulfate soil analysis. Soil sample taken over depth indicated, for salinity analysis.
Field Tests	N = 17 4, 7, 10	Standard Penetration Test (SPT) performed between depths indicated by lines. Individual show blows per 150mm penetration. 'R' as noted below.
	N_c = 5 7 3 R	Solid Cone Penetration Test (SCPT) performed between depths indicated by lines. Individual figures show blows per 150mm penetration for 60 degree solid cone driven by SPT hammer. 'R' refers to apparent hammer refusal within the corresponding 150mm depth increment.
	VNS = 25 PID = 100	Vane shear reading in kPa of Undrained Shear Strength. Photoionisation detector reading in ppm (Soil sample heads pace test).
Moisture (Cohesive Soils) (Cohesionless)	MC > PL MC ≈ PL MC < PL D M W	Moisture content estimated to be greater than plastic limit. Moisture content estimated to be approximately equal to plastic limit. Moisture content estimated to be less than plastic limit. DRY – Runs freely through fingers. MOIST – Does not run freely but no free water visible on soil surface. WET – Free water visible on soil surface.
Strength (Consistency) Cohesive Soils	VS S F St VSt H ( )	VERY SOFT – Unconfined compressive strength less than 25kPa SOFT – Unconfined compressive strength 25-5 0kPa FIRM – Unconfined compressive strength 50-1 00kPa STIFF – Unconfined compressive strength 100- 200kPa VERY STIFF – Unconfined compressive strength 200- 400kPa HARD – Unconfined compressive strength greater than 400kPa Bracketed symbol indicates estimated consistency based o n tactile examination or other tests.
Density Index/ Relative Density (Cohesionless Soils)	VL L MD D VD ( )	**Density Index (ID) Range (%)** / **SPT ' N' Value Range (Blows/300mm)** Very Loose <15 / 0-4 Loose 15-35 / 4-10 Medium Dense 35-65 / 10-30 Dense 65-85 / 30-50 Very Dense >85 / >50 Bracketed symbol indicates estimated density based on ease of drilling or other tests.
Hand Penetrometer Readings	300 250	Numbers indicate individual test results in kPa on representative undisturbed material unless noted otherwise
Remarks	'V' bit 'TC' bit T_{60}	Hardened steel 'V' shaped bit. Tungsten carbide wing bit. Penetration of auger string in mm under static load of rig applied by drill head hydraulics without rotation of augers.

LOG SYMBOLS CONTINUED

ROCK STRENGTH

Rock strength is defined by the Point Load Strength Index (Is 50) and refers to the strength of the rock substance in the bedding. The test procedure is described by the International Journal of Rock Mechanics, Mining and Geomechanics Abstract Volume 22, No 2, 1985.

TERM	SYMBOL	Is (50) MPa	FIELD GUIDE
Extremely Low:	EL	0.03	Easily remoulded by hand to a material with soil properties.
Very Low:	VL	0.1	May be crumbled in the hand. Sandstone is "sugary" and friable.
Low:	L	0.3	A piece of core 150 mm long x 50mm dia. may be broken by hand and easily scored with a knife. Sharp edges of core may be friable and break during handling.
Medium Strength:	M	1	A piece of core 150 mm long x 50mm dia. can be broken by hand with difficulty. Readily scored with knife.
High:	H	3	A piece of core 150 mm long x 50mm dia. core cannot be broken by hand, can be slightly scratched or scored with knife; rock rings under hammer.
Very High:	VH	10	A piece of core 150 mm long x 50mm dia. may be broken with hand-held pick after more than one blow. Cannot be scratched with pen knife; rock rings under hammer.
Extremely High:	EH		A piece of core 150 mm long x 50mm dia. is very difficult to break with h and-held hammer . Rings when struck with a hammer.

ROCK STRENGTH

ABBREVIATION	DESCRIPTION	NOTES
Be	Bedding Plane Parting	Defect orientations measured relative to the normal to (i.e. relative to horizontal for vertical holes)
CS	Clay Seam	
J	Joint	
P	Planar	
Un	Undulating	
S	Smooth	
R	Rough	
IS	Iron stained	
XWS	Extremely Weathered Seam	
Cr	Crushed Seam	
60t	Thickness of defect in millimetres	

Appendix D: Laboratory Reports & COC Documents

SAMPLE AND CHAIN OF CUSTODY FORM

TO:
ENVIROLAB SERVICES PTY LTD
12 ASHLEY STREET
CHATSWOOD NSW 2067
P: (02) 99106200
F: (02) 99106201

Attention: Aileen

EIS Job Number: E30067KM

Date Results Required: STANDARD

Page: 1 of 1

FROM:
ENVIRONMENTAL INVESTIGATION SERVICES
REAR OF 115 WICKS ROAD
MACQUARIE PARK, NSW 2113
P: 02-9888 5000 F: 02-9888 5001
Attention: Rob Muller

Location: Kirribilli
Sampler: Rob Muller

Sample Preserved in Esky on Ice

Tests Required

Date Sampled	Lab Ref:	Sample Number	Depth (m)	Sample Container	PID	Sample Description	Combo 2	Combo 3	Combo 6	Combo 6a	8 Metals	PAHs	TRH/BTEX	BTEX	Asbestos			
20/02/2017	1	BH2	0.17-0.23	G, A	0	Fill				X								
20/02/2017	2	BH3	0.15-0.26	G, A	0	Fill				X								
20/02/2017	3	BH3	0.26-0.32	G, A	0	Fill				X								
20/02/2017	4	DUP1	-	G	-	Soil duplicate		X										
20/02/2017	5	TB	-	G	-	Trip blank								X				
20/02/2017	6	FR	-	V	-	Field rinsate								X				

ENVIROLAB

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 162413
Date Received: 23.02.17
~~Time Received:~~ 12:00
Received by: JE
~~Temp: Cool/Ambient~~
Cooling: Ice/~~Icepack~~
Security: ~~Intact/Broken/None~~

Remarks (comments/detection limits required):

Sample Containers:
G - 250mg Glass Jar
V - vial
A - Ziplock Asbestos Bag
P - Plastic Bag

Relinquished By:	Date:	Time:	Received By:	Date:
	23/2/17	9:45am		23.2.17

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
enquiries@envirolabservices.com.au
www.envirolabservices.com.au

SAMPLE RECEIPT ADVICE

Client Details	
Client	Environmental Investigation Services
Attention	Rob Muller

Sample Login Details	
Your Reference	E30067KM, Kirribilli
Envirolab Reference	**162413**
Date Sample Received	23/02/2017
Date Instructions Received	23/02/2017
Date Results Expected to be Reported	**02/03/2017**

Sample Condition	
Samples received in appropriate condition for analysis	YES
No. of Samples Provided	5 Soils, 1 Water
Turnaround Time Requested	Standard
Temperature on receipt (°C)	15.0
Cooling Method	Ice Pack
Sampling Date Provided	YES

Comments
Samples will be held for 1 month for water samples and 2 months for soil samples from date of receipt of samples

Please direct any queries to:

Aileen Hie	Jacinta Hurst
Phone: 02 9910 6200	Phone: 02 9910 6200
Fax: 02 9910 6201	Fax: 02 9910 6201
Email: ahie@envirolabservices.com.au	Email: jhurst@envirolabservices.com.au

Sample and Testing Details on following page

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
enquiries@envirolabservices.com.au
www.envirolabservices.com.au

Sample Id	*vTRH(C6-C10)/BTEXN in Soil*	*svTRH (C10-C40) in Soil*	*PAHs in Soil*	*Organochlorine Pesticides in soil*	*Organophosphorus Pesticides*	*PCBs in Soil*	*Acid Extractable metals in soil*	*Asbestos ID - soils*	*BTEX in Water*
BH2-0.17-0.23	✓	✓	✓	✓	✓	✓	✓	✓	
BH3-0.15-0.26	✓	✓	✓	✓	✓	✓	✓	✓	
BH3-0.26-0.32	✓	✓	✓	✓	✓	✓	✓	✓	
DUP1	✓	✓	✓				✓		
TB	✓								
FR									✓

The '✓' indicates the testing you have requested. ***THIS IS NOT A REPORT OF THE RESULTS****.*

12 Ashley Street, Chatswood, NSW 2067
tel: +61 2 9910 6200

email: sydney@envirolab.com.au
envirolab.com.au

Envirolab Services Pty Ltd - Sydney | ABN 37 112 535 645

CERTIFICATE OF ANALYSIS 162413

Client:

Environmental Investigation Services
PO Box 976
North Ryde BC
NSW 1670

Attention: Rob Muller

Sample log in details:

Your Reference:	**E30067KM, Kirribilli**
No. of samples:	5 Soils, 1 Water
Date samples received / completed instructions received	23/02/17 / 23/02/17

Analysis Details:

Please refer to the following pages for results, methodology summary and quality control data.
Samples were analysed as received from the client. Results relate specifically to the samples as received.
Results are reported on a dry weight basis for solids and on an as received basis for other matrices.
Please refer to the last page of this report for any comments relating to the results.

Report Details:

Date results requested by: / Issue Date:	2/03/17 / 1/03/17
Date of Preliminary Report:	Not Issued

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Accredited for compliance with ISO/IEC 17025 - Testing **Tests not covered by NATA are denoted with *.**

Results Approved By:

David Springer
General Manager

vTRH(C6-C10)/BTEXN in Soil						
Our Reference:	UNITS	162413-1	162413-2	162413-3	162413-4	162413-5
Your Reference	---------- -	BH2	BH3	BH3	DUP1	TB
Depth	----------	0.17-0.23	0.15-0.26	0.26-0.32	-	-
Date Sampled		20/02/2017	20/02/2017	20/02/2017	20/02/2017	20/02/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	24/02/2017	24/02/2017	24/02/2017	24/02/2017	24/02/2017
Date analysed	-	27/02/2017	27/02/2017	27/02/2017	27/02/2017	27/02/2017
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	[NA]
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	[NA]
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	[NA]
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	[NA]
naphthalene	mg/kg	<1	<1	<1	<1	[NA]
Surrogate aaa-Trifluorotoluene	%	107	112	125	115	113

svTRH (C10-C40) in Soil					
Our Reference:	UNITS	162413-1	162413-2	162413-3	162413-4
Your Reference	---------- -	BH2	BH3	BH3	DUP1
Depth	----------	0.17-0.23	0.15-0.26	0.26-0.32	-
Date Sampled		20/02/2017	20/02/2017	20/02/2017	20/02/2017
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	24/02/2017	24/02/2017	24/02/2017	24/02/2017
Date analysed	-	24/02/2017	24/02/2017	24/02/2017	24/02/2017
TRHC$_{10}$ - C$_{14}$	mg/kg	<50	<50	<50	<50
TRHC$_{15}$ - C$_{28}$	mg/kg	<100	<100	<100	<100
TRHC$_{29}$ - C$_{36}$	mg/kg	<100	<100	<100	<100
TRH>C$_{10}$-C$_{16}$	mg/kg	<50	<50	<50	<50
TRH>C$_{10}$ - C$_{16}$ less Naphthalene (F2)	mg/kg	<50	<50	<50	<50
TRH>C$_{16}$-C$_{34}$	mg/kg	<100	<100	<100	<100
TRH>C$_{34}$-C$_{40}$	mg/kg	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50
Surrogate o-Terphenyl	%	80	78	78	80

PAHs in Soil Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ---------- - ---------- 	162413-1 BH2 0.17-0.23 20/02/2017 Soil	162413-2 BH3 0.15-0.26 20/02/2017 Soil	162413-3 BH3 0.26-0.32 20/02/2017 Soil	162413-4 DUP1 - 20/02/2017 Soil
Date extracted	-	24/02/2017	24/02/2017	24/02/2017	24/02/2017
Date analysed	-	27/02/2017	27/02/2017	27/02/2017	27/02/2017
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.6	0.3	0.4	0.3
Anthracene	mg/kg	0.2	<0.1	0.1	<0.1
Fluoranthene	mg/kg	0.8	0.6	0.8	0.4
Pyrene	mg/kg	0.7	0.6	0.8	0.4
Benzo(a)anthracene	mg/kg	0.3	0.3	0.4	0.2
Chrysene	mg/kg	0.4	0.3	0.4	0.2
Benzo(b,j+k)fluoranthene	mg/kg	0.5	0.4	0.7	0.3
Benzo(a)pyrene	mg/kg	0.2	0.2	0.4	0.1
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	0.1	0.2	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	0.1	0.1	0.2	0.1
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	0.5	<0.5
Total +ve PAH's	mg/kg	4.1	3.0	4.7	2.0
Surrogate p-Terphenyl-d14	%	94	93	96	93

Organochlorine Pesticides in soil				
Our Reference:	UNITS	162413-1	162413-2	162413-3
Your Reference	---------- -	BH2	BH3	BH3
Depth	----------	0.17-0.23	0.15-0.26	0.26-0.32
Date Sampled		20/02/2017	20/02/2017	20/02/2017
Type of sample		Soil	Soil	Soil
Date extracted	-	24/02/2017	24/02/2017	24/02/2017
Date analysed	-	24/02/2017	24/02/2017	24/02/2017
HCB	mg/kg	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1
Surrogate TCMX	%	95	93	96

Organophosphorus Pesticides Our Reference: Your Reference	UNITS ---------- -	162413-1 BH2	162413-2 BH3	162413-3 BH3
Depth	----------	0.17-0.23	0.15-0.26	0.26-0.32
Date Sampled		20/02/2017	20/02/2017	20/02/2017
Type of sample		Soil	Soil	Soil
Date extracted	-	24/02/2017	24/02/2017	24/02/2017
Date analysed	-	24/02/2017	24/02/2017	24/02/2017
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1
Dichlorvos	mg/kg	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1
Surrogate TCMX	%	95	93	96

PCBs in Soil				
Our Reference:	UNITS	162413-1	162413-2	162413-3
Your Reference	----------	BH2	BH3	BH3
	-			
Depth	----------	0.17-0.23	0.15-0.26	0.26-0.32
Date Sampled		20/02/2017	20/02/2017	20/02/2017
Type of sample		Soil	Soil	Soil
Date extracted	-	24/02/2017	24/02/2017	24/02/2017
Date analysed	-	24/02/2017	24/02/2017	24/02/2017
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1
Surrogate TCLMX	%	95	93	96

Acid Extractable metals in soil					
Our Reference:	UNITS	162413-1	162413-2	162413-3	162413-4
Your Reference	---------- -	BH2	BH3	BH3	DUP1
Depth	----------	0.17-0.23	0.15-0.26	0.26-0.32	-
Date Sampled		20/02/2017	20/02/2017	20/02/2017	20/02/2017
Type of sample		Soil	Soil	Soil	Soil
Date prepared	-	24/02/2017	24/02/2017	24/02/2017	24/02/2017
Date analysed	-	24/02/2017	24/02/2017	24/02/2017	24/02/2017
Arsenic	mg/kg	<4	<4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	11	10	15	14
Copper	mg/kg	21	57	14	24
Lead	mg/kg	310	160	210	250
Mercury	mg/kg	<0.1	0.1	<0.1	<0.1
Nickel	mg/kg	5	7	6	6
Zinc	mg/kg	50	78	93	43

Moisture					
Our Reference:	UNITS	162413-1	162413-2	162413-3	162413-4
Your Reference	---------- -	BH2	BH3	BH3	DUP1
Depth	----------	0.17-0.23	0.15-0.26	0.26-0.32	-
Date Sampled		20/02/2017	20/02/2017	20/02/2017	20/02/2017
Type of sample		Soil	Soil	Soil	Soil
Date prepared	-	24/02/2017	24/02/2017	24/02/2017	24/02/2017
Date analysed	-	27/02/2017	27/02/2017	27/02/2017	27/02/2017
Moisture	%	10	8.7	7.7	10

Asbestos ID - soils				
Our Reference:	UNITS	162413-1	162413-2	162413-3
Your Reference	---------- -	BH2	BH3	BH3
Depth	----------	0.17-0.23	0.15-0.26	0.26-0.32
Date Sampled		20/02/2017	20/02/2017	20/02/2017
Type of sample		Soil	Soil	Soil
Date analysed	-	1/03/2017	1/03/2017	1/03/2017
Sample mass tested	g	Approx. 35g	Approx. 30g	Approx. 25g
Sample Description	-	Brown sandy soil	Brown sandy soil	Brown sandy soil
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected

BTEX in Water		
Our Reference:	UNITS	162413-6
Your Reference	----------	FR
	-	
Depth	----------	-
Date Sampled		20/02/2017
Type of sample		water
Date extracted	-	24/02/2017
Date analysed	-	24/02/2017
Benzene	µg/L	<1
Toluene	µg/L	<1
Ethylbenzene	µg/L	<1
m+p-xylene	µg/L	<2
o-xylene	µg/L	<1
Surrogate Dibromofluoromethane	%	104
Surrogate toluene-d8	%	97
Surrogate 4-BFB	%	97

Method ID	Methodology Summary
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.
Org-014	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-012	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. For soil results:- 1. 'TEQ PQL' values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. 'TEQ zero' values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more susceptible to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. 'TEQ half PQL' values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. Note, the Total +ve PAHs PQL is reflective of the lowest individual PQL and is therefore" Total +ve PAHs" is simply a sum of the positive individual PAHs.
Org-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Org-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's. Note, the Total +ve reported DDD+DDE+DDT PQL is reflective of the lowest individual PQL and is therefore simply a sum of the positive individually report DDD+DDE+DDT.
Org-008	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD. Note, the Total +ve PCBs PQL is reflective of the lowest individual PQL and is therefore" Total +ve PCBs" is simply a sum of the positive individual PCBs.

Method ID	Methodology Summary
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.

QUALITY CONTROL vTRH(C6-C10)/BTEXN in Soil	UNITS	PQL	METHOD	Blank
Date extracted	-			24/02/2017
Date analysed	-			27/02/2017
$TRHC_6$ - C_9	mg/kg	25	Org-016	<25
$TRHC_6$ - C_{10}	mg/kg	25	Org-016	<25
Benzene	mg/kg	0.2	Org-016	<0.2
Toluene	mg/kg	0.5	Org-016	<0.5
Ethylbenzene	mg/kg	1	Org-016	<1
m+p-xylene	mg/kg	2	Org-016	<2
o-Xylene	mg/kg	1	Org-016	<1
naphthalene	mg/kg	1	Org-014	<1
Surrogate aaa-Trifluorotoluene	%		Org-016	115

QUALITY CONTROL svTRH (C10-C40) in Soil	UNITS	PQL	METHOD	Blank
Date extracted	-			24/02/2017
Date analysed	-			24/02/2017
$TRHC_{10}$ - C_{14}	mg/kg	50	Org-003	<50
$TRHC_{15}$ - C_{28}	mg/kg	100	Org-003	<100
$TRHC_{29}$ - C_{36}	mg/kg	100	Org-003	<100
$TRH>C_{10}$-C_{16}	mg/kg	50	Org-003	<50
$TRH>C_{16}$-C_{34}	mg/kg	100	Org-003	<100
$TRH>C_{34}$-C_{40}	mg/kg	100	Org-003	<100
Surrogate o-Terphenyl	%		Org-003	83

QUALITY CONTROL PAHs in Soil	UNITS	PQL	METHOD	Blank
Date extracted	-			24/02/2017
Date analysed	-			27/02/2017
Naphthalene	mg/kg	0.1	Org-012	<0.1
Acenaphthylene	mg/kg	0.1	Org-012	<0.1
Acenaphthene	mg/kg	0.1	Org-012	<0.1
Fluorene	mg/kg	0.1	Org-012	<0.1
Phenanthrene	mg/kg	0.1	Org-012	<0.1
Anthracene	mg/kg	0.1	Org-012	<0.1
Fluoranthene	mg/kg	0.1	Org-012	<0.1
Pyrene	mg/kg	0.1	Org-012	<0.1
Benzo(a)anthracene	mg/kg	0.1	Org-012	<0.1
Chrysene	mg/kg	0.1	Org-012	<0.1
Benzo(b,j+k) fluoranthene	mg/kg	0.2	Org-012	<0.2
Benzo(a)pyrene	mg/kg	0.05	Org-012	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	<0.1

QUALITY CONTROL PAHs in Soil	UNITS	PQL	METHOD	Blank
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	<0.1
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	<0.1
Surrogate p-Terphenyl-d14	%		Org-012	98

QUALITY CONTROL Organochlorine Pesticides in soil	UNITS	PQL	METHOD	Blank
Date extracted	-			24/02/2017
Date analysed	-			24/02/2017
HCB	mg/kg	0.1	Org-005	<0.1
alpha-BHC	mg/kg	0.1	Org-005	<0.1
gamma-BHC	mg/kg	0.1	Org-005	<0.1
beta-BHC	mg/kg	0.1	Org-005	<0.1
Heptachlor	mg/kg	0.1	Org-005	<0.1
delta-BHC	mg/kg	0.1	Org-005	<0.1
Aldrin	mg/kg	0.1	Org-005	<0.1
Heptachlor Epoxide	mg/kg	0.1	Org-005	<0.1
gamma-Chlordane	mg/kg	0.1	Org-005	<0.1
alpha-chlordane	mg/kg	0.1	Org-005	<0.1
Endosulfan I	mg/kg	0.1	Org-005	<0.1
pp-DDE	mg/kg	0.1	Org-005	<0.1
Dieldrin	mg/kg	0.1	Org-005	<0.1
Endrin	mg/kg	0.1	Org-005	<0.1
pp-DDD	mg/kg	0.1	Org-005	<0.1
Endosulfan II	mg/kg	0.1	Org-005	<0.1
pp-DDT	mg/kg	0.1	Org-005	<0.1
Endrin Aldehyde	mg/kg	0.1	Org-005	<0.1
Endosulfan Sulphate	mg/kg	0.1	Org-005	<0.1
Methoxychlor	mg/kg	0.1	Org-005	<0.1
Surrogate TCMX	%		Org-005	97

QUALITY CONTROL Organophosphorus Pesticides	UNITS	PQL	METHOD	Blank
Date extracted	-			24/02/2017
Date analysed	-			24/02/2017
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-008	<0.1
Bromophos-ethyl	mg/kg	0.1	Org-008	<0.1
Chlorpyriphos	mg/kg	0.1	Org-008	<0.1
Chlorpyriphos-methyl	mg/kg	0.1	Org-008	<0.1
Diazinon	mg/kg	0.1	Org-008	<0.1
Dichlorvos	mg/kg	0.1	Org-008	<0.1
Dimethoate	mg/kg	0.1	Org-008	<0.1
Ethion	mg/kg	0.1	Org-008	<0.1
Fenitrothion	mg/kg	0.1	Org-008	<0.1
Malathion	mg/kg	0.1	Org-008	<0.1
Parathion	mg/kg	0.1	Org-008	<0.1
Ronnel	mg/kg	0.1	Org-008	<0.1
Surrogate TCMX	%		Org-008	97
QUALITY CONTROL PCBs in Soil	UNITS	PQL	METHOD	Blank
Date extracted	-			24/02/2017
Date analysed	-			24/02/2017
Aroclor 1016	mg/kg	0.1	Org-006	<0.1
Aroclor 1221	mg/kg	0.1	Org-006	<0.1
Aroclor 1232	mg/kg	0.1	Org-006	<0.1
Aroclor 1242	mg/kg	0.1	Org-006	<0.1
Aroclor 1248	mg/kg	0.1	Org-006	<0.1
Aroclor 1254	mg/kg	0.1	Org-006	<0.1
Aroclor 1260	mg/kg	0.1	Org-006	<0.1
Surrogate TCLMX	%		Org-006	97
QUALITY CONTROL Acid Extractable metals in soil	UNITS	PQL	METHOD	Blank
Date prepared	-			24/02/2017
Date analysed	-			24/02/2017
Arsenic	mg/kg	4	Metals-020	<4
Cadmium	mg/kg	0.4	Metals-020	<0.4
Chromium	mg/kg	1	Metals-020	<1
Copper	mg/kg	1	Metals-020	<1
Lead	mg/kg	1	Metals-020	<1
Mercury	mg/kg	0.1	Metals-021	<0.1
Nickel	mg/kg	1	Metals-020	<1
Zinc	mg/kg	1	Metals-020	<1

QUALITY CONTROL BTEX in Water	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			24/02/2017	[NT]	[NT]	LCS-W1	24/02/2017
Date analysed	-			24/02/2017	[NT]	[NT]	LCS-W1	24/02/2017
Benzene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W1	97%
Toluene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W1	98%
Ethylbenzene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W1	96%
m+p-xylene	µg/L	2	Org-016	<2	[NT]	[NT]	LCS-W1	99%
o-xylene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W1	100%
Surrogate Dibromofluoromethane	%		Org-016	101	[NT]	[NT]	LCS-W1	104%
Surrogate toluene-d8	%		Org-016	95	[NT]	[NT]	LCS-W1	101%
Surrogate 4-BFB	%		Org-016	101	[NT]	[NT]	LCS-W1	107%

QUALITY CONTROL vTRH(C6-C10)/BTEXN in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	[NT]	[NT]	LCS-8	24/02/2017
Date analysed	-	[NT]	[NT]	LCS-8	27/02/2017
TRHC$_6$ - C$_9$	mg/kg	[NT]	[NT]	LCS-8	111%
TRHC$_6$ - C$_{10}$	mg/kg	[NT]	[NT]	LCS-8	111%
Benzene	mg/kg	[NT]	[NT]	LCS-8	90%
Toluene	mg/kg	[NT]	[NT]	LCS-8	112%
Ethylbenzene	mg/kg	[NT]	[NT]	LCS-8	115%
m+p-xylene	mg/kg	[NT]	[NT]	LCS-8	120%
o-Xylene	mg/kg	[NT]	[NT]	LCS-8	120%
naphthalene	mg/kg	[NT]	[NT]	[NR]	[NR]
Surrogate aaa-Trifluorotoluene	%	[NT]	[NT]	LCS-8	109%

QUALITY CONTROL svTRH (C10-C40) in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	[NT]	[NT]	LCS-8	24/02/2017
Date analysed	-	[NT]	[NT]	LCS-8	24/02/2017
TRHC$_{10}$ - C$_{14}$	mg/kg	[NT]	[NT]	LCS-8	91%
TRHC$_{15}$ - C$_{28}$	mg/kg	[NT]	[NT]	LCS-8	91%
TRHC$_{29}$ - C$_{36}$	mg/kg	[NT]	[NT]	LCS-8	91%
TRH>C$_{10}$-C$_{16}$	mg/kg	[NT]	[NT]	LCS-8	91%
TRH>C$_{16}$-C$_{34}$	mg/kg	[NT]	[NT]	LCS-8	91%
TRH>C$_{34}$-C$_{40}$	mg/kg	[NT]	[NT]	LCS-8	91%
Surrogate o-Terphenyl	%	[NT]	[NT]	LCS-8	81%

QUALITY CONTROL PAHs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	[NT]	[NT]	LCS-8	24/02/2017
Date analysed	-	[NT]	[NT]	LCS-8	27/02/2017
Naphthalene	mg/kg	[NT]	[NT]	LCS-8	93%
Acenaphthylene	mg/kg	[NT]	[NT]	[NR]	[NR]
Acenaphthene	mg/kg	[NT]	[NT]	[NR]	[NR]
Fluorene	mg/kg	[NT]	[NT]	LCS-8	98%
Phenanthrene	mg/kg	[NT]	[NT]	LCS-8	105%
Anthracene	mg/kg	[NT]	[NT]	[NR]	[NR]
Fluoranthene	mg/kg	[NT]	[NT]	LCS-8	104%
Pyrene	mg/kg	[NT]	[NT]	LCS-8	103%
Benzo(a)anthracene	mg/kg	[NT]	[NT]	[NR]	[NR]
Chrysene	mg/kg	[NT]	[NT]	LCS-8	99%
Benzo(b,j+k)fluoranthene	mg/kg	[NT]	[NT]	[NR]	[NR]
Benzo(a)pyrene	mg/kg	[NT]	[NT]	LCS-8	83%
Indeno(1,2,3-c,d)pyrene	mg/kg	[NT]	[NT]	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	[NT]	[NT]	[NR]	[NR]
Benzo(g,h,i)perylene	mg/kg	[NT]	[NT]	[NR]	[NR]
Surrogate p-Terphenyl-d14	%	[NT]	[NT]	LCS-8	105%

QUALITY CONTROL Organochlorine Pesticides in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	[NT]	[NT]	LCS-8	24/02/2017
Date analysed	-	[NT]	[NT]	LCS-8	24/02/2017
HCB	mg/kg	[NT]	[NT]	[NR]	[NR]
alpha-BHC	mg/kg	[NT]	[NT]	LCS-8	87%
gamma-BHC	mg/kg	[NT]	[NT]	[NR]	[NR]
beta-BHC	mg/kg	[NT]	[NT]	LCS-8	99%
Heptachlor	mg/kg	[NT]	[NT]	LCS-8	95%
delta-BHC	mg/kg	[NT]	[NT]	[NR]	[NR]
Aldrin	mg/kg	[NT]	[NT]	LCS-8	90%
Heptachlor Epoxide	mg/kg	[NT]	[NT]	LCS-8	95%
gamma-Chlordane	mg/kg	[NT]	[NT]	[NR]	[NR]
alpha-chlordane	mg/kg	[NT]	[NT]	[NR]	[NR]
Endosulfan I	mg/kg	[NT]	[NT]	[NR]	[NR]
pp-DDE	mg/kg	[NT]	[NT]	LCS-8	96%
Dieldrin	mg/kg	[NT]	[NT]	LCS-8	101%
Endrin	mg/kg	[NT]	[NT]	LCS-8	99%
pp-DDD	mg/kg	[NT]	[NT]	LCS-8	96%
Endosulfan II	mg/kg	[NT]	[NT]	[NR]	[NR]
pp-DDT	mg/kg	[NT]	[NT]	[NR]	[NR]
Endrin Aldehyde	mg/kg	[NT]	[NT]	[NR]	[NR]
Endosulfan Sulphate	mg/kg	[NT]	[NT]	LCS-8	104%

QUALITY CONTROL Organochlorine Pesticides in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Methoxychlor	mg/kg	[NT]	[NT]	[NR]	[NR]
Surrogate TCMX	%	[NT]	[NT]	LCS-8	105%
QUALITY CONTROL Organophosphorus Pesticides	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	[NT]	[NT]	LCS-8	24/02/2017
Date analysed	-	[NT]	[NT]	LCS-8	24/02/2017
Azinphos-methyl (Guthion)	mg/kg	[NT]	[NT]	[NR]	[NR]
Bromophos-ethyl	mg/kg	[NT]	[NT]	[NR]	[NR]
Chlorpyriphos	mg/kg	[NT]	[NT]	LCS-8	85%
Chlorpyriphos-methyl	mg/kg	[NT]	[NT]	[NR]	[NR]
Diazinon	mg/kg	[NT]	[NT]	[NR]	[NR]
Dichlorvos	mg/kg	[NT]	[NT]	LCS-8	86%
Dimethoate	mg/kg	[NT]	[NT]	[NR]	[NR]
Ethion	mg/kg	[NT]	[NT]	LCS-8	86%
Fenitrothion	mg/kg	[NT]	[NT]	LCS-8	95%
Malathion	mg/kg	[NT]	[NT]	LCS-8	89%
Parathion	mg/kg	[NT]	[NT]	LCS-8	96%
Ronnel	mg/kg	[NT]	[NT]	LCS-8	79%
Surrogate TCMX	%	[NT]	[NT]	LCS-8	97%
QUALITY CONTROL PCBs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	[NT]	[NT]	LCS-8	24/02/2017
Date analysed	-	[NT]	[NT]	LCS-8	24/02/2017
Aroclor 1016	mg/kg	[NT]	[NT]	[NR]	[NR]
Aroclor 1221	mg/kg	[NT]	[NT]	[NR]	[NR]
Aroclor 1232	mg/kg	[NT]	[NT]	[NR]	[NR]
Aroclor 1242	mg/kg	[NT]	[NT]	[NR]	[NR]
Aroclor 1248	mg/kg	[NT]	[NT]	[NR]	[NR]
Aroclor 1254	mg/kg	[NT]	[NT]	LCS-8	104%
Aroclor 1260	mg/kg	[NT]	[NT]	[NR]	[NR]
Surrogate TCLMX	%	[NT]	[NT]	LCS-8	97%

QUALITY CONTROL Acid Extractable metals in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date prepared	-	[NT]	[NT]	LCS-8	24/02/2017
Date analysed	-	[NT]	[NT]	LCS-8	24/02/2017
Arsenic	mg/kg	[NT]	[NT]	LCS-8	108%
Cadmium	mg/kg	[NT]	[NT]	LCS-8	98%
Chromium	mg/kg	[NT]	[NT]	LCS-8	108%
Copper	mg/kg	[NT]	[NT]	LCS-8	106%
Lead	mg/kg	[NT]	[NT]	LCS-8	97%
Mercury	mg/kg	[NT]	[NT]	LCS-8	100%
Nickel	mg/kg	[NT]	[NT]	LCS-8	101%
Zinc	mg/kg	[NT]	[NT]	LCS-8	99%

Report Comments:

Asbestos: Excessive sample volume was provided for asbestos analysis. A portion of the supplied sample was sub-sampled according to Envirolab procedures. We cannot guarantee that this sub-sample is indicative of the entire sample. Envirolab recommends supplying 40-50g (50mL) of sample in its own container as per AS4964-2004.

Note: Samples 162413-1, 2, 3 were sub-sampled from bags provided by the client.

Asbestos ID was analysed by Approved Identifier:	Lucy Zhu
Asbestos ID was authorised by Approved Signatory:	Paul Ching

INS: Insufficient sample for this test	PQL: Practical Quantitation Limit	NT: Not tested
NR: Test not required	RPD: Relative Percent Difference	NA: Test not required
<: Less than	>: Greater than	LCS: Laboratory Control Sample

Quality Control Definitions

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

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

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

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

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

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.
Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.
Spikes for Physical and Aggregate Tests are not applicable.
For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.
Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

Aileen Hie

From: Rob Muller <RMuller@jkgroup.net.au>
Sent: Tuesday, 14 March 2017 11:49 AM
To: Aileen Hie
Subject: TCLP for batch #162413

Hi Aileen. Could you please arrange for the following TCLP analyses with two-day turnaround:

Sample ID and depth	Lab ID	TCLP Required
BH2 (0.17-0.23)	162413-1	Lead
BH3 (0.15-0.26)	162413-2	Lead
BH3 (0.26-0.32)	162413-3	Lead

162413-A
Due: 21/3/17

Regards,

Rob Muller
Senior Environmental Scientist

T: +612 9888 5000
F: +612 9888 5001
RMuller@jkgroup.net.au
www.jkgroup.net.au

ENVIRONMENTAL INVESTIGATION SERVICES
CONSULTING ENVIRONMENTAL ENGINEERS AND SCIENTISTS
PO Box 976, North Ryde BC NSW 1670
115 Wicks Rd, Macquarie Park NSW 2113

12 Ashley Street, Chatswood, NSW 2067
tel: +61 2 9910 6200

email: sydney@envirolab.com.au
envirolab.com.au

Envirolab Services Pty Ltd - Sydney | ABN 37 112 535 645

CERTIFICATE OF ANALYSIS 162413-A

Client:

Environmental Investigation Services
PO Box 976
North Ryde BC
NSW 1670

Attention: Rob Muller

Sample log in details:

Your Reference:	**E30067KM, Kirribilli**
No. of samples:	Additional Testing
Date samples received / completed instructions received	23/02/17 / 14/03/17

Analysis Details:

Please refer to the following pages for results, methodology summary and quality control data.
Samples were analysed as received from the client. Results relate specifically to the samples as received.
Results are reported on a dry weight basis for solids and on an as received basis for other matrices.
Please refer to the last page of this report for any comments relating to the results.

Report Details:

Date results requested by: / Issue Date:	21/03/17 / 21/03/17
Date of Preliminary Report:	Not Issued

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Accredited for compliance with ISO/IEC 17025 - Testing **Tests not covered by NATA are denoted with *.**

Results Approved By:

David Springer
General Manager

Metals in TCLP USEPA1311				
Our Reference:	UNITS	162413-A-1	162413-A-2	162413-A-3
Your Reference	---------- -	BH2	BH3	BH3
Depth	----------	0.17-0.23	0.15-0.26	0.26-0.32
Date Sampled		20/02/2017	20/02/2017	20/02/2017
Type of sample		Soil	Soil	Soil
Date extracted	-	21/03/2017	21/03/2017	21/03/2017
Date analysed	-	21/03/2017	21/03/2017	21/03/2017
pH of soil for fluid# determ.	pH units	9.8	9.9	9.3
pH of soil TCLP (after HCl)	pH units	1.6	1.7	1.8
Extraction fluid used	-	1	1	1
pH of final Leachate	pH units	5.2	5.4	5.7
Lead in TCLP	mg/L	1.4	0.38	0.63

Method ID	Methodology Summary
Inorg-004	Toxicity Characteristic Leaching Procedure (TCLP) using in house method INORG-004.
EXTRACT.7	Toxicity Characteristic Leaching Procedure (TCLP) using Zero Headspace Extraction (zHE) using AS4439 and USEPA 1311.
Inorg-001	pH - Measured using pH meter and electrode in accordance with APHA latest edition, 4500-H+. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
Metals-020 ICP-AES	Determination of various metals by ICP-AES.

QUALITY CONTROL Metals in TCLP USEPA1311	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			21/03/2017	[NT]	[NT]	LCS-W1	21/03/2017
Date analysed	-			21/03/2017	[NT]	[NT]	LCS-W1	21/03/2017
Lead in TCLP	mg/L	0.03	Metals-020 ICP-AES	<0.03	[NT]	[NT]	LCS-W1	101%

Report Comments:

Asbestos ID was analysed by Approved Identifier:	Not applicable for this job
Asbestos ID was authorised by Approved Signatory:	Not applicable for this job

INS: Insufficient sample for this test	PQL: Practical Quantitation Limit	NT: Not tested
NR: Test not required	RPD: Relative Percent Difference	NA: Test not required
<: Less than	>: Greater than	LCS: Laboratory Control Sample

Quality Control Definitions

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

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

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

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.
Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.
Spikes for Physical and Aggregate Tests are not applicable.
For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.
Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

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Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

SAMPLE AND CHAIN OF CUSTODY FORM

TO:		FROM:
ENVIROLAB SERVICES PTY LTD	EIS Job Number: E30067KM	ENVIRONMENTAL INVESTIGATION SERVICES
12 ASHLEY STREET		REAR OF 115 WICKS ROAD
CHATSWOOD NSW 2067	Date Results Required: **2-day turnaround**	MACQUARIE PARK, NSW 2113
P: (02) 99106200		P: 02-9888 5000 F: 02-9888 5001
F: (02) 99106201	Page: 1 of 1	Attention: Rob Muller
Attention: Aileen		

Location:	Kirribilli	Sample Preserved in Esky on Ice
Sampler:	Rob Muller	Tests Required

Date Sampled	Lab Ref:	Sample Number	Depth (m)	Sample Container	PID	Sample Description	Combo #13A	Combo #3A	TCLP PAHs and 6 metals	BTEX	Heavy metals	Combo 3	TRH/BTEX	BTEX	Asbestos			
5/09/2017	1	BH4	0.0-0.1	G, A	0	Fill: silty sand	X											
5/09/2017	2	BH5	0.2-0.4	G, A	0	Fill: silty clayey sand	X											
5/09/2017	3	BH6	0.0-0.1	G, A	0	Fill: silty sand	X											
5/09/2017	4	BH7	0.0-0.1	G, A	0	Fill: silty sand		X	X									
5/09/2017	5	BH7	0.3-0.5	G, A	0	Fill: silty sand		X	X									
5/09/2017	6	BH7	0.9-1.1	G, A	0	Fill: silty sand	X											
5/09/2017	7	BH8	0.0-0.1	G, A	0	Fill: silty clayey sand		X	X									
5/09/2017	8	BH8	0.15-0.25	G, A	0	Fill: silty clayey sand		X	X									
5/09/2017	9	BH8	0.35-0.45	G, A	0	Fill: silty clayey sand	X											
5/09/2017	10	BH9	0.0-0.1	G, A	0	Fill: silty clayey sand	X											
5/09/2017	11	BH9	1.0-1.1	G, A	0	Fill: silty clayey sand		X	X									
5/09/2017	12	BH9	1.9-2.0	G, A	0	Fill: silty clayey sand		X	X									
5/09/2017	13	BH10	0.1-0.2	G, A	0	Fill: silty sand	X											
5/09/2017	14	BH10	0.25-0.35	G, A	0	Fill: silty sand		X	X									
5/09/2017	15	BH11	0.1-0.2	G, A	0	Fill: silty sand	X											
5/09/2017	16	BH11	0.3-0.4	G, A	0	Fill: silty sand		X	X									
5/09/2017	—	DUP-X	-	G	-	Soil duplicate						X						
5/09/2017	17	TB	-	G (125ml)	-	Trip blank				X								
5/09/2017	18	TS	-	V	-	Trip spike				X								
5/09/2017	19	FR	-	V	-	Field rinsate					X							

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 175050
Date Received: 6/9/17
Time Received: 16:00
Received by: MT
Temp: Cool/Ambient 12.5
Cooling: Ice/Icepack
Security: Intact/Broken/None

Remarks (comments/detection limits required):

Please send DUP-X to Envirolab Melbourne for inter-lab analysis.

Sample Containers:
G - 250ml Glass Jar V - vial
A - Ziplock Asbestos Bag
P - Plastic Bag

Relinquished By:	Date:	Time:	Received By:	Date:
Rob Muller	6/9/17	1:52pm	MT EIS	6/9/17 16:00

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

SAMPLE RECEIPT ADVICE

Client Details

Client	Environmental Investigation Services
Attention	Rob Muller

Sample Login Details

Your reference	E30067KM Kirribilli
Envirolab Reference	175050
Date Sample Received	06/09/2017
Date Instructions Received	06/09/2017
Date Results Expected to be Reported	08/09/2017

Sample Condition

Samples received in appropriate condition for analysis	YES
No. of Samples Provided	18 Soil, 1 Water
Turnaround Time Requested	2 days
Temperature on Receipt (°C)	12.5
Cooling Method	Ice Pack
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

Aileen Hie	Jacinta Hurst
Phone: 02 9910 6200	**Phone: 02 9910 6200**
Fax: 02 9910 6201	**Fax: 02 9910 6201**
Email: ahie@envirolab.com.au	**Email: jhurst@envirolab.com.au**

Analysis Underway, details on the following page:

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

Sample ID	vTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticidesin soil	Organophosphorus Pesticides	PCBsin Soil	Acid Extractable metalsin soil	Asbestos ID - soils	Metals in TCLP USEPA1311	PAHs in TCLP(USEPA 1311)	Metals in Water - Dissolved
BH4-0.0-0.1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
BH5-0.2-0.4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
BH6-0.0-0.1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
BH7-0.0-0.1	✓	✓	✓				✓	✓	✓	✓	
BH7-0.3-0.5	✓	✓	✓				✓	✓	✓	✓	
BH7-0.9-1.1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
BH8-0.0-0.1	✓	✓	✓				✓	✓	✓	✓	
BH8-0.15-0.25	✓	✓	✓				✓	✓	✓	✓	
BH8-0.35-0.45	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
BH9-0.0-0.1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
BH9-1.0-1.1	✓	✓	✓				✓	✓	✓	✓	
BH9-1.9-2.0	✓	✓	✓				✓	✓	✓	✓	
BH10-0.1-0.2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
BH10-0.25-0.35	✓	✓	✓				✓	✓	✓	✓	
BH11-0.1-0.2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
BH11-0.3-0.4	✓	✓	✓				✓	✓	✓	✓	
TB	✓										
TS	✓										
FR											✓

The '✓' indicates the testing you have requested. **THIS IS NOT A REPORT OF THE RESULTS.**

Additional Info

Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.

Requests for longer term sample storage must be received in writing.

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

CERTIFICATE OF ANALYSIS 175050

Client Details

Client	Environmental Investigation Services
Attention	Rob Muller
Address	PO Box 976, North Ryde BC, NSW, 1670

Sample Details

Your Reference	**E30067KM Kirribilli**
Number of Samples	18 Soil, 1 Water
Date samples received	06/09/2017
Date completed instructions received	06/09/2017

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Please refer to the last page of this report for any comments relating to the results.

Report Details

Date results requested by	08/09/2017
Date of Issue	22/09/2017
Reissue Details	This report replaces R00 created on 08/09/2017 due to: revised report with additional results.

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Accredited for compliance with ISO/IEC 17025 - Testing. **Tests not covered by NATA are denoted with ***

Asbestos Approved By
Analysed by Asbestos Approved Identifier: Paul Ching
Authorised by Asbestos Approved Signatory: Paul Ching

Results Approved By
Jeremy Faircloth, Organics Supervisor
Leon Ow, Chemist
Long Pham, Team Leader, Metals
Paul Ching, Senior Analyst
Steven Luong, Chemist

Authorised By

David Springer, General Manager

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		175050-1	175050-2	175050-3	175050-4	175050-5
Your Reference	UNITS	BH4	BH5	BH6	BH7	BH7
Depth		0.0-0.1	0.2-0.4	0.0-0.1	0.0-0.1	0.3-0.5
Date Sampled		05/09/2017	05/09/2017	05/09/2017	05/09/2017	05/09/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	07/09/2017	07/09/2017	07/09/2017	07/09/2017	07/09/2017
Date analysed	-	08/09/2017	08/09/2017	08/09/2017	08/09/2017	08/09/2017
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	99	100	107	100	104

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		175050-6	175050-7	175050-8	175050-9	175050-10
Your Reference	UNITS	BH7	BH8	BH8	BH8	BH9
Depth		0.9-1.1	0.0-0.1	0.15-0.25	0.35-0.45	0.0-0.1
Date Sampled		05/09/2017	05/09/2017	05/09/2017	05/09/2017	05/09/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	07/09/2017	07/09/2017	07/09/2017	07/09/2017	07/09/2017
Date analysed	-	08/09/2017	08/09/2017	08/09/2017	08/09/2017	08/09/2017
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	102	106	105	101	104

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		175050-11	175050-12	175050-13	175050-14	175050-15
Your Reference	UNITS	BH9	BH9	BH10	BH10	BH11
Depth		1.0-1.1	1.9-2.0	0.1-0.2	0.25-0.35	0.1-0.2
Date Sampled		05/09/2017	05/09/2017	05/09/2017	05/09/2017	05/09/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	07/09/2017	07/09/2017	07/09/2017	07/09/2017	07/09/2017
Date analysed	-	08/09/2017	08/09/2017	08/09/2017	08/09/2017	08/09/2017
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	100	98	101	99	98

vTRH(C6-C10)/BTEXN in Soil				
Our Reference		175050-16	175050-17	175050-18
Your Reference	UNITS	BH11	TB	TS
Depth		0.3-0.4	-	-
Date Sampled		05/09/2017	05/09/2017	05/09/2017
Type of sample		Soil	Soil	Soil
Date extracted	-	07/09/2017	07/09/2017	07/09/2017
Date analysed	-	08/09/2017	08/09/2017	08/09/2017
TRH C_6 - C_9	mg/kg	<25	[NA]	[NA]
TRH C_6 - C_{10}	mg/kg	<25	[NA]	[NA]
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	[NA]	[NA]
Benzene	mg/kg	<0.2	<0.2	95%
Toluene	mg/kg	<0.5	<0.5	94%
Ethylbenzene	mg/kg	<1	<1	94%
m+p-xylene	mg/kg	<2	<2	93%
o-Xylene	mg/kg	<1	<1	94%
Total +ve Xylenes	mg/kg	<1	<1	[NA]
naphthalene	mg/kg	<1	<1	[NA]
Surrogate aaa-Trifluorotoluene	%	92	102	93

svTRH (C10-C40) in Soil						
Our Reference		175050-1	175050-2	175050-3	175050-4	175050-5
Your Reference	UNITS	BH4	BH5	BH6	BH7	BH7
Depth		0.0-0.1	0.2-0.4	0.0-0.1	0.0-0.1	0.3-0.5
Date Sampled		05/09/2017	05/09/2017	05/09/2017	05/09/2017	05/09/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	07/09/2017	07/09/2017	07/09/2017	07/09/2017	07/09/2017
Date analysed	-	07/09/2017	07/09/2017	07/09/2017	07/09/2017	07/09/2017
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100	270
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	110	190
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	<100	150	400
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100	110
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	150	510
Surrogate o-Terphenyl	%	91	90	89	88	90

svTRH (C10-C40) in Soil						
Our Reference		175050-6	175050-7	175050-8	175050-9	175050-10
Your Reference	UNITS	BH7	BH8	BH8	BH8	BH9
Depth		0.9-1.1	0.0-0.1	0.15-0.25	0.35-0.45	0.0-0.1
Date Sampled		05/09/2017	05/09/2017	05/09/2017	05/09/2017	05/09/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	07/09/2017	07/09/2017	07/09/2017	07/09/2017	07/09/2017
Date analysed	-	07/09/2017	08/09/2017	08/09/2017	07/09/2017	07/09/2017
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	120	<100	180	<100	1,100
TRH C_{29} - C_{36}	mg/kg	<100	<100	120	<100	480
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50	76
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	76
TRH >C_{16} -C_{34}	mg/kg	180	<100	260	<100	1,500
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100	240
Total +ve TRH (>C10-C40)	mg/kg	180	<50	260	<50	1,800
Surrogate o-Terphenyl	%	90	86	89	83	80

svTRH (C10-C40) in Soil						
Our Reference		175050-11	175050-12	175050-13	175050-14	175050-15
Your Reference	UNITS	BH9	BH9	BH10	BH10	BH11
Depth		1.0-1.1	1.9-2.0	0.1-0.2	0.25-0.35	0.1-0.2
Date Sampled		05/09/2017	05/09/2017	05/09/2017	05/09/2017	05/09/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	07/09/2017	07/09/2017	07/09/2017	07/09/2017	07/09/2017
Date analysed	-	07/09/2017	07/09/2017	07/09/2017	07/09/2017	07/09/2017
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	200
TRH C_{15} - C_{28}	mg/kg	<100	<100	230	160	1,100
TRH C_{29} - C_{36}	mg/kg	<100	<100	330	210	960
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50	240
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	240
TRH >C_{16} -C_{34}	mg/kg	<100	<100	430	290	1,700
TRH >C_{34} -C_{40}	mg/kg	<100	<100	190	140	620
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	620	430	2,600
Surrogate o-Terphenyl	%	83	83	92	88	124

svTRH (C10-C40) in Soil			
Our Reference		175050-16	175050-20
Your Reference	UNITS	BH11	BH9 - [TRIPLICATE]
Depth		0.3-0.4	0.0-0.1
Date Sampled		05/09/2017	05/09/2017
Type of sample		Soil	Soil
Date extracted	-	07/09/2017	08/09/2017
Date analysed	-	07/09/2017	08/09/2017
TRH C_{10} - C_{14}	mg/kg	170	<50
TRH C_{15} - C_{28}	mg/kg	2,200	<100
TRH C_{29} - C_{36}	mg/kg	1,400	110
TRH >C_{10} -C_{16}	mg/kg	280	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	280	<50
TRH >C_{16} -C_{34}	mg/kg	3,100	160
TRH >C_{34} -C_{40}	mg/kg	720	<100
Total +ve TRH (>C10-C40)	mg/kg	4,100	160
Surrogate o-Terphenyl	%	#	80

PAHs in Soil						
Our Reference		175050-1	175050-2	175050-3	175050-4	175050-5
Your Reference	UNITS	BH4	BH5	BH6	BH7	BH7
Depth		0.0-0.1	0.2-0.4	0.0-0.1	0.0-0.1	0.3-0.5
Date Sampled		05/09/2017	05/09/2017	05/09/2017	05/09/2017	05/09/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	07/09/2017	07/09/2017	07/09/2017	07/09/2017	07/09/2017
Date analysed	-	08/09/2017	08/09/2017	08/09/2017	08/09/2017	08/09/2017
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.2
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	0.1	0.2
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.4
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.5
Phenanthrene	mg/kg	0.1	0.6	0.1	0.8	13
Anthracene	mg/kg	<0.1	0.1	<0.1	0.2	2.1
Fluoranthene	mg/kg	0.2	1.4	0.2	4.0	19
Pyrene	mg/kg	0.2	1.4	0.2	4.9	16
Benzo(a)anthracene	mg/kg	<0.1	0.8	0.1	2.7	8.6
Chrysene	mg/kg	0.1	0.8	0.1	2.6	8.5
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	1	0.2	4.6	15
Benzo(a)pyrene	mg/kg	0.09	0.84	0.1	3.4	9.3
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	0.4	<0.1	1.6	4.5
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	0.4	1.3
Benzo(g,h,i)perylene	mg/kg	<0.1	0.5	<0.1	2.0	5.2
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	1.1	<0.5	4.7	14
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	1.1	<0.5	4.7	14
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	1.1	<0.5	4.7	14
Total +ve PAH's	mg/kg	0.71	8.3	1.1	27	100
Surrogate p-Terphenyl-d14	%	87	93	87	90	84

PAHs in Soil						
Our Reference		175050-6	175050-7	175050-8	175050-9	175050-10
Your Reference	UNITS	BH7	BH8	BH8	BH8	BH9
Depth		0.9-1.1	0.0-0.1	0.15-0.25	0.35-0.45	0.0-0.1
Date Sampled		05/09/2017	05/09/2017	05/09/2017	05/09/2017	05/09/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	07/09/2017	07/09/2017	07/09/2017	07/09/2017	07/09/2017
Date analysed	-	08/09/2017	08/09/2017	08/09/2017	08/09/2017	08/09/2017
Naphthalene	mg/kg	0.2	0.1	0.2	<0.1	2.4
Acenaphthylene	mg/kg	0.2	<0.1	0.6	0.2	4.1
Acenaphthene	mg/kg	0.2	<0.1	0.2	<0.1	1.5
Fluorene	mg/kg	0.2	<0.1	1.1	0.2	6.7
Phenanthrene	mg/kg	6.2	1.0	8.6	2.3	79
Anthracene	mg/kg	1.1	0.2	1.6	0.5	18
Fluoranthene	mg/kg	9.6	2.4	11	3.9	75
Pyrene	mg/kg	8.6	2.1	11	4.0	63
Benzo(a)anthracene	mg/kg	4.2	1.1	4.8	1.9	28
Chrysene	mg/kg	3.7	1.0	4.2	1.8	22
Benzo(b,j+k)fluoranthene	mg/kg	6.3	2	6.7	2.9	24
Benzo(a)pyrene	mg/kg	4.0	0.99	4.9	1.9	14
Indeno(1,2,3-c,d)pyrene	mg/kg	1.8	0.4	2.0	0.9	9.8
Dibenzo(a,h)anthracene	mg/kg	0.5	0.1	0.5	0.2	3.6
Benzo(g,h,i)perylene	mg/kg	2.0	0.5	2.4	1.0	9.6
Benzo(a)pyrene TEQ calc (zero)	mg/kg	5.7	1.5	6.8	2.8	24
Benzo(a)pyrene TEQ calc(half)	mg/kg	5.7	1.5	6.8	2.8	24
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	5.7	1.5	6.8	2.8	24
Total +ve PAH's	mg/kg	49	12	59	22	360
Surrogate p-Terphenyl-d14	%	87	84	87	86	96

PAHs in Soil						
Our Reference		175050-11	175050-12	175050-13	175050-14	175050-15
Your Reference	UNITS	BH9	BH9	BH10	BH10	BH11
Depth		1.0-1.1	1.9-2.0	0.1-0.2	0.25-0.35	0.1-0.2
Date Sampled		05/09/2017	05/09/2017	05/09/2017	05/09/2017	05/09/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	07/09/2017	07/09/2017	07/09/2017	07/09/2017	07/09/2017
Date analysed	-	08/09/2017	08/09/2017	08/09/2017	08/09/2017	08/09/2017
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	1.1	0.8	0.2	0.4	0.8
Anthracene	mg/kg	0.3	0.2	<0.1	<0.1	0.2
Fluoranthene	mg/kg	1.7	1.7	0.8	1	1.8
Pyrene	mg/kg	1.8	1.4	0.8	1.0	1.8
Benzo(a)anthracene	mg/kg	0.9	0.7	0.5	0.5	0.9
Chrysene	mg/kg	0.8	0.6	0.5	0.5	0.9
Benzo(b,j+k)fluoranthene	mg/kg	1	1	1	0.9	2
Benzo(a)pyrene	mg/kg	0.68	0.69	0.57	0.57	0.87
Indeno(1,2,3-c,d)pyrene	mg/kg	0.2	0.3	0.3	0.3	0.4
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	0.3	0.3	0.3	0.3	0.4
Benzo(a)pyrene TEQ calc (zero)	mg/kg	0.9	0.9	0.8	0.8	1.2
Benzo(a)pyrene TEQ calc(half)	mg/kg	0.9	0.9	0.8	0.8	1.2
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	0.9	0.9	0.8	0.8	1.2
Total +ve PAH's	mg/kg	8.9	7.6	5.0	5.5	9.6
Surrogate p-Terphenyl-d14	%	92	89	88	96	95

PAHs in Soil			
Our Reference		175050-16	175050-20
Your Reference	UNITS	BH11	BH9 - [TRIPLICATE]
Depth		0.3-0.4	0.0-0.1
Date Sampled		05/09/2017	05/09/2017
Type of sample		Soil	Soil
Date extracted	-	07/09/2017	07/09/2017
Date analysed	-	08/09/2017	08/09/2017
Naphthalene	mg/kg	3.2	<0.1
Acenaphthylene	mg/kg	8.0	0.1
Acenaphthene	mg/kg	1.8	<0.1
Fluorene	mg/kg	9.2	<0.1
Phenanthrene	mg/kg	68	0.8
Anthracene	mg/kg	14	0.2
Fluoranthene	mg/kg	62	5.6
Pyrene	mg/kg	59	5.4
Benzo(a)anthracene	mg/kg	28	3.2
Chrysene	mg/kg	31	2.6
Benzo(b,j+k)fluoranthene	mg/kg	32	3.9
Benzo(a)pyrene	mg/kg	21	2.2
Indeno(1,2,3-c,d)pyrene	mg/kg	7.2	1.3
Dibenzo(a,h)anthracene	mg/kg	2.4	0.4
Benzo(g,h,i)perylene	mg/kg	7.3	1.3
Benzo(a)pyrene TEQ calc (zero)	mg/kg	30	3.4
Benzo(a)pyrene TEQ calc(half)	mg/kg	30	3.4
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	30	3.4
Total +ve PAH's	mg/kg	350	27
Surrogate p-Terphenyl-d14	%	94	91

Organochlorine Pesticides in soil						
Our Reference		175050-1	175050-2	175050-3	175050-6	175050-9
Your Reference	UNITS	BH4	BH5	BH6	BH7	BH8
Depth		0.0-0.1	0.2-0.4	0.0-0.1	0.9-1.1	0.35-0.45
Date Sampled		05/09/2017	05/09/2017	05/09/2017	05/09/2017	05/09/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	07/09/2017	07/09/2017	07/09/2017	07/09/2017	07/09/2017
Date analysed	-	07/09/0207	07/09/0207	07/09/0207	07/09/0207	07/09/0207
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	79	85	88	85	78

Organochlorine Pesticides in soil				
Our Reference		175050-10	175050-13	175050-15
Your Reference	UNITS	BH9	BH10	BH11
Depth		0.0-0.1	0.1-0.2	0.1-0.2
Date Sampled		05/09/2017	05/09/2017	05/09/2017
Type of sample		Soil	Soil	Soil
Date extracted	-	07/09/2017	07/09/2017	07/09/2017
Date analysed	-	07/09/0207	07/09/0207	07/09/0207
HCB	mg/kg	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	0.2
Endrin	mg/kg	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.2	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1
Surrogate TCMX	%	86	84	109

Organophosphorus Pesticides						
Our Reference		175050-1	175050-2	175050-3	175050-6	175050-9
Your Reference	UNITS	BH4	BH5	BH6	BH7	BH8
Depth		0.0-0.1	0.2-0.4	0.0-0.1	0.9-1.1	0.35-0.45
Date Sampled		05/09/2017	05/09/2017	05/09/2017	05/09/2017	05/09/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	07/09/2017	07/09/2017	07/09/2017	07/09/2017	07/09/2017
Date analysed	-	07/09/0207	07/09/0207	07/09/0207	07/09/0207	07/09/0207
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	79	85	88	85	78

Organophosphorus Pesticides				
Our Reference		175050-10	175050-13	175050-15
Your Reference	UNITS	BH9	BH10	BH11
Depth		0.0-0.1	0.1-0.2	0.1-0.2
Date Sampled		05/09/2017	05/09/2017	05/09/2017
Type of sample		Soil	Soil	Soil
Date extracted	-	07/09/2017	07/09/2017	07/09/2017
Date analysed	-	07/09/0207	07/09/0207	07/09/0207
Azinphos-methyl (Guthion)	mg/kg	<0.2	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1
Dichlorvos	mg/kg	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1
Surrogate TCMX	%	86	84	109

PCBs in Soil						
Our Reference		175050-1	175050-2	175050-3	175050-6	175050-9
Your Reference	UNITS	BH4	BH5	BH6	BH7	BH8
Depth		0.0-0.1	0.2-0.4	0.0-0.1	0.9-1.1	0.35-0.45
Date Sampled		05/09/2017	05/09/2017	05/09/2017	05/09/2017	05/09/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	07/09/2017	07/09/2017	07/09/2017	07/09/2017	07/09/2017
Date analysed	-	07/09/0207	07/09/0207	07/09/0207	07/09/0207	07/09/0207
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	79	85	88	85	78

PCBs in Soil				
Our Reference		175050-10	175050-13	175050-15
Your Reference	UNITS	BH9	BH10	BH11
Depth		0.0-0.1	0.1-0.2	0.1-0.2
Date Sampled		05/09/2017	05/09/2017	05/09/2017
Type of sample		Soil	Soil	Soil
Date extracted	-	07/09/2017	07/09/2017	07/09/2017
Date analysed	-	07/09/0207	07/09/0207	07/09/0207
Aroclor 1016	mg/kg	<1	<0.2	<0.2
Aroclor 1221	mg/kg	<1	<0.2	<0.2
Aroclor 1232	mg/kg	<1	<0.2	<0.2
Aroclor 1242	mg/kg	<1	<0.2	<0.2
Aroclor 1248	mg/kg	<1	<0.2	<0.2
Aroclor 1254	mg/kg	<1	<0.2	<0.2
Aroclor 1260	mg/kg	<1	<0.2	<0.2
Total +ve PCBs (1016-1260)	mg/kg	<1	<0.2	<0.2
Surrogate TCLMX	%	86	84	109

Acid Extractable metals in soil						
Our Reference		175050-1	175050-2	175050-3	175050-4	175050-5
Your Reference	UNITS	BH4	BH5	BH6	BH7	BH7
Depth		0.0-0.1	0.2-0.4	0.0-0.1	0.0-0.1	0.3-0.5
Date Sampled		05/09/2017	05/09/2017	05/09/2017	05/09/2017	05/09/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	07/09/2017	07/09/2017	07/09/2017	07/09/2017	07/09/2017
Date analysed	-	07/09/2017	07/09/2017	07/09/2017	07/09/2017	07/09/2017
Arsenic	mg/kg	4	5	4	6	5
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	7	16	9	13	17
Copper	mg/kg	29	33	12	25	16
Lead	mg/kg	42	310	27	120	270
Mercury	mg/kg	<0.1	0.5	<0.1	0.1	0.3
Nickel	mg/kg	6	7	6	7	8
Zinc	mg/kg	76	140	44	120	75
Beryllium	mg/kg	<1	<1	<1	<1	<1

Acid Extractable metals in soil						
Our Reference		175050-6	175050-7	175050-8	175050-9	175050-10
Your Reference	UNITS	BH7	BH8	BH8	BH8	BH9
Depth		0.9-1.1	0.0-0.1	0.15-0.25	0.35-0.45	0.0-0.1
Date Sampled		05/09/2017	05/09/2017	05/09/2017	05/09/2017	05/09/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	07/09/2017	07/09/2017	07/09/2017	07/09/2017	07/09/2017
Date analysed	-	07/09/2017	07/09/2017	07/09/2017	07/09/2017	07/09/2017
Arsenic	mg/kg	4	<4	8	10	6
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	13	9	24	23	9
Copper	mg/kg	17	15	23	44	15
Lead	mg/kg	330	41	99	140	110
Mercury	mg/kg	0.4	0.1	0.1	0.2	<0.1
Nickel	mg/kg	6	5	16	15	7
Zinc	mg/kg	81	81	200	170	80
Beryllium	mg/kg	<1	<1	<1	<1	<1

Acid Extractable metals in soil						
Our Reference		175050-11	175050-12	175050-13	175050-14	175050-15
Your Reference	UNITS	BH9	BH9	BH10	BH10	BH11
Depth		1.0-1.1	1.9-2.0	0.1-0.2	0.25-0.35	0.1-0.2
Date Sampled		05/09/2017	05/09/2017	05/09/2017	05/09/2017	05/09/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	07/09/2017	07/09/2017	07/09/2017	07/09/2017	07/09/2017
Date analysed	-	07/09/2017	07/09/2017	07/09/2017	07/09/2017	07/09/2017
Arsenic	mg/kg	<4	<4	<4	<4	4
Cadmium	mg/kg	<0.4	<0.4	1	1	1
Chromium	mg/kg	9	8	27	27	47
Copper	mg/kg	13	19	130	120	190
Lead	mg/kg	77	61	200	170	490
Mercury	mg/kg	0.1	0.1	0.9	0.6	1.4
Nickel	mg/kg	5	8	19	22	17
Zinc	mg/kg	71	79	560	480	480
Beryllium	mg/kg	<1	<1	<1	<1	<1

Acid Extractable metals in soil		
Our Reference		175050-16
Your Reference	UNITS	BH11
Depth		0.3-0.4
Date Sampled		05/09/2017
Type of sample		Soil
Date prepared	-	07/09/2017
Date analysed	-	07/09/2017
Arsenic	mg/kg	4
Cadmium	mg/kg	4
Chromium	mg/kg	59
Copper	mg/kg	170
Lead	mg/kg	580
Mercury	mg/kg	1.4
Nickel	mg/kg	19
Zinc	mg/kg	520
Beryllium	mg/kg	<1

Moisture						
Our Reference		175050-1	175050-2	175050-3	175050-4	175050-5
Your Reference	UNITS	BH4	BH5	BH6	BH7	BH7
Depth		0.0-0.1	0.2-0.4	0.0-0.1	0.0-0.1	0.3-0.5
Date Sampled		05/09/2017	05/09/2017	05/09/2017	05/09/2017	05/09/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	07/09/2017	07/09/2017	07/09/2017	07/09/2017	07/09/2017
Date analysed	-	08/09/2017	08/09/2017	08/09/2017	08/09/2017	08/09/2017
Moisture	%	12	13	5.3	6.5	8.1

Moisture						
Our Reference		175050-6	175050-7	175050-8	175050-9	175050-10
Your Reference	UNITS	BH7	BH8	BH8	BH8	BH9
Depth		0.9-1.1	0.0-0.1	0.15-0.25	0.35-0.45	0.0-0.1
Date Sampled		05/09/2017	05/09/2017	05/09/2017	05/09/2017	05/09/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	07/09/2017	07/09/2017	07/09/2017	07/09/2017	07/09/2017
Date analysed	-	08/09/2017	08/09/2017	08/09/2017	08/09/2017	08/09/2017
Moisture	%	7.0	6.8	9.1	10	12

Moisture						
Our Reference		175050-11	175050-12	175050-13	175050-14	175050-15
Your Reference	UNITS	BH9	BH9	BH10	BH10	BH11
Depth		1.0-1.1	1.9-2.0	0.1-0.2	0.25-0.35	0.1-0.2
Date Sampled		05/09/2017	05/09/2017	05/09/2017	05/09/2017	05/09/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	07/09/2017	07/09/2017	07/09/2017	07/09/2017	07/09/2017
Date analysed	-	08/09/2017	08/09/2017	08/09/2017	08/09/2017	08/09/2017
Moisture	%	12	18	24	21	31

Moisture		
Our Reference		175050-16
Your Reference	UNITS	BH11
Depth		0.3-0.4
Date Sampled		05/09/2017
Type of sample		Soil
Date prepared	-	07/09/2017
Date analysed	-	08/09/2017
Moisture	%	28

Asbestos ID - soils						
Our Reference		175050-1	175050-2	175050-3	175050-4	175050-5
Your Reference	UNITS	BH4	BH5	BH6	BH7	BH7
Depth		0.0-0.1	0.2-0.4	0.0-0.1	0.0-0.1	0.3-0.5
Date Sampled		05/09/2017	05/09/2017	05/09/2017	05/09/2017	05/09/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	8/09/2017	8/09/2017	8/09/2017	8/09/2017	8/09/2017
Sample mass tested	g	Approx. 30g	Approx. 30g	Approx. 30g	Approx. 30g	Approx. 35g
Sample Description	-	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

Asbestos ID - soils						
Our Reference		175050-6	175050-7	175050-8	175050-9	175050-10
Your Reference	UNITS	BH7	BH8	BH8	BH8	BH9
Depth		0.9-1.1	0.0-0.1	0.15-0.25	0.35-0.45	0.0-0.1
Date Sampled		05/09/2017	05/09/2017	05/09/2017	05/09/2017	05/09/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	8/09/2017	8/09/2017	8/09/2017	8/09/2017	8/09/2017
Sample mass tested	g	Approx. 30g	Approx. 40g	Approx. 35g	Approx. 30g	Approx. 40g
Sample Description	-	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

Asbestos ID - soils						
Our Reference		175050-11	175050-12	175050-13	175050-14	175050-15
Your Reference	UNITS	BH9	BH9	BH10	BH10	BH11
Depth		1.0-1.1	1.9-2.0	0.1-0.2	0.25-0.35	0.1-0.2
Date Sampled		05/09/2017	05/09/2017	05/09/2017	05/09/2017	05/09/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	8/09/2017	8/09/2017	8/09/2017	8/09/2017	8/09/2017
Sample mass tested	g	Approx. 35g	Approx. 30g	Approx. 20g	Approx. 20g	Approx. 15g
Sample Description	-	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

Asbestos ID - soils		
Our Reference		175050-16
Your Reference	UNITS	BH11
Depth		0.3-0.4
Date Sampled		05/09/2017
Type of sample		Soil
Date analysed	-	8/09/2017
Sample mass tested	g	Approx. 15g
Sample Description	-	Brown coarse-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected

Metals in TCLP USEPA1311						
Our Reference		175050-1	175050-2	175050-3	175050-4	175050-5
Your Reference	UNITS	BH4	BH5	BH6	BH7	BH7
Depth		0.0-0.1	0.2-0.4	0.0-0.1	0.0-0.1	0.3-0.5
Date Sampled		05/09/2017	05/09/2017	05/09/2017	05/09/2017	05/09/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	07/09/2017	07/09/2017	07/09/2017	07/09/2017	07/09/2017
Date analysed	-	07/09/2017	07/09/2017	07/09/2017	07/09/2017	07/09/2017
pH of soil for fluid# determ.	pH units	8.4	9.7	8.9	9.1	9.6
pH of soil TCLP (after HCl)	pH units	2.0	1.9	1.7	2.0	5.9
Extraction fluid used	-	1	1	1	1	2
pH of final Leachate	pH units	5.4	6.2	5.9	5.2	5.6
Arsenic in TCLP	mg/L	<0.05	<0.05	<0.05	<0.05	0.07
Cadmium in TCLP	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Chromium in TCLP	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Lead in TCLP	mg/L	<0.03	0.1	<0.03	0.07	0.92
Mercury in TCLP	mg/L	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Nickel in TCLP	mg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Beryllium in TCLP	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01

Metals in TCLP USEPA1311						
Our Reference		175050-6	175050-7	175050-8	175050-9	175050-10
Your Reference	UNITS	BH7	BH8	BH8	BH8	BH9
Depth		0.9-1.1	0.0-0.1	0.15-0.25	0.35-0.45	0.0-0.1
Date Sampled		05/09/2017	05/09/2017	05/09/2017	05/09/2017	05/09/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	07/09/2017	07/09/2017	07/09/2017	07/09/2017	07/09/2017
Date analysed	-	07/09/2017	07/09/2017	07/09/2017	07/09/2017	07/09/2017
pH of soil for fluid# determ.	pH units	9.6	7.6	7.6	7.6	7.6
pH of soil TCLP (after HCl)	pH units	2.3	1.7	1.6	1.7	1.7
Extraction fluid used	-	1	1	1	1	1
pH of final Leachate	pH units	5.7	4.9	4.9	4.9	4.9
Arsenic in TCLP	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05
Cadmium in TCLP	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Chromium in TCLP	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Lead in TCLP	mg/L	0.40	<0.03	0.06	0.09	0.07
Mercury in TCLP	mg/L	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Nickel in TCLP	mg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Beryllium in TCLP	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01

Metals in TCLP USEPA1311						
Our Reference		175050-11	175050-12	175050-13	175050-14	175050-15
Your Reference	UNITS	BH9	BH9	BH10	BH10	BH11
Depth		1.0-1.1	1.9-2.0	0.1-0.2	0.25-0.35	0.1-0.2
Date Sampled		05/09/2017	05/09/2017	05/09/2017	05/09/2017	05/09/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	07/09/2017	07/09/2017	07/09/2017	07/09/2017	07/09/2017
Date analysed	-	07/09/2017	07/09/2017	07/09/2017	07/09/2017	07/09/2017
pH of soil for fluid# determ.	pH units	7.7	7.6	7.3	7.6	7.2
pH of soil TCLP (after HCl)	pH units	1.9	1.7	1.8	2.2	1.8
Extraction fluid used	-	1	1	1	1	1
pH of final Leachate	pH units	4.9	4.9	5.1	5.2	4.9
Arsenic in TCLP	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05
Cadmium in TCLP	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Chromium in TCLP	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Lead in TCLP	mg/L	0.06	<0.03	<0.03	<0.03	0.1
Mercury in TCLP	mg/L	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Nickel in TCLP	mg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Beryllium in TCLP	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01

Metals in TCLP USEPA1311		
Our Reference		175050-16
Your Reference	UNITS	BH11
Depth		0.3-0.4
Date Sampled		05/09/2017
Type of sample		Soil
Date extracted	-	07/09/2017
Date analysed	-	07/09/2017
pH of soil for fluid# determ.	pH units	7.1
pH of soil TCLP (after HCl)	pH units	1.9
Extraction fluid used	-	1
pH of final Leachate	pH units	4.9
Arsenic in TCLP	mg/L	<0.05
Cadmium in TCLP	mg/L	<0.01
Chromium in TCLP	mg/L	0.01
Lead in TCLP	mg/L	0.1
Mercury in TCLP	mg/L	<0.0005
Nickel in TCLP	mg/L	<0.02
Beryllium in TCLP	mg/L	<0.01

PAHs in TCLP (USEPA 1311)						
Our Reference		175050-1	175050-2	175050-3	175050-4	175050-5
Your Reference	UNITS	BH4	BH5	BH6	BH7	BH7
Depth		0.0-0.1	0.2-0.4	0.0-0.1	0.0-0.1	0.3-0.5
Date Sampled		05/09/2017	05/09/2017	05/09/2017	05/09/2017	05/09/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	07/09/2017	07/09/2017	07/09/2017	07/09/2017	07/09/2017
Date analysed	-	08/09/2017	08/09/2017	08/09/2017	08/09/2017	08/09/2017
Naphthalene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Acenaphthylene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Acenaphthene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Fluorene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Phenanthrene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001	0.002
Anthracene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Fluoranthene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001	0.002
Pyrene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001	0.001
Benzo(a)anthracene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Chrysene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Benzo(bjk)fluoranthene in TCLP	mg/L	<0.002	<0.002	<0.002	<0.002	<0.002
Benzo(a)pyrene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Indeno(1,2,3-c,d)pyrene - TCLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Dibenzo(a,h)anthracene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Benzo(g,h,i)perylene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Total +ve PAH's	mg/L	NIL (+)VE	NIL (+)VE	NIL (+)VE	NIL (+)VE	0.0050
Surrogate p-Terphenyl-d14	%	123	100	97	131	132

PAHs in TCLP (USEPA 1311)						
Our Reference		175050-6	175050-7	175050-8	175050-9	175050-10
Your Reference	UNITS	BH7	BH8	BH8	BH8	BH9
Depth		0.9-1.1	0.0-0.1	0.15-0.25	0.35-0.45	0.0-0.1
Date Sampled		05/09/2017	05/09/2017	05/09/2017	05/09/2017	05/09/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	07/09/2017	07/09/2017	07/09/2017	07/09/2017	07/09/2017
Date analysed	-	08/09/2017	08/09/2017	08/09/2017	08/09/2017	08/09/2017
Naphthalene in TCLP	mg/L	<0.001	<0.001	0.001	<0.001	<0.001
Acenaphthylene in TCLP	mg/L	<0.001	<0.001	0.002	<0.001	<0.001
Acenaphthene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Fluorene in TCLP	mg/L	<0.001	<0.001	0.002	<0.001	<0.001
Phenanthrene in TCLP	mg/L	<0.001	<0.001	0.004	<0.001	<0.001
Anthracene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Fluoranthene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Pyrene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Benzo(a)anthracene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Chrysene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Benzo(bjk)fluoranthene in TCLP	mg/L	<0.002	<0.002	<0.002	<0.002	<0.002
Benzo(a)pyrene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Indeno(1,2,3-c,d)pyrene - TCLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Dibenzo(a,h)anthracene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Benzo(g,h,i)perylene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Total +ve PAH's	mg/L	NIL (+)VE	NIL (+)VE	0.0080	NIL (+)VE	NIL (+)VE
Surrogate p-Terphenyl-d14	%	136	118	108	105	97

PAHs in TCLP (USEPA 1311)						
Our Reference		175050-11	175050-12	175050-13	175050-14	175050-15
Your Reference	UNITS	BH9	BH9	BH10	BH10	BH11
Depth		1.0-1.1	1.9-2.0	0.1-0.2	0.25-0.35	0.1-0.2
Date Sampled		05/09/2017	05/09/2017	05/09/2017	05/09/2017	05/09/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	07/09/2017	07/09/2017	07/09/2017	07/09/2017	07/09/2017
Date analysed	-	08/09/2017	08/09/2017	08/09/2017	08/09/2017	08/09/2017
Naphthalene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Acenaphthylene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Acenaphthene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Fluorene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Phenanthrene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Anthracene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Fluoranthene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Pyrene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Benzo(a)anthracene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Chrysene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Benzo(bjk)fluoranthene in TCLP	mg/L	<0.002	<0.002	<0.002	<0.002	<0.002
Benzo(a)pyrene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Indeno(1,2,3-c,d)pyrene - TCLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Dibenzo(a,h)anthracene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Benzo(g,h,i)perylene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Total +ve PAH's	mg/L	NIL (+)VE	NIL (+)VE	NIL (+)VE	NIL (+)VE	NIL (+)VE
Surrogate p-Terphenyl-d14	%	92	88	113	108	82

PAHs in TCLP (USEPA 1311)		
Our Reference		175050-16
Your Reference	UNITS	BH11
Depth		0.3-0.4
Date Sampled		05/09/2017
Type of sample		Soil
Date extracted	-	07/09/2017
Date analysed	-	08/09/2017
Naphthalene in TCLP	mg/L	<0.001
Acenaphthylene in TCLP	mg/L	<0.001
Acenaphthene in TCLP	mg/L	<0.001
Fluorene in TCLP	mg/L	<0.001
Phenanthrene in TCLP	mg/L	<0.001
Anthracene in TCLP	mg/L	<0.001
Fluoranthene in TCLP	mg/L	<0.001
Pyrene in TCLP	mg/L	<0.001
Benzo(a)anthracene in TCLP	mg/L	<0.001
Chrysene in TCLP	mg/L	<0.001
Benzo(bjk)fluoranthene in TCLP	mg/L	<0.002
Benzo(a)pyrene in TCLP	mg/L	<0.001
Indeno(1,2,3-c,d)pyrene - TCLP	mg/L	<0.001
Dibenzo(a,h)anthracene in TCLP	mg/L	<0.001
Benzo(g,h,i)perylene in TCLP	mg/L	<0.001
Total +ve PAH's	mg/L	NIL (+)VE
Surrogate p-Terphenyl-d14	%	90

Metals in Water - Dissolved		
Our Reference		175050-19
Your Reference	UNITS	FR
Depth		-
Date Sampled		05/09/2017
Type of sample		Water
Date digested	-	07/09/2017
Date analysed	-	07/09/2017
Arsenic - Dissolved	mg/L	<0.05
Cadmium - Dissolved	mg/L	<0.01
Chromium - Dissolved	mg/L	<0.01
Copper - Dissolved	mg/L	<0.01
Lead - Dissolved	mg/L	<0.03
Mercury - Dissolved	mg/L	<0.0005
Nickel - Dissolved	mg/L	<0.02
Zinc - Dissolved	mg/L	<0.02

Method ID	Methodology Summary
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.
EXTRACT.7	Toxicity Characteristic Leaching Procedure (TCLP) using Zero Headspace Extraction (zHE) using AS4439 and USEPA 1311.
Inorg-001	pH - Measured using pH meter and electrode in accordance with APHA latest edition, 4500-H+. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
Inorg-004	Toxicity Characteristic Leaching Procedure (TCLP) using in house method INORG-004.
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Metals-020	Determination of various metals by ICP-AES.
Metals-020 ICP-AES	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Metals-021 CV-AAS	Determination of Mercury by Cold Vapour AAS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Org-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's. Note, the Total +ve reported DDD+DDE+DDT PQL is reflective of the lowest individual PQL and is therefore simply a sum of the positive individually report DDD+DDE+DDT.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD. Note, the Total +ve PCBs PQL is reflective of the lowest individual PQL and is therefore" Total +ve PCBs" is simply a sum of the positive individual PCBs.
Org-008	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Org-012	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS.

Method ID	Methodology Summary
Org-012	Leachates are extracted with Dichloromethane and analysed by GC-MS.
Org-012	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013.
Org-012	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. For soil results:- 1. 'EQ PQL'values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. 'EQ zero'values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more susceptible to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. 'EQ half PQL'values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. Note, the Total +ve PAHs PQL is reflective of the lowest individual PQL and is therefore "Total +ve PAHs" is simply a sum of the positive individual PAHs.
Org-014	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-11	175050-2
Date extracted	-			07/09/2017	1	07/09/2017	07/09/2017		07/09/2017	07/09/2017
Date analysed	-			08/09/2017	1	08/09/2017	08/09/2017		08/09/2017	08/09/2017
TRH C_6 - C_9	mg/kg	25	Org-016	<25	1	<25	<25	0	110	104
TRH C_6 - C_{10}	mg/kg	25	Org-016	<25	1	<25	<25	0	110	104
Benzene	mg/kg	0.2	Org-016	<0.2	1	<0.2	<0.2	0	110	102
Toluene	mg/kg	0.5	Org-016	<0.5	1	<0.5	<0.5	0	109	104
Ethylbenzene	mg/kg	1	Org-016	<1	1	<1	<1	0	111	104
m+p-xylene	mg/kg	2	Org-016	<2	1	<2	<2	0	110	104
o-Xylene	mg/kg	1	Org-016	<1	1	<1	<1	0	111	105
naphthalene	mg/kg	1	Org-014	<1	1	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	106	1	99	102	3	110	104

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	10	07/09/2017	07/09/2017		[NT]	[NT]
Date analysed	-			[NT]	10	08/09/2017	08/09/2017		[NT]	[NT]
TRH C_6 - C_9	mg/kg	25	Org-016	[NT]	10	<25	<25	0	[NT]	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-016	[NT]	10	<25	<25	0	[NT]	[NT]
Benzene	mg/kg	0.2	Org-016	[NT]	10	<0.2	<0.2	0	[NT]	[NT]
Toluene	mg/kg	0.5	Org-016	[NT]	10	<0.5	<0.5	0	[NT]	[NT]
Ethylbenzene	mg/kg	1	Org-016	[NT]	10	<1	<1	0	[NT]	[NT]
m+p-xylene	mg/kg	2	Org-016	[NT]	10	<2	<2	0	[NT]	[NT]
o-Xylene	mg/kg	1	Org-016	[NT]	10	<1	<1	0	[NT]	[NT]
naphthalene	mg/kg	1	Org-014	[NT]	10	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	[NT]	10	104	103	1	[NT]	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-11	175050-2
Date extracted	-			07/09/2017	1	07/09/2017	07/09/2017		07/09/2017	07/09/2017
Date analysed	-			07/09/2017	1	07/09/2017	07/09/2017		07/09/2017	07/09/2017
TRH C_{10} - C_{14}	mg/kg	50	Org-003	<50	1	<50	<50	0	95	105
TRH C_{15} - C_{28}	mg/kg	100	Org-003	<100	1	<100	<100	0	101	118
TRH C_{29} - C_{36}	mg/kg	100	Org-003	<100	1	<100	120	18	91	86
TRH >C_{10} -C_{16}	mg/kg	50	Org-003	<50	1	<50	<50	0	95	105
TRH >C_{16} -C_{34}	mg/kg	100	Org-003	<100	1	<100	120	18	101	118
TRH >C_{34} -C_{40}	mg/kg	100	Org-003	<100	1	<100	<100	0	91	86
Surrogate o-Terphenyl	%		Org-003	90	1	91	93	2	97	90

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	10	07/09/2017	07/09/2017		[NT]	[NT]
Date analysed	-			[NT]	10	07/09/2017	07/09/2017		[NT]	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-003	[NT]	10	<50	<50	0	[NT]	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-003	[NT]	10	1100	<100	167	[NT]	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-003	[NT]	10	480	<100	131	[NT]	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-003	[NT]	10	76	<50	41	[NT]	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-003	[NT]	10	1500	<100	175	[NT]	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-003	[NT]	10	240	<100	82	[NT]	[NT]
Surrogate o-Terphenyl	%		Org-003	[NT]	10	80	90	12	[NT]	[NT]

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-11	175050-2
Date extracted	-			07/09/2017	1	07/09/2017	07/09/2017		07/09/2017	07/09/2017
Date analysed	-			08/09/2017	1	08/09/2017	08/09/2017		08/09/2017	08/09/2017
Naphthalene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	100	107
Acenaphthylene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	108	98
Phenanthrene	mg/kg	0.1	Org-012	<0.1	1	0.1	<0.1	0	105	113
Anthracene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012	<0.1	1	0.2	0.1	67	103	105
Pyrene	mg/kg	0.1	Org-012	<0.1	1	0.2	0.1	67	103	106
Benzo(a)anthracene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012	<0.1	1	0.1	<0.1	0	116	99
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-012	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012	<0.05	1	0.09	0.07	25	113	102
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	86	1	87	85	2	89	95

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	10	07/09/2017	07/09/2017		[NT]	[NT]
Date analysed	-			[NT]	10	08/09/2017	08/09/2017		[NT]	[NT]
Naphthalene	mg/kg	0.1	Org-012	[NT]	10	2.4	0.2	169	[NT]	[NT]
Acenaphthylene	mg/kg	0.1	Org-012	[NT]	10	4.1	0.2	181	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-012	[NT]	10	1.5	<0.1	175	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012	[NT]	10	6.7	0.2	188	[NT]	[NT]
Phenanthrene	mg/kg	0.1	Org-012	[NT]	10	79	2.7	187	[NT]	[NT]
Anthracene	mg/kg	0.1	Org-012	[NT]	10	18	0.5	189	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012	[NT]	10	75	3.6	182	[NT]	[NT]
Pyrene	mg/kg	0.1	Org-012	[NT]	10	63	3.3	180	[NT]	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-012	[NT]	10	28	1.7	177	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012	[NT]	10	22	1.3	178	[NT]	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-012	[NT]	10	24	2.2	166	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012	[NT]	10	14	1.3	166	[NT]	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	[NT]	10	9.8	0.6	177	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	[NT]	10	3.6	0.2	179	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	[NT]	10	9.6	0.6	176	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	[NT]	10	96	96	0	[NT]	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-11	175050-2
Date extracted	-			07/09/2017	1	07/09/2017	07/09/2017		07/09/2017	07/09/2017
Date analysed	-			07/09/0207	1	07/09/0207	07/09/0207		07/09/0207	07/09/0207
HCB	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	88	97
gamma-BHC	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	99	111
Heptachlor	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	98	111
delta-BHC	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	102	114
Heptachlor Epoxide	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	95	108
gamma-Chlordane	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	100	114
Dieldrin	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	105	120
Endrin	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	92	106
pp-DDD	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	100	114
Endosulfan II	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	87	103
Methoxychlor	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-005	106	1	79	79	0	99	106

QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	10	07/09/2017	07/09/2017		[NT]	[NT]
Date analysed	-			[NT]	10	07/09/0207	07/09/0207		[NT]	[NT]
HCB	mg/kg	0.1	Org-005	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-005	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
gamma-BHC	mg/kg	0.1	Org-005	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-005	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-005	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
delta-BHC	mg/kg	0.1	Org-005	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-005	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-005	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
gamma-Chlordane	mg/kg	0.1	Org-005	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-005	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-005	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-005	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Dieldrin	mg/kg	0.1	Org-005	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Endrin	mg/kg	0.1	Org-005	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-005	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Endosulfan II	mg/kg	0.1	Org-005	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-005	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-005	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-005	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Methoxychlor	mg/kg	0.1	Org-005	[NT]	10	<0.2	<0.1	67	[NT]	[NT]
Surrogate TCMX	%		Org-005	[NT]	10	86	78	10	[NT]	[NT]

QUALITY CONTROL: Organophosphorus Pesticides						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-11	175050-2
Date extracted	-			07/09/2017	1	07/09/2017	07/09/2017		07/09/2017	07/09/2017
Date analysed	-			07/09/0207	1	07/09/0207	07/09/0207		07/09/0207	07/09/0207
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	86	83
Chlorpyriphos-methyl	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Dichlorvos	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	88	93
Dimethoate	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	91	86
Fenitrothion	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	90	83
Malathion	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	100	102
Parathion	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	90	86
Ronnel	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	100	93
Surrogate TCMX	%		Org-008	106	1	79	79	0	92	81

QUALITY CONTROL: Organophosphorus Pesticides						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	10	07/09/2017	07/09/2017		[NT]	[NT]
Date analysed	-			[NT]	10	07/09/0207	07/09/0207		[NT]	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-008	[NT]	10	<0.2	<0.1	67	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-008	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos	mg/kg	0.1	Org-008	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos-methyl	mg/kg	0.1	Org-008	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-008	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Dichlorvos	mg/kg	0.1	Org-008	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Dimethoate	mg/kg	0.1	Org-008	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-008	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Fenitrothion	mg/kg	0.1	Org-008	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Malathion	mg/kg	0.1	Org-008	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Parathion	mg/kg	0.1	Org-008	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-008	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-008	[NT]	10	86	78	10	[NT]	[NT]

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-11	175050-2
Date extracted	-			07/09/2017	1	07/09/2017	07/09/2017		07/09/2017	07/09/2017
Date analysed	-			07/09/0207	1	07/09/0207	07/09/0207		07/09/0207	07/09/0207
Aroclor 1016	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	100	100
Aroclor 1260	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCLMX	%		Org-006	106	1	79	79	0	92	81

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	10	07/09/2017	07/09/2017		[NT]	[NT]
Date analysed	-			[NT]	10	07/09/0207	07/09/0207		[NT]	[NT]
Aroclor 1016	mg/kg	0.1	Org-006	[NT]	10	<1	<1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-006	[NT]	10	<1	<1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-006	[NT]	10	<1	<1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-006	[NT]	10	<1	<1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-006	[NT]	10	<1	<1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-006	[NT]	10	<1	<1	0	[NT]	[NT]
Aroclor 1260	mg/kg	0.1	Org-006	[NT]	10	<1	<1	0	[NT]	[NT]
Surrogate TCLMX	%		Org-006	[NT]	10	86	78	10	[NT]	[NT]

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-11	175050-2
Date prepared	-			07/09/2017	1	07/09/2017	07/09/2017		07/09/2017	07/09/2017
Date analysed	-			07/09/2017	1	07/09/2017	07/09/2017		07/09/2017	07/09/2017
Arsenic	mg/kg	4	Metals-020	<4	1	4	6	40	96	89
Cadmium	mg/kg	0.4	Metals-020	<0.4	1	<0.4	<0.4	0	90	83
Chromium	mg/kg	1	Metals-020	<1	1	7	8	13	97	84
Copper	mg/kg	1	Metals-020	<1	1	29	30	3	97	90
Lead	mg/kg	1	Metals-020	<1	1	42	43	2	92	76
Mercury	mg/kg	0.1	Metals-021	<0.1	1	<0.1	<0.1	0	107	80
Nickel	mg/kg	1	Metals-020	<1	1	6	6	0	94	86
Zinc	mg/kg	1	Metals-020	<1	1	76	77	1	94	91
Beryllium	mg/kg	1	Metals-020	<1	1	<1	<1	0	97	92

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	10	07/09/2017	07/09/2017		[NT]	[NT]
Date analysed	-			[NT]	10	07/09/2017	07/09/2017		[NT]	[NT]
Arsenic	mg/kg	4	Metals-020	[NT]	10	6	6	0	[NT]	[NT]
Cadmium	mg/kg	0.4	Metals-020	[NT]	10	<0.4	<0.4	0	[NT]	[NT]
Chromium	mg/kg	1	Metals-020	[NT]	10	9	10	11	[NT]	[NT]
Copper	mg/kg	1	Metals-020	[NT]	10	15	16	6	[NT]	[NT]
Lead	mg/kg	1	Metals-020	[NT]	10	110	140	24	[NT]	[NT]
Mercury	mg/kg	0.1	Metals-021	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Nickel	mg/kg	1	Metals-020	[NT]	10	7	6	15	[NT]	[NT]
Zinc	mg/kg	1	Metals-020	[NT]	10	80	90	12	[NT]	[NT]
Beryllium	mg/kg	1	Metals-020	[NT]	10	<1	<1	0	[NT]	[NT]

QUALITY CONTROL: Metals in TCLP USEPA1311						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	175050-6
Date extracted	-			07/09/2017	3	07/09/2017	07/09/2017		07/09/2017	07/09/2017
Date analysed	-			07/09/2017	3	07/09/2017	07/09/2017		07/09/2017	07/09/2017
Arsenic in TCLP	mg/L	0.05	Metals-020 ICP-AES	<0.05	3	<0.05	<0.05	0	113	117
Cadmium in TCLP	mg/L	0.01	Metals-020 ICP-AES	<0.01	3	<0.01	<0.01	0	113	108
Chromium in TCLP	mg/L	0.01	Metals-020 ICP-AES	<0.01	3	<0.01	<0.01	0	111	108
Lead in TCLP	mg/L	0.03	Metals-020 ICP-AES	<0.03	3	<0.03	<0.03	0	104	99
Mercury in TCLP	mg/L	0.0005	Metals-021 CV-AAS	<0.0005	3	<0.0005	<0.0005	0	98	100
Nickel in TCLP	mg/L	0.02	Metals-020 ICP-AES	<0.02	3	<0.02	<0.02	0	106	102
Beryllium in TCLP	mg/L	0.01	Metals-020 ICP-AES	<0.01	3	<0.01	<0.01	0	100	101

QUALITY CONTROL: Metals in TCLP USEPA1311						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	12	07/09/2017	07/09/2017		[NT]	[NT]
Date analysed	-			[NT]	12	07/09/2017	07/09/2017		[NT]	[NT]
Arsenic in TCLP	mg/L	0.05	Metals-020 ICP-AES	[NT]	12	<0.05	<0.05	0	[NT]	[NT]
Cadmium in TCLP	mg/L	0.01	Metals-020 ICP-AES	[NT]	12	<0.01	<0.01	0	[NT]	[NT]
Chromium in TCLP	mg/L	0.01	Metals-020 ICP-AES	[NT]	12	<0.01	<0.01	0	[NT]	[NT]
Lead in TCLP	mg/L	0.03	Metals-020 ICP-AES	[NT]	12	<0.03	<0.03	0	[NT]	[NT]
Mercury in TCLP	mg/L	0.0005	Metals-021 CV-AAS	[NT]	12	<0.0005	<0.0005	0	[NT]	[NT]
Nickel in TCLP	mg/L	0.02	Metals-020 ICP-AES	[NT]	12	<0.02	<0.02	0	[NT]	[NT]
Beryllium in TCLP	mg/L	0.01	Metals-020 ICP-AES	[NT]	12	<0.01	<0.01	0	[NT]	[NT]

QUALITY CONTROL: PAHs in TCLP (USEPA 1311)						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			07/09/2017	1	07/09/2017	07/09/2017		07/09/2017	[NT]
Date analysed	-			08/09/2017	1	08/09/2017	08/09/2017		08/09/2017	[NT]
Naphthalene in TCLP	mg/L	0.001	Org-012	<0.001	1	<0.001	<0.001	0	83	[NT]
Acenaphthylene in TCLP	mg/L	0.001	Org-012	<0.001	1	<0.001	<0.001	0	[NT]	[NT]
Acenaphthene in TCLP	mg/L	0.001	Org-012	<0.001	1	<0.001	<0.001	0	[NT]	[NT]
Fluorene in TCLP	mg/L	0.001	Org-012	<0.001	1	<0.001	<0.001	0	106	[NT]
Phenanthrene in TCLP	mg/L	0.001	Org-012	<0.001	1	<0.001	<0.001	0	103	[NT]
Anthracene in TCLP	mg/L	0.001	Org-012	<0.001	1	<0.001	<0.001	0	[NT]	[NT]
Fluoranthene in TCLP	mg/L	0.001	Org-012	<0.001	1	<0.001	<0.001	0	103	[NT]
Pyrene in TCLP	mg/L	0.001	Org-012	<0.001	1	<0.001	<0.001	0	102	[NT]
Benzo(a)anthracene in TCLP	mg/L	0.001	Org-012	<0.001	1	<0.001	<0.001	0	[NT]	[NT]
Chrysene in TCLP	mg/L	0.001	Org-012	<0.001	1	<0.001	<0.001	0	111	[NT]
Benzo(bjk)fluoranthene in TCLP	mg/L	0.002	Org-012	<0.002	1	<0.002	<0.002	0	[NT]	[NT]
Benzo(a)pyrene in TCLP	mg/L	0.001	Org-012	<0.001	1	<0.001	<0.001	0	80	[NT]
Indeno(1,2,3-c,d)pyrene - TCLP	mg/L	0.001	Org-012	<0.001	1	<0.001	<0.001	0	[NT]	[NT]
Dibenzo(a,h)anthracene in TCLP	mg/L	0.001	Org-012	<0.001	1	<0.001	<0.001	0	[NT]	[NT]
Benzo(g,h,i)perylene in TCLP	mg/L	0.001	Org-012	<0.001	1	<0.001	<0.001	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	131	1	123	120	2	107	[NT]

QUALITY CONTROL: Metals in Water - Dissolved						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date digested	-			07/09/2017	[NT]	[NT]	[NT]	[NT]	07/09/2017	[NT]
Date analysed	-			07/09/2017	[NT]	[NT]	[NT]	[NT]	07/09/2017	[NT]
Arsenic - Dissolved	mg/L	0.05	Metals-020	<0.05	[NT]	[NT]	[NT]	[NT]	102	[NT]
Cadmium - Dissolved	mg/L	0.01	Metals-020	<0.01	[NT]	[NT]	[NT]	[NT]	110	[NT]
Chromium - Dissolved	mg/L	0.01	Metals-020	<0.01	[NT]	[NT]	[NT]	[NT]	106	[NT]
Copper - Dissolved	mg/L	0.01	Metals-020	<0.01	[NT]	[NT]	[NT]	[NT]	104	[NT]
Lead - Dissolved	mg/L	0.03	Metals-020	<0.03	[NT]	[NT]	[NT]	[NT]	105	[NT]
Mercury - Dissolved	mg/L	0.0005	Metals-021	<0.0005	[NT]	[NT]	[NT]	[NT]	99	[NT]
Nickel - Dissolved	mg/L	0.02	Metals-020	<0.02	[NT]	[NT]	[NT]	[NT]	105	[NT]
Zinc - Dissolved	mg/L	0.02	Metals-020	<0.02	[NT]	[NT]	[NT]	[NT]	105	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

Report Comments

TRH Soil C10-C40 NEPM (Sample 16) - # Percent recovery is not possible to report as the high concentration of analytes in the sample/s have caused interference.
10/10d: The RPD for duplicate results is accepted due to the non homogenous nature of the sample/s. Laboratory %RPD acceptance criteria exceeded for laboratory sample number 175050-10. Therefore a triplicate has been issued as laboratory sample number 175050-20.

PCBs in Soil (sample 10,10d,13 and 15) - PQL has been raised due to interference from analytes(other than those being tested) in the sample/s.

OC's and OP in Soil (sample 10) - PQL has been raised due to interference from analytes(other than those being tested) in the sample/s.

Asbestos: Excessive sample volumes were provided for asbestos analysis.
A portion of the supplied samples were sub-sampled according to Envirolab
procedures.
We cannot guarantee that these sub-samples are indicative of the entire sample.
Envirolab recommends supplying 40-50g (50mL) of sample in its own
container as per AS4964-2004.
Note: Samples 175050-1 to 5 & 7 to 16 were sub-sampled from bags provided by the client.

PAH in soil:
10/10d: The RPD for duplicate results is accepted due to the non homogenous nature of the sample/s. Laboratory %RPD acceptance criteria exceeded for laboratory sample number 175050-10. Therefore a triplicate has been issued as laboratory sample number 175050-20.

SAMPLE AND CHAIN OF CUSTODY FORM

TO:
ENVIROLAB SERVICES PTY LTD
12 ASHLEY STREET
CHATSWOOD NSW 2067
P: (02) 99106200
F: (02) 99106201

Attention: Aileen

EIS Job Number: E30067KM

Date Results Required: 2-day turnaround

Page: 1 of 1

FROM:
ENVIRONMENTAL INVESTIGATION SERVICES
REAR OF 115 WICKS ROAD
MACQUARIE PARK, NSW 2113
P: 02-9888 5000 F: 02-9888 5001
Attention: Rob Muller

Location: Kirribilli
Sampler: Rob Muller

Sample Preserved in Esky on Ice

Tests Required

Date Sampled	Lab Ref:	Sample Number	Depth (m)	Sample Container	PID	Sample Description	Combo #13A	Combo #3A	TCLP PAHs and 6 metals	BTEX	Heavy metals	Combo 3	TRH/BTEX	BTEX	Asbestos
5/09/2017	1	BH4	0.0-0.1	G, A	0	Fill: silty sand	X								
5/09/2017	2	BH5	0.2-0.4	G, A	0	Fill: silty clayey sand	X								
5/09/2017	3	BH6	0.0-0.1	G, A	0	Fill: silty sand	X								
5/09/2017	4	BH7	0.0-0.1	G, A	0	Fill: silty sand		X	X						
5/09/2017	5	BH7	0.3-0.5	G, A	0	Fill: silty sand		X	X						
5/09/2017	6	BH7	0.9-1.1	G, A	0	Fill: silty sand	X								
5/09/2017	7	BH8	0.0-0.1	G, A	0	Fill: silty clayey sand		X	X						
5/09/2017	8	BH8	0.15-0.25	G, A	0	Fill: silty clayey sand		X	X						
5/09/2017	9	BH8	0.35-0.45	G, A	0	Fill: silty clayey sand	X								
5/09/2017	10	BH9	0.0-0.1	G, A	0	Fill: silty clayey sand	X								
5/09/2017	11	BH9	1.0-1.1	G, A	0	Fill: silty clayey sand		X	X						
5/09/2017	12	BH9	1.9-2.0	G, A	0	Fill: silty clayey sand		X	X						
5/09/2017	13	BH10	0.1-0.2	G, A	0	Fill: silty sand	X								
5/09/2017	14	BH10	0.25-0.35	G, A	0	Fill: silty sand		X	X						
5/09/2017	15	BH11	0.1-0.2	G, A	0	Fill: silty sand	X								
5/09/2017	16	BH11	0.3-0.4	G, A	0	Fill: silty sand		X	X						
5/09/2017	—	DUP-X	-	G	-	Soil duplicate						X			
5/09/2017	17	TB	-	G (125ml)	-	Trip blank				X					
5/09/2017	18	TS	-	V	-	Trip spike				X					
5/09/2017	19	FR	-	V	-	Field rinsate					X				

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200
Job No: 17505
Date Received: 6/9/17
Time Received: 16:00
Received By: M
Temp: Cool/Ambient 12.5
Cooling: Ice/Icepack
Security: Intact/Broken/None

ENVIROLAB
Envirolab Services
12 Ashley Street
Chatswood NSW 2067
Ph: (02) 9910 6200
Job No: 17505
Date Received: 6/9/17
Time Received: 16:00
Received By: M
Temp: Cool/Ambient 16.7°C.
Cooling: Ice/Icepack
Security: Intact/Broken/None

Remarks (comments/detection limits required):
Please send DUP-X to Envirolab Melbourne for inter-lab analysis.

Sample Containers:
G - 250ml Glass Jar V - vial
A - Ziplock Asbestos Bag
P - Plastic Bag

Relinquished By:	Date:	Time:	Received By:	Date:
Rob Muller	6/9/17	1:52pm	MT EIS	6/9/17 16:00

Relin: EIS JACK EMBLEN
7/9/17 13:15

ENVIROLAB SERVICES
A division of Envirolab Group
ENVIROLAB GROUP
Envirolab Services Pty Ltd - Melbourne
ABN 37 112 535 645 -02
1 Dalmore Drive, Scoresby, VIC 3179 Australia
Ph +613 9763 2500 Fax +613 9763 2633
melbourne@envirolab.com.au
www.envirolab.com.au

SAMPLE RECEIPT ADVICE

Client Details	
Client	Environmental Investigation Services
Attention	Rob Muller

Sample Login Details	
Your Reference	E30067KM - Kirribilli
Envirolab Reference	**11722**
Date Sample Received	08/09/2017
Date Instructions Received	08/09/2017
Date Results Expected to be Reported	**12/09/2017**

Sample Condition	
Samples received in appropriate condition for analysis	YES
No. of Samples Provided	1 Soil
Turnaround Time Requested	48hr
Temperature on receipt (°C)	16.7C
Cooling Method	Ice Pack
Sampling Date Provided	YES

Comments
Samples will be held for 1 month for water samples and 2 months for soil samples from date of receipt of samples

Please direct any queries to:

Pamela Adams	Analisa Mathrick
Phone: 03 9763 2500	Phone: 03 9763 2500
Fax: 03 9763 2633	Fax: 03 9763 2633
Email: padams@envirolab.com.au	Email: amathrick@envirolab.com.au

Sample and Testing Details on following page

A division of Envirolab Group

Envirolab Services Pty Ltd - Melbourne
ABN 37 112 535 645 -02
1 Dalmore Drive, Scoresby, VIC 3179 Australia
Ph +613 9763 2500 Fax +613 9763 2633
melbourne@envirolab.com.au
www.envirolab.com.au

Sample Id	*vTRH(C6-C10)/BTEXN in Soil*	*TRH Soil C10-C40 NEPM*	*PAHs in Soil*	*Acid Extractable metals in soil*
DUP-X	✓	✓	✓	✓

1 Dalmore Drive, Scoresby VIC 3179
+61 3 9763 2500

melbourne@envirolab.com.au
envirolab.com.au

Envirolab Services Pty Ltd - Melbourne | ABN 37 112 645 - 002

CERTIFICATE OF ANALYSIS 11722

Client:

Environmental Investigation Services
PO Box 976
North Ryde BC
NSW 1670

Attention: Rob Muller

Sample log in details:

Your Reference:	**E30067KM - Kirribilli**
No. of samples:	1 Soil
Date samples received / completed instructions received	08/09/2017 / 08/09/2017

Analysis Details:

Please refer to the following pages for results, methodology summary and quality control data.
Samples were analysed as received from the client. Results relate specifically to the samples as received.
Results are reported on a dry weight basis for solids and on an as received basis for other matrices.
Please refer to the last page of this report for any comments relating to the results.

Report Details:

Date results requested by: / Issue Date:	12/09/17 / 12/09/17
Date of Preliminary Report:	Not Issued

NATA accreditation number 2901. This document shall not be reproduced except in full.
Accredited for compliance with ISO/IEC 17025 - Testing **Tests not covered by NATA are denoted with *.**

Results Approved By:

Chris De Luca
Senior Chemist

vTRH(C6-C10)/BTEXN in Soil		
Our Reference:	UNITS	11722-1
Your Reference	----------	DUP-X
Date Sampled	----------	5/09/2017
Type of sample		Soil
Date extracted	-	09/09/2017
Date analysed	-	10/09/2017
vTRH C_6 - C_9	mg/kg	<25
vTRH C_6 - C_{10}	mg/kg	<25
TRH C_6 - C_{10} less BTEX (F1)	mg/kg	<25
Benzene	mg/kg	<0.2
Toluene	mg/kg	<0.5
Ethylbenzene	mg/kg	<1
m+p-xylene	mg/kg	<2
o-Xylene	mg/kg	<1
Naphthalene	mg/kg	<1
Total +ve Xylenes	mg/kg	<1
Surrogate aaa-Trifluorotoluene	%	96

TRH Soil C10-C40 NEPM		
Our Reference:	UNITS	11722-1
Your Reference	----------	DUP-X
Date Sampled	----------	5/09/2017
Type of sample		Soil
Date extracted	-	09/09/2017
Date analysed	-	10/09/2017
TRHC$_{10}$ - C$_{14}$	mg/kg	<50
TRHC$_{15}$ - C$_{28}$	mg/kg	<100
TRHC$_{29}$ - C$_{36}$	mg/kg	<100
Total +ve TRH (C10-C36)	mg/kg	<50
TRH>C$_{10}$-C$_{16}$	mg/kg	<50
TRH>C$_{10}$ - C$_{16}$ less Naphthalene (F2)	mg/kg	<50
TRH>C$_{16}$-C$_{34}$	mg/kg	<100
TRH>C$_{34}$-C$_{40}$	mg/kg	<100
Total +ve TRH (>C10-C40)	mg/kg	<50
Surrogate o-Terphenyl	%	92

PAHs in Soil		
Our Reference:	UNITS	11722-1
Your Reference	----------	DUP-X
Date Sampled	----------	5/09/2017
Type of sample		Soil
Date extracted	-	09/09/2017
Date analysed	-	11/09/2017
Naphthalene	mg/kg	<0.1
Acenaphthylene	mg/kg	0.1
Acenaphthene	mg/kg	<0.1
Fluorene	mg/kg	<0.1
Phenanthrene	mg/kg	0.8
Anthracene	mg/kg	0.2
Fluoranthene	mg/kg	1.4
Pyrene	mg/kg	1.3
Benzo(a)anthracene	mg/kg	0.8
Chrysene	mg/kg	0.7
Benzo(b,j&k)fluoranthene	mg/kg	1.2
Benzo(a)pyrene	mg/kg	0.83
Indeno(1,2,3-c,d)pyrene	mg/kg	0.4
Dibenzo(a,h)anthracene	mg/kg	0.1
Benzo(g,h,i)perylene	mg/kg	0.5
Total +ve PAH's	mg/kg	8.6
Benzo(a)pyrene TEQ calc (Zero)	mg/kg	1.2
Benzo(a)pyrene TEQ calc (Half)	mg/kg	1.2
Benzo(a)pyrene TEQ calc (PQL)	mg/kg	1.2
Surrogate p-Terphenyl-d_{14}	%	114

Acid Extractable metals in soil		
Our Reference:	UNITS	11722-1
Your Reference	----------	DUP-X
Date Sampled	----------	5/09/2017
Type of sample		Soil
Date digested	-	11/09/2017
Date analysed	-	11/09/2017
Arsenic	mg/kg	5
Cadmium	mg/kg	<0.4
Chromium	mg/kg	18
Copper	mg/kg	24
Lead	mg/kg	300
Mercury	mg/kg	0.2
Nickel	mg/kg	9
Zinc	mg/kg	160

Moisture		
Our Reference:	UNITS	11722-1
Your Reference	----------	DUP-X
Date Sampled	----------	5/09/2017
Type of sample		Soil
Date prepared	-	09/09/2017
Date analysed	-	11/09/2017
Moisture	%	10

Method ID	Methodology Summary
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.
Org-014	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-012	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. For soil results:- 1. 'TEQ PQL' values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. 'TEQ zero' values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more susceptible to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. 'TEQ half PQL' values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. Note, the Total +ve PAHs PQL is reflective of the lowest individual PQL and is therefore" Total +ve PAHs" is simply a sum of the positive individual PAHs.
Metals-020 ICP-AES	Determination of various metals by ICP-AES.
Metals-021 CV-AAS	Determination of Mercury by Cold Vapour AAS.
Inorg-008	Moisture content determined by heating at 105 deg C for a minimum of 12 hours.

QUALITY CONTROL vTRH(C6-C10)/BTEXN in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base || Duplicate || %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			09/09/2017	11722-1	09/09/2017 || 09/09/2017	LCS-1	09/09/2017
Date analysed	-			10/09/2017	11722-1	10/09/2017 || 10/09/2017	LCS-1	10/09/2017
vTRH C_6 - C_9	mg/kg	25	Org-016	<25	11722-1	<25 || <25	LCS-1	86%
vTRH C_6 - C_{10}	mg/kg	25	Org-016	<25	11722-1	<25 || <25	LCS-1	86%
Benzene	mg/kg	0.2	Org-016	<0.2	11722-1	<0.2 || <0.2	LCS-1	87%
Toluene	mg/kg	0.5	Org-016	<0.5	11722-1	<0.5 || <0.5	LCS-1	87%
Ethylbenzene	mg/kg	1	Org-016	<1	11722-1	<1 || <1	LCS-1	86%
m+p-xylene	mg/kg	2	Org-016	<2	11722-1	<2 || <2	LCS-1	85%
o-Xylene	mg/kg	1	Org-016	<1	11722-1	<1 || <1	LCS-1	86%
Naphthalene	mg/kg	1	Org-014	<1	11722-1	<1 || <1	[NR]	[NR]
Surrogate aaa-Trifluorotoluene	%		Org-016	100	11722-1	96 || 98 || RPD: 2	LCS-1	98%

QUALITY CONTROL TRH Soil C10-C40 NEPM	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base || Duplicate || %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			09/09/2017	11722-1	09/09/2017 || 09/09/2017	LCS-1	09/09/2017
Date analysed	-			10/09/2017	11722-1	10/09/2017 || 10/09/2017	LCS-1	10/09/2017
TRH C_{10} - C_{14}	mg/kg	50	Org-003	<50	11722-1	<50 || <50	LCS-1	92%
TRH C_{15} - C_{28}	mg/kg	100	Org-003	<100	11722-1	<100 || <100	LCS-1	88%
TRH C_{29} - C_{36}	mg/kg	100	Org-003	<100	11722-1	<100 || <100	LCS-1	80%
TRH >C_{10}-C_{16}	mg/kg	50	Org-003	<50	11722-1	<50 || <50	LCS-1	92%
TRH >C_{16}-C_{34}	mg/kg	100	Org-003	<100	11722-1	<100 || <100	LCS-1	88%
TRH >C_{34}-C_{40}	mg/kg	100	Org-003	<100	11722-1	<100 || <100	LCS-1	80%
Surrogate o-Terphenyl	%		Org-003	94	11722-1	92 || 92 || RPD: 0	LCS-1	87%

QUALITY CONTROL PAHs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base || Duplicate || %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			09/09/2017	11722-1	09/09/2017 || 09/09/2017	LCS-1	09/09/2017
Date analysed	-			11/09/2017	11722-1	11/09/2017 || 11/09/2017	LCS-1	11/09/2017
Naphthalene	mg/kg	0.1	Org-012	<0.1	11722-1	<0.1 || <0.1	LCS-1	90%
Acenaphthylene	mg/kg	0.1	Org-012	<0.1	11722-1	0.1 || 0.3 || RPD: 100	LCS-1	88%
Acenaphthene	mg/kg	0.1	Org-012	<0.1	11722-1	<0.1 || <0.1	[NR]	[NR]
Fluorene	mg/kg	0.1	Org-012	<0.1	11722-1	<0.1 || 0.1	LCS-1	92%
Phenanthrene	mg/kg	0.1	Org-012	<0.1	11722-1	0.8 || 0.9 || RPD: 12	LCS-1	92%
Anthracene	mg/kg	0.1	Org-012	<0.1	11722-1	0.2 || 0.3 || RPD: 40	[NR]	[NR]
Fluoranthene	mg/kg	0.1	Org-012	<0.1	11722-1	1.4 || 1.5 || RPD: 7	LCS-1	92%
Pyrene	mg/kg	0.1	Org-012	<0.1	11722-1	1.3 || 1.5 || RPD: 14	LCS-1	90%
Benzo(a)anthracene	mg/kg	0.1	Org-012	<0.1	11722-1	0.8 || 0.9 || RPD: 12	[NR]	[NR]
Chrysene	mg/kg	0.1	Org-012	<0.1	11722-1	0.7 || 0.8 || RPD: 13	LCS-1	106%

QUALITY CONTROL PAHs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Benzo(b,j&k) fluoranthene	mg/kg	0.2	Org-012	<0.2	11722-1	1.2 || 1.3 || RPD: 8	[NR]	[NR]
Benzo(a)pyrene	mg/kg	0.05	Org-012	<0.05	11722-1	0.83 || 0.91 || RPD: 9	LCS-1	82%
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	<0.1	11722-1	0.4 || 0.5 || RPD: 22	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	<0.1	11722-1	0.1 || 0.2 || RPD: 67	[NR]	[NR]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	<0.1	11722-1	0.5 || 0.5 || RPD: 0	[NR]	[NR]
Surrogate p-Terphenyl-d_{14}	%		Org-012	100	11722-1	114 || 116 || RPD: 2	LCS-1	100%
QUALITY CONTROL Acid Extractable metals in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date digested	-			11/09/2017	[NT]	[NT]	LCS-1	11/09/2017
Date analysed	-			11/09/2017	[NT]	[NT]	LCS-1	11/09/2017
Arsenic	mg/kg	4	Metals-020 ICP-AES	<4	[NT]	[NT]	LCS-1	101%
Cadmium	mg/kg	0.4	Metals-020 ICP-AES	<0.4	[NT]	[NT]	LCS-1	105%
Chromium	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-1	107%
Copper	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-1	102%
Lead	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-1	103%
Mercury	mg/kg	0.1	Metals-021 CV-AAS	<0.1	[NT]	[NT]	LCS-1	119%
Nickel	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-1	104%
Zinc	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-1	102%

QUALITY CONTROL Moisture	UNITS	PQL	METHOD	Blank
Date prepared	-			[NT]
Date analysed	-			[NT]
Moisture	%	0.1	Inorg-008	[NT]

Report Comments:

Asbestos ID was analysed by Approved Identifier:	Not applicable for this job
Asbestos ID was authorised by Approved Signatory:	Not applicable for this job

INS: Insufficient sample for this test	PQL: Practical Quantitation Limit	NT: Not tested
NR: Test not required	RPD: Relative Percent Difference	NA: Test not required
<: Less than	>: Greater than	LCS: Laboratory Control Sample

Quality Control Definitions

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

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

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

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

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

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batched of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.
Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.
Spikes for Physical and Aggregate Tests are not applicable.
For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.
Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

Appendix E: Statistical Calculations

UCL Statistics for Uncensored Full Data Sets

User Selected Options	
Date/Time of Computation	19/09/2017 2:31:08 PM
From File	WorkSheet.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Lead

General Statistics

Total Number of Observations	19	Number of Distinct Observations	18
		Number of Missing Observations	0
Minimum	27	Mean	197.2
Maximum	580	Median	160
SD	152.7	Std. Error of Mean	35.04
Coefficient of Variation	0.774	Skewness	1.18

Normal GOF Test

Shapiro Wilk Test Statistic	0.889	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.901	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.151	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.203	Data appear Normal at 5% Significance Level

Data appear Approximate Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	258	95% Adjusted-CLT UCL (Chen-1995)	265
		95% Modified-t UCL (Johnson-1978)	259.6

Gamma GOF Test

A-D Test Statistic	0.15	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.754	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.0773	**Kolmogrov-Smirnoff Gamma GOF Test**
5% K-S Critical Value	0.201	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.761	k star (bias corrected MLE)	1.518
Theta hat (MLE)	112	Theta star (bias corrected MLE)	129.9
nu hat (MLE)	66.92	nu star (bias corrected)	57.69
MLE Mean (bias corrected)	197.2	MLE Sd (bias corrected)	160.1
		Approximate Chi Square Value (0.05)	41.23
Adjusted Level of Significance	0.0369	Adjusted Chi Square Value	40.01

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	275.9	95% Adjusted Gamma UCL (use when n<50)	284.3

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.973	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.901	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.083	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.203	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

58	Lognormal Statistics										
59				Minimum of Logged Data	3.296			Mean of logged Data	4.974		
60				Maximum of Logged Data	6.363			SD of logged Data	0.858		
61											
62	Assuming Lognormal Distribution										
63				95% H-UCL	340.9			90% Chebyshev (MVUE) UCL	335.2		
64				95% Chebyshev (MVUE) UCL	394.8			97.5% Chebyshev (MVUE) UCL	477.4		
65				99% Chebyshev (MVUE) UCL	639.6						
66											
67	Nonparametric Distribution Free UCL Statistics										
68	Data appear to follow a Discernible Distribution at 5% Significance Level										
69											
70	Nonparametric Distribution Free UCLs										
71				95% CLT UCL	254.8			95% Jackknife UCL	258		
72				95% Standard Bootstrap UCL	252.9			95% Bootstrap-t UCL	273.3		
73				95% Hall's Bootstrap UCL	280.1			95% Percentile Bootstrap UCL	255.2		
74				95% BCA Bootstrap UCL	263						
75				90% Chebyshev(Mean, Sd) UCL	302.3			95% Chebyshev(Mean, Sd) UCL	349.9		
76				97.5% Chebyshev(Mean, Sd) UCL	416			99% Chebyshev(Mean, Sd) UCL	545.8		
77											
78	Suggested UCL to Use										
79				95% Student's-t UCL	258						
80											
81	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.										
82	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)										
83	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.										
84	For additional insight the user may want to consult a statistician.										
85											

Appendix F: Report Explanatory Notes

STANDARD SAMPLING PROCEDURE (SSP)

These protocols specify the basic procedures to be used when sampling soils or groundwater for environmental site assessments undertaken by EIS.

The purpose of these protocols is to provide standard methods for: sampling, decontamination procedures for sampling equipment, sample preservation, sample storage and sample handling. Deviations from these procedures must be recorded.

Soil Sampling

- Prepare a borehole/test pit log or made a note of the sample description for stockpiles.
- Layout sampling equipment on clean plastic sheeting to prevent direct contact with ground surface. The work area should be at a distance from the drill rig/excavator such that the machine can operate in a safe manner.
- Ensure all sampling equipment has been decontaminated prior to use.
- Remove any surface debris from the immediate area of the sampling location.
- Collect samples and place in glass jar with a Teflon seal. This should be undertaken as quickly as possible to prevent the loss of any volatiles. If possible, fill the glass jars completely.
- Collect samples for asbestos analysis and place in a zip-lock plastic bag.
- Label the sampling containers with the EIS job number, sample location (e.g. BH1), sampling depth interval and date. If more than one sample container is used, this should also be indicated (e.g. 2 = Sample jar 1 of 2 jars).
- Photoionisation detector (PID) screening of volatile organic compounds (VOCs) should be undertaken on samples using the soil sample headspace method. Headspace measurements are taken following equilibration of the headspace gasses in partly filled zip-lock plastic bags. PID headspace data is recorded on the borehole/test pit log and the chain of custody forms.
- Record the lithology of the sample and sample depth on the borehole/test pit log generally in accordance with AS1726-1993[19].
- Store the sample in a sample container cooled with ice or chill packs. On completion of the sampling the sample container should be delivered to the lab immediately or stored in the refrigerator prior to delivery to the lab. All samples are preserved in accordance with the standards outlined in the report.
- Check for the presence of groundwater after completion of each borehole using an electronic dip metre or water whistle. Boreholes should be left open until the end of fieldwork. All groundwater levels in the boreholes should be rechecked on the completion of the fieldwork.
- Backfill the boreholes/test pits with the excavation cuttings or clean sand prior to leaving the site.

Decontamination Procedures for Soil Sampling Equipment

- All sampling equipment should be decontaminated between every sampling location. This excludes single use PVC tubing used for push tubes etc. Equipment and materials required for the decontamination include:
  - Phosphate free detergent (Decon 90);
  - Potable water;
  - Stiff brushes; and
  - Plastic sheets.

[19] Standards Australia, (1993), *Geotechnical Site Investigations.* (AS1726-1993)

- Ensure the decontamination materials are clean prior to proceeding with the decontamination.
- Fill both buckets with clean potable water and add phosphate free detergent to one bucket.
- In the bucket containing the detergent, scrub the sampling equipment until all the material attached to the equipment has been removed.
- Rinse sampling equipment in the bucket containing potable water.
- Place cleaned equipment on clean plastic sheets.

If all materials are not removed by this procedure, high-pressure water cleaning is recommended. If any equipment is not completely decontaminated by both these processes, then the equipment should not be used until it has been thoroughly cleaned.

Groundwater Sampling

Groundwater samples are more sensitive to contamination than soil samples and therefore adhesion to this protocol is particularly important to obtain reliable, reproducible results. The recommendations detailed in AS/NZS 5667.1:1998 are considered to form a minimum standard.

The basis of this protocol is to maintain the security of the borehole and obtain accurate and representative groundwater samples. The following procedure should be used for collection of groundwater samples from previously installed groundwater monitoring wells.

- After monitoring well installation, at least three bore volumes should be pumped from the monitoring wells (well development) to remove any water introduced during the drilling process and/or the water that is disturbed during installation of the monitoring well. This should be completed prior to purging and sampling.
- Groundwater monitoring wells should then be left to recharge for at least three days before purging and sampling. Prior to purging or sampling, the condition of each well should observed and any anomalies recorded on the field data sheets. The following information should be noted: the condition of the well, noting any signs of damage, tampering or complete destruction; the condition and operation of the well lock; the condition of the protective casing and the cement footing (raised or cracked); and, the presence of water between protective casing and well.
- Take the groundwater level from the collar of the piezometer/monitoring well using an electronic dip meter. The collar level should be taken (if required) during the site visit using a dumpy level and staff.
- Purging and sampling of piezometers/monitoring wells is done on the same site visit when using micro-purge (or other low flow) techniques.
- Layout and organize all equipment associated with groundwater sampling in a location where they will not interfere with the sampling procedure and will not pose a risk of contaminating samples. Equipment generally required includes:
  - Micropore filtration system or Stericup single-use filters (for heavy metals samples);
  - Filter paper for Micropore filtration system; Bucket with volume increments;
  - Sample containers: teflon bottles with 1 ml nitric acid, 75mL glass vials with 1 mL hydrochloric acid, 1 L amber glass bottles;
  - Bucket with volume increments;
  - Flow cell;
  - pH/EC/Eh/T meters;
  - Plastic drums used for transportation of purged water;
  - Esky and ice;
  - Nitrile gloves;
  - Distilled water (for cleaning);
  - Electronic dip meter;

- Low flow pump pack and associated tubing; and
- Groundwater sampling forms.

- If single-use stericup filtration is not used, clean the Micropore filtration system thoroughly with distilled water prior to use and between each sample. Filter paper should be changed between samples. 0.45um filter paper should be placed below the glass fibre filter paper in the filtration system.
- Ensure all non-disposable sampling equipment is decontaminated or that new disposable equipment is available prior to any work commencing at a new location. The procedure for decontamination of groundwater equipment is outlined at the end of this section.
- Disposable gloves should be used whenever samples are taken to protect the sampler and to assist in avoidance of contamination.
- Groundwater samples are obtained from the monitoring wells using low flow/micro-purge sampling equipment to reduce the disturbance of the water column and loss of volatiles.
- During pumping to purge the well, the pH, temperature, conductivity, dissolved oxygen, redox potential and groundwater levels are monitored (where possible) using calibrated field instruments to assess the development of steady state conditions. Steady state conditions are generally considered to have been achieved when the difference in the pH measurements was less than 0.2 units and the difference in conductivity was less than 10%.
- All measurements are recorded on specific data sheets.
- Once steady state conditions are considered to have been achieved, groundwater samples are obtained directly from the pump tubing and placed in appropriate glass bottles, BTEX vials or plastic bottles.
- All samples are preserved in accordance with water sampling requirements detailed in the NEPM 2013 and placed in an insulated container with ice. Groundwater samples are preserved by immediate storage in an insulated sample container with ice as outlined in the report text.
- Record the sample on the appropriate log in accordance with AS1726:1993. At the end of each water sampling complete a chain of custody form.

Decontamination Procedures for Groundwater Sampling Equipment

- All equipment associated with the groundwater sampling procedure (other than single-use items) should be decontaminated between every sampling location.
- The following equipment and materials are required for the decontamination procedure:
  - Phosphate free detergent;
  - Potable water;
  - Distilled water; and
  - Plastic Sheets or bulk bags (plastic bags).
- Fill one bucket with clean potable water and phosphate free detergent, and one bucket with distilled water.
- Flush potable water and detergent through pump head. Wash sampling equipment and pump head using brushes in the bucket containing detergent until all materials attached to the equipment are removed.
- Flush pump head with distilled water.
- Change water and detergent solution after each sampling location.
- Rinse sampling equipment in the bucket containing distilled water.
- Place cleaned equipment on clean plastic sheets.
- If all materials are not removed by this procedure that equipment should not be used until it has been thoroughly cleaned

QA/QC DEFINITIONS

The QA/QC terms used in this report are defined below. The definitions are in accordance with US EPA publication SW-846, entitled *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods* (1994[20]) methods and those described in *Environmental Sampling and Analysis, A Practical Guide,* (H. Keith 1991[21]).

Practical Quantitation Limit (PQL), Limit of Reporting (LOR) & Estimated Quantitation Limit (EQL)

These terms all refer to the concentration above which results can be expressed with a minimum 95% confidence level. The laboratory reporting limits are generally set at ten times the standard deviation for the Method Detection limit (MDL) for each specific analyte. For the purposes of this report the LOR, PQL, and EQL are considered to be equivalent.

When assessing laboratory data it should be borne in mind that values at or near the PQL have two important limitations.

"The uncertainty of the measurement value can approach, and even equal, the reported value. Secondly, confirmation of the analytes reported is virtually impossible unless identification uses highly selective methods. These issues diminish when reliably measurable amounts of analytes are present. Accordingly, legal and regulatory actions should be limited to data at or above the reliable detection limit" Keith 1991.

Precision

The degree to which data generated from repeated measurements differ from one another due to random errors. Precision is measured using the standard deviation or Relative Percent Difference (RPD). Acceptable targets for precision in this report will be less than 50% RPD for concentrations greater than ten times the PQL, less than 75% RPD for concentrations between five and ten times the PQL and less than 100% RPD for concentrations that are less than five times the PQL.

Accuracy

Accuracy is a measure of the agreement between an experimental result and the true value of the parameter being measured. The assessment of accuracy for an analysis can be achieved through the analysis of known reference materials or assessed by the analysis of surrogates, field blanks, trip spikes and matrix spikes.

The proximity of an averaged result to the true value, where all random errors have been statistically removed. Accuracy is measured by percent recovery. Acceptable limits for accuracy generally lie between 70% to 130% recoveries. Certain laboratory methods may allow for values that lie outside these limits.

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents a characteristic of a population, parameter variations at a sampling point, or an environmental condition. Representativeness is primarily dependent upon the design and implementation of the sampling program. Representativeness of the data is partially ensured by the avoidance of contamination, adherence to sample handing and analysis protocols and use of proper chain-of-custody and documentation procedures.

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[20] US EPA, (1994), *SW-846: Test Methods for Evaluating Solid Waste, Physical/Chemical Methods.* (US EPA SW-846)

[21] Keith, H. (1991), *Environmental Sampling and Analysis, A Practical Guide.*

Completeness

Completeness is a measure of the number of valid measurements in a data set compared to the total number of measurements made and overall performance against DQIs. The following information is assessed for completeness:

- Chain-of-custody forms; Sample receipt form;
- All sample results reported; All blank data reported;
- All laboratory duplicate and RPDs calculated;
- All surrogate spike data reported;
- All matrix spike and lab control spike (LCS) data reported and RPDs calculated;
- Spike recovery acceptable limits reported; and
- NATA stamp on reports.

Comparability

Comparability is the evaluation of the similarity of conditions (e.g. sample depth, sample homogeneity) under which separate sets of data are produced. Data comparability checks include a bias assessment that may arise from the following sources:

- Collection and analysis of samples by different personnel; Use of different techniques;
- Collection and analysis by the same personnel using the same methods but at different times; and
- Spatial and temporal changes (due to environmental dynamics).

Blanks

The purpose of laboratory and field blanks is to check for artifacts and interferences that may arise during sampling and analysis.

Matrix Spikes

Samples are spiked with laboratory grade standards to detect interactive effects between the sample matrix and the analytes being measured. Matrix Spikes are reported as a percent recovery and are prepared for 1 in every 20 samples. Sample batches that contain less than 20 samples may be reported with a Matrix Spike from another batch. The percent recovery is calculated using the formula below. Acceptable recovery limits are 70% to 130%.

$$\frac{\text{(Spike Sample Result – Sample Result) x 100}}{\text{Concentration of Spike Added}}$$

Surrogate Spikes

Samples are spiked with a known concentration of compounds that are chemically related to the analyte being investigated but unlikely to be detected in the environment. The purpose of the Surrogate Spikes is to check the accuracy of the analytical technique. Surrogate Spikes are reported as percent recovery.

Duplicates

Laboratory duplicates measure precision, expressed as Relative Percent Difference. Duplicates are prepared from a single field sample and analysed as two separate extraction procedures in the laboratory. The RPD is calculated using the formula where D1 is the sample concentration and D2 is the duplicate sample concentration:

$$\frac{(D1 - D2) \times 100}{\{(D1 + D2)/2\}}$$