25 June 2020 Reference No. 19130799-005-L-Rev1

Sean Gilchrist
Starryland NSW Pty Ltd C/O PDS Pty Ltd
Level 1
63 York Street
Sydney NSW 2000

PRELIMINARY IN SITU WASTE CLASSIFICATION REPORT, GRAN CENTRAL DEVELOPMENT, GRANVILLE

Dear Sean,

1.0 INTRODUCTION

Property Development Solutions (Aust) Pty Ltd (PDS) on behalf of Starryland NSW Pty Ltd (Starryland) engaged Golder Associates Pty Ltd to perform geotechnical and environmental investigations of the proposed Gran Central building development located at 134-142 Parramatta Road, 26-38 Good Street and 59-61 Cowper Street, Granville (the site).

Reports prepared to date as part of investigations on the site comprise an environmental investigation report (Golder 2019) and a draft geotechnical and hydrogeological investigation report (Golder 2020).

This document presents a preliminary *in situ* waste classification for material, on the accessible portion of the site, likely to be generated as excavation spoil by the proposed site development.

2.0 WASTE CLASSIFICATION PROCESS

The Waste Classification Guidelines (EPA 2014a) includes a six step process for classification of waste. The six steps, which are to be applied in order, are identified in the table below.

Step 1: Is the waste special waste?	Yes, asbestos was detected in some samples (see **Section 4.0**).
Step 2: Is the waste liquid waste?	No, based on the field observations (see **Section 3.0**).
Step 3: Is the waste pre-classified?	No, the waste is not a pre-classified material identified in EPA 2014a.
Step 4: Does the waste possess hazardous characteristics?	No, the waste would not be defined as a dangerous good under the relevant classes or divisions of the Transport of Dangerous Goods Code.
Step 5: Determining a waste's classification using chemical assessment.	Chemical assessment of the waste material was performed (see **Section 3.0** and **Section 4.0**).

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Step 6: Is the waste putrescible or non-putrescible?	Based on the field observations the waste material is considered to be non-putrescible (see **Section 3.0** and **Section 4.5**).

The preliminary in situ waste classification for material likely to be generated as excavation spoil by the proposed site development is identified in **Section 5.0**.

3.0 FIELDWORK AND ANALYTICAL SCHEDULE

Four boreholes were drilled across the site in July 2019, with an additional six boreholes drilled in November 2019, on the accessible portion of the site. This excluded the portions of the site below existing buildings and the central portion of the site located near a car sales office. A groundwater monitoring well was installed at location BH01, and nested monitoring wells were installed at locations BH101/BH101A and BH102/102A. Soil vapour implants were installed at locations BH104 and BH105. A site plan is presented in **APPENDIX A**.

Mixed fill was present across the site at depths varying between 40 mm and 450 mm. The fill was described as sandy, silty or gravelly clay; sandy or clayey silt; gravel and clayey gravel; and silty and gravelly sand. Silty clay, or clayey silt was present below the fill. The residual clay was of high plasticity and brown to red brown in colour, becoming pale grey with depth. The thickness of clay is expected to vary between approximately 1.2 m and 3.4 m, with depth increasing towards the northern and eastern parts of the site. The clay was underlain by highly to moderately weathered siltstone. Copies of borelogs (excluding well installation records) are presented in **APPENDIX B**.

No visual or olfactory observations of potential contamination were made at the investigation locations. The maximum field screening PID measurement was 6.9 parts per million (ppm), indicating a low potential for the presence of volatile organic compounds.

Photographs of the site taken during a site inspection in July 2019 showing the site surface conditions and of samples representative of the proposed surplus spoil are presented as **Plates 1** to **10** in **APPENDIX C**. Additional photographs of core samples collected during the investigations also included with the borehole logs in **APPENDIX B**.

The primary and field duplicate samples were transported under chain of custody protocols to the SGS Environmental Services (SGS) laboratory at Alexandria. The field triplicate samples were transported under chain of custody protocols to the Envirolab Services Pty Ltd (ELS) laboratory at Chatswood. SGS and ELS are accredited by the National Association of Testing Authorities, Australia (NATA) for the analyses performed, except quantification of asbestos in soil and calculation of total OPPs.

The samples were analysed for a general suite of contaminants of potential concern. The analysis suite comprised:

- Selected heavy metals (arsenic, cadmium, copper, chromium, lead, mercury, nickel and zinc);
- Total petroleum hydrocarbons (TPH) / total recoverable hydrocarbons (TRH);
- Benzene, toluene, ethyl benzene, xylenes and naphthalene (BTEX);
- Polycyclic aromatic hydrocarbons (PAHs);
- Polychlorinated biphenyls (PCBs);
- Organochlorine pesticides (OCPs);
- Organophosphorous pesticides (OPPs);

- Asbestos[1]; and
- Toxicity Characteristics Leaching - lead.

The environmental investigation report (Golder 2019) included a review of on-line acid sulfate soil (ASS) mapping hosted by the Australian Soil Resource Information System[2] (ASRIS). The review indicated the site is located in an area as having no known occurrence of ASS (Golder 2019). The ASRIS mapping is based on existing data sets which have been converted to a national classification system (ASRIS 2011).

4.0 LABORATORY ANALYTICAL RESULTS AND DISCUSSION

The results of the screening of laboratory analytical results against the threshold concentrations provided in NSW EPA (2014a) is presented in **Table 1** in **APPENDIX D.** Laboratory certificates are included in **APPENDIX E** and data validation records are presented in **APPENDIX F**.

4.1 Metals

Metals were detected in all of the samples analysed. With the exception of lead in two fill samples (samples BH02_0.15-0.20 and BH103/201103/2001 at 930 mg/kg and 790 mg/kg respectively) and arsenic in one fill sample (BH02_0.15-0.20 at 130 mg/kg), the concentrations of metals were below the maximum allowable SCC value for classification as General Solid Waste (i.e. CT1 values) without TCLP analysis.

TCLP analysis was performed on sample BH103/201103/2001, with the leachable lead concentration of 0.62 mg/L below the maximum allowable TCLP1 value for classification as General Solid Waste. Sample BH103/201103/2001 would be classified as General Solid Waste based on the total and TCLP lead results.

4.2 Organics

Concentrations of TPH, BTEX, OCP, OPP and PCBs were below the respective maximum CT1 values for General Solid Waste.

Benzo(a)pyrene was detected at concentrations above the maximum CT1 value of 0.8 mg/kg in two samples (in samples B02_0.15-0.20 at 2.1 mg/kg and BH04_1.05-1.15 at 1 mg/kg).

4.3 Asbestos

Asbestos was detected in three samples of fill material (samples BH02_0.15-0.20, BH03_0.10-0.20 and BH103/201103/2002) collected from the south western portion of the site.

4.4 Statistical Analysis

Statistical analysis was performed using ProUCL[3] to determine the upper confidence limit (UCL) of the average concentrations of arsenic, lead and BaP in fill and natural material on the site due to these analytes exceeding the respective maximum CT1 values.

The UCL average concentrations of arsenic, lead and BaP in fill were unable to be estimated, or be unreliable, due to the small sample size (i.e. < 10 samples).

ProUCL was unable to estimate the UCL average of BaP in natural material using the recommended calculation methodology which takes into account the occurrence of non-detects (only one detection out of twelve primary samples was reported). The UCL of the average BaP concentration was therefore calculated by adopting 0.5 times the detection limit as a result was 0.5 mg/kg, which is below the maximum allowable

[1] Reported as mass/percentage or as presence/absence.

[2] The ASRIS mapping is based on existing data sets which have been converted to a national classification system (ASRIS 2011).

[3] A statistical software package developed by the United States Environment Protection Agency.

CT1 value for General Solid Waste. It is acknowledged that this historical substitution method is no longer considered reliable, and is not recommended by ProUCL.

A summary of the results of the statistical analysis is presented in **Table 1** below, with copies of the UCL calculation results presented in **APPENDIX G**. The UCL average concentrations or arsenic, lead and BaP were below their respective CT1 concentrations.

Table 1: UCL Average Concentrations

Analyte	UCL average concentration (mg/kg)	
	Fill	Natural
Arsenic	Small sample size, not calculated	9.2
Lead	Small sample size, reported value considered unreliable	17.9
Benzo(a)pyrene	Small sample size, reported value considered unreliable	0.5

4.5 Putrescible Materials

The Waste Classification Guidelines states that certain materials, including soils, are generally not classified as putrescible. The sampled materials as described in soil bore logs (**APPENDIX B**) and as shown in the photographs (**APPENDIX C**) are considered to be non-putrescible.

5.0 WASTE CLASSIFICATION

Based on the results of laboratory analysis and the procedures detailed in the Waste Classification Guidelines (EPA 2014) potential spoil from excavations as part of the site development has been allocated a preliminary waste classification identified in **Table 2** for the purpose of off-site disposal. The quantity of material to be excavated and disposed will be determined following finalisation of the building plans.

Table 2: Preliminary *In situ* Waste Classification

Material	Approximate depth (mbgl)	Preliminary *in situ* waste classification
Fill - south western portion of site	Up to approximately 0.5 mbgl	Restricted Solid Waste (Special Waste - asbestos) See text below.
Fill - remainder of site	Between 0.16 and 0.6 mbgl	General Solid Waste - non putrescible
Natural	-	General Solid Waste - non putrescible

Note: the approximate depths are based on observations made at the existing investigation locations. Depths may vary elsewhere on site.

The preliminary classification of Restricted Solid Waste for fill material in the south western corner of the site is due in part to the small number of fill samples analysed for the contaminants, which has prevented the calculation of UCL average concentrations. It is noted that additional investigations at the site will be required to assess material in the un-investigated portions of the site. The additional investigations, anticipated to include total and TCLP analyses, may provide sufficient information to allow reassessment of chemical classification of the material at a lower waste type.

Asbestos was identified in three locations (BH02, BH03 and BH103), all of which were located in the south western portion of the site. Fill material from this area would be classified as Special Waste, in addition to its chemical classification. The additional investigations should include an attempt to delineate the area of fill containing asbestos, and therefore limit the amount of material requiring off-site disposal as Special Waste.

6.0 POTENTIAL FOR VIRGIN EXCAVATED NATURAL MATERIAL

The residual silty clay, clayey silt and siltstone on the site may be able to be classified as Virgin Excavated Natural Material (VENM). This classification would be subject to the results of additional analysis of samples collected from the to-date unassessed portion of the site, visual inspections during bulk earth works, and would require the preparation of a VENM certificate in the format prescribed by EPA[4].

7.0 REFERENCES

ASRIS 2011 — ASRIS – Australian Soil Resource Information System. http://www.asris.csiro.au. Accessed August 2019.

Golder 2019 — *Proposed Gran Central Development Preliminary Environmental Investigation Report*, Golder Associates Pty Ltd, reference19122955-002-R-Rev0, 1 November 2019.

Golder 2020 — *Proposed Gran Central Development Geotechnical and Hydrogeological Investigation Report*, Golder Associates Pty Ltd, reference19130799-003-R-Rev0 GHI, 17 February 2020.

EPA 2014 — *Waste Classification Guidelines Part 1: Classifying waste*, NSW Environment Protection Authority, November 2014.

8.0 CLOSURE

Your attention is drawn to the document titled - “Important Information Relating to this Report”, which is included in **APPENDIX H** of this report. The statements presented in that document are intended to inform a reader of the report about its proper use. There are important limitations as to who can use the report and how it can be used. It is important that a reader of the report understands and has realistic expectations about those matters. The Important Information document does not alter the obligations Golder Associates has under the contract between it and its client.

We trust the information presented herein meets your current requirements, however if you require any further information please do not hesitate to contact either of the undersigned on 9478 3900.

Golder Associates Pty Ltd

Shane Doyle
Principal Environmental Scientist

Gavan Butterfield
Associate

SPD/GB/spd

https://golderassociates.sharepoint.com/sites/117062/project files/6 deliverables/19130799-005-wc/19130799-005-l-rev1.docx

[4] The EPA VENM certificate form is located at https://www.epa.nsw.gov.au/your-environment/waste/classifying-waste/virgin-excavated-natural-material.

APPENDIX A

Figure

LEGEND

- Cross section
- Site boundary

Investigation locations

Stage 1

- Borehole, backfilled
- Borehole, monitoring well installed

Stage 2

- Borehole, backfilled
- Borehole, shallow and deep monitoring well installed
- Borehole, vapour well installed

0 15 30

1:400 METRES

NOTE(S)
1. COORDINATE SYSTEM: GDA 1994 MGA ZONE 56

REFERENCE(S)
1. AERIAL PHOTO (C) NEARMAP
2. KEYMAP SOURCED FROM ESRI ONLINE BASEMAPS

CLIENT
STARRYLAND NSW PTY LTD C/O PDS GROUP

PROJECT
GRAN CENTRAL DEVELOPMENT

TITLE
BOREHOLE LOCATION PLAN

CONSULTANT
GOLDER

DD-MM-YYYY	05-02-2020
DESIGNED	EAA
PREPARED	EAA
REVIEWED	-
APPROVED	-

PROJECT NO.	CONTROL	REV.	FIGURE
19130799	-	-	-

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ISO A3
25mm
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APPENDIX B

Borelogs

DRAFT REPORT OF BOREHOLE: BH01M

SHEET: 1 OF 3

CLIENT:	PDS and Starrylands	COORDS: 315964 m E 6254865 m N MGA94 56 (hhGPS)	DRILL RIG: Komatsu 05
PROJECT:	Proposed Gran Central	SURFACE RL: 10.8 m DATUM: AHD (MAP)	CONTRACTOR: Nealings
LOCATION:	Cnr Parramatta Rd and Good Street, Granville	INCLINATION: -90°	LOGGED: FY DATE: 31/7/19
JOB NO:	19122955	HOLE DEPTH: 10.10 m	CHECKED: BJF DATE: 20/8/19

Drilling					Sampling		Field Material Description				
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	GROUP SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
DTC	-		0	0.14				-	CONCRETE average 140mm thick	-	-	ROAD SURFACE
				10.62	DS 0.14-0.18 m PID = 0.1 ppm			-	igneous aggregate			FILL
	M				DS 0.35-0.45 m PID = 0.1 ppm			CI-CH	FILL: Sandy CLAY low plasticity, dark grey, find to medium grained sand, with fine to coarse, sub angular to sub rounded gravel			RESIDUAL SOIL
HA				0.70	DS 0.53-0.60 m							
				10.10	PID = 0 ppm DS 0.80-0.90 m				Silty CLAY medium - high plasticity, brown mottled orange brown, trace fine to coarse, sub angular to sub rounded gravel	w > PL	-	
	H		1	1.10	PID = 1 ppm							
				9.70	DS 1.10-1.20 m PID = 2.1 ppm				red-brown mottled pale grey, with fine to coarse, sub angular to sub rounded gravel			
					DS 1.30-1.40 m PID = 0.5 ppm							
	L			1.70	SPT 1.45-1.90 m				pale grey mottled pale brown, trace fine to coarse, sub angular to sub rounded gravel, with iron indurate band		H	@ 1.45 m, Hand Auger refusal
		09/08/19		9.10	5, 15, 25 N=40 PID = 0.3 ppm			-	SILTSTONE pale grey, inferred low strength, with medium strength layer, extremely weathered, with clay seams, trace iron staining	-	-	
	M		2									
				3.00								
ADT			3	7.80	SPT 3.00-3.45 m 10, 16, 22 N=38 PID = 0.1 ppm			CI-CH	Silty CLAY medium - high plasticity, pale grey mottled red-brown, with iron indurate bands			
	M-H	01/08/19			DS 3.40-3.50 m PID = 0.4 ppm					w > PL	H	
		RETURN	4		DS 3.90-4.00 m PID = 0.1 ppm							
					DS 4.40-4.50 m PID = 0.2 ppm							
WB	-	Water		4.65	SPT 4.50-4.75 m 6, 21/100mm HB N>21			-	SILTSTONE grey to dark grey and grey brown, very low to low strength	-	-	BEDROCK
		90-100%	5						For Continuation Refer to Sheet 2			
			6									
			7									
			8									
			9									
			10									

This report of borehole must be read in conjunction with accompanying notes and abbreviations.

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RL3

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DRAFT REPORT OF BOREHOLE: BH01M

SHEET: 2 OF 3

CLIENT: PDS and Starrylands
PROJECT: Proposed Gran Central
LOCATION: Cnr Parramatta Rd and Good Street, Granville
JOB NO: 19122955

COORDS: 315964 m E 6254865 m N MGA94 56 (hhGPS)
SURFACE RL: 10.8 m DATUM: AHD (MAP)
INCLINATION: -90°
HOLE DEPTH: 10.10 m

DRILL RIG: Komatsu 05
CONTRACTOR: Nealings
LOGGED: FY DATE: 31/7/19
CHECKED: BJF DATE: 20/8/19

Drilling						Field Material Description					Defect Information	
METHOD	WATER	TCR	RQD (SCR)	DEPTH (metres)	DEPTH RL	GRAPHIC LOG	ROCK / SOIL MATERIAL DESCRIPTION	WEATHERING	INFERRED STRENGTH UCS MPa (VL 0.6, L 2.0, M 6.0, H 20, VH 60, EH 200)	LABORATORY STRENGTH (MPa)	DEFECT DESCRIPTION & Additional Observations	AVERAGE DEFECT SPACING (mm) (10, 30, 100, 300, 1000, 3000)
				0								
				1								
				2								
				3								
				4								
					4.83		Continuation of Sheet 1					
NMLC	90-100% Water RETURN	100	60 (95)	5	5.97		SILTSTONE grey to dark grey and grey brown, with pale grey lamination, bedded at 0-5°, with iron staining	HW MW		PLI(A)=0.09 PLI(A)=0.11 PLI(D)=0.04	4.88 m: EWS, 0°, 5 mm, clay 4.95 m: P, 0-5°, Pl, Sm, Fe Sn 5.11 m: P, 0-5°, Pl, Sm, Fe Sn 5.23 m: EWS, 0°, Fe Sn, 5 mm, clay 5.30 m: P, 0-5°, Pl, Sm, Fe Sn 5.36 m: EWS, 0°, Fe Sn, 5 mm, weathered siltstone 5.48 m: EWS, 0°, Fe Sn, 5 mm, weathered siltstone	
					5.60		no ironstaining	FR				
		100	80 (90)	6	5.20					PLI(D)=0.43 PLI(A)=0.49	5.60 m: P, 0°, Pl, Sm, Fe Sn 5.93 m: P, 0-5°, Pl, Sm, Cn 5.93-6.04 m: J, 80°, Pl, Sm, Cn, 110 mm 6.04 m: P, 0-5°, Pl, Sm, Cn 6.47 m: P, 0°, Pl, Sm, Cn	
		100	90 (95)	7						PLI(D)=0.46 PLI(A)=0.45 PLI(D)=0.23 PLI(A)=0.62	6.95 m: EWS, 0°, 5 mm, clay 7.38 m: EWS, 0°, 5 mm, clay 7.39-7.51 m: Px 5, 0°, sp = 20-30 mm, Pl, Sm, Ve, clay	
		100	85 (100)	8							8.05 m: EWS, 0°, 6 mm, clay 8.35 m: J, 5-15°, Cv, Sm, Cn	
				9						PLI(D)=0.37 PLI(A)=0.72	8.65-9.91 m: Px 3, 0°, sp = 590-670 mm, Pl, Sm, Cn	
				10						PLI(D)=0.14 PLI(A)=0.89		

This report of borehole must be read in conjunction with accompanying notes and abbreviations.

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DRAFT REPORT OF BOREHOLE: BH01M

SHEET: 3 OF 3

CLIENT: PDS and Starrylands
COORDS: 315964 m E 6254865 m N MGA94 56 (hhGPS)
DRILL RIG: Komatsu 05

PROJECT: Proposed Gran Central
SURFACE RL: 10.8 m DATUM: AHD (MAP)
CONTRACTOR: Nealings

LOCATION: Cnr Parramatta Rd and Good Street, Granville
INCLINATION: -90°
LOGGED: FY DATE: 31/7/19

JOB NO: 19122955
HOLE DEPTH: 10.10 m
CHECKED: BJF DATE: 20/8/19

Drilling						Field Material Description					Defect Information	
METHOD	WATER	TCR	RQD (SCR)	DEPTH (metres)	DEPTH RL	GRAPHIC LOG	ROCK / SOIL MATERIAL DESCRIPTION	WEATHERING	INFERRED STRENGTH UCS MPa (VL 0.6, L 2.0, M 6.0, H 20, VH 60, EH 200)	LABORATORY STRENGTH (MPa)	DEFECT DESCRIPTION & Additional Observations	AVERAGE DEFECT SPACING (mm) (10, 30, 100, 300, 1000, 3000)
				10	10.10 0.70		END OF BOREHOLE @ 10.10 m TARGET DEPTH PIEZOMETER INSTALLED BH01M was redrilled on 2-8-19 using HQ size shoe, to install monitoring well			PLI(D)=0.74 PLI(A)=0.77		
				11								
				12								
				13								
				14								
				15								
				16								
				17								
				18								
				19								
				20								

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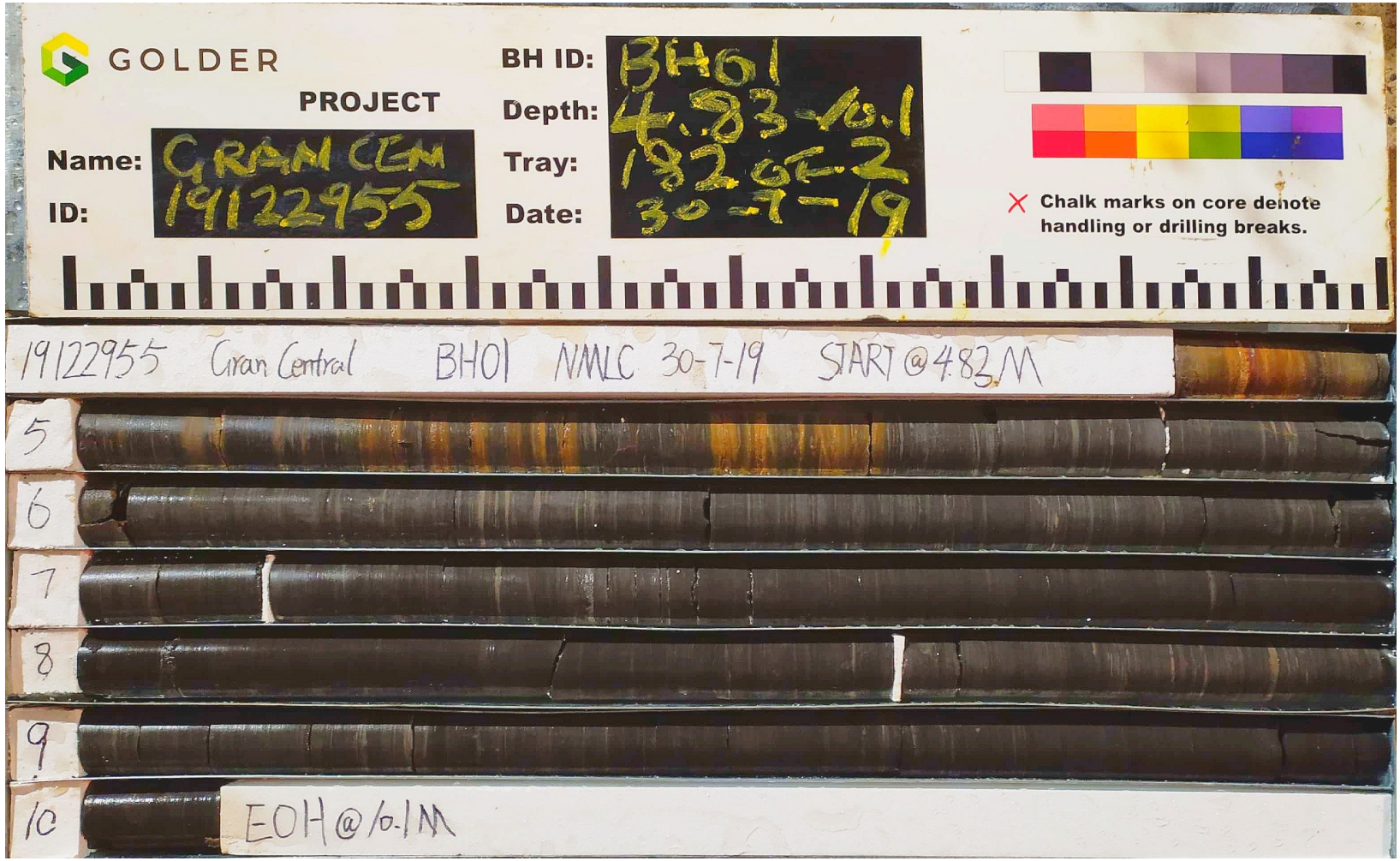
DRAFT REPORT OF CORE PHOTOGRAPHS: BH01M

CLIENT:	PDS and Starrylands	COORDS: 315964 m E 6254865 m N MGA94 56 (hhGPS)	
PROJECT:	Proposed Gran Central	SURFACE RL: 10.8 m DATUM: AHD (MAP)	
LOCATION:	Cnr Parramatta Rd and Good Street, Granville	INCLINATION: -90°	
JOB NO:	19122955	HOLE DEPTH: 10.10 m	

DRILL RIG: Komatsu 05
CONTRACTOR: Nealings
LOGGED: FY DATE: 31/7/19
CHECKED: BJF DATE: 20/8/19



This report of core photographs must be read in conjunction with accompanying notes and abbreviations.

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DRAFT REPORT OF BOREHOLE: BH02

SHEET: 1 OF 2

CLIENT:	PDS and Starrylands	COORDS: 315954 m E 6254814 m N MGA94 56 (hhGPS)	DRILL RIG: Komatsu 05
PROJECT:	Proposed Gran Central	SURFACE RL: 12.5 m DATUM: AHD (MAP)	CONTRACTOR: Nealings
LOCATION:	Cnr Parramatta Rd and Good Street, Granville	INCLINATION: -90°	LOGGED: FY DATE: 1/8/19
JOB NO:	19122955	HOLE DEPTH: 8.75 m	CHECKED: BJF DATE: 20/8/19

Drilling					Sampling		Field Material Description				
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	GROUP SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
DTC	-		0	0.12	PID = 0 ppm			-	CONCRETE average 120mm thick	-	-	ROAD SURFACE
				0.30	DS 0.15-0.20 m			-	igneous aggregate		-	FILL
				12.20	DS 0.20-0.30 m				FILL: Silty CLAY			RESIDUAL SOIL
				0.60	PID = 0 ppm			CI-CH	medium - high plasticity, dark grey to dark brown, with fine to coarse, sub rounded to sub angular gravel, trace fine to medium grained sand			
				11.90	DS 0.30-0.40 m							
HA	H	GWNE			PID = 0 ppm				brown	w > PL	H	
					DS 0.60-0.70 m							
				1.00	PID = 0 ppm				Silty CLAY			
			1	11.50					medium - high plasticity, brown to pale brown, trace gravel			
					DS 1.10-1.20 m				mottled red-brown			
					PID = 0 ppm							
				1.55	DS 1.40-1.50 m				pale grey mottled red-brown and pale brown, fine to coarse, sub rounded Ironstone			@ 1.50 m, NDD Target Reached
ADT	H			10.95	SPT 1.50-1.65 m			-				
					23/150mm, 8/0mm HB				SILTSTONE	-	-	
					N>8				pale grey, very low to low strength, extremely weathered, trace iron staining			
					PID = 0 ppm							
			2		DS 1.80-1.85 m				For Continuation Refer to Sheet 2			
			3									
			4									
			5									
			6									
			7									
			8									
			9									
			10									

This report of borehole must be read in conjunction with accompanying notes and abbreviations.

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DRAFT REPORT OF BOREHOLE: BH02

SHEET: 2 OF 2

CLIENT: PDS and Starrylands
PROJECT: Proposed Gran Central
LOCATION: Cnr Parramatta Rd and Good Street, Granville
JOB NO: 19122955

COORDS: 315954 m E 6254814 m N MGA94 56 (hhGPS)
SURFACE RL: 12.5 m DATUM: AHD (MAP)
INCLINATION: -90°
HOLE DEPTH: 8.75 m

DRILL RIG: Komatsu 05
CONTRACTOR: Nealings
LOGGED: FY DATE: 1/8/19
CHECKED: BJF DATE: 20/8/19

Drilling						Field Material Description					Defect Information	
METHOD	WATER	TCR	RQD (SCR)	DEPTH (metres)	DEPTH RL	GRAPHIC LOG	ROCK / SOIL MATERIAL DESCRIPTION	WEATHERING	INFERRED STRENGTH UCS MPa (VL 0.6, L 2.0, M 6.0, H 20, VH 60, EH 200)	LABORATORY STRENGTH (MPa)	DEFECT DESCRIPTION & Additional Observations	AVERAGE DEFECT SPACING (mm) (10, 30, 100, 300, 1000, 3000)
				0								
				1								
					1.86		Continuation of Sheet 1					
NMLC	90-100% Water RETURN	100	0 (20)	2	10.64		SILTSTONE pale grey, with ironstone band, bedded at 0-20°, trace iron staining	XW			1.86-1.99 m: EWS, 0°, 130 mm, Recovered as fractured core 2.06-2.09 m: EWS, 0°, 30 mm, weathered siltstone 2.16-2.23 m: J, 80-90°, 70 mm, Healed 2.16 m: P, 0°, Pl, Sm, Cn 2.16-2.23 m: J, 80-90°, 70 mm, Healed 2.29-2.36 m: JX2, 70-90°, sp = 5 mm, Pl, Sm, Cn, 70 mm 2.30 m: P, 0°, Pl, Sm, Cn	
					2.92							
		100	0 (0)	3	9.58		Silty CLAY (CI-CH) medium - high plasticity, pale grey, with ironstone gravel/layers, inferred to be at least very stiff	RS			2.35-2.40 m: PX2, 0-5°, sp = 5-40 mm, St, Sm, Cn 2.46 m: PX3, 0°, sp = 10 mm, Pl, Sm, Cn 2.51 m: PX2, 0°, sp = 3 mm, Pl, Sm, Cn 2.53 m: Px2, 0°, sp = 20 mm, Pl, Sm, Cn 2.62 m: P, 0°, Pl, Sm, Fe Sn 2.77 m: P, 0°, Pl, Sm, Cn 2.85 m: EWS, 0°, 30 mm 3.00-3.02 m: J, 90°, Pl, Sm, Fe Sn, 20 mm 3.02 m: P, 0°, Pl, Sm, Fe Sn 3.05 m: P, 0°, Pl, Sm, Fe Sn	
				4								
					4.92							
		100	0 (40)	5	7.58		SILTSTONE dark grey and orange brown, with pale grey lamination, bedded at 0-5°, trace iron staining	MW		PLI(A)=0.16	4.94 m: P, 0-45°, Cv, Sm, Fe Sn 5.05-5.51 m: Px6, 0-5°, sp = 60-200 mm, Pl-St, Sm, Fe Sn 5.10 m: J, 0-45°, Ir, Sm, Fe Sn 5.18 m: J, 0-20°, Ir, Sm, Fe Sn 5.23-5.26 m: J, 70°, Pl, Sm, Fe Sn, 30 mm 5.26 m: EWS, 0°, Fe Sn, 15 mm, weathered siltstone 5.37 m: EWS, 0°, clay, 5 mm	
				6				SW		PLI(A)=0.19	5.57-5.84 m: Jx 14, 5-10°, sp = 10-30 mm, Pl, Sm, Fe Sn 5.72-5.86 m: J, 70°, Pl, Sm, Fe Sn, 140 mm 5.85 m: EWS, 0°, clay Sn, 15 mm	
					6.45							
		100	75 (90)		6.05		no iron staining	FR		PLI(D)=0.03 PLI(A)=0.21 PLI(D)=0.17 PLI(A)=0.28 PLI(A)=0.59 PLI(A)=0.61	5.91-6.00 m: Px4, 0°, sp = 20-30 mm, Pl, Sm, Fe Sn 6.11-6.47 m: EWSx2, 0°, sp = 30-200 mm, Fe Sn, 60 mm 6.71-8.56 m: Px13, 0°, sp = 30-250 mm, Pl, Sm, Cn 7.03 m: EWS, 0°, 15 mm, weathered siltstone	
				7								
		100	85 (100)	8						PLI(D)=0.73 PLI(A)=0.75	8.13 m: P, 0°, Pl, Sm, clay Ve	
					8.75					PLI(D)=0.55 PLI(A)=0.59		
					3.75		END OF BOREHOLE @ 8.75 m TARGET DEPTH GROUTED					
				9								
				10								

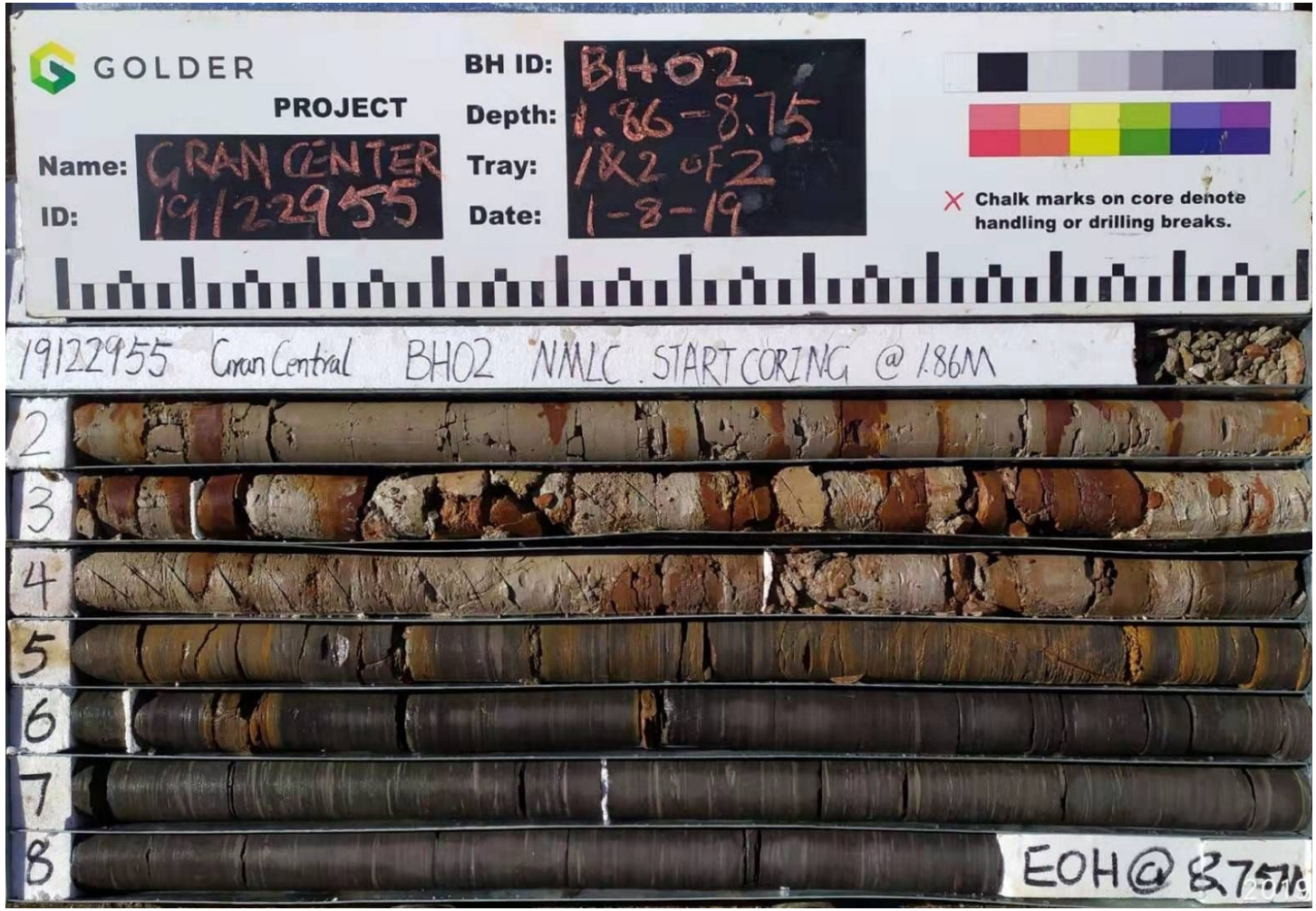
This report of borehole must be read in conjunction with accompanying notes and abbreviations.

GAP gINT FN. F02a
RL3

GAP 8_16.8 LIB.GLB Log GAP CORED BOREHOLE 19122955-BC_BJF.GPJ <<DrawingFile>> 20/08/2019 13:00 8.30.004 Datgel Tools

DRAFT REPORT OF CORE PHOTOGRAPHS: BH02

CLIENT:	PDS and Starrylands	COORDS: 315954 m E 6254814 m N MGA94 56 (hhGPS)	SHEET: 1 OF 1
PROJECT:	Proposed Gran Central	SURFACE RL: 12.5 m DATUM: AHD (MAP)	DRILL RIG: Komatsu 05
LOCATION:	Cnr Parramatta Rd and Good Street, Granville	INCLINATION: -90°	CONTRACTOR: Nealings
JOB NO:	19122955	HOLE DEPTH: 8.75 m	LOGGED: FY DATE: 1/8/19
			CHECKED: BJF DATE: 20/8/19



This report of core photographs must be read in conjunction with accompanying notes and abbreviations.

GAP 8_16.8 LIB.GLB GrfcTbl GAP CORE PHOTO 1 PER PAGE 19122955-BC_BJF.GPJ <<DrawingFile>> 20/08/2019 13:00 8.30.004 Datgel Tools

DRAFT REPORT OF BOREHOLE: BH03

SHEET: 1 OF 2

CLIENT: PDS and Starrylands
PROJECT: Proposed Gran Central
LOCATION: Cnr Parramatta Rd and Good Street, Granville
JOB NO: 19122955

COORDS: 315991 m E 6254810 m N MGA94 56 (hhGPS)
SURFACE RL: 12.3 m DATUM: AHD (MAP)
INCLINATION: -90°
HOLE DEPTH: 8.34 m

DRILL RIG: Komatsu 05
CONTRACTOR: Nealings
LOGGED: FY DATE: 1/8/19
CHECKED: BJF DATE: 20/8/19

Drilling					Sampling		Field Material Description				
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	GROUP SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
HA	M	GWNE	0	12.30 *0.23* 12.07	PID = 0 ppm DS 0.10-0.20 m PID = 0.1 ppm			-	TOPSOIL: Silty CLAY medium to high plasticity, dark brown, trace rootlets and wood fibre	w > PL	-	TOPSOIL
					DS 0.40-0.50 m PID = 0 ppm DS 0.50-0.60 m			CI-CH	Silty CLAY medium to high plasticity, pale brown to brown mottled red-brown			RESIDUAL SOIL
				0.75 11.55 *0.90*	DS 0.80-0.90 m				pale grey and red-brown		-	
	H		1	11.40	PID = 0 ppm				pale grey mottled red-brown	w > PL		
					DS 1.30-1.40 m PID = 0 ppm DS 1.40-1.50 m							
ADT	M	RETURN		*1.80*	PID = 0 ppm SPT 1.50-1.95 m 7, 16, 36 N=52						H	@ 1.50 m, NDD Target Reached
			2	10.50				-	SILTSTONE pale grey, low to medium strength, extremely weathered	-	-	
WB	-	90-100% Water			PID = 0 ppm SPT 2.00-2.12 m 21/120mm HB N=R PID = 0 ppm				For Continuation Refer to Sheet 2			
			3									
			4									
			5									
			6									
			7									
			8									
			9									
			10									

This report of borehole must be read in conjunction with accompanying notes and abbreviations.

GAP gINT FN. F01a
RL3

GAP 8_16.8 LIB.GLB Log GAP NON-CORED FULL PAGE 19122955-BC_BJF.GPJ <<DrawingFile>> 20/08/2019 13:00 8.30.004 Datgel Tools

DRAFT REPORT OF BOREHOLE: BH03

SHEET: 2 OF 2

CLIENT:	PDS and Starrylands	COORDS: 315991 m E 6254810 m N MGA94 56 (hhGPS)	DRILL RIG: Komatsu 05
PROJECT:	Proposed Gran Central	SURFACE RL: 12.3 m DATUM: AHD (MAP)	CONTRACTOR: Nealings
LOCATION:	Cnr Parramatta Rd and Good Street, Granville	INCLINATION: -90°	LOGGED: FY DATE: 1/8/19
JOB NO:	19122955	HOLE DEPTH: 8.34 m	CHECKED: BJF DATE: 20/8/19

Drilling						Field Material Description					Defect Information	
METHOD	WATER	TCR	RQD (SCR)	DEPTH (metres)	DEPTH RL	GRAPHIC LOG	ROCK / SOIL MATERIAL DESCRIPTION	WEATHERING	INFERRED STRENGTH UCS MPa (VL 0.6, L 2.0, M 6.0, H 20, VH 60, EH 200)	LABORATORY STRENGTH (MPa)	DEFECT DESCRIPTION & Additional Observations	AVERAGE DEFECT SPACING (mm) (10, 30, 100, 300, 1000, 3000)
				0								
				1								
				2								
					2.25		Continuation of Sheet 1					
NMLC	90-100% Water RETURN	100	45 (55)	3	10.05			XW			2.29-2.59 m: EWS, 0°, sp = 10-20 mm, Ir, Sm, Fe Sn, 100 mm, Recovered as fractured core 2.61 m: P, 0°, Pl, Sm, Fe Sn 2.69-2.77 m: EWS, 0°, Fe Sn, 80 mm 2.91 m: P, 0°, Pl, Sm, Fe Sn 3.12 m: P, 0-15°, Ir, Sm, Fe Sn	
		100	0 (0)	4	*4.05* 8.25		Silty CLAY (CI-CH) medium - high plasticity, pale grey, with brown, iron indurate shale band.	RS				
		100	40 (10)	5	*5.60*							
				6	6.70 *6.06* *6.21*		SILTSTONE red-brown to brown and dark grey, with iron staining dark grey	HW SW		PLI(D)=0.06 PLI(A)=0.16	5.85-5.94 m: EWS, 0-5°, clay, 90 mm 5.95-6.11 m: J, 90°, Ir, Sm, Fe Sn, 160 mm 6.11-6.13 m: EWS, 0°, clay, 20 mm	
		100	65 (40)	7	6.01 *7.56*		Core Loss: 80 mm SILTSTONE dark grey, with pale grey lamination, bedded at 0-5°, with iron staining	FR		PLI(A)=0.07 PLI(A)=0.07 PLI(D)=0.14 PLI(A)=0.26	6.31 m: Px3, 0°, sp = 10 mm, Pl, Sm, Fe Sn, 3 mm 6.59-6.71 m: EWS, 0°, Fe Sn, 90 mm, weathered siltstone and clay 6.72 m: P, 0-10°, St, Sm, Fe Sn 6.79 m: P, 0-5°, Pl, Sm, Fe Sn 6.84 m: P, 0°, Pl, Sm, Fe Sn 6.86-6.87 m: EWS, 0°, Fe Sn, 10 mm 6.98 m: P, 0°, Pl, Sm, Fe Sn 7.09 m: P, 0-5°, Pl, Sm, Cn 7.19-7.25 m: Px5, 0-5°, sp = 5-15 mm, Pl, Sm, Fe Sn, 80 mm	
		100	95 (90)	8	4.74 *8.34*		no staining			PLI(D)=0.28 PLI(A)=0.54	7.21-7.23 m: J, 70°, Pl, Sm, Fe Sn, 20 mm 7.42-7.45 m: Px2, 0-5°, sp = 10-20 mm, Pl, Sm, Fe Sn 7.60-7.64 m: Px3, 0-5°, sp = 10-30 mm, Pl, Sm, Cn	
				9	3.96		END OF BOREHOLE @ 8.34 m TARGET DEPTH GROUTED			PLI(D)=0.42 PLI(A)=0.79	8.27 m: Px2, 0°, sp = 5 mm, Pl, Sm, Cn 8.28-8.29 m: J, 90°, Pl, Sm, Cn, 10 mm	
				10								

This report of borehole must be read in conjunction with accompanying notes and abbreviations.

GAP gINT FN. F02a
RL3

GAP 8_16.8 LIB.GLB Log GAP CORED BOREHOLE 19122955-BC_BJF.GPJ <<DrawingFile>> 20/08/2019 13:00 8.30.004 Datgel Tools

DRAFT REPORT OF CORE PHOTOGRAPHS: BH03

CLIENT:	PDS and Starrylands	COORDS: 315991 m E 6254810 m N MGA94 56 (hhGPS)	SHEET: 1 OF 1
PROJECT:	Proposed Gran Central	SURFACE RL: 12.3 m DATUM: AHD (MAP)	DRILL RIG: Komatsu 05
LOCATION:	Cnr Parramatta Rd and Good Street, Granville	INCLINATION: -90°	CONTRACTOR: Nealings
JOB NO:	19122955	HOLE DEPTH: 8.34 m	LOGGED: FY DATE: 1/8/19
			CHECKED: BJF DATE: 20/8/19

This report of core photographs must be read in conjunction with accompanying notes and abbreviations.

GAP 8_16.8 LIB.GLB GrfcTbl GAP CORE PHOTO 1 PER PAGE 19122955-BC_BJF.GPJ <<DrawingFile>> 20/08/2019 13:00 8.30.004 Datgel Tools

DRAFT REPORT OF BOREHOLE: BH04

SHEET: 1 OF 2

CLIENT:	PDS and Starrylands	COORDS: 316031 m E 6254831 m N MGA94 56 (hhGPS)	DRILL RIG: Komatsu 05
PROJECT:	Proposed Gran Central	SURFACE RL: 11.0 m DATUM: AHD (MAP)	CONTRACTOR: Nealings
LOCATION:	Cnr Parramatta Rd and Good Street, Granville	INCLINATION: -90°	LOGGED: FY DATE: 29/7/19
JOB NO:	19122955	HOLE DIA: 90 mm HOLE DEPTH: 7.80 m	CHECKED: BJF DATE: 20/8/19

Drilling					Sampling		Field Material Description				
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	*DEPTH* RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	GROUP SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
			0	10.98				-	FILL: GRAVEL medium to coarse grained, poorly graded, sub-angular, blue metal	-	-	FILL
				0.25				-				
				10.75	DS 0.10-0.20 m PID = 0.8 ppm DS 0.25-0.35 m PID = 0.7 ppm DS 0.55-0.65 m PID = 1.8 ppm			CI-CH	FILL: Gravelly SAND fine to medium grained, fine to coarse, sub rounded to sub angular gravel, trace glass.			RESIDUAL SOIL
HA	H								Silty CLAY medium to high plasticity, brown mottled red-brown		-	
			1		DS 1.05-1.15 m PID = 6.9 ppm DS 1.30-1.35 m PID = 2.4 ppm DS 1.40-1.50 m PID = 3.7 ppm SPT 1.50-1.95 m 6, 12, 17 N=29 U75 2.00-2.35 m					w > PL		@ 1.50 m, NDD Target Reached
ADT	M	GWNE	2								VSt - H	
				2.80								
	H		3	8.20	DS 2.80-3.00 m SPT 3.00-3.15 m 13 HB N>30			-	SILTSTONE pale grey, low to medium strength, extremely weathered, trace iron staining	w < PL	H	
									For Continuation Refer to Sheet 2			
			4									
			5									
			6									
			7									
			8									
			9									
			10									

This report of borehole must be read in conjunction with accompanying notes and abbreviations.

GAP gINT FN. F01a
RL3

GAP 8_16.8 LIB.GLB Log GAP NON-CORED FULL PAGE 19122955-BC_BJF.GPJ <<DrawingFile>> 20/08/2019 13:00 8.30.004 Datgel Tools

DRAFT REPORT OF BOREHOLE: BH04

SHEET: 2 OF 2

CLIENT: PDS and Starrylands
PROJECT: Proposed Gran Central
LOCATION: Cnr Parramatta Rd and Good Street, Granville
JOB NO: 19122955

COORDS: 316031 m E 6254831 m N MGA94 56 (hhGPS)
SURFACE RL: 11.0 m DATUM: AHD (MAP)
INCLINATION: -90°
HOLE DIA: 90 mm HOLE DEPTH: 7.80 m

DRILL RIG: Komatsu 05
CONTRACTOR: Nealings
LOGGED: FY DATE: 29/7/19
CHECKED: BJF DATE: 20/8/19

Drilling						Field Material Description					Defect Information	
METHOD	WATER	TCR	RQD (SCR)	DEPTH (metres)	DEPTH RL	GRAPHIC LOG	ROCK / SOIL MATERIAL DESCRIPTION	WEATHERING	INFERRED STRENGTH UCS MPa (VL 0.6, L 2.0, M 6.0, H 20, VH 60, EH 200)	LABORATORY STRENGTH (MPa)	DEFECT DESCRIPTION & Additional Observations	AVERAGE DEFECT SPACING (mm) (10, 30, 100, 300, 1000, 3000)
				0								
				1								
				2								
				3	3.10		Continuation of Sheet 1					
NMLC	90-100% Water RETURN	40	0 (0)		3.28 7.72 3.77		SILTSTONE pale grey, trace iron staining Core Loss: 490 mm	XW			3.10-3.95 m: Recovered as fine to medium, sub rounded to sub angular shale gravel	
					7.23		SILTSTONE pale grey, trace iron staining					
		100	35 (80)	4	4.15 6.85		Silty CLAY (CI-CH) medium to high plasticity, pale grey				4.05 m: P, 5-10°, St, Sm, clay Ct, 3 mm	
		100	10 (15)	5	5.45 5.55		SILTSTONE brown and dark grey, with iron staining	HW			5.49-5.50 m: Px 2, 0°, sp = 5 mm, Pl, Sm, Fe Sn	
					5.84			MW			5.49-5.50 m: J, 90°, Ir, Sm, Fe Sn, 10 mm	
		100	70 (85)	6	5.16		with pale grey lamination, bedded @ 0-5°, no staining	SW - FR		PLI(D)=0.12 PLI(A)=0.30 PLI(D)=0.00 PLI(A)=0.17	5.57 m: Px2, 0-5°, sp = 10 mm, Ir, Sm-Ro, Fe Sn, 5 mm, weathered siltstone 5.58-5.60 m: J, 80°, Pl, Sm, Fe Sn, 20 mm 5.60-5.68 m: EWS, 5°, Fe Sn, 80 mm, clay and weathered siltstone 5.90 m: P, 0°, Pl, Sm, clay Ve 6.20-6.27 m: EWSx3, 0°, sp = 60 mm, Fe Sn, 20 mm 6.63 m: P, 0°, Pl, Sm-Ro, Fe Sn 6.66-6.69 m: EWS, 0°, Fe Sn, weathered siltstone 6.83 m: EWS, 0°, 15 mm, clay 7.13 m: Px 2, 0°, sp = 3 mm, Pl, Sm, Cn	
		100	80 (95)	7	7.80					PLI(D)=0.28 PLI(A)=0.40 PLI(D)=0.23 PLI(A)=0.36	7.55 m: P, 0°, Pl, Sm, Cn	
				8	3.20		END OF BOREHOLE @ 7.80 m TARGET DEPTH GROUTED			PLI(D)=0.25 PLI(A)=0.43		
				9								
				10								

This report of borehole must be read in conjunction with accompanying notes and abbreviations.

GAP gINT FN. F02a
RL3

GAP 8_16.8 LIB.GLB Log GAP CORED BOREHOLE 19122955-BC_BJF.GPJ <<DrawingFile>> 20/08/2019 13:00 8.30.004 Datgel Tools

DRAFT REPORT OF CORE PHOTOGRAPHS: BH04

CLIENT:	PDS and Starrylands	COORDS: 316031 m E 6254831 m N MGA94 56 (hhGPS)	SHEET: 1 OF 1
PROJECT:	Proposed Gran Central	SURFACE RL: 11.0 m DATUM: AHD (MAP)	DRILL RIG: Komatsu 05
LOCATION:	Cnr Parramatta Rd and Good Street, Granville	INCLINATION: -90°	CONTRACTOR: Nealings
JOB NO:	19122955	HOLE DIA: 90 mm HOLE DEPTH: 7.80 m	LOGGED: FY DATE: 29/7/19
			CHECKED: BJF DATE: 20/8/19

This report of core photographs must be read in conjunction with accompanying notes and abbreviations.

GAP gINT FN. F31
RL1

GAP 8_16.8 LIB.GLB GrfcTbl GAP CORE PHOTO 1 PER PAGE 19122955-BC_BJF.GPJ <<DrawingFile>> 20/08/2019 13:00 8.30.004 Datgel Tools

REPORT OF BOREHOLE: BH101

SHEET: 1 OF 3

CLIENT: Starryland
PROJECT: Starrylands - Gran Central
LOCATION: 134-142 Parramatta Road, Granville
JOB NO: 19130799

COORDS: 316004 m 6254801 m (hhGPS)
SURFACE RL: 12.5 m DATUM: AHD (MAP)
INCLINATION: -90°
HOLE DEPTH: 13.52 m

DRILL RIG: Komatsu 05
CONTRACTOR: Nealings
LOGGED: CW DATE: 15/11/19
CHECKED: BC DATE: 18/11/19

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	GROUP SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
DTC	-	GWNE during and immediately after auger drilling	0	0.15				-	CONCRETE: pale grey with purple red and dark grey, rounded to angular aggregate, up to 25mm diameter, 8mm reinforcing bar at 75mm spacing at 100mm cover	-	-	ROAD SURFACE
	M			12.33	DS 0.15-0.17 m PID = 1.1 ppm			-		D	-	FILL
				0.60 11.90	DS 0.45-0.50 m PID = 1.1 ppm			-	FILL: Gravelly SAND fine to coarse grained, dark brown, with silt		-	
HA	M-H		1	1.10 1.15 11.35	DS 1.05-1.15 m PID = 1.2 ppm			CH	FILL: Clayey SILT low liquid limit, dark grey, with fine grained, angular gravel, remnants of earthen ware pipe from 0.20-0.30m			RESIDUAL SOIL
									Silty CLAY high plasticity, red brown, trace fine to coarse, sub-rounded to sub-angular ironstone gravel		-	
									trace fine sand			
ADT	L		2		DS 1.55-2.00 m SPT 1.55-2.00 m 6, 11, 15 N=26 PID = 1 ppm				becoming mottled grey, no sand	w ~ PL	H	
			3	3.00 9.50	DS 2.80-3.25 m SPT 2.80-3.25 m 8, 17, 24 N=41 HB 50mm into second interval PID = 1.1 ppm				pale grey with iron indurated bands and gravels grading into extremely weathered siltstone			EXTREMELY WEATHERED MATERIAL
WB									For Continuation Refer to Sheet 2			
			4									
			5									
			6									
			7									
			8									
			9									
			10									

GAP 8_16.8 LIB.GLB Log GAP NON-CORED FULL PAGE 19130799 - GRAN CENTRAL - REV4.GPJ <<DrawingFile>> 05/02/2020 13:59 8.30.004 Datgel Tools

REPORT OF BOREHOLE: BH101

SHEET: 2 OF 3

CLIENT: Starryland
PROJECT: Starrylands - Gran Central
LOCATION: 134-142 Parramatta Road, Granville
JOB NO: 19130799

COORDS: 316004 m 6254801 m (hhGPS)
SURFACE RL: 12.5 m DATUM: AHD (MAP)
INCLINATION: -90°
HOLE DEPTH: 13.52 m

DRILL RIG: Komatsu 05
CONTRACTOR: Nealings
LOGGED: CW DATE: 15/11/19
CHECKED: BC DATE: 18/11/19

Drilling						Field Material Description					Defect Information	
METHOD	WATER	TCR	RQD (SCR)	DEPTH (metres)	DEPTH RL	GRAPHIC LOG	ROCK / SOIL MATERIAL DESCRIPTION	WEATHERING	INFERRED STRENGTH UCS MPa (VL 0.6, L 2.0, M 6.0, H 20, VH 60, EH 200)	LABORATORY STRENGTH (MPa)	DEFECT DESCRIPTION & Additional Observations	AVERAGE DEFECT SPACING (mm) (10, 30, 100, 300, 1000, 3000)
				0								
				1								
				2								
				3								
					3.35		Continuation of Sheet 1					
NMLC	90-100% Water RETURN				9.15		Silty CLAY: high plasticity, pale grey, extremely weathered siltstone with iron indurated bands and gravels	RS - XW				
					3.87					PLI(A)=0.01		
				4	4.00		CORE LOSS: 130mm			PLI(D)=0.01		
		85	0 (55)		8.50		SILTSTONE pale grey	HW		PLI(A)=0.01	4.18-4.19 m: EWS, 0°, clay, 10mm	
											4.45-4.56 m: JX2, 0-25°, St, Sm, Cn	
					4.66					PLI(A)=0.10		
					7.84		Silty CLAY: high plasticity, pale to dark grey, extremely weathered siltstone, very stiff to hard, with medium strength iron indurated bands and gravels	RS - XW				
		100	0 (0)	5						PLI(A)=0.19		
		100	0 (0)									
				6								
					6.40							
		100	60 (65)		6.10		SILTSTONE dark grey, with pale grey sandstone laminations, average bedding dipping at 0-5 degrees, average lamination spacing 10-20mm, average 1-2mm thick	MW - SW		PLI(D)=0.02 PLI(A)=0.05	6.45-6.53 m: EWS, 0°, clay, 80mm 6.58 m: J, 50°, Pl, Sm, Cn 6.74 m: P, 0°, Pl, Sm, Cn 6.74-6.78 m: J, 70-90°, St, Sm, fe Sn 6.74 m: P, 0°, Pl, Sm, Cn 6.79 m: P, 0°, Pl, Sm, fe Ve 6.80-6.81 m: EWS, 0°, clay, 10mm 6.88 m: P, 0°, Pl, Sm, Cn 6.93-7.10 m: EWS, 0°, clay, 70mm 7.13 m: J, 90° 7.32 m: P, 5°, Pl, Sm, Cn 7.44 m: P, 5°, Pl, Sm, fe Ve 7.46 m: P, 5°, Pl, Sm, fe Ve 7.63-7.65 m: PX2, 0°, Pl, Sm, fe Ve 7.78-7.85 m: PX2, 0°, Pl, Sm, Cn 7.92-7.94 m: PX2, 0°, Pl, Sm, fe Ve 7.98-8.00 m: EWS, 0°, recovered as fractured rock 8.03-8.17 m: PX8, 0°, Pl, Sm, fe Ve, spacing 10-30mm 8.09 m: EWS, 0°, clay, 4mm 8.52-8.69 m: J, 0-90°, Ir, Sm, Cn 8.95 m: P, 0°, Pl, Sm, Cn 9.24 m: P, 0°, Pl, Sm, Cn 9.40 m: P, 0°, Pl, Sm, Cn 9.42-9.43 m: EWS, 0°, recovered as fractured rock
					7.70							
				7	4.72		CORE LOSS: 20mm			PLI(A)=0.05		
							SILTSTONE: as above			PLI(A)=0.07		
							CORE LOSS: 20mm			PLI(A)=0.03		
							SILTSTONE: as above			PLI(A)=0.23		
		95	45 (85)	8				FR		PLI(A)=0.58 PLI(D)=0.14 PLI(A)=0.23 PLI(A)=0.33 PLI(A)=0.34 PLI(A)=0.50 PLI(A)=0.42 PLI(D)=0.22 PLI(A)=0.28 PLI(A)=0.61 PLI(D)=0.21 PLI(A)=0.43		
				9								
		100	95 (100)									
				10								

GAP 8_16.8 LIB.GLB Log GAP CORED BOREHOLE 19130799 - GRAN CENTRAL - REV4.GPJ <<DrawingFile>> 05/02/2020 13:59 8.30.004 Datgel Tools

This report of borehole must be read in conjunction with accompanying notes and abbreviations.

REPORT OF BOREHOLE: BH101

SHEET: 3 OF 3

CLIENT: Starryland
PROJECT: Starrylands - Gran Central
LOCATION: 134-142 Parramatta Road, Granville
JOB NO: 19130799

COORDS: 316004 m 6254801 m (hhGPS)
SURFACE RL: 12.5 m DATUM: AHD (MAP)
INCLINATION: -90°
HOLE DEPTH: 13.52 m

DRILL RIG: Komatsu 05
CONTRACTOR: Nealings
LOGGED: CW DATE: 15/11/19
CHECKED: BC DATE: 18/11/19

Drilling						Field Material Description					Defect Information	
METHOD	WATER	TCR	RQD (SCR)	DEPTH (metres)	DEPTH RL	GRAPHIC LOG	ROCK / SOIL MATERIAL DESCRIPTION	WEATHERING	INFERRED STRENGTH UCS MPa (VL 0.6, L 2.0, M 6.0, H 20, VH 60, EH 200)	LABORATORY STRENGTH (MPa)	DEFECT DESCRIPTION & Additional Observations	AVERAGE DEFECT SPACING (mm) (10, 30, 100, 300, 1000, 3000)
NMLC	90-100% Water RETURN	100	95 (100)	10			SILTSTONE: as above	FR		PLI(A)=0.23 PLI(A)=0.23 PLI(A)=0.24 PLI(A)=0.49 PLI(A)=0.48	10.23 m: P, 0-5°, St, Sm, Cn 10.24 m: J, 50°, Pl, Sm, Cn 10.50 m: P, 0°, Pl, Sm, clay Ve	
		100	100 (100)	11						PLI(A)=0.67 PLI(A)=0.69 PLI(D)=0.10 PLI(A)=0.64	11.62 m: P, 0°, Pl, Sm, Cn 11.73 m: P, 0°, Pl, Sm, Cn	
		995	100 (100)	12						PLI(A)=0.37 PLI(A)=0.32 PLI(A)=0.71 PLI(A)=0.90	12.63 m: P, 0°, Pl, Sm, Cn	
				13						PLI(A)=0.32		
					13.52 -1.02		END OF BOREHOLE @ 13.52 m TARGET DEPTH STANDPIPE INSTALLED			PLI(A)=0.44 PLI(D)=0.23 PLI(A)=0.41		
				14								
				15								
				16								
				17								
				18								
				19								
				20								

This report of borehole must be read in conjunction with accompanying notes and abbreviations.

GAP gINT FN. F02a
RL3

GAP 8_16.8 LIB.GLB Log GAP CORED BOREHOLE 19130799 - GRAN CENTRAL - REV4.GPJ <<DrawingFile>> 05/02/2020 13:59 8.30.004 Datgel Tools

REPORT OF CORE PHOTOGRAPHS: BH101

CLIENT:	Starryland	COORDS: 316004 m 6254801 m (hhGPS)	SHEET: 1 OF 3
PROJECT:	Starrylands - Gran Central	SURFACE RL: 12.5 m DATUM: AHD (MAP)	DRILL RIG: Komatsu 05
LOCATION:	134-142 Parramatta Road, Granville	INCLINATION: -90°	CONTRACTOR: Nealings
JOB NO:	19130799	HOLE DEPTH: 13.52 m	LOGGED: CW DATE: 15/11/19
			CHECKED: BC DATE: 18/11/19

This report of core photographs must be read in conjunction with accompanying notes and abbreviations.

GAP 8_16.8 LIB.GLB GrfcTbl GAP CORE PHOTO 1 PER PAGE 19130799 - GRAN CENTRAL - REV4.GPJ <<DrawingFile>> 05/02/2020 14:00 8.30.004 Datgel Tools

REPORT OF CORE PHOTOGRAPHS: BH101

CLIENT:	Starryland	COORDS: 316004 m 6254801 m (hhGPS)	SHEET: 2 OF 3
PROJECT:	Starrylands - Gran Central	SURFACE RL: 12.5 m DATUM: AHD (MAP)	DRILL RIG: Komatsu 05
LOCATION:	134-142 Parramatta Road, Granville	INCLINATION: -90°	CONTRACTOR: Nealings
JOB NO:	19130799	HOLE DEPTH: 13.52 m	LOGGED: CW DATE: 15/11/19
			CHECKED: BC DATE: 18/11/19

This report of core photographs must be read in conjunction with accompanying notes and abbreviations.

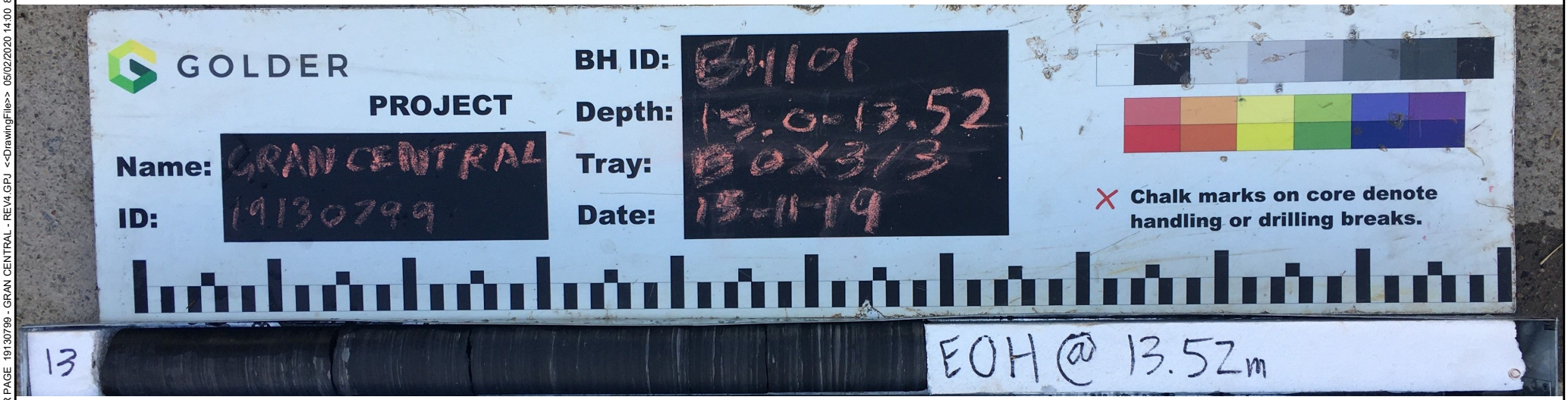
GAP gINT FN. F31
RL1

GAP 8_16.8 LIB.GLB GrfcTbl GAP CORE PHOTO 1 PER PAGE 19130799 - GRAN CENTRAL - REV4.GPJ <<DrawingFile>> 05/02/2020 14:00 8.30.004 Datgel Tools

GOLDER

REPORT OF CORE PHOTOGRAPHS: BH101

CLIENT:	Starryland	COORDS: 316004 m 6254801 m (hhGPS)	SHEET: 3 OF 3
PROJECT:	Starrylands - Gran Central	SURFACE RL: 12.5 m DATUM: AHD (MAP)	DRILL RIG: Komatsu 05
LOCATION:	134-142 Parramatta Road, Granville	INCLINATION: -90°	CONTRACTOR: Nealings
JOB NO:	19130799	HOLE DEPTH: 13.52 m	LOGGED: CW DATE: 15/11/19
			CHECKED: BC DATE: 18/11/19



This report of core photographs must be read in conjunction with accompanying notes and abbreviations.

GAP gINT FN. F31
RL1

GAP 8_16.8 LIB.GLB GrfcTbl GAP CORE PHOTO 1 PER PAGE 19130799 - GRAN CENTRAL - REV4.GPJ <<DrawingFile>> 05/02/2020 14:00 8.30.004 Datgel Tools

REPORT OF BOREHOLE: BH101a

SHEET: 1 OF 1

CLIENT: Starryland
PROJECT: Starrylands - Gran Central
LOCATION: 134-142 Parramatta Road, Granville
JOB NO: 19130799

COORDS: 316003 m 6254803 m (hhGPS)
SURFACE RL: 12.5 m DATUM: AHD (MAP)
INCLINATION: -90°
HOLE DEPTH: 3.29 m

DRILL RIG: Komatsu 05
CONTRACTOR: Nealings
LOGGED: CW DATE: 13/11/19
CHECKED: BC DATE: 18/11/19

Drilling					Sampling		Field Material Description				
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	GROUP SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
DTC	-	GWNE during and immediately after auger drilling	0	0.15				-	CONCRETE: pale grey with purple red and dark grey, rounded to angular aggregate, up to 25mm diameter, 8mm reinforcing bar at 75mm spacing at 100mm cover	-	-	ROAD SURFACE
	M			0.25				-		D	-	FILL
				0.35				-		w ~ PL	-	
				12.15				-				
				0.55				-	FILL: Sandy GRAVEL fine to coarse grained, angular, dark brown, trace silt			
				11.95				CH				RESIDUAL SOIL
HA	M-H		1						FILL: Gravelly SAND fine to coarse grained, angular, pale grey			
									FILL: Sandy CLAY high plasticity, dark brown, fine to coarse sand, with silt		-	
									Silty CLAY high plasticity, red mottled brown and grey, trace fine to coarse, sub-rounded to sub-angular ironstone gravel			
					SPT 1.65-2.10 m 4, 8, 15 N=23					w ~ PL		
ADT	L		2								H	
				3.00								
	M		3	9.50	SPT 3.00-3.29 m 15, 30/140mm HB N>30			-	pale grey with iron indurated bands and gravels grading into extremely weathered siltstone			EXTREMELY WEATHERED MATERIAL
				9.21					END OF BOREHOLE @ 3.29 m TARGET DEPTH STANDPIPE INSTALLED			
			4									
			5									
			6									
			7									
			8									
			9									
			10									

This report of borehole must be read in conjunction with accompanying notes and abbreviations. It has been prepared for hydrogeological purposes only, without attempt to assess geotechnical properties or possible contamination. Any reference to geotechnical properties or potential contamination are for information only and do not necessarily indicate the presence or absence of the properties stated.

GAP 8_16.8 LIB.GLB Log GAP NON-CORED FULL PAGE 19130799 - GRAN CENTRAL - REV4.GPJ <<DrawingFile>> 05/02/2020 14:00 8.30.004 Datgel Tools

REPORT OF BOREHOLE: BH102

SHEET: 1 OF 3

CLIENT: Starryland
PROJECT: Starrylands - Gran Central
LOCATION: 134-142 Parramatta Road, Granville
JOB NO: 19130799

COORDS: 316002 m 6254851 m (hhGPS)
SURFACE RL: 10.9 m DATUM: AHD (MAP)
INCLINATION: -90°
HOLE DEPTH: 12.38 m

DRILL RIG: Komatsu 05
CONTRACTOR: Nealings
LOGGED: CW DATE: 19/11/19
CHECKED: BC DATE: 29/11/19

Drilling					Sampling		Field Material Description				
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	GROUP SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
DTC	H	GWNE during and immediately after auger drilling	0	0.11				-	CONCRETE: pale grey with red and dark grey, sub-angular to angular aggregate, up to 25mm diameter, 8mm reinforcing bar at 100mm spacing at 100mm cover	-	-	ROAD SURFACE
				0.30	DS 0.11-0.16 m 2A PID = 1.7 ppm			-		M	-	FILL
				10.60	DS 0.45-0.60 m 1A PID = 1.9 ppm			-			-	RESIDUAL SOIL
HA	M-H			0.80 10.10				CH	FILL: Gravelly SAND fine to coarse grained, dark grey, fine grained, sub-anguar to angular gravel, trace silt			
			1		DS 1.15-1.20 m 1A PID = 1.9 ppm				FILL: Silty CLAY medium plasticity, brown mottled red			
					1A SPT 1.50-1.95 m 2, 4, 8 N=12 PID = 2.1 ppm				Silty CLAY high plasticity, red mottled grey	w ~ PL	F - St	
	L			1.80 9.10					pale grey with iron indurated bands and gravels grading into extremely weathered siltstone		VSt - H	EXTREMELY WEATHERED MATERIAL
ADT			2	2.20 8.70				-	SILTSTONE: pale grey, inferred very low strength and highly weathered	-	-	WEATHERED ROCK
	M		3		1A SPT 3.00-3.10 m 22/100mm HB N=R PID = 2 ppm				For Continuation Refer to Sheet 2			
			4									
			5									
			6									
			7									
			8									
			9									
			10									

This report of borehole must be read in conjunction with accompanying notes and abbreviations.

GAP 8_16.8 LIB.GLB Log GAP NON-CORED FULL PAGE 19130799 - GRAN CENTRAL - REV4.GPJ <<DrawingFile>> 05/02/2020 14:00 8.30.004 Datgel Tools

REPORT OF BOREHOLE: BH102

SHEET: 2 OF 3

CLIENT: Starryland
PROJECT: Starrylands - Gran Central
LOCATION: 134-142 Parramatta Road, Granville
JOB NO: 19130799

COORDS: 316002 m 6254851 m (hhGPS)
SURFACE RL: 10.9 m DATUM: AHD (MAP)
INCLINATION: -90°
HOLE DEPTH: 12.38 m

DRILL RIG: Komatsu 05
CONTRACTOR: Nealings
LOGGED: CW DATE: 19/11/19
CHECKED: BC DATE: 29/11/19

Drilling						Field Material Description					Defect Information	
METHOD	WATER	TCR	RQD (SCR)	DEPTH (metres)	DEPTH RL	GRAPHIC LOG	ROCK / SOIL MATERIAL DESCRIPTION	WEATHERING	INFERRED STRENGTH UCS MPa (VL 0.6, L 2.0, M 6.0, H 20, VH 60, EH 200)	LABORATORY STRENGTH (MPa)	DEFECT DESCRIPTION & Additional Observations	AVERAGE DEFECT SPACING (mm) (10, 30, 100, 300, 1000, 3000)
				0								
				1								
				2								
				3	3.08		Continuation of Sheet 1					
NMLC	90-100% Water RETURN	95	0 (0)	4	3.21 7.62 4.52		SILTSTONE pale grey CORE LOSS: 70mm Silty CLAY: high plasticity, pale grey, extremely weathered siltstone, very stiff to hard, with low to medium strength iron indurated bands and gravels	HW RS - XW		UCS=0.140 PLI(D)=0.02 PLI(A)=0.01 PLI(A)=0.01	3.14-3.21 m: EWS, 0°, recovered as fractured rock	
		90	0 (15)	5	4.62 6.28 5.48		CORE LOSS: 100mm Silty CLAY: high plasticity, pale grey, extremely weathered siltstone, very stiff to hard, with low to medium strength iron indurated bands and gravels					
		95	25 (85)	6	5.42 5.90 4.96 6.54 4.26		SILTSTONE dark grey, with pale grey sandstone laminations, average bedding dipping at 0-5 degrees, average lamination spacing 10-20mm, average 1-2mm thick, ironstained CORE LOSS: 40mm SILTSTONE: as above CORE LOSS: 100mm SILTSTONE: as above	HW MW - SW		PLI(A)=0.11 PLI(D)=0.05 PLI(A)=0.09 PLI(A)=0.06 PLI(A)=0.06	5.50 m: P, 0-10°, Un, Sm, fe Ve 5.53 m: EWS, 0-10°, clay, 5mm 5.70-5.75 m: EWS, 0°, clay, 50mm 5.84-5.90 m: EWS, 0°, clay, 60mm 6.05 m: P, 5°, Pl, Sm, fe Sn 6.13 m: P, 0°, Pl, Sm, Cn 6.25 m: P, 0°, Pl, Sm, Cn 6.37-6.41 m: PX2, 0°, Pl, Sm, fe Ve 6.50-6.54 m: EWS, 0°, clay, 40mm	
		100	95 (100)	7 8	7.59 3.31		no ironstaining	FR		PLI(A)=0.16 PLI(D)=0.16 PLI(A)=0.18 PLI(A)=0.18 PLI(A)=0.18 PLI(A)=0.03 PLI(A)=0.17 PLI(D)=0.17 PLI(A)=0.21 PLI(A)=0.17 PLI(A)=0.55 PLI(A)=0.52 PLI(A)=0.44 PLI(D)=0.03	6.83 m: P, 0-10°, Pl, Sm, fe Ve 6.88 m: P, 0°, Pl, Sm, Cn 6.93 m: EWS, 0°, recovered as fractured rock, 5mm 6.94 m: P, 0°, Pl, Sm, fe Ve 6.97-6.99 m: J, 40-50°, Pl, Sm 6.99-7.00 m: EWS, 0°, recovered as fractured rock, 5mm 7.04-7.09 m: PX5, 0°, Pl, Sm, fe Ve 7.26 m: J, 0-10°, Un, Sm, fe Ve 7.27-7.47 m: EWSX5, 0°, fe Sn, weathered siltstone, 55mm 7.51-7.55 m: PX2, 0°, Pl, Sm, fe Ve 7.79-7.80 m: EWS, 0-10°, clay, 10mm 8.27 m: P, 0°, St, Sm, Cn 8.48 m: J, 5-10°, Pl, Sm, Cn 8.50 m: P, 0°, Pl, Sm, Cn	
		100	100 (100)	9 10						PLI(A)=0.43 PLI(D)=0.30	8.81 m: P, 0°, Pl, Sm, Cn 9.52 m: P, 0°, Pl, Sm, Cn	

This report of borehole must be read in conjunction with accompanying notes and abbreviations.

GAP gINT FN. F02a
RL3

GAP 8_16.8 LIB.GLB Log GAP CORED BOREHOLE 19130799 - GRAN CENTRAL - REV4.GPJ <<DrawingFile>> 05/02/2020 14:00 8.30.004 Datgel Tools

REPORT OF BOREHOLE: BH102

SHEET: 3 OF 3

CLIENT: Starryland
PROJECT: Starrylands - Gran Central
LOCATION: 134-142 Parramatta Road, Granville
JOB NO: 19130799

COORDS: 316002 m 6254851 m (hhGPS)
SURFACE RL: 10.9 m DATUM: AHD (MAP)
INCLINATION: -90°
HOLE DEPTH: 12.38 m

DRILL RIG: Komatsu 05
CONTRACTOR: Nealings
LOGGED: CW DATE: 19/11/19
CHECKED: BC DATE: 29/11/19

Drilling						Field Material Description					Defect Information	
METHOD	WATER	TCR	RQD (SCR)	DEPTH (metres)	DEPTH RL	GRAPHIC LOG	ROCK / SOIL MATERIAL DESCRIPTION	WEATHERING	INFERRED STRENGTH UCS MPa (VL 0.6, L 2.0, M 6.0, H 20, VH 60, EH 200)	LABORATORY STRENGTH (MPa)	DEFECT DESCRIPTION & Additional Observations	AVERAGE DEFECT SPACING (mm) (10, 30, 100, 300, 1000, 3000)
NMLC	90-100% Water RETURN	100	100 (100)	10				FR		PLI(A)=0.92 PLI(D)=0.72 PLI(A)=1.46	10.23 m: P, 0-5°, Pl, Sm, Cn 10.56 m: P, 0°, Pl, Sm, Cn	
		100	125 (100)	11						PLI(A)=0.81 PLI(A)=0.75 PLI(A)=0.77 PLI(A)=0.56	11.31 m: P, 0-20°, Un, Sm, Cn 11.69 m: P, 0°, Pl, Sm, Cn	
		100	100 (100)	12	12.38 -1.48		END OF BOREHOLE @ 12.38 m TARGET DEPTH STANDPIPE INSTALLED			PLI(A)=1.09 PLI(D)=0.87 PLI(A)=0.48		
				13								
				14								
				15								
				16								
				17								
				18								
				19								
				20								

This report of borehole must be read in conjunction with accompanying notes and abbreviations.

GAP gINT FN. F02a
RL3

GAP 8_16.8 LIB.GLB Log GAP CORED BOREHOLE 19130799 - GRAN CENTRAL - REV4.GPJ <<DrawingFile>> 05/02/2020 14:00 8.30.004 Datgel Tools

REPORT OF CORE PHOTOGRAPHS: BH102

CLIENT:	Starryland	COORDS: 316002 m 6254851 m (hhGPS)	SHEET: 1 OF 2
PROJECT:	Starrylands - Gran Central	SURFACE RL: 10.9 m DATUM: AHD (MAP)	DRILL RIG: Komatsu 05
LOCATION:	134-142 Parramatta Road, Granville	INCLINATION: -90°	CONTRACTOR: Nealings
JOB NO:	19130799	HOLE DEPTH: 12.38 m	LOGGED: CW DATE: 19/11/19
			CHECKED: BC DATE: 29/11/19

This report of core photographs must be read in conjunction with accompanying notes and abbreviations.

GAP gINT FN. F31
RL1

GAP 8_16.8 LIB.GLB GrfcTbl GAP CORE PHOTO 1 PER PAGE 19130799 - GRAN CENTRAL - REV4.GPJ <<DrawingFile>> 05/02/2020 14:00 8.30.004 Datgel Tools

REPORT OF CORE PHOTOGRAPHS: BH102

CLIENT:	Starryland	COORDS: 316002 m 6254851 m (hhGPS)	
PROJECT:	Starrylands - Gran Central	SURFACE RL: 10.9 m DATUM: AHD (MAP)	
LOCATION:	134-142 Parramatta Road, Granville	INCLINATION: -90°	
JOB NO:	19130799	HOLE DEPTH: 12.38 m	

SHEET: 2 OF 2
DRILL RIG: Komatsu 05
CONTRACTOR: Nealings
LOGGED: CW DATE: 19/11/19
CHECKED: BC DATE: 29/11/19

This report of core photographs must be read in conjunction with accompanying notes and abbreviations.

GAP gINT FN. F31
RL1

GAP 8_16.8 LIB.GLB GrfcTbl GAP CORE PHOTO 1 PER PAGE 19130799 - GRAN CENTRAL - REV4.GPJ <<DrawingFile>> 05/02/2020 14:00 8.30.004 Datgel Tools

REPORT OF BOREHOLE: BH102a

SHEET: 1 OF 1

CLIENT: Starryland
PROJECT: Starrylands - Gran Central
LOCATION: 134-142 Parramatta Road, Granville
JOB NO: 19130799

COORDS: 316002 m 6254848 m (hhGPS)
SURFACE RL: 11.0 m DATUM: AHD (MAP)
INCLINATION: -90°
HOLE DEPTH: 5.40 m

DRILL RIG: Komatsu 05
CONTRACTOR: Nealings
LOGGED: CW DATE: 19/11/19
CHECKED: BC DATE: 29/11/19

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	GROUP SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
DTC	-	GWNE during and immediately after auger drilling	0	0.12				-	CONCRETE: pale grey with red and dark grey, sub-angular to angular aggregate, up to 25mm diameter, 8mm reinforcing bar at 100mm spacing at 100mm cover	-	-	ROAD SURFACE
				10.81				-		D	-	FILL
								-		w ~ PL		RESIDUAL SOIL
HA	M-H		1	0.80 10.20				CH	FILL: Gravelly SAND fine to coarse grained, well graded, dark grey, fine grained, sub-anguar to angular gravel			
									FILL: Silty CLAY medium plasticity, dark brown mottled red		-	
				1.30 1.40					Silty CLAY high plasticity, red mottled grey			
				9.60					grey mottled red	w ~ PL		EXTREMELY WEATHERED MATERIAL
					SPT 1.50-1.95 m 3, 5, 5 N=10				with trace root			
	L		2						pale grey, inferred extremely weathered siltstone, with low to medium strength iron indurated bands and gravels		St - VSt	
				2.80 8.20				-	SILTSTONE: pale grey, highly weathered, inferred very low strength with low to medium strength iron indurated bands and gravels			WEATHERED ROCK
ADT			3		SPT 3.00-3.45 m 13, 15, 19 N=34 HB 100mm into first interval							
	M		4							-	-	
					SPT 4.50-4.59 m 10/90mm HB N=R							
			5									
				5.60					END OF BOREHOLE @ 5.40 m TARGET DEPTH STANDPIPE INSTALLED			
			6									
			7									
			8									
			9									
			10									

This report of borehole must be read in conjunction with accompanying notes and abbreviations. It has been prepared for hydrogeological purposes only, without attempt to assess geotechnical properties or possible contamination. Any reference to geotechnical properties or potential contamination are for information only and do not necessarily indicate the presence or absence of the properties stated.

GAP 8_16.8 LIB.GLB Log GAP NON-CORED FULL PAGE 19130799 - GRAN CENTRAL - REV4.GPJ <<DrawingFile>> 05/02/2020 14:01 8.30.004 Datgel Tools

REPORT OF BOREHOLE: BH103

SHEET: 1 OF 3

CLIENT: Starryland
PROJECT: Starrylands - Gran Central
LOCATION: 134-142 Parramatta Road, Granville
JOB NO: 19130799

COORDS: 315967 m 6254815 m (hhGPS)
SURFACE RL: 12.5 m DATUM: AHD (MAP)
INCLINATION: -90°
HOLE DEPTH: 13.60 m

DRILL RIG: Komatsu 05
CONTRACTOR: Nealings
LOGGED: CW DATE: 12/11/19
CHECKED: BC DATE: 18/11/19

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	GROUP SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
DTC	-	GWNE during and immediately after auger drilling	0	12.42	DS 0.08-0.10 m PID = 1.3 ppm DS 0.10-0.15 m PID = 1.4 ppm			-	CONCRETE: pale grey with purple red and dark grey, rounded to angular aggregate, up to 25mm diameter	-	-	ROAD SURFACE
	L			*0.49*				-	FILL: Silty SAND fine to coarse grained, dark brown, low plasticity silt, with fine grained, angular gravel	D	-	FILL
HA				12.01	DS 0.58-0.60 m PID = 1.1 ppm DS 0.60-0.65 m PID = 1.6 ppm			CH	Silty CLAY high plasticity, dark brown and red and grey		F	RESIDUAL SOIL
	M-H		1	*1.20*	DS 1.10-1.25 m PID = 0.9 ppm					w ~ PL	St	
				11.30					grey			
				1.53	SPT 1.43-1.68 m 20, 30/100mm HB N>30 Hammer bounce starting from 100mm into first interval. PID = 1.3 ppm				increased ironstaining, grading to extremely weathered siltstone.		VSt - H	EXTREMELY WEATHERED MATERIAL
			2						For Continuation Refer to Sheet 2			
			3									
			4									
			5									
			6									
			7									
			8									
			9									
			10									

This report of borehole must be read in conjunction with accompanying notes and abbreviations.

GAP gINT FN. F01a
RL3

GAP 8_16.8 LIB.GLB Log GAP NON-CORED FULL PAGE 19130799 - GRAN CENTRAL - REV4.GPJ <<DrawingFile>> 05/02/2020 14:04 8.30.004 Datgel Tools

REPORT OF BOREHOLE: BH103

SHEET: 2 OF 3

CLIENT: Starryland
PROJECT: Starrylands - Gran Central
LOCATION: 134-142 Parramatta Road, Granville
JOB NO: 19130799

COORDS: 315967 m 6254815 m (hhGPS)
SURFACE RL: 12.5 m DATUM: AHD (MAP)
INCLINATION: -90°
HOLE DEPTH: 13.60 m

DRILL RIG: Komatsu 05
CONTRACTOR: Nealings
LOGGED: CW DATE: 12/11/19
CHECKED: BC DATE: 18/11/19

Drilling						Field Material Description					Defect Information	
METHOD	WATER	TCR	RQD (SCR)	DEPTH (metres)	DEPTH RL	GRAPHIC LOG	ROCK / SOIL MATERIAL DESCRIPTION	WEATHERING	INFERRED STRENGTH UCS MPa (VL 0.6, L 2.0, M 6.0, H 20, VH 60, EH 200)	LABORATORY STRENGTH (MPa)	DEFECT DESCRIPTION & Additional Observations	AVERAGE DEFECT SPACING (mm) (10, 30, 100, 300, 1000, 3000)
				0								
				1								
					1.68		Continuation of Sheet 1					
NMLC	90-100% Water RETURN	100	0 (70)	2	10.82		SILTSTONE pale grey and orange brown, ironstained	HW			1.72-1.82 m: EWS, recovered as fractured rock 1.84-1.87 m: EWS, recovered as fractured rock 1.86-1.89 m: J, 60-80°, St, Sm, Cn 1.92-2.03 m: EWS, recovered as fractured rock 2.06 m: P, 0°, St, Sm, Cn 2.10-2.14 m: EWS, recovered as fractured rock 2.14-2.25 m: JX3, 90°, St, Sm, Cn	
				3	3.07						2.25 m: P, 0-5°, Pl, Sm, Cn	
		85			3.17 9.33 3.74		CORE LOSS Silty CLAY: high plasticity, pale grey, extremely weathered siltstone, very stiff to hard, with iron bands and gravels	XW			2.26-2.29 m: PX3, 0-10°, St, Sm, Cn 2.26 m: JX2, 0°, Un, Sm, fe Sn 2.26-2.29 m: PX3, 0-10°, St, Sm, Cn 2.28-2.36 m: J, 90°, Un, Sm, Cn 2.33 m: P, 0-5°, Pl, Sm, Cn 2.36 m: P, 0-10°, St, Sm, Cn 2.42-2.46 m: EWS, St, 40mm 2.52 m: P, 0°, Pl, Sm, Cn 2.59 m: P, 0°, Pl, Sm, fe Sn	
				4	8.72 4.09 8.41 4.33 4.45 8.05		CORE LOSS Silty CLAY: pale grey and red stained, very stiff to hard, grading into extremely weathered siltstone, with iron bands and gravels. NO CORE (SPT) Silty CLAY: pale grey and red stained, very stiff to hard, grading into extremely weathered siltstone, with iron bands and gravels.	HW		PLI(A)=0.02	2.64 m: PX2, 0-20°, St, Sm, fe Sn 2.76 m: P, 0-5°, Pl, Sm, Cn 2.87 m: P, 15°, St, Sm, Cn 2.87-2.94 m: J, 60°, St, Sm, Cn 2.87 m: P, 15°, St, Sm, Cn 2.87-2.94 m: J, 60°, St, Sm, Cn	
		100	20 (60)	5			SILTSTONE dark grey, with pale grey sandstone laminations, average bedding dipping at 0-5 degrees, average lamination spacing 10-20mm, average thickness 1-2mm	SW		PLI(A)=0.32 PLI(A)=0.06 PLI(A)=0.08 PLI(A)=0.17 PLI(D)=0.26 PLI(A)=0.27 PLI(D)=0.29 PLI(A)=0.49	2.95 m: P, 0°, St, Sm, Cn 3.03-3.07 m: DB SPT 4.09-4.39 m; 15, 25/150mm HB N>25 HB at 120 into first interval PID = 1.8 ppm 4.45-5.60 m: PX16, 0-5°, Pl, Sm, fe Sn 4.54-4.58 m: EWS, 0-40°, clay 4.59 m: EWS, 0°, clay, 3mm 4.65-4.67 m: EWS, 0°, clay, 20mm 4.71-4.76 m: EWS, 0°, clay, 50mm 5.15-5.18 m: PX4, 0°, Pl, Sm, Cn 5.51 m: J, 10°, Pl, Sm, fe Sn 5.54 m: J, 45-90°, St, Sm, fe Sn 5.57-5.60 m: J, 70°, St, Sm, fe Sn 5.60-6.27 m: PX8, 0°, Pl, Sm, fe Sn 5.61 m: J, 45°, Pl, Sm, fe Sn	
		100	45 (85)	6				FR			5.72 m: JX2, 0-20°, St, Sm, clay Ve 5.77-5.79 m: EWS, 0°, clay, 20mm	
		100	95 (100)	7						PLI(A)=0.37 PLI(D)=0.33 PLI(A)=0.31	5.97 m: P, 0°, Pl, Sm, fe Sn, 10mm 6.17-6.21 m: EWS, 0°, 40mm 6.32-7.05 m: PX7, 0-5°, Pl, Sm, clay Ve 7.10 m: P, 0°, Pl, Sm, Cn 7.21-7.23 m: PX3, 0°, Pl, Sm, Cn 7.36-7.37 m: EWS, 0°, 10mm 7.67 m: P, 0°, Pl, Sm, Cn	
				8							7.97 m: P, 0°, Un, Sm, Cn 8.07 m: P, 0°, Pl, Sm, Cn	
		100	70 (100)	9						PLI(D)=0.31 PLI(A)=0.43 PLI(D)=0.05 PLI(A)=0.53 PLI(D)=0.25 PLI(A)=0.71 PLI(A)=0.55 PLI(D)=0.13 PLI(D)=0.21 PLI(A)=0.67	8.31 m: DB 8.51 m: P, 0°, Pl, Sm, clay Ve 8.88 m: P, 0°, Pl, Sm, Cn 8.92 m: P, 0°, Pl, Sm, Cn 8.96 m: P, 0°, Pl, Sm, Cn 9.02 m: P, 0°, Pl, Sm, Cn 9.13 m: P, 0°, Pl, Sm, Cn 9.20 m: P, 0°, Pl, Sm, clay Ve 9.23 m: P, 0°, Pl, Sm, Cn 9.28 m: P, 0°, Pl, Sm, Cn 9.32 m: P, 0°, Pl, Sm, clay Ve 9.53 m: DB	
				10								

This report of borehole must be read in conjunction with accompanying notes and abbreviations.

GAP 8_16.8 LIB.GLB Log GAP CORED BOREHOLE 19130799 - GRAN CENTRAL - REV4.GPJ <<DrawingFile>> 05/02/2020 14:04 8.30.004 Datgel Tools

REPORT OF BOREHOLE: BH103

SHEET: 3 OF 3

CLIENT: Starryland
PROJECT: Starrylands - Gran Central
LOCATION: 134-142 Parramatta Road, Granville
JOB NO: 19130799

COORDS: 315967 m 6254815 m (hhGPS)
SURFACE RL: 12.5 m DATUM: AHD (MAP)
INCLINATION: -90°
HOLE DEPTH: 13.60 m

DRILL RIG: Komatsu 05
CONTRACTOR: Nealings
LOGGED: CW DATE: 12/11/19
CHECKED: BC DATE: 18/11/19

Drilling						Field Material Description					Defect Information	
METHOD	WATER	TCR	RQD (SCR)	DEPTH (metres)	DEPTH RL	GRAPHIC LOG	ROCK / SOIL MATERIAL DESCRIPTION	WEATHERING	INFERRED STRENGTH UCS MPa (VL 0.6, L 2.0, M 6.0, H 20, VH 60, EH 200)	LABORATORY STRENGTH (MPa)	DEFECT DESCRIPTION & Additional Observations	AVERAGE DEFECT SPACING (mm) (10, 30, 100, 300, 1000, 3000)
NMLC	90-100% Water RETURN	100	100 (100)	10			SILTSTONE dark grey, with pale grey sandstone laminations, average bedding dipping at 0-5 degrees, average lamination spacing 10-20mm, average thickness 1-2mm	FR	M	PLI(D)=0.26 PLI(A)=0.57 PLI(D)=0.37 PLI(A)=0.85 PLI(A)=0.81	9.66 m: P, 0°, Pl, Sm, Cn 9.70 m: P, 0°, Pl, Sm, Cn 9.72 m: DB 9.87 m: P, 0°, Pl, Sm, clay Ve 10.07 m: P, 0°, Un, Sm, Cn 10.19 m: DB 10.42-10.51 m: DBX3 10.69 m: P, 0°, Pl, Sm, Cn 10.88 m: P, 0°, Pl, Sm, Cn 11.01 m: HB	
				11						PLI(A)=1.09		
		100	100 (100)	12						PLI(A)=0.23 PLI(A)=0.53	11.52-12.68 m: DBX7	
				13						PLI(A)=0.52	12.50 m: P, 5°, Pl, Sm, Cn	
		100	100 (100)		13.60						13.25 m: P, 0°, Pl, Sm, Cn 13.43 m: P, 0°, Pl, Sm, clay Ve	
					-1.10		END OF BOREHOLE @ 13.60 m TARGET DEPTH GROUTED					
				14								
				15								
				16								
				17								
				18								
				19								
				20								

This report of borehole must be read in conjunction with accompanying notes and abbreviations.

GAP gINT FN. F02a
RL3

GAP 8_16.8 LIB.GLB Log GAP CORED BOREHOLE 19130799 - GRAN CENTRAL - REV4.GPJ <<DrawingFile>> 05/02/2020 14:04 8.30.004 Datgel Tools

REPORT OF CORE PHOTOGRAPHS: BH103

CLIENT:	Starryland	COORDS: 315967 m 6254815 m (hhGPS)	SHEET: 1 OF 3
PROJECT:	Starrylands - Gran Central	SURFACE RL: 12.5 m DATUM: AHD (MAP)	DRILL RIG: Komatsu 05
LOCATION:	134-142 Parramatta Road, Granville	INCLINATION: -90°	CONTRACTOR: Nealings
JOB NO:	19130799	HOLE DEPTH: 13.60 m	LOGGED: CW DATE: 12/11/19
			CHECKED: BC DATE: 18/11/19

This report of core photographs must be read in conjunction with accompanying notes and abbreviations.

GAP gINT FN. F31
RL1

GAP 8_16.8 LIB.GLB GrfcTbl GAP CORE PHOTO 1 PER PAGE 19130799 - GRAN CENTRAL - REV4.GPJ <<DrawingFile>> 05/02/2020 14:04 8.30.004 Datgel Tools

REPORT OF CORE PHOTOGRAPHS: BH103

CLIENT:	Starryland	COORDS: 315967 m 6254815 m (hhGPS)	SHEET: 2 OF 3
PROJECT:	Starrylands - Gran Central	SURFACE RL: 12.5 m DATUM: AHD (MAP)	DRILL RIG: Komatsu 05
LOCATION:	134-142 Parramatta Road, Granville	INCLINATION: -90°	CONTRACTOR: Nealings
JOB NO:	19130799	HOLE DEPTH: 13.60 m	LOGGED: CW DATE: 12/11/19
			CHECKED: BC DATE: 18/11/19

This report of core photographs must be read in conjunction with accompanying notes and abbreviations.

GAP gINT FN. F31
RL1

GAP 8_16.8 LIB.GLB GrfcTbl GAP CORE PHOTO 1 PER PAGE 19130799 - GRAN CENTRAL - REV4.GPJ <<DrawingFile>> 05/02/2020 14:04 8.30.004 Datgel Tools

REPORT OF CORE PHOTOGRAPHS: BH103

CLIENT:	Starryland	COORDS: 315967 m 6254815 m (hhGPS)	SHEET: 3 OF 3
PROJECT:	Starrylands - Gran Central	SURFACE RL: 12.5 m DATUM: AHD (MAP)	DRILL RIG: Komatsu 05
LOCATION:	134-142 Parramatta Road, Granville	INCLINATION: -90°	CONTRACTOR: Nealings
JOB NO:	19130799	HOLE DEPTH: 13.60 m	LOGGED: CW DATE: 12/11/19
			CHECKED: BC DATE: 18/11/19

This report of core photographs must be read in conjunction with accompanying notes and abbreviations.

GAP 8_16.8 LIB.GLB GrfcTbl GAP CORE PHOTO 1 PER PAGE 19130799 - GRAN CENTRAL - REV4.GPJ <<DrawingFile>> 05/02/2020 14:04 8.30.004 Datgel Tools

REPORT OF BOREHOLE: BH104

SHEET: 1 OF 1

CLIENT: Starryland
PROJECT: Starrylands - Gran Central
LOCATION: 134-142 Parramatta Road, Granville
JOB NO: 19130799

COORDS: 315966 m 6254859 m (hhGPS)
SURFACE RL: 10.8 m DATUM: AHD (MAP)
INCLINATION: -90°
HOLE DEPTH: 1.65 m

DRILL RIG: Komatsu 05
CONTRACTOR: Nealings
LOGGED: CW DATE: 15/11/19
CHECKED: BC DATE: 29/11/19

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	GROUP SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
DTC	-	GWNE during and immediately after auger drilling	0	0.15				-	CONCRETE: pale grey with red and dark grey aggregates	-	-	ROAD SURFACE
				0.30				-	FILL: Clayey GRAVEL sub-angular to angular, brown, medium plasticity clay	M	-	FILL
				10.45				CH				RESIDUAL SOIL
				0.55	DS 0.50-0.58 m				Gravelly CLAY medium to high plasticity, grey mottled brown, sub-rounded to sub-angular gravel			
				0.65								
				10.10				CH				
HA	M-H			10.03					red mottled grey, trace gravel	w ~ PL	F - St	
			1	1.00								
				9.75					Silty CLAY high plasticity, red mottled brown			
				9.60					with fine, sub-rounded to sub-angular gravel			
				1.45					trace gravel			
				9.30	DS 1.45-1.50 m				no gravel, red mottled grey			
				9.10					trace fine, sub-angular gravel			
			2						END OF BOREHOLE @ 1.65 m TARGET DEPTH PRODUCTION WELL			
			3									
			4									
			5									
			6									
			7									
			8									
			9									
			10									

This report of borehole must be read in conjunction with accompanying notes and abbreviations. It has been prepared for environmental purposes only, without attempt to consider geotechnical properties or the geotechnical significance of the materials encountered. As such it should not be relied upon for geotechnical purposes.

GAP gINT FN. F01a
RL3

GAP 8_16.8 LIB.GLB Log GAP NON-CORED FULL PAGE 19130799 - GRAN CENTRAL - REV4.GPJ <<DrawingFile>> 05/02/2020 14:04 8.30.004 Datgel Tools

REPORT OF BOREHOLE: BH105

SHEET: 1 OF 1

CLIENT: Starryland
PROJECT: Starrylands - Gran Central
LOCATION: 134-142 Parramatta Road, Granville
JOB NO: 19130799

COORDS: 315961 m 6254851 m (hhGPS)
SURFACE RL: 11.0 m DATUM: AHD (MAP)
INCLINATION: -90°
HOLE DEPTH: 1.47 m

DRILL RIG: Komatsu 05
CONTRACTOR: Nealings
LOGGED: CW DATE: 15/11/19
CHECKED: BC DATE: 29/11/19

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	GROUP SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
DTC	-		0	0.15				-	CONCRETE: pale grey with red and dark grey aggregates	-	-	ROAD SURFACE
				0.25 10.75				-	FILL: Gravelly CLAY		-	FILL
				0.45 10.55	DS 0.42-0.49 m			CH	low to medium plasticity, grey mottled brown, sub-rounded to sub-angular gravel			RESIDUAL SOIL
HA	M-H	GWNE during and immediately after auger drilling	1						Silty CLAY high plasticity, red-brown, trace fine, sub-angular gravel	w ~ PL	F - St	
									no gravel, red mottled grey and brown			
				1.15 9.85	DS 1.30-1.32 m				grey mottled red			
				9.53					END OF BOREHOLE @ 1.47 m REFUSAL ON WEATHERED ROCK PRODUCTION WELL			
			2									
			3									
			4									
			5									
			6									
			7									
			8									
			9									
			10									

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GAP gINT FN. F01a
RL3

GAP 8_16.8 LIB.GLB Log GAP NON-CORED FULL PAGE 19130799 - GRAN CENTRAL - REV4.GPJ <<DrawingFile>> 05/02/2020 14:04 8.30.004 Datgel Tools

REPORT OF BOREHOLE: BH106 (CBR)

SHEET: 1 OF 1

CLIENT: Starryland
PROJECT: Starrylands - Gran Central
LOCATION: 134-142 Parramatta Road, Granville
JOB NO: 19130799

COORDS: 315949 m 6254810 m (hhGPS)
SURFACE RL: 12.8 m DATUM: AHD (MAP)
INCLINATION: -90°
HOLE DEPTH: 1.49 m

DRILL RIG: Komatsu 05
CONTRACTOR: Nealings
LOGGED: CW DATE: 15/11/19
CHECKED: BC DATE: 29/11/19

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	GROUP SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
DTC	-	GWNE during and immediately after augering	0	0.13				-	CONCRETE: pale grey with red, pale brown, blue and dark grey aggregate, rounded to angular aggregate, up to 20mm diameter	-	-	ROAD SURFACE
				0.30				-				FILL
				12.50	BDS 0.30-1.49 m			CH	FILL: Sandy SILT dark brown, fine to coarse grained sand, with gravel			RESIDUAL SOIL
HA	M-H		1	1.10					Silty CLAY high plasticity, red brown	w ~ PL	F - St	
				11.70					mottled grey			
				1.30								
				11.50					grey			
				11.31					END OF BOREHOLE @ 1.49 m TARGET DEPTH GROUTED			
			2									
			3									
			4									
			5									
			6									
			7									
			8									
			9									
			10									

This report of borehole must be read in conjunction with accompanying notes and abbreviations. It has been prepared for geotechnical purposes only, without attempt to assess possible contamination. Any references to potential contamination are for information only and do not necessarily indicate the presence or absence of soil or groundwater contamination.

GAP gINT FN. F01a
RL3

GAP 8_16.8 LIB.GLB Log GAP NON-CORED FULL PAGE 19130799 - GRAN CENTRAL - REV4.GPJ <<DrawingFile>> 05/02/2020 14:04 8.30.004 Datgel Tools

EXPLANATION OF NOTES, ABBREVIATIONS & TERMS USED ON BOREHOLE AND TEST PIT REPORTS

DRILLING/EXCAVATION METHOD

ADH	Hollow auger drilling	EX	Excavator	PQ3	Diamond core - 83 mm
ADT	Auger drilling with tc-bit	HA	Hand auger	PT	Push tube sampling
ADV	Auger drilling with v-bit	HAND	Excavated by hand methods	RAB	Rotary air blast
AIRCORE	Aircore	HMLC	Diamond core - 63 mm	RC	Reverse circulation
AT	Air track	HQ3	Diamond core - 61 mm	RT	Rock roller
BH	Backhoe bucket	JET	Jetting	SONIC	Sonic drilling
CT	Cable tool rig	MZ	Mazier tube sampling	SPT	Standard penetration testing
DTC	Diatube coring	NDD	Non-destructive digging	U	Undisturbed tube sampling
EE	Existing excavation	NMLC	Diamond core - 52 mm	WB	Washbore drilling
EPT	Extruded push tube	NQ3	Diamond core - 45 mm		

PENETRATION/EXCAVATION RESISTANCE

L **Low resistance.** Rapid penetration possible with little effort from the equipment used.

M **Medium resistance.** Excavation/possible at an acceptable rate with moderate effort from the equipment used.

H **High resistance** to penetration/excavation. Further penetration is possible at a slow rate and requires significant effort from the equipment.

R **Refusal or Practical Refusal.** No further progress possible without the risk of damage or unacceptable wear to the digging implement or machine.

These assessments are subjective and are dependent on many factors including the equipment power, weight, condition of excavation or drilling tools, and the experience of the operator.

WATER

	Water level at date shown		Partial water loss
	Water inflow		Complete water loss

GROUNDWATER NOT OBSERVED	The observation of groundwater, whether present or not, was not possible due to drilling water, surface seepage or cave in of the borehole/test pit.
GROUNDWATER NOT ENCOUNTERED	The borehole/test pit was dry soon after excavation. However, groundwater could be present in less permeable strata. Inflow may have been observed had the borehole/test pit been left open for a longer period.

SAMPLING AND TESTING

SPT	Standard Penetration Test to AS1289.6.3.1-2004
4,7,11 N=18	4,7,11 = Blows per 150mm. N = Blows per 300mm penetration following 150mm seating
30/80 mm	Where practical refusal occurs, the blows and penetration for that interval are reported
RW	Penetration occurred under the rod weight only
HW	Penetration occurred under the hammer and rod weight only
HB	Hammer double bouncing on anvil
DS	Disturbed sample
BDS	Bulk disturbed sample
G	Gas Sample
W	Water Sample
FP	Field permeability test over section noted
FV	Field vane shear test expressed as uncorrected shear strength (sv = peak value, sr = residual value)
PID	Photoionisation Detector reading in ppm
PM	Pressuremeter test over section noted
PP	Pocket penetrometer test expressed as instrument reading in kPa
U63	Thin walled tube sample - number indicates nominal sample diameter in millimetres
WPT	Water pressure test
DCP	Dynamic cone penetration test
CPT	Cone penetration test
CPTu	Cone penetration test with pore pressure (u) measurement

RANKING OF VISUALLY OBSERVABLE CONTAMINATION AND ODOUR (for specific soil contamination assessment projects)

R = 0	No visible evidence of contamination	R = A	No non-natural odours identified
R = 1	Slight evidence of visible contamination	R = B	Slight non-natural odours identified
R = 2	Visible contamination	R = C	Moderate non-natural odours identified
R = 3	Significant visible contamination	R = D	Strong non-natural odours identified

ROCK CORE RECOVERY

TCR = Total Core Recovery (%)	RQD = Rock Quality Designation (%)	SCR = Solid Core Recovery (%)	F = Fracture Frequency
$= \frac{\text{Length of core recovered}}{\text{Length of core run}} \times 100$	$= \frac{\sum \text{Axial lengths of core} > 100\text{ mm}}{\text{Length of core run}} \times 100$	$= \frac{\sum \text{Length of cyclindrical core recovered}}{\text{Length of core run}} \times 100$	$= \frac{\text{No. of defects}}{\text{Length of zone (m)}}$

METHOD OF SOIL DESCRIPTION USED ON BOREHOLE AND TEST PIT REPORTS

SYMBOLS

FILL

GRAVEL (GW, GP, GM or GC)

SAND (SW, SP, SM or SC)

SILT (ML or MH)

CLAY (CL, CI or CH)

ORGANIC SOILS (OL, OH or Pt)

COBBLES or BOULDERS

Combinations of these basic symbols may be used to indicate mixed materials such as sandy clay.

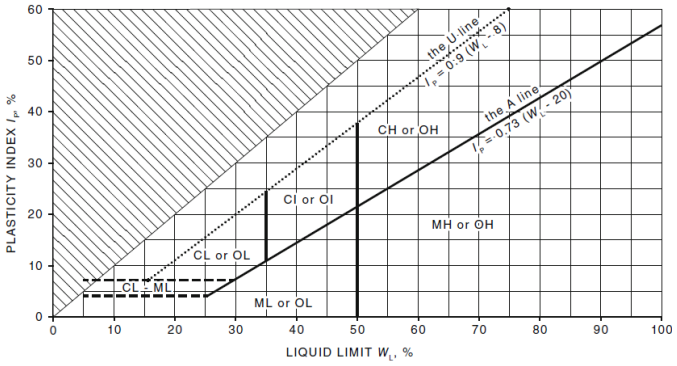
CLASSIFICATION AND INFERRED STRATIGRAPHY

Soil and Rock is classified and described in Reports of Boreholes and Test Pits using the preferred method given in AS1726-2017. The material properties are assessed in the field by visual/tactile methods.

Particle Size

Soil Group	Sub Division	Particle Size
BOULDERS		> 200 mm
COBBLES		63 to 200 mm
GRAVEL	Coarse	19 to 63 mm
	Medium	6.7 to 19 mm
	Fine	2.36 to 6.7 mm
SAND	Coarse	0.6 to 2.36 mm
	Medium	0.21 to 0.6 mm
	Fine	0.075 to 0.21 mm
SILT		0.002 to 0.075 mm
CLAY		< 0.002 mm

Plasticity Properties



MOISTURE CONDITION

Symbol	Term	Description
D	Dry	Sands and gravels are free flowing. Clays and silts may be brittle or friable and powdery.
M	Moist	Soils are darker than in dry condition and may feel cool. Sands and gravels tend to cohere.
W	Wet	Soils exude free water. Sand and gravels tend to cohere.

Moisture condition for fine grained soils is described relative to the plastic limit or liquid limit as specified in AS1726-2017.

CONSISTENCY AND DENSITY

Fine Grained Soils

Symbol	Term	Undrained Shear Strength
VS	Very Soft	0 to 12 kPa
S	Soft	12 to 25 kPa
F	Firm	25 to 50 kPa
St	Stiff	50 to 100 kPa
VSt	Very Stiff	100 to 200 kPa
H	Hard	Above 200 kPa
Fr	Friable	-

Coarse Grained Soils

Symbol	Term	Density Index (%)	SPN "N" *
VL	Very Loose	Less than 15	0 to 4
L	Loose	15 to 35	4 to 10
MD	Medium Dense	35 to 65	10 to 30
D	Dense	65 to 85	30 to 50
VD	Very Dense	Above 85	Above 50

In the absence of test results, consistency and density may be assessed from correlations with the observed behaviour of the material.

* SPT correlations are not stated in AS1726-2017, and may be subject to corrections for overburden pressure and equipment type.

CEMENTATION

Weakly Cemented	The soil may be easily disaggregated by hand in air or water.
Moderately Cemented	Effort is required to disaggregate the soil by hand in air or water.

TERMS FOR ROCK MATERIAL STRENGTH & WEATHERING AND ABBREVIATIONS FOR DEFECT DESCRIPTIONS

STRENGTH

Symbol	Term	UCS (MPa)	Field Guide
VL	Very Low	0.6 to 2	Material crumbles under firm blows with sharp end of pick; can be peeled with knife; too hard to cut a triaxial sample by hand. Pieces up to 30 mm can be broken by finger pressure.
L	Low	2 to 6	Easily scored with a knife; indentations 1 mm to 3 mm show in the specimen with firm blows of pick point; has dull sound under hammer. A piece of core 150 mm long by 50 mm diameter may be broken by hand. Sharp edges of core may be friable and break during handling.
M	Medium	6 to 20	Readily scored with a knife; a piece of core 150 mm long by 50 mm diameter can be broken by hand with difficulty.
H	High	20 to 60	A piece of core 150 mm long by 50 mm diameter cannot be broken by hand but can be broken with pick with a single firm blow; rock rings under hammer.
VH	Very High	60 to 200	Hand specimen breaks with pick after more than one blow; rock rings under hammer.
EH	Extremely High	>200	Specimen requires many blows with geological pick to break through intact material; rock rings under hammer.

Material with strength less than 'Very Low' shall be described using soil characteristics. The presence of an original rock structure, fabric or texture should be noted, if relevant.

ROCK MATERIAL WEATHERING

Symbol		Term	Field Guide
RS		Residual Soil	Material is weathered to such an extent that it has soil properties. Mass structure and material texture and fabric of original rock are no longer visible, but the soil has not been significantly transported.
XW		Extremely Weathered	Material is weathered to such an extent that it has soil properties. Mass structure and material texture and fabric of original rock are still visible.
DW	HW	Highly Weathered	The whole of the rock material is discoloured, usually by iron staining or bleaching to the extent that the colour of the original rock is not recognizable. Rock strength is significantly changed by weathering. Some primary minerals have weathered to clay minerals. Porosity may be increased by leaching, or may be decreased due to deposition of weathering products in pores.
	MW	Moderately Weathered	The whole of the rock material is discoloured, usually by iron staining or bleaching to the extent that the colour of the original rock is not recognizable, but shows little or no change of strength from fresh rock.
SW		Slightly Weathered	Rock is partially discoloured with staining or bleaching along joints but shows little or no change of strength from fresh rock.
FR		Fresh	Rock shows no sign of decomposition of individual minerals or colour changes.

ABBREVIATIONS FOR DEFECT TYPES AND DESCRIPTIONS

Defect Type	
P	Parting
X	Foliation
L	Cleavage
C	Contact
J	Joint
SSu	Sheared Surface
SS	Sheared Seam
SZ	Sheared Zone
CS	Crushed Seam
IS	Infilled Seam
EWS	Extremely Weathered Seam
V	Vein

Coating or Infilling	
Cn	Clean
Sn	Stain
Ve	Veneer
Ct	Coating
In	Infill

Planarity	
Pl	Planar
Cv	Curved
Un	Undulating
St	Stepped
Ir	Irregular

Roughness	
VRo	Very Rough
Ro	Rough
Sm	Smooth
Po	Polished
Sl	Slickensided

Vertical Boreholes – The dip (inclination from horizontal) of the defect is given.
Inclined Boreholes – The inclination is measured as the acute angle between the core axis and the vertical direction.

APPENDIX C

Site Photographs

Plate 1: View to east across the car yard on 38-44 Good Street

Plate 2: View to the south across 59 and 61 Cowper Street

Plate 3: View to the south of the concrete paved area at the rear of 138 Parramatta Road

Plate 4: Silty clay with iron indurate band at BH01 - material between 1.45 and 1.9 m depth

Plate 5: Siltstone at BH02 - material between 1.5 and 1.65 m depth

Plate 6: Silty clay at BH03 - material between 1.5 and 1.95 m depth

Plate 7: Silty clay at BH04 - material between 1.5 and 1.95 m depth

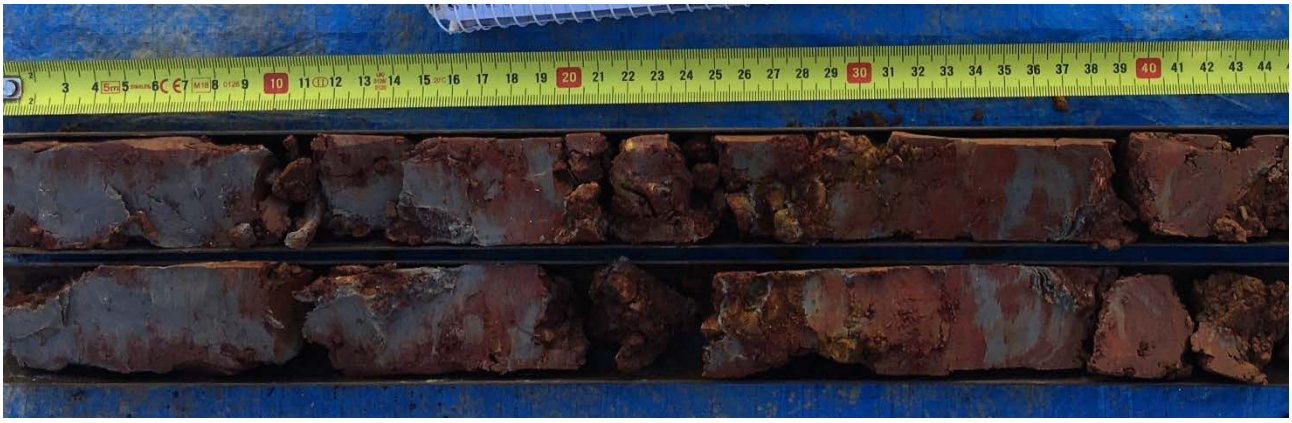


Plate 8: Silty clay at BH101 - material between 1.55 and -2.00 m depth

Plate 9: Silty clay with iron indurated bands at BH102 - material between 1.5 and 1.95 m depth

Plate 10: Silty clay grading to extremely weathered siltstone at BH103 - material between 1.5 and 1.75 m depth

APPENDIX D

Summary Tables

							Field_ID	BH01_0.14-0.18	BH01_1.30-1.40	BH02_0.15-0.20	BH02_1.40-1.50	BH03_0.10-0.20	BH03_0.80-0.90	DU2	TR1	BH03_1.40-1.50	BH04_0.10-0.20	BH04_1.05-1.15	DU1
							Location_Code	BH01M	BH01M	BH02	BH02	BH03	BH03	BH03	BH03	BH03	BH04	BH04	BH04
							Sample_Depth_Range	0.14-0.18	1.3-1.4	0.15-0.2	1.4-1.5	0.1-0.2	0.8-0.9	0.8-0.9	0.8-0.9	1.4-1.5	0.1-0.2	1.05-1.15	1.05-1.15
							Sampled_Date_Time	30-07-19	30-07-19	31-07-19	31-07-19	01-08-19	01-08-19	01-08-19	01-08-19	01-08-19	29-07-19	29-07-19	29-07-19
ChemName	**output unit**	**EQL**	CT1 General Solld Waste	CT2 Restricted Solid Waste	SCC1/TCLP1 General Solid Waste	SCC2/TCLP2 Restricted Solid Waste													
Asbestos																			
Asbestos in soil (>7mm ACM)	%w/w	0.01					<0.01	-	<0.01	-	<0.01	-	-	-	-	-	-	-	
Asbestos in soil (<2mm AF/FA)	%w/w	0.001					<0.001	-	<0.001	-	<0.001	-	-	-	-	-	-	-	
Asbestos in soil (<7mm AF/FA)	%w/w	0.001					<0.001	-	0.012	-	0.039	-	-	-	-	-	-	-	
Asbestos in soil (>2mm to <7mm AF/FA)	%w/w	0.001					<0.001	-	0.012	-	0.039	-	-	-	-	-	-	-	
Weight Asbestos in soil (<2mm AF/FA)	g	0.0001					<0.0001	-	-	-	-	-	-	-	-	-	-	-	
Weight Asbestos in soil (>2mm to <7mm AF/FA)	g	0.0001					<0.0001	-	-	-	-	-	-	-	-	-	-	-	
Mass Asbestos in FA & AF	g	0.0001					-	-	0.036	-	0.108	-	-	-	-	-	-	-	
Asbestos (1-Detect or <1-Non-Detect)	No	0					-	-	1	-	1	-	-	-	-	-	-	-	
Asbestos Detected	g	0.01					<0.01	-	>0.01	-	>0.01	-	-	-	-	<0.01	-	-	
Mass of test sample	g	0.01					<0.01	-	-	-	-	-	-	-	-	-	-	-	
Sample weight (dry)	g	1					378	-	291	-	280	-	-	-	-	-	-	-	
Mass ACM	g	0.01					-	-	<0.01	-	<0.01	-	-	-	-	-	-	-	
Mass Asbestos in Asbestos Fines (AF)	g	0.0001					-	-	<0.0001	-	<0.0001	-	-	-	-	-	-	-	
TRH - HSL																			
TRH C6 - C10 Fraction F1	mg/kg	25					<25	<25	<25	<25	-	<25	<25	<25	<25	-	<25	<25	
TRH C6 - C10 Fraction Less BTEX F1	mg/kg	25					<25	<25	<25	<25	-	<25	<25	<25	<25	-	<25	<25	
TRH >C10 - C16 Fraction F2	mg/kg	25					<25	<25	<25	<25	-	<25	<25	<50	<25	-	<25	<25	
TRH >C10 - C16 Fraction Less Naphthalene (F2)	mg/kg	25					<25	<25	<25	<25	-	<25	<25	<50	<25	-	<25	<25	
TRH >C16 - C34 Fraction F3	mg/kg	90					<90	<90	150	<90	-	<90	<90	<100	<90	-	140	<90	
TRH >C34 - C40 Fraction F4	mg/kg	120					<120	<120	<120	<120	-	<120	<120	<100	<120	-	<120	<120	
TRH C37 - C40 Fraction	mg/kg	100					<100	<100	<100	<100	-	<100	<100	-	<100	-	<100	<100	
TRH+C10 - C40 (Sum of total) (Lab Reported)	mg/kg	210					<210	<210	<210	<210	-	<210	<210	<50	<210	-	<210	<210	
TPH Group - Waste Classification																			
TRH C6 - C9 Fraction	mg/kg	20	650	2600			<20	<20	<20	<20	-	<20	<20	<25	<20	-	<20	<20	
TRH C10 - C14 Fraction	mg/kg	20					<20	<20	<20	<20	-	<20	<20	<50	<20	-	<20	<20	
TRH C15 - C28 Fraction	mg/kg	45					<45	<45	91	<45	-	<45	<45	<100	<45	-	69	<45	
TRH C29 - C36 Fraction	mg/kg	45					60	<45	71	<45	-	<45	<45	<100	<45	-	87	<45	
TRH+C10 - C36 (Sum of total) (Lab Reported)	mg/kg	110	10000	40000			<110	<110	160	<110	-	<110	<110	-	<110	-	160	<110	
BTEX																			
Benzene	mg/kg	0.1	10	40			<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.2	<0.1	-	<0.1	<0.1	
Toluene	mg/kg	0.1	288	1152			<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.5	<0.1	-	<0.1	<0.1	
Ethylbenzene	mg/kg	0.1	600	2400			<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	<1	<0.1	-	<0.1	<0.1	
Xylenes (m & p)	mg/kg	0.2					<0.2	<0.2	<0.2	<0.2	-	<0.2	<0.2	<2	<0.2	-	<0.2	<0.2	
Xylene (o)	mg/kg	0.1					<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	<1	<0.1	-	<0.1	<0.1	
Xylenes (Sum of total) (Lab Reported)	mg/kg	0.3	1000	4000			<0.3	<0.3	<0.3	<0.3	-	<0.3	<0.3	<3	<0.3	-	<0.3	<0.3	
Total BTEX	mg/kg	0.6					<0.6	<0.6	<0.6	<0.6	-	<0.6	<0.6	-	<0.6	-	<0.6	<0.6	
Heavy Metals																			
Arsenic	mg/kg	1	100	400			6	3	130	2	-	8	5	6	8	-	8	7	
Cadmium	mg/kg	0.3	20	80			<0.3	<0.3	2.3	<0.3	-	<0.3	<0.3	<0.4	<0.3	-	<0.3	<0.3	
Chromium	mg/kg	0.5	100	400			22	2.1	26	2.5	-	21	17	20	11	-	24	22	
Copper	mg/kg	0.5					37	5.6	150	4.3	-	3.4	3.7	4	4.6	-	3.4	3.4	
Lead	mg/kg	1	100	400	1500	6000	20	5	930	9	-	27	15	20	28	-	14	14	
Lead TCLP	mg/L	0.02			5	20	-	-	-	-	-	-	-	-	-	-	-	-	
Mercury	mg/kg	0.05	4	16			<0.05	<0.05	1.4	<0.05	-	<0.05	<0.05	<0.1	<0.05	-	<0.05	<0.05	
Nickel	mg/kg	0.5	40	160			37	0.5	22	<0.5	-	0.6	0.6	<1	<0.5	-	<0.5	<0.5	
Zinc	mg/kg	2					65	3.4	1300	3.2	-	27	21	20	19	-	5.8	5.4	
Organochlorine Pesticides																			
a-BHC	mg/kg	0.1	<50	<50			<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	
b-BHC	mg/kg	0.1	<50	<50			<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	
g-BHC	mg/kg	0.1	<50	<50			<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	
d-BHC	mg/kg	0.1	<50	<50			<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	
Aldrin	mg/kg	0.1	<50	<50			<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	
Dieldrin	mg/kg	0.2	<50	<50			<0.2	<0.2	<0.2	<0.2	-	<0.2	<0.2	<0.1	<0.2	-	<0.2	<0.2	
cis-Chlordane	mg/kg	0.1	<50	<50			<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	
gamma-Chlordane	mg/kg	0.1	<50	<50			<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	-	<0.1	-	<0.1	<0.1	
trans-Chlordane	mg/kg	0.1	<50	<50			-	-	-	-	-	-	-	<0.1	-	-	-	-	
DDD	mg/kg	0.1	<50	<50			<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	
DDE	mg/kg	0.1	<50	<50			-	-	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	-	-	-	
DDT	mg/kg	0.1	<50	<50			<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	
o,p-DDD	mg/kg	0.1	<50	<50			<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	-	<0.1	-	<0.1	<0.1	
p,p-DDE	mg/kg	0.1	<50	<50			<0.1	<0.1	-	-	-	-	-	-	-	-	<0.1	<0.1	
o,p-DDE	mg/kg	0.1	<50	<50			<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	-	<0.1	-	<0.1	<0.1	
2,4-DDT	mg/kg	0.1	<50	<50			<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	-	<0.1	-	<0.1	<0.1	
DDT+DDE+DDD (Sum of total) (Lab Reported)	mg/kg	0.1	<50	<50			-	-	-	-	-	-	-	<0.1	-	-	-	-	
Endosulfan I	mg/kg	0.2					<0.2	<0.2	<0.2	<0.2	-	<0.2	<0.2	<0.1	<0.2	-	<0.2	<0.2	
Endosulfan II	mg/kg	0.2	60	240			<0.2	<0.2	<0.2	<0.2	-	<0.2	<0.2	<0.1	<0.2	-	<0.2	<0.2	

						Field_ID	BH01_0.14-0.18	BH01_1.30-1.40	BH02_0.15-0.20	BH02_1.40-1.50	BH03_0.10-0.20	BH03_0.80-0.90	DU2	TR1	BH03_1.40-1.50	BH04_0.10-0.20	BH04_1.05-1.15	DU1
						Location_Code	BH01M	BH01M	BH02	BH02	BH03	BH03	BH03	BH03	BH03	BH04	BH04	BH04
						Sample_Depth_Range	0.14-0.18	1.3-1.4	0.15-0.2	1.4-1.5	0.1-0.2	0.8-0.9	0.8-0.9	0.8-0.9	1.4-1.5	0.1-0.2	1.05-1.15	1.05-1.15
						Sampled_Date_Time	30-07-19	30-07-19	31-07-19	31-07-19	01-08-19	01-08-19	01-08-19	01-08-19	01-08-19	29-07-19	29-07-19	29-07-19
ChemName	**output unit**	**EQL**	CT1 General Solld Waste	CT2 Restricted Solid Waste	SCC1/TCLP1 General Solid Waste	SCC2/TCLP2 Restricted Solid Waste												
Endosulfan sulphate	mg/kg	0.1					<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1
Endrin	mg/kg	0.2	<50	<50			<0.2	<0.2	<0.2	<0.2	-	<0.2	<0.2	<0.1	<0.2	-	<0.2	<0.2
Endrin aldehyde	mg/kg	0.1	<50	<50			<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1
Endrin ketone	mg/kg	0.1					<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	-	<0.1	-	<0.1	<0.1
Heptachlor	mg/kg	0.1	<50	<50			-	-	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	-	-	-
Heptachlor epoxide	mg/kg	0.1	<50	<50			<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1
Heptachlor & heptachlor epoxide (Sum Lab Reported)	mg/kg	0.1	<50	<50			<0.1	<0.1	-	-	-	-	-	-	-	-	<0.1	<0.1
Hexachlorobenzene	mg/kg	0.1	<50	<50			<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1
Isodrin	mg/kg	0.1	<50	<50			<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	-	<0.1	-	<0.1	<0.1
Methoxychlor	mg/kg	0.1					<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1
Mirex	mg/kg	0.1					<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	-	<0.1	-	<0.1	<0.1
trans-Nonachlor	mg/kg	0.1					<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	-	<0.1	-	<0.1	<0.1
Organophosphorous Pesticides																		
OPP (Sum of total)	mg/kg	1.7					<1.7	<1.7	-	-	-	-	-	-	-	-	<1.7	<1.7
Azinphos-methyl	mg/kg	0.2					<0.2	<0.2	<0.2	<0.2	-	<0.2	<0.2	-	<0.2	-	<0.2	<0.2
Bromophos-ethyl	mg/kg	0.2					<0.2	<0.2	<0.2	<0.2	-	<0.2	<0.2	-	<0.2	-	<0.2	<0.2
Chlorpyriphos	mg/kg	0.2	4	16			<0.2	<0.2	<0.2	<0.2	-	<0.2	<0.2	-	<0.2	-	<0.2	<0.2
Chlorpyriphos-methyl	mg/kg	0.1					-	-	-	-	-	-	-	-	-	-	-	-
Diazinon	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	-	<0.5	-	<0.5	<0.5
Dichlorvos	mg/kg	0.5	250	1000			<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	-	<0.5	-	<0.5	<0.5
Dimethoate	mg/kg	0.5	250	1000			<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	-	<0.5	-	<0.5	<0.5
Ethion	mg/kg	0.2	250	1000			<0.2	<0.2	<0.2	<0.2	-	<0.2	<0.2	-	<0.2	-	<0.2	<0.2
Fenitrothion	mg/kg	0.2	250	1000			<0.2	<0.2	<0.2	<0.2	-	<0.2	<0.2	-	<0.2	-	<0.2	<0.2
Malathion	mg/kg	0.2	250	1000			<0.2	<0.2	<0.2	<0.2	-	<0.2	<0.2	-	<0.2	-	<0.2	<0.2
Methidathion	mg/kg	0.5	250	1000			<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	-	<0.5	-	<0.5	<0.5
Parathion	mg/kg	0.2					<0.2	<0.2	<0.2	<0.2	-	<0.2	<0.2	-	<0.2	-	<0.2	<0.2
Ronnel	mg/kg	0.1					-	-	-	-	-	-	-	-	-	-	-	-
PAH																		
Benzo(b+j) & Benzo(k)fluoranthene	mg/kg	0.2					-	-	-	-	-	-	-	<0.2	-	-	-	-
Acenaphthene	mg/kg	0.1					<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1
Acenaphthylene	mg/kg	0.1					0.2	<0.1	0.2	<0.1	-	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1
Anthracene	mg/kg	0.1					<0.1	<0.1	0.3	<0.1	-	<0.1	<0.1	<0.1	<0.1	-	0.1	<0.1
Benz(a)anthracene	mg/kg	0.1					0.2	<0.1	1.4	<0.1	-	<0.1	<0.1	<0.1	<0.1	-	0.7	<0.1
Benzo(a)pyrene	mg/kg	0.1	0.8	3.2			0.3	<0.1	2.1	<0.1	-	<0.1	<0.1	<0.05	<0.1	-	1	<0.1
Benzo(a)pyrene TEQ (lower bound)*	mg/kg	0.2					0.4	<0.2	2.9	<0.2	-	<0.2	<0.2	<0.5	<0.2	-	1.3	<0.2
Benzo(a)pyrene TEQ (medium bound)*	mg/kg	0.2					-	-	2.9	<0.2	-	<0.2	<0.2	<0.5	<0.2	-	1.4	<0.2
Benzo(a)pyrene TEQ (upper bound)*	mg/kg	0.3					0.5	<0.3	2.9	<0.3	-	<0.3	<0.3	<0.5	<0.3	-	1.4	<0.3
Benzo(b)&(j)fluoranthene	mg/kg	0.1					0.3	<0.1	2.2	<0.1	-	<0.1	<0.1	-	<0.1	-	1.2	<0.1
Benzo(g,h,i)perylene	mg/kg	0.1					0.3	<0.1	1.2	<0.1	-	<0.1	<0.1	<0.1	<0.1	-	0.6	<0.1
Benzo(k)fluoranthene	mg/kg	0.1					0.1	<0.1	1.1	<0.1	-	<0.1	<0.1	-	<0.1	-	0.5	<0.1
Chrysene	mg/kg	0.1					0.2	<0.1	1.7	<0.1	-	<0.1	<0.1	<0.1	<0.1	-	0.7	<0.1
Dibenz(a,h)anthracene	mg/kg	0.1					<0.1	<0.1	0.2	<0.1	-	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1
Benzo(a)pyrene TEQ (Calculated)	TEQ	0.2					0.4	<0.2	-	-	-	-	-	-	-	-	-	-
Fluoranthene	mg/kg	0.1					0.3	<0.1	3.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	-	1.2	<0.1
Fluorene	mg/kg	0.1					<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1					0.2	<0.1	1.2	<0.1	-	<0.1	<0.1	<0.1	<0.1	-	0.6	<0.1
Naphthalene	mg/kg	0.1					<0.1	<0.1	<0.1 - 0.2	<0.1	-	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1
Phenanthrene	mg/kg	0.1					0.3	<0.1	1.5	<0.1	-	<0.1	<0.1	<0.1	<0.1	-	0.4	<0.1
Pyrene	mg/kg	0.1					0.5	<0.1	3.3	<0.1	-	<0.1	<0.1	<0.1	<0.1	-	1.3	<0.1
PAH (Sum of Common 16 PAHs - Lab Reported)	mg/kg	0.8	200	800			2.9	<0.8	20	<0.8	-	<0.8	<0.8	-	<0.8	-	8.4	<0.8
Total PAH (NEPM/WHO 16)	mg/kg	0.8					2.9	<0.8	20	<0.8	-	<0.8	<0.8	<0.05	<0.8	-	8.4	<0.8
1-Methylnaphthalene	mg/kg	0.1					<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	-	<0.1	-	<0.1	<0.1
2-Methylnaphthalene	mg/kg	0.1					<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	-	<0.1	-	<0.1	<0.1
Polychlorinated Biphenyls																		
Aroclor 1016	mg/kg	0.2					<0.2	<0.2	<0.2	<0.2	-	<0.2	<0.2	<0.1	<0.2	-	<0.2	<0.2
Aroclor 1232	mg/kg	0.2					<0.2	<0.2	<0.2	<0.2	-	<0.2	<0.2	<0.1	<0.2	-	<0.2	<0.2
Aroclor 1242	mg/kg	0.2					<0.2	<0.2	<0.2	<0.2	-	<0.2	<0.2	<0.1	<0.2	-	<0.2	<0.2
Aroclor 1248	mg/kg	0.2					<0.2	<0.2	<0.2	<0.2	-	<0.2	<0.2	<0.1	<0.2	-	<0.2	<0.2
Aroclor 1254	mg/kg	0.2					<0.2	<0.2	<0.2	<0.2	-	<0.2	<0.2	<0.1	<0.2	-	<0.2	<0.2
Aroclor 1260	mg/kg	0.2					<0.2	<0.2	<0.2	<0.2	-	<0.2	<0.2	<0.1	<0.2	-	<0.2	<0.2
Aroclor 1268	mg/kg	0.2					<0.2	<0.2	<0.2	<0.2	-	<0.2	<0.2	-	<0.2	-	<0.2	<0.2
Aroclor 1221	mg/kg	0.2					<0.2	<0.2	<0.2	<0.2	-	<0.2	<0.2	<0.1	<0.2	-	<0.2	<0.2
Aroclor 1262	mg/kg	0.2					<0.2	<0.2	<0.2	<0.2	-	<0.2	<0.2	-	<0.2	-	<0.2	<0.2
PCB (Sum of Total-Lab Reported)	mg/kg	1	<50	<50			<1	<1	<1	<1	-	<1	<1	<0.1	<1	-	<1	<1

							Field_ID	BH04_1.40-1.50	BH101_0.15-0.17	BH101_1.55-2.0	BH102_0.11-0.16	BH102_0.45-0.60	QCB100	BH102_3.0-3.1	BH103/201103/2001	BH103/201103/2002	BH103/201103/2005	BH104_0.50-0.58
							Location_Code	BH04	BH101	BH101	BH102	BH102	QCB100	BH102	BH103	BH103	BH103	BH104
							Sample_Depth_Range	1.4-1.5	0.15-0.17	1.55-2.0	0.11-0.16	0.45-0.60	0.45-0.6	3.0-3.1	0.08-0.10	0.10-0.15	1.1-1.25	0.50-0.58
							Sampled_Date_Time	29-07-19	14-11-19	14-11-19	18-11-19	18-11-19	18-11-19	18-11-19	11-11-19	11-11-19	11-11-19	15-11-19
ChemName	**output unit**	**EQL**	CT1 General Solld Waste	CT2 Restricted Solid Waste	SCC1/TCLP1 General Solid Waste	SCC2/TCLP2 Restricted Solid Waste												
Asbestos																		
Asbestos in soil (>7mm ACM)	%w/w	0.01					-	<0.01	-	<0.01	-	-	-	-	<0.01	-	-	
Asbestos in soil (<2mm AF/FA)	%w/w	0.001					-	<0.001	-	<0.001	-	-	-	-	<0.001	-	-	
Asbestos in soil (<7mm AF/FA)	%w/w	0.001					-	<0.001	-	<0.001	-	-	-	-	0.002	-	-	
Asbestos in soil (>2mm to <7mm AF/FA)	%w/w	0.001					-	<0.001	-	<0.001	-	-	-	-	0.002	-	-	
Weight Asbestos in soil (<2mm AF/FA)	g	0.0001					-	-	-	-	-	-	-	-	-	-	-	
Weight Asbestos in soil (>2mm to <7mm AF/FA)	g	0.0001					-	-	-	-	-	-	-	-	-	-	-	
Mass Asbestos in FA & AF	g	0.0001					-	<0.0001	-	<0.0001	-	-	-	-	0.0139	-	-	
Asbestos (1-Detect or <1-Non-Detect)	No	0					-	0	-	0	-	-	-	-	1	-	-	
Asbestos Detected	g	0.01					-	<0.01	-	<0.01	-	-	-	-	-	-	-	
Mass of test sample	g	0.01					-	-	-	-	-	-	-	-	<100	-	-	
Sample weight (dry)	g	1					-	523	-	415	-	-	-	-	575	-	-	
Mass ACM	g	0.01					-	<0.01	-	<0.01	-	-	-	-	<0.01	-	-	
Mass Asbestos in Asbestos Fines (AF)	g	0.0001					-	<0.0001	-	<0.0001	-	-	-	-	<0.0001	-	-	
TRH - HSL																		
TRH C6 - C10 Fraction F1	mg/kg	25					<25	<25	<25	-	<25	<25	<25	<25	-	<25	<25	
TRH C6 - C10 Fraction Less BTEX F1	mg/kg	25					<25	<25	<25	-	<25	<25	<25	<25	-	<25	<25	
TRH >C10 - C16 Fraction F2	mg/kg	25					<25	<25	<25	-	<25	<25	<25	<25	-	<25	<25	
TRH >C10 - C16 Fraction Less Naphthalene (F2)	mg/kg	25					<25	<25	<25	-	<25	<25	<25	<25	-	<25	<25	
TRH >C16 - C34 Fraction F3	mg/kg	90					<90	<90	<90	-	<90	<100	<90	<90	-	<90	<90	
TRH >C34 - C40 Fraction F4	mg/kg	120					<120	<120	<120	-	<120	<100	<120	<120	-	<120	<120	
TRH C37 - C40 Fraction	mg/kg	100					<100	<100	<100	-	<100	-	<100	<100	-	<100	<100	
TRH+C10 - C40 (Sum of total) (Lab Reported)	mg/kg	210					<210	<210	<210	-	<210	<50	<210	<210	-	<210	<210	
TPH Group - Waste Classification																		
TRH C6 - C9 Fraction	mg/kg	20	650	2600			<20	<20	<20	-	<20	<25	<20	<20	-	<20	<20	
TRH C10 - C14 Fraction	mg/kg	20					<20	<20	<20	-	<20	<50	<20	<20	-	<20	<20	
TRH C15 - C28 Fraction	mg/kg	45					<45	<45	<45	-	<45	<100	<45	<45	-	<45	<45	
TRH C29 - C36 Fraction	mg/kg	45					<45	<45	<45	-	<45	<100	<45	<45	-	<45	<45	
TRH+C10 - C36 (Sum of total) (Lab Reported)	mg/kg	110	10000	40000			<110	<110	<110	-	<110	-	<110	<110	-	<110	<110	
BTEX																		
Benzene	mg/kg	0.1	10	40			<0.1	<0.1	<0.1	-	<0.1	<0.2	<0.1	<0.1	-	<0.1	<0.1	
Toluene	mg/kg	0.1	288	1152			<0.1	<0.1	<0.1	-	<0.1	<0.5	<0.1	<0.1	-	<0.1	<0.1	
Ethylbenzene	mg/kg	0.1	600	2400			<0.1	<0.1	<0.1	-	<0.1	<1	<0.1	<0.1	-	<0.1	<0.1	
Xylenes (m & p)	mg/kg	0.2					<0.2	<0.2	<0.2	-	<0.2	<2	<0.2	<0.2	-	<0.2	<0.2	
Xylene (o)	mg/kg	0.1					<0.1	<0.1	<0.1	-	<0.1	<1	<0.1	<0.1	-	<0.1	<0.1	
Xylenes (Sum of total) (Lab Reported)	mg/kg	0.3	1000	4000			<0.3	<0.3	<0.3	-	<0.3	<3	<0.3	<0.3	-	<0.3	<0.3	
Total BTEX	mg/kg	0.6					<0.6	<0.6	<0.6	-	<0.6	-	<0.6	<0.6	-	<0.6	<0.6	
Heavy Metals																		
Arsenic	mg/kg	1	100	400			7	2	2	-	2	7	<1	14	-	5	9	
Cadmium	mg/kg	0.3	20	80			<0.3	<0.3	<0.3	-	<0.3	<0.4	<0.3	0.6	-	<0.3	<0.3	
Chromium	mg/kg	0.5	100	400			11	7.3	15	-	23	31	2.8	22	-	18	23	
Copper	mg/kg	0.5					3.8	24	2.8	-	0.8	<1	4.9	150	-	2.8	3.5	
Lead	mg/kg	1	100	400	1500	6000	11	38	11	-	15	10	4	790	-	16	15	
Lead TCLP	mg/L	0.02			5	20	-	-	-	-	-	-	-	0.62	-	-	-	
Mercury	mg/kg	0.05	4	16			<0.05	<0.05	<0.05	-	<0.05	<0.1	<0.05	1.1	-	<0.05	<0.05	
Nickel	mg/kg	0.5	40	160			<0.5	30	<0.5	-	1.5	2	<0.5	10	-	<0.5	0.7	
Zinc	mg/kg	2					3.5	71	3.8	-	5.1	3	<2	590	-	9.4	11	
Organochlorine Pesticides																		
a-BHC	mg/kg	0.1	<50	<50			<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	
b-BHC	mg/kg	0.1	<50	<50			<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	
g-BHC	mg/kg	0.1	<50	<50			<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	
d-BHC	mg/kg	0.1	<50	<50			<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	
Aldrin	mg/kg	0.1	<50	<50			<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	
Dieldrin	mg/kg	0.2	<50	<50			<0.2	<0.2	<0.2	-	<0.2	<0.1	<0.2	<0.2	-	<0.2	<0.2	
cis-Chlordane	mg/kg	0.1	<50	<50			<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	
gamma-Chlordane	mg/kg	0.1	<50	<50			<0.1	<0.1	<0.1	-	<0.1	-	<0.1	<0.1	-	<0.1	<0.1	
trans-Chlordane	mg/kg	0.1	<50	<50			-	-	-	-	-	<0.1	-	-	-	-	-	
DDD	mg/kg	0.1	<50	<50			<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	
DDE	mg/kg	0.1	<50	<50			-	-	-	-	-	-	-	-	-	-	-	
DDT	mg/kg	0.1	<50	<50			<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	
o,p-DDD	mg/kg	0.1	<50	<50			<0.1	<0.1	<0.1	-	<0.1	-	<0.1	<0.1	-	<0.1	<0.1	
p,p-DDE	mg/kg	0.1	<50	<50			<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	
o,p-DDE	mg/kg	0.1	<50	<50			<0.1	<0.1	<0.1	-	<0.1	-	<0.1	<0.1	-	<0.1	<0.1	
2,4-DDT	mg/kg	0.1	<50	<50			<0.1	<0.1	<0.1	-	<0.1	-	<0.1	<0.1	-	<0.1	<0.1	
DDT+DDE+DDD (Sum of total) (Lab Reported)	mg/kg	0.1	<50	<50			-	-	-	-	-	<0.1	-	-	-	-	-	
Endosulfan I	mg/kg	0.2					<0.2	<0.2	<0.2	-	<0.2	<0.1	<0.2	<0.2	-	<0.2	<0.2	
Endosulfan II	mg/kg	0.2	60	240			<0.2	<0.2	<0.2	-	<0.2	<0.1	<0.2	<0.2	-	<0.2	<0.2	

							Field_ID	BH04_1.40-1.50	BH101_0.15-0.17	BH101_1.55-2.0	BH102_0.11-0.16	BH102_0.45-0.60	QCB100	BH102_3.0-3.1	BH103/201103/2001	BH103/201103/2002	BH103/201103/2005	BH104_0.50-0.58
							Location_Code	BH04	BH101	BH101	BH102	BH102	QCB100	BH102	BH103	BH103	BH103	BH104
							Sample_Depth_Range	1.4-1.5	0.15-0.17	1.55-2.0	0.11-0.16	0.45-0.60	0.45-0.6	3.0-3.1	0.08-0.10	0.10-0.15	1.1-1.25	0.50-0.58
							Sampled_Date_Time	29-07-19	14-11-19	14-11-19	18-11-19	18-11-19	18-11-19	18-11-19	11-11-19	11-11-19	11-11-19	15-11-19
ChemName	**output unit**	**EQL**	CT1 General Solld Waste	CT2 Restricted Solid Waste	SCC1/TCLP1 General Solid Waste	SCC2/TCLP2 Restricted Solid Waste												
Endosulfan sulphate	mg/kg	0.1					<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	
Endrin	mg/kg	0.2	<50	<50			<0.2	<0.2	<0.2	-	<0.2	<0.1	<0.2	<0.2	-	<0.2	<0.2	
Endrin aldehyde	mg/kg	0.1	<50	<50			<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	
Endrin ketone	mg/kg	0.1					<0.1	<0.1	<0.1	-	<0.1	-	<0.1	<0.1	-	<0.1	<0.1	
Heptachlor	mg/kg	0.1	<50	<50			-	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	
Heptachlor epoxide	mg/kg	0.1	<50	<50			<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	
Heptachlor & heptachlor epoxide (Sum Lab Reported)	mg/kg	0.1	<50	<50			<0.1	-	-	-	-	-	-	-	-	-	-	
Hexachlorobenzene	mg/kg	0.1	<50	<50			<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	
Isodrin	mg/kg	0.1	<50	<50			<0.1	<0.1	<0.1	-	<0.1	-	<0.1	<0.1	-	<0.1	<0.1	
Methoxychlor	mg/kg	0.1					<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	
Mirex	mg/kg	0.1					<0.1	<0.1	<0.1	-	<0.1	-	<0.1	<0.1	-	<0.1	<0.1	
trans-Nonachlor	mg/kg	0.1					<0.1	<0.1	<0.1	-	<0.1	-	<0.1	<0.1	-	<0.1	<0.1	
Organophosphorous Pesticides																		
OPP (Sum of total)	mg/kg	1.7					<1.7	-	-	-	<1.7	-	<1.7	-	-	-	-	
Azinphos-methyl	mg/kg	0.2					<0.2	<0.2	<0.2	-	<0.2	<0.1	<0.2	<0.2	-	<0.2	<0.2	
Bromophos-ethyl	mg/kg	0.2					<0.2	<0.2	<0.2	-	<0.2	<0.1	<0.2	<0.2	-	<0.2	<0.2	
Chlorpyriphos	mg/kg	0.2	4	16			<0.2	<0.2	<0.2	-	<0.2	<0.1	<0.2	<0.2	-	<0.2	<0.2	
Chlorpyriphos-methyl	mg/kg	0.1					-	-	-	-	-	<0.1	-	-	-	-	-	
Diazinon	mg/kg	0.5					<0.5	<0.5	<0.5	-	<0.5	<0.1	<0.5	<0.5	-	<0.5	<0.5	
Dichlorvos	mg/kg	0.5	250	1000			<0.5	<0.5	<0.5	-	<0.5	<0.1	<0.5	<0.5	-	<0.5	<0.5	
Dimethoate	mg/kg	0.5	250	1000			<0.5	<0.5	<0.5	-	<0.5	<0.1	<0.5	<0.5	-	<0.5	<0.5	
Ethion	mg/kg	0.2	250	1000			<0.2	<0.2	<0.2	-	<0.2	<0.1	<0.2	<0.2	-	<0.2	<0.2	
Fenitrothion	mg/kg	0.2	250	1000			<0.2	<0.2	<0.2	-	<0.2	<0.1	<0.2	<0.2	-	<0.2	<0.2	
Malathion	mg/kg	0.2	250	1000			<0.2	<0.2	<0.2	-	<0.2	<0.1	<0.2	<0.2	-	<0.2	<0.2	
Methidathion	mg/kg	0.5	250	1000			<0.5	<0.5	<0.5	-	<0.5	-	<0.5	<0.5	-	<0.5	<0.5	
Parathion	mg/kg	0.2					<0.2	<0.2	<0.2	-	<0.2	<0.1	<0.2	<0.2	-	<0.2	<0.2	
Ronnel	mg/kg	0.1					-	-	-	-	-	<0.1	-	-	-	-	-	
PAH																		
Benzo(b+j) & Benzo(k)fluoranthene	mg/kg	0.2					-	-	-	-	-	<0.2	-	-	-	-	-	
Acenaphthene	mg/kg	0.1					<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	
Acenaphthylene	mg/kg	0.1					<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	0.1	-	<0.1	<0.1	
Anthracene	mg/kg	0.1					<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	0.1	-	<0.1	<0.1	
Benz(a)anthracene	mg/kg	0.1					<0.1	0.3	<0.1	-	<0.1	<0.1	<0.1	0.5	-	<0.1	<0.1	
Benzo(a)pyrene	mg/kg	0.1	0.8	3.2			<0.1	0.5	<0.1	-	<0.1	<0.05	<0.1	0.7	-	<0.1	<0.1	
Benzo(a)pyrene TEQ (lower bound)*	mg/kg	0.2					<0.2	0.6	<0.2	-	<0.2	<0.5	<0.2	0.9	-	<0.2	<0.2	
Benzo(a)pyrene TEQ (medium bound)*	mg/kg	0.2					<0.2	0.6	<0.2	-	<0.2	<0.5	<0.2	0.9	-	<0.2	<0.2	
Benzo(a)pyrene TEQ (upper bound)*	mg/kg	0.3					<0.3	0.7	<0.3	-	<0.3	<0.5	<0.3	1	-	<0.3	<0.3	
Benzo(b)&(j)fluoranthene	mg/kg	0.1					<0.1	0.5	<0.1	-	<0.1	-	<0.1	0.7	-	<0.1	<0.1	
Benzo(g,h,i)perylene	mg/kg	0.1					<0.1	0.2	<0.1	-	<0.1	<0.1	<0.1	0.4	-	<0.1	<0.1	
Benzo(k)fluoranthene	mg/kg	0.1					<0.1	0.2	<0.1	-	<0.1	-	<0.1	0.3	-	<0.1	<0.1	
Chrysene	mg/kg	0.1					<0.1	0.4	<0.1	-	<0.1	<0.1	<0.1	0.5	-	<0.1	<0.1	
Dibenz(a,h)anthracene	mg/kg	0.1					<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	
Benzo(a)pyrene TEQ (Calculated)	TEQ	0.2					-	-	-	-	-	-	-	-	-	-	-	
Fluoranthene	mg/kg	0.1					<0.1	0.5	<0.1	-	<0.1	<0.1	<0.1	0.8	-	<0.1	<0.1	
Fluorene	mg/kg	0.1					<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1					<0.1	0.2	<0.1	-	<0.1	<0.1	<0.1	0.4	-	<0.1	<0.1	
Naphthalene	mg/kg	0.1					<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	
Phenanthrene	mg/kg	0.1					<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	0.2	-	<0.1	<0.1	
Pyrene	mg/kg	0.1					<0.1	0.7	<0.1	-	<0.1	<0.1	<0.1	0.9	-	<0.1	<0.1	
PAH (Sum of Common 16 PAHs - Lab Reported)	mg/kg	0.8	200	800			<0.8	3.4	<0.8	-	<0.8	-	<0.8	5.6	-	<0.8	<0.8	
Total PAH (NEPM/WHO 16)	mg/kg	0.8					<0.8	3.4	<0.8	-	<0.8	<0.05	<0.8	5.6	-	<0.8	<0.8	
1-Methylnaphthalene	mg/kg	0.1					<0.1	<0.1	<0.1	-	<0.1	-	<0.1	<0.1	-	<0.1	<0.1	
2-Methylnaphthalene	mg/kg	0.1					<0.1	<0.1	<0.1	-	<0.1	-	<0.1	<0.1	-	<0.1	<0.1	
Polychlorinated Biphenyls																		
Aroclor 1016	mg/kg	0.2					<0.2	<0.2	<0.2	-	<0.2	<0.1	<0.2	<0.2	-	<0.2	<0.2	
Aroclor 1232	mg/kg	0.2					<0.2	<0.2	<0.2	-	<0.2	<0.1	<0.2	<0.2	-	<0.2	<0.2	
Aroclor 1242	mg/kg	0.2					<0.2	<0.2	<0.2	-	<0.2	<0.1	<0.2	<0.2	-	<0.2	<0.2	
Aroclor 1248	mg/kg	0.2					<0.2	<0.2	<0.2	-	<0.2	<0.1	<0.2	<0.2	-	<0.2	<0.2	
Aroclor 1254	mg/kg	0.2					<0.2	<0.2	<0.2	-	<0.2	<0.1	<0.2	<0.2	-	<0.2	<0.2	
Aroclor 1260	mg/kg	0.2					<0.2	<0.2	<0.2	-	<0.2	<0.1	<0.2	<0.2	-	<0.2	<0.2	
Aroclor 1268	mg/kg	0.2					<0.2	<0.2	<0.2	-	<0.2	-	<0.2	<0.2	-	<0.2	<0.2	
Aroclor 1221	mg/kg	0.2					<0.2	<0.2	<0.2	-	<0.2	<0.1	<0.2	<0.2	-	<0.2	<0.2	
Aroclor 1262	mg/kg	0.2					<0.2	<0.2	<0.2	-	<0.2	-	<0.2	<0.2	-	<0.2	<0.2	
PCB (Sum of Total-Lab Reported)	mg/kg	1	<50	<50			<1	<1	<1	-	<1	<0.1	<1	<1	-	<1	<1	

					Field_ID									
					Location_Code									
					Sample_Depth_Range									
					Sampled_Date_Time									
			CT1 General Solld Waste	CT2 Restricted Solid Waste	SCC1/TCLP1 General Solid Waste	SCC2/TCLP2 Restricted Solid Waste	Statistical Summary							
ChemName	**output unit**	**EQL**					Number of Results	Number of Detects	Minimum Concentration	Minimum Detect	Maximum Concentration	Maximum Detect	Number of Guideline Exceedances	Number of Guideline Exceedances (Detects Only)
Asbestos														
Asbestos in soil (>7mm ACM)	%w/w	0.01					6	0	<0.01	ND	<0.01	ND	0	0
Asbestos in soil (<2mm AF/FA)	%w/w	0.001					6	0	<0.001	ND	<0.001	ND	0	0
Asbestos in soil (<7mm AF/FA)	%w/w	0.001					6	3	<0.001	0.002	0.039	0.039	0	0
Asbestos in soil (>2mm to <7mm AF/FA)	%w/w	0.001					6	3	<0.001	0.002	0.039	0.039	0	0
Weight Asbestos in soil (<2mm AF/FA)	g	0.0001					1	0	<0.0001	ND	<0.0001	ND	0	0
Weight Asbestos in soil (>2mm to <7mm AF/FA)	g	0.0001					1	0	<0.0001	ND	<0.0001	ND	0	0
Mass Asbestos in FA & AF	g	0.0001					5	3	<0.0001	0.0139	0.108	0.108	0	0
Asbestos (1-Detect or <1-Non-Detect)	No	0					5	3	-	-	-	-	0	0
Asbestos Detected	g	0.01					6	2	<0.01	0.01	0.01	0.01	0	0
Mass of test sample	g	0.01					2	0	<0.01	ND	<100	ND	0	0
Sample weight (dry)	g	1					6	0	280	280	575	575	0	0
Mass ACM	g	0.01					5	0	<0.01	ND	<0.01	ND	0	0
Mass Asbestos in Asbestos Fines (AF)	g	0.0001					5	0	<0.0001	ND	<0.0001	ND	0	0
TRH - HSL														
TRH C6 - C10 Fraction F1	mg/kg	25					19	0	<25	ND	<25	ND	0	0
TRH C6 - C10 Fraction Less BTEX F1	mg/kg	25					19	0	<25	ND	<25	ND	0	0
TRH >C10 - C16 Fraction F2	mg/kg	25					19	0	<25	ND	<50	ND	0	0
TRH >C10 - C16 Fraction Less Naphthalene (F2)	mg/kg	25					19	0	<25	ND	<50	ND	0	0
TRH >C16 - C34 Fraction F3	mg/kg	90					19	2	<90	140	150	150	0	0
TRH >C34 - C40 Fraction F4	mg/kg	120					19	0	<100	ND	<120	ND	0	0
TRH C37 - C40 Fraction	mg/kg	100					17	0	<100	ND	<100	ND	0	0
TRH+C10 - C40 (Sum of total) (Lab Reported)	mg/kg	210					19	0	<50	ND	<210	ND	0	0
TPH Group - Waste Classification														
TRH C6 - C9 Fraction	mg/kg	20	650	2600			19	0	<20	ND	<25	ND	0	0
TRH C10 - C14 Fraction	mg/kg	20					19	0	<20	ND	<50	ND	0	0
TRH C15 - C28 Fraction	mg/kg	45					19	2	<45	69	<100	91	0	0
TRH C29 - C36 Fraction	mg/kg	45					19	3	<45	60	<100	87	0	0
TRH+C10 - C36 (Sum of total) (Lab Reported)	mg/kg	110	10000	40000			17	2	<110	160	160	160	0	0
BTEX														
Benzene	mg/kg	0.1	10	40			19	0	<0.1	ND	<0.2	ND	0	0
Toluene	mg/kg	0.1	288	1152			19	0	<0.1	ND	<0.5	ND	0	0
Ethylbenzene	mg/kg	0.1	600	2400			19	0	<0.1	ND	<1	ND	0	0
Xylenes (m & p)	mg/kg	0.2					19	0	<0.2	ND	<2	ND	0	0
Xylene (o)	mg/kg	0.1					19	0	<0.1	ND	<1	ND	0	0
Xylenes (Sum of total) (Lab Reported)	mg/kg	0.3	1000	4000			19	0	<0.3	ND	<3	ND	0	0
Total BTEX	mg/kg	0.6					17	0	<0.6	ND	<0.6	ND	0	0
Heavy Metals														
Arsenic	mg/kg	1	100	400			19	18	<1	2	130	130	1	1
Cadmium	mg/kg	0.3	20	80			19	2	<0.3	0.6	2.3	2.3	0	0
Chromium	mg/kg	0.5	100	400			19	19	2.1	2.1	31	31	0	0
Copper	mg/kg	0.5					19	18	0.8	0.8	150	150	0	0
Lead	mg/kg	1	100	400	1500	6000	19	19	4	4	930	930	1	1
Lead TCLP	mg/L	0.02			5	20	1	1	0.62	0.62	0.62	0.62	0	0
Mercury	mg/kg	0.05	4	16			19	2	<0.05	1.1	1.4	1.4	0	0
Nickel	mg/kg	0.5	40	160			19	10	<0.5	0.5	37	37	0	0
Zinc	mg/kg	2					19	18	<2	3	1300	1300	0	0
Organochlorine Pesticides														
a-BHC	mg/kg	0.1	<50	<50			19	0	<0.1	ND	<0.1	ND	0	0
b-BHC	mg/kg	0.1	<50	<50			19	0	<0.1	ND	<0.1	ND	0	0
g-BHC	mg/kg	0.1	<50	<50			19	0	<0.1	ND	<0.1	ND	0	0
d-BHC	mg/kg	0.1	<50	<50			19	0	<0.1	ND	<0.1	ND	0	0
Aldrin	mg/kg	0.1	<50	<50			19	0	<0.1	ND	<0.1	ND	0	0
Dieldrin	mg/kg	0.2	<50	<50			19	0	<0.1	ND	<0.2	ND	0	0
cis-Chlordane	mg/kg	0.1	<50	<50			19	0	<0.1	ND	<0.1	ND	0	0
gamma-Chlordane	mg/kg	0.1	<50	<50			17	0	<0.1	ND	<0.1	ND	0	0
trans-Chlordane	mg/kg	0.1	<50	<50			2	0	<0.1	ND	<0.1	ND	0	0
DDD	mg/kg	0.1	<50	<50			19	0	<0.1	ND	<0.1	ND	0	0
DDE	mg/kg	0.1	<50	<50			6	0	<0.1	ND	<0.1	ND	0	0
DDT	mg/kg	0.1	<50	<50			19	0	<0.1	ND	<0.1	ND	0	0
o,p-DDD	mg/kg	0.1	<50	<50			17	0	<0.1	ND	<0.1	ND	0	0
p,p-DDE	mg/kg	0.1	<50	<50			13	0	<0.1	ND	<0.1	ND	0	0
o,p-DDE	mg/kg	0.1	<50	<50			17	0	<0.1	ND	<0.1	ND	0	0
2,4-DDT	mg/kg	0.1	<50	<50			17	0	<0.1	ND	<0.1	ND	0	0
DDT+DDE+DDD (Sum of total) (Lab Reported)	mg/kg	0.1	<50	<50			2	0	<0.1	ND	<0.1	ND	0	0
Endosulfan I	mg/kg	0.2					19	0	<0.1	ND	<0.2	ND	0	0
Endosulfan II	mg/kg	0.2	60	240			19	0	<0.1	ND	<0.2	ND	0	0

							Field_ID							
							Location_Code							
							Sample_Depth_Range							
							Sampled_Date_Time							
			CT1 General Solid Waste	CT2 Restricted Solid Waste	SCC1/TCLP1 General Solid Waste	SCC2/TCLP2 Restricted Solid Waste	Statistical Summary							
ChemName	**output unit**	**EQL**					Number of Results	Number of Detects	Minimum Concentration	Minimum Detect	Maximum Concentration	Maximum Detect	Number of Guideline Exceedances	Number of Guideline Exceedances (Detects Only)
Endosulfan sulphate	mg/kg	0.1					19	0	<0.1	ND	<0.1	ND	0	0
Endrin	mg/kg	0.2	<50	<50			19	0	<0.1	ND	<0.2	ND	0	0
Endrin aldehyde	mg/kg	0.1	<50	<50			19	0	<0.1	ND	<0.1	ND	0	0
Endrin ketone	mg/kg	0.1					17	0	<0.1	ND	<0.1	ND	0	0
Heptachlor	mg/kg	0.1	<50	<50			14	0	<0.1	ND	<0.1	ND	0	0
Heptachlor epoxide	mg/kg	0.1	<50	<50			19	0	<0.1	ND	<0.1	ND	0	0
Heptachlor & heptachlor epoxide (Sum Lab Reported)	mg/kg	0.1	<50	<50			5	0	<0.1	ND	<0.1	ND	0	0
Hexachlorobenzene	mg/kg	0.1	<50	<50			19	0	<0.1	ND	<0.1	ND	0	0
Isodrin	mg/kg	0.1	<50	<50			17	0	<0.1	ND	<0.1	ND	0	0
Methoxychlor	mg/kg	0.1					19	0	<0.1	ND	<0.1	ND	0	0
Mirex	mg/kg	0.1					17	0	<0.1	ND	<0.1	ND	0	0
trans-Nonachlor	mg/kg	0.1					17	0	<0.1	ND	<0.1	ND	0	0
Organophosphorous Pesticides														
OPP (Sum of total)	mg/kg	1.7					7	0	<1.7	ND	<1.7	ND	0	0
Azinphos-methyl	mg/kg	0.2					18	0	<0.1	ND	<0.2	ND	0	0
Bromophos-ethyl	mg/kg	0.2					18	0	<0.1	ND	<0.2	ND	0	0
Chlorpyriphos	mg/kg	0.2	4	16			18	0	<0.1	ND	<0.2	ND	0	0
Chlorpyriphos-methyl	mg/kg	0.1					1	0	<0.1	ND	<0.1	ND	0	0
Diazinon	mg/kg	0.5					18	0	<0.1	ND	<0.5	ND	0	0
Dichlorvos	mg/kg	0.5	250	1000			18	0	<0.1	ND	<0.5	ND	0	0
Dimethoate	mg/kg	0.5	250	1000			18	0	<0.1	ND	<0.5	ND	0	0
Ethion	mg/kg	0.2	250	1000			18	0	<0.1	ND	<0.2	ND	0	0
Fenitrothion	mg/kg	0.2	250	1000			18	0	<0.1	ND	<0.2	ND	0	0
Malathion	mg/kg	0.2	250	1000			18	0	<0.1	ND	<0.2	ND	0	0
Methidathion	mg/kg	0.5	250	1000			17	0	<0.5	ND	<0.5	ND	0	0
Parathion	mg/kg	0.2					18	0	<0.1	ND	<0.2	ND	0	0
Ronnel	mg/kg	0.1					1	0	<0.1	ND	<0.1	ND	0	0
PAH														
Benzo(b+j) & Benzo(k)fluoranthene	mg/kg	0.2					2	0	<0.2	ND	<0.2	ND	0	0
Acenaphthene	mg/kg	0.1					19	0	<0.1	ND	<0.1	ND	0	0
Acenaphthylene	mg/kg	0.1					19	3	<0.1	0.1	0.2	0.2	0	0
Anthracene	mg/kg	0.1					19	3	<0.1	0.1	0.3	0.3	0	0
Benz(a)anthracene	mg/kg	0.1					19	5	<0.1	0.2	1.4	1.4	0	0
Benzo(a)pyrene	mg/kg	0.1	0.8	3.2			19	5	<0.05	0.3	2.1	2.1	2	2
Benzo(a)pyrene TEQ (lower bound)*	mg/kg	0.2					19	5	<0.2	0.4	2.9	2.9	0	0
Benzo(a)pyrene TEQ (medium bound)*	mg/kg	0.2					17	4	<0.2	0.6	2.9	2.9	0	0
Benzo(a)pyrene TEQ (upper bound)*	mg/kg	0.3					19	5	<0.3	0.5	2.9	2.9	0	0
Benzo(b)&(j)fluoranthene	mg/kg	0.1					17	5	<0.1	0.3	2.2	2.2	0	0
Benzo(g,h,i)perylene	mg/kg	0.1					19	5	<0.1	0.2	1.2	1.2	0	0
Benzo(k)fluoranthene	mg/kg	0.1					17	5	<0.1	0.1	1.1	1.1	0	0
Chrysene	mg/kg	0.1					19	5	<0.1	0.2	1.7	1.7	0	0
Dibenz(a,h)anthracene	mg/kg	0.1					19	1	<0.1	0.2	0.2	0.2	0	0
Benzo(a)pyrene TEQ (Calculated)	TEQ	0.2					2	1	<0.2	0.4	0.4	0.4	0	0
Fluoranthene	mg/kg	0.1					19	5	<0.1	0.3	3.1	3.1	0	0
Fluorene	mg/kg	0.1					19	0	<0.1	ND	<0.1	ND	0	0
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1					19	5	<0.1	0.2	1.2	1.2	0	0
Naphthalene	mg/kg	0.1					19	1	<0.1	ND	0.2	0.2	0	0
Phenanthrene	mg/kg	0.1					19	4	<0.1	0.2	1.5	1.5	0	0
Pyrene	mg/kg	0.1					19	5	<0.1	0.5	3.3	3.3	0	0
PAH (Sum of Common 16 PAHs - Lab Reported)	mg/kg	0.8	200	800			17	5	<0.8	2.9	20	20	0	0
Total PAH (NEPM/WHO 16)	mg/kg	0.8					19	5	<0.05	2.9	20	20	0	0
1-Methylnaphthalene	mg/kg	0.1					17	0	<0.1	ND	<0.1	ND	0	0
2-Methylnaphthalene	mg/kg	0.1					17	0	<0.1	ND	<0.1	ND	0	0
Polychlorinated Biphenyls														
Aroclor 1016	mg/kg	0.2					19	0	<0.1	ND	<0.2	ND	0	0
Aroclor 1232	mg/kg	0.2					19	0	<0.1	ND	<0.2	ND	0	0
Aroclor 1242	mg/kg	0.2					19	0	<0.1	ND	<0.2	ND	0	0
Aroclor 1248	mg/kg	0.2					19	0	<0.1	ND	<0.2	ND	0	0
Aroclor 1254	mg/kg	0.2					19	0	<0.1	ND	<0.2	ND	0	0
Aroclor 1260	mg/kg	0.2					19	0	<0.1	ND	<0.2	ND	0	0
Aroclor 1268	mg/kg	0.2					17	0	<0.2	ND	<0.2	ND	0	0
Aroclor 1221	mg/kg	0.2					19	0	<0.1	ND	<0.2	ND	0	0
Aroclor 1262	mg/kg	0.2					17	0	<0.2	ND	<0.2	ND	0	0
PCB (Sum of Total-Lab Reported)	mg/kg	1	<50	<50			19	0	<0.1	ND	<1	ND	0	0

APPENDIX E

Laboratory Certificates

source: [Untitled].pdf page: 1 SGS Ref: SE196065_COC

E-MAILED

CHAIN OF CUSTODY & ANALYSIS REQUEST

Page _1__ of _2___

SGS

SGS Environmental Services Sydney
Unit 16, 33 Maddox Street
Alexandria NSW 2015
Telephone No: (02) 85940400
Facsimile No: (02) 85940499
Email: au.samplereceipt.sydney@sgs.com

Lab ID Number: *(please quote on correspondence)*

Site: Gran Central, Granville

Company Name:	Golder Associates Pty Ltd	Project Name/No:	Gran Central - 19122955
Address:	Level 8, 40 Mount Street	Purchase Order No:	PO21564
	North Sydney NSW	Results Required Date:	5 day TAT
		Telephone:	0431 063 254
		Fax:	
Contact Name:	Frank Yu	Email Results to:	FYu@golder.com.au; sdoyle@golder.com.au
Quotation No:			

SGS ID	Client Sample ID	Sampling Date/ Time	Matrix (Tick as appropriate) Soil Sample	Water Sample	Other	NO. OF CONTAINERS	HOLD	HOLD (Freeze)	CL17 SUITE	ASBESTOS WA DOH NEPM	TRH/BTEX/PAH/HM*8	Notes/Guidelines/LOR/ Special instructions
1	BH01_0.14-0.18	30/7/2019	X			2			X	X		
	BH01_0.35-0.45	30/7/2019	X			2	X					
	BH01_0.80-0.90	30/7/2019	X			2	X					
	BH01_1.10-1.20	30/7/2019	X			1	X					
2	BH01_1.30-1.40	30/7/2019	X			2			X			
	BH01_1.45-1.90	30/7/2019	X			1	X					
	BH01_3.00-3.45	30/7/2019	X			1	X					
	BH01_3.40-3.50	30/7/2019	X			1	X					
	BH01_3.90-4.00	30/7/2019	X			1	X					
	BH01_4.40-4.50	30/7/2019	X			1	X					
	BH01_4.50-4.65	30/7/2019	X			1	X					
	BH01_4.65-4.75	30/7/2019	X			1	X					
	Rinsate water	30/7/2019		X		4	X					

ANALYSIS REQUESTED

Additional Report Formats
- ☐ NEPM
- ☐ CSV
- ☐ ESDAT
- ☐ DQO
- ☐ GO, Guidelines ---------
- ☐ Others _____

SGS EHS Alexandria Laboratory

SE196065 COC
Received: 02 – Aug – 2019

Relinquished By: Frank Yu	Date/Time: 1/8/2019	Received By:	Date/Time: 2/8/19 2:35
Relinquished By:	Date/Time:	Received By:	Date/Time:
Samples Intact: Yes / No	Temperature: 4.8 °C	Sample Security Sealed: Yes / No	Hazards: *e.g. may contain Asbestos*

Comments / Subcontracting details: COC Golder review: SPD 2/8/2019

CHAIN OF CUSTODY & ANALYSIS REQUEST

SGS Environmental Services Sydney
Unit 16, 33 Maddox Street
Alexandria NSW 2015
Telephone No: (02) 85940400
Facsimile No: (02) 85940499
Email: au.samplereceipt.sydney@sgs.com

Lab ID Number: *(please quote on correspondence)*

Site: Gran Central, Granville

Company Name:	Golder Associates Pty Ltd	Project Name/No:	Gran Central - 19122955		
Address:	Level 8, 40 Mount Street	Purchase Order No:	PO21564		
	North Sydney NSW	Results Required Date:	5 day TAT		
		Telephone:	0431 063 254	Fax:	
Contact Name:	Frank Yu	Email Results to:	FYu@golder.com.au; sdoyle@golder.com.au		
Quotation No:					

SGS ID	Client Sample ID	Sampling Date/ Time	Matrix (Tick as appropriate) Soil Sample	Water Sample	Other	NO. OF CONTAINERS	HOLD	HOLD (Freeze)	CL17 SUITE	ASBESTOS WA DOH NEPM	TRH/BTEX/PAH/HM*8							
	Rinsate water	30/7/2019		X		1	X											

ANALYSIS REQUESTED

Additional Report Formats

- ☐ NEPM
- ☐ CSV
- ☐ ESDAT
- ☐ DQO
- ☐ GO, Guidelines --------
- ☐ Others _____

Notes/Guidelines/LOR/ Special instructions

Relinquished By: Frank Yu	Date/Time: 30/7/2019	Received By:	Date/Time: 2/8/19 2:35
Relinquished By:	Date/Time:	Received By:	Date/Time:
Samples Intact: Yes / No	Temperature: 4.2 °C	Sample Security Sealed: Yes / No	Hazards: *e.g. may contain Asbestos*

Comments / Subcontracting details: COC Golder review: SPD 2/8/2019

SAMPLE RECEIPT ADVICE

SE196065

CLIENT DETAILS

Contact	Frank Yu
Client	GOLDER ASSOCIATES PTY LTD
Address	Level 8, 40 Mount Street North Sydney NSW 2065
Telephone	0431 063 254
Facsimile	02 9478 3901
Email	FYu@golder.com.au
Project	**19122955 - Gran Central**
Order Number	**PO21564**
Samples	2

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
Samples Received	Thu 1/8/2019
Report Due	Fri 9/8/2019
SGS Reference	**SE196065**

SUBMISSION DETAILS

This is to confirm that 2 samples were received on Thursday 1/8/2019. Results are expected to be ready by COB Friday 9/8/2019. Please quote SGS reference SE196065 when making enquiries. Refer below for details relating to sample integrity upon receipt.

Samples clearly labelled	Yes	Complete documentation received	Yes
Sample container provider	SGS	Sample cooling method	Ice
Samples received in correct containers	Yes	Sample counts by matrix	2 Soil
Date documentation received	2/8/2019@10:20am	Type of documentation received	COC
Samples received in good order	Yes	Samples received without headspace	Yes
Sample temperature upon receipt	4.8°C	Sufficient sample for analysis	Yes
Turnaround time requested	Standard		

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

COMMENTS

10 Soil and 2 Water samples have been placed on hold as no tests have been assigned for them by the client . These samples will not be processed.

This document is issued by the Company under its General Conditions of Service accessible at www.sgs.com/en/Terms-and-Conditions.aspx. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein.

SAMPLE RECEIPT ADVICE

SE196065

CLIENT DETAILS

Client GOLDER ASSOCIATES PTY LTD

Project 19122955 - Gran Central

SUMMARY OF ANALYSIS

No.	Sample ID	OC Pesticides in Soil	OP Pesticides in Soil	PAH (Polynuclear Aromatic Hydrocarbons) in Soil	PCBs in Soil	Total Recoverable Elements in Soil/Waste	TRH (Total Recoverable Hydrocarbons) in Soil	VOC's in Soil	Volatile Petroleum Hydrocarbons in Soil
001	BH01_0.14-0.18	29	14	26	11	7	10	11	7
002	BH01_1.30-1.40	29	14	26	11	7	10	11	7

CONTINUED OVERLEAF

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

SAMPLE RECEIPT ADVICE

SE196065

CLIENT DETAILS

Client GOLDER ASSOCIATES PTY LTD

Project 19122955 - Gran Central

SUMMARY OF ANALYSIS

No.	Sample ID	Fibre Identification in soil	Gravimetric Determination of Asbestos in Soil	Mercury in Soil	Moisture Content
001	BH01_0.14-0.18	2	9	1	1
002	BH01_1.30-1.40	-	-	1	1

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

ANALYTICAL REPORT

Accreditation No. 2562

CLIENT DETAILS

Contact	Frank Yu
Client	GOLDER ASSOCIATES PTY LTD
Address	Level 8, 40 Mount Street North Sydney NSW 2065
Telephone	0431 063 254
Facsimile	02 9478 3901
Email	FYu@golder.com.au
Project	**19122955 - Gran Central**
Order Number	**PO21564**
Samples	2

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
SGS Reference	**SE196065 R0**
Date Received	1/8/2019
Date Reported	9/8/2019

COMMENTS

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

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

Asbestos analysed by Approved Identifier Yusuf Kuthpudin .

SIGNATORIES

Akheeqar Beniameen
Chemist

Bennet Lo
Senior Organic Chemist/Metals Chemist

Kamrul Ahsan
Senior Chemist

Ly Kim Ha
Organic Section Head

Ravee Sivasubramaniam
Hygiene Team Leader

VOC's in Soil [AN433] Tested: 6/8/2019

PARAMETER	UOM	LOR	BH01_0.14-0.18 SOIL - 30/7/2019 SE196065.001	BH01_1.30-1.40 SOIL - 30/7/2019 SE196065.002
Benzene	mg/kg	0.1	<0.1	<0.1
Toluene	mg/kg	0.1	<0.1	<0.1
Ethylbenzene	mg/kg	0.1	<0.1	<0.1
m/p-xylene	mg/kg	0.2	<0.2	<0.2
o-xylene	mg/kg	0.1	<0.1	<0.1
Total Xylenes	mg/kg	0.3	<0.3	<0.3
Total BTEX	mg/kg	0.6	<0.6	<0.6
Naphthalene	mg/kg	0.1	<0.1	<0.1

Volatile Petroleum Hydrocarbons in Soil [AN433] Tested: 6/8/2019

PARAMETER	UOM	LOR	BH01_0.14-0.18 SOIL - 30/7/2019 SE196065.001	BH01_1.30-1.40 SOIL - 30/7/2019 SE196065.002
TRH C6-C9	mg/kg	20	<20	<20
Benzene (F0)	mg/kg	0.1	<0.1	<0.1
TRH C6-C10	mg/kg	25	<25	<25
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25

TRH (Total Recoverable Hydrocarbons) in Soil [AN403] Tested: 6/8/2019

PARAMETER	UOM	LOR	BH01_0.14-0.18 SOIL - 30/7/2019 SE196065.001	BH01_1.30-1.40 SOIL - 30/7/2019 SE196065.002
TRH C10-C14	mg/kg	20	<20	<20
TRH C15-C28	mg/kg	45	<45	<45
TRH C29-C36	mg/kg	45	**60**	<45
TRH C37-C40	mg/kg	100	<100	<100
TRH >C10-C16	mg/kg	25	<25	<25
TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25	<25
TRH >C16-C34 (F3)	mg/kg	90	<90	<90
TRH >C34-C40 (F4)	mg/kg	120	<120	<120
TRH C10-C36 Total	mg/kg	110	<110	<110
TRH C10-C40 Total (F bands)	mg/kg	210	<210	<210

PAH (Polynuclear Aromatic Hydrocarbons) in Soil [AN420] Tested: 6/8/2019

PARAMETER	UOM	LOR	BH01_0.14-0.18 SOIL - 30/7/2019 SE196065.001	BH01_1.30-1.40 SOIL - 30/7/2019 SE196065.002
Naphthalene	mg/kg	0.1	<0.1	<0.1
2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1
1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1
Acenaphthylene	mg/kg	0.1	**0.2**	<0.1
Acenaphthene	mg/kg	0.1	<0.1	<0.1
Fluorene	mg/kg	0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.1	**0.3**	<0.1
Anthracene	mg/kg	0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.1	**0.3**	<0.1
Pyrene	mg/kg	0.1	**0.5**	<0.1
Benzo(a)anthracene	mg/kg	0.1	**0.2**	<0.1
Chrysene	mg/kg	0.1	**0.2**	<0.1
Benzo(b&j)fluoranthene	mg/kg	0.1	**0.3**	<0.1
Benzo(k)fluoranthene	mg/kg	0.1	**0.1**	<0.1
Benzo(a)pyrene	mg/kg	0.1	**0.3**	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	**0.2**	<0.1
Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.1	**0.3**	<0.1
Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.2	**0.4**	<0.2
Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	**0.5**	<0.3
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	**0.4**	<0.2
Total PAH (18)	mg/kg	0.8	**2.9**	<0.8
Total PAH (NEPM/WHO 16)	mg/kg	0.8	**2.9**	<0.8

OC Pesticides in Soil [AN420] Tested: 6/8/2019

PARAMETER	UOM	LOR	BH01_0.14-0.18 SOIL - 30/7/2019 SE196065.001	BH01_1.30-1.40 SOIL - 30/7/2019 SE196065.002
Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1
Alpha BHC	mg/kg	0.1	<0.1	<0.1
Lindane	mg/kg	0.1	<0.1	<0.1
Heptachlor	mg/kg	0.1	<0.1	<0.1
Aldrin	mg/kg	0.1	<0.1	<0.1
Beta BHC	mg/kg	0.1	<0.1	<0.1
Delta BHC	mg/kg	0.1	<0.1	<0.1
Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1
o,p'-DDE	mg/kg	0.1	<0.1	<0.1
Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2
Gamma Chlordane	mg/kg	0.1	<0.1	<0.1
Alpha Chlordane	mg/kg	0.1	<0.1	<0.1
trans-Nonachlor	mg/kg	0.1	<0.1	<0.1
p,p'-DDE	mg/kg	0.1	<0.1	<0.1
Dieldrin	mg/kg	0.2	<0.2	<0.2
Endrin	mg/kg	0.2	<0.2	<0.2
o,p'-DDD	mg/kg	0.1	<0.1	<0.1
o,p'-DDT	mg/kg	0.1	<0.1	<0.1
Beta Endosulfan	mg/kg	0.2	<0.2	<0.2
p,p'-DDD	mg/kg	0.1	<0.1	<0.1
p,p'-DDT	mg/kg	0.1	<0.1	<0.1
Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1
Methoxychlor	mg/kg	0.1	<0.1	<0.1
Endrin Ketone	mg/kg	0.1	<0.1	<0.1
Isodrin	mg/kg	0.1	<0.1	<0.1
Mirex	mg/kg	0.1	<0.1	<0.1
Total CLP OC Pesticides	mg/kg	1	<1	<1

OP Pesticides in Soil [AN420] Tested: 6/8/2019

PARAMETER	UOM	LOR	BH01_0.14-0.18 SOIL - 30/7/2019 SE196065.001	BH01_1.30-1.40 SOIL - 30/7/2019 SE196065.002
Dichlorvos	mg/kg	0.5	<0.5	<0.5
Dimethoate	mg/kg	0.5	<0.5	<0.5
Diazinon (Dimpylate)	mg/kg	0.5	<0.5	<0.5
Fenitrothion	mg/kg	0.2	<0.2	<0.2
Malathion	mg/kg	0.2	<0.2	<0.2
Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2	<0.2
Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2	<0.2
Bromophos Ethyl	mg/kg	0.2	<0.2	<0.2
Methidathion	mg/kg	0.5	<0.5	<0.5
Ethion	mg/kg	0.2	<0.2	<0.2
Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	<0.2
Total OP Pesticides*	mg/kg	1.7	<1.7	<1.7

PCBs in Soil [AN420] Tested: 6/8/2019

PARAMETER	UOM	LOR	BH01_0.14-0.18 SOIL - 30/7/2019 SE196065.001	BH01_1.30-1.40 SOIL - 30/7/2019 SE196065.002
Arochlor 1016	mg/kg	0.2	<0.2	<0.2
Arochlor 1221	mg/kg	0.2	<0.2	<0.2
Arochlor 1232	mg/kg	0.2	<0.2	<0.2
Arochlor 1242	mg/kg	0.2	<0.2	<0.2
Arochlor 1248	mg/kg	0.2	<0.2	<0.2
Arochlor 1254	mg/kg	0.2	<0.2	<0.2
Arochlor 1260	mg/kg	0.2	<0.2	<0.2
Arochlor 1262	mg/kg	0.2	<0.2	<0.2
Arochlor 1268	mg/kg	0.2	<0.2	<0.2
Total PCBs (Arochlors)	mg/kg	1	<1	<1

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES [AN040/AN320] Tested: 6/8/2019

PARAMETER	UOM	LOR	BH01_0.14-0.18 SOIL - 30/7/2019 SE196065.001	BH01_1.30-1.40 SOIL - 30/7/2019 SE196065.002
Arsenic, As	mg/kg	1	**6**	**3**
Cadmium, Cd	mg/kg	0.3	<0.3	<0.3
Chromium, Cr	mg/kg	0.5	**22**	**2.1**
Copper, Cu	mg/kg	0.5	**37**	**5.6**
Lead, Pb	mg/kg	1	**20**	**5**
Nickel, Ni	mg/kg	0.5	**37**	**0.5**
Zinc, Zn	mg/kg	2	**65**	**3.4**

Mercury in Soil [AN312] Tested: 6/8/2019

PARAMETER	UOM	LOR	BH01_0.14-0.18 SOIL - 30/7/2019 SE196065.001	BH01_1.30-1.40 SOIL - 30/7/2019 SE196065.002
Mercury	mg/kg	0.05	<0.05	<0.05

Moisture Content [AN002] Tested: 6/8/2019

PARAMETER	UOM	LOR	BH01_0.14-0.18 SOIL - 30/7/2019 SE196065.001	BH01_1.30-1.40 SOIL - 30/7/2019 SE196065.002
% Moisture	%w/w	0.5	**15**	**16**

Fibre Identification in soil [AN602] Tested: 8/8/2019

PARAMETER	UOM	LOR	BH01_0.14-0.18 SOIL - 30/7/2019 SE196065.001
Asbestos Detected	No unit	-	No
Estimated Fibres*	%w/w	0.01	<0.01

Gravimetric Determination of Asbestos in Soil [AN605] Tested: 8/8/2019

PARAMETER	UOM	LOR	BH01_0.14-0.18 SOIL - 30/7/2019 SE196065.001
Total Sample Weight*	g	1	**378**
ACM in >7mm Sample*	g	0.01	<0.01
AF/FA in >2mm to <7mm Sample*	g	0.0001	<0.0001
AF/FA in <2mm Sample*	g	0.0001	<0.0001
Asbestos in soil (>7mm ACM)*	%w/w	0.01	<0.01
Asbestos in soil (>2mm to <7mm AF/FA)*	%w/w	0.001	<0.001
Asbestos in soil (<2mm AF/FA)*	%w/w	0.001	<0.001
Asbestos in soil (<7mm AF/FA)*	%w/w	0.001	<0.001
Fibre Type*	No unit	-	-

METHOD	METHODOLOGY SUMMARY
AN002	The test is carried out by drying (at either 40°C or 105°C) a known mass of sample in a weighed evaporating basin. After fully dry the sample is re-weighed. Samples such as sludge and sediment having high percentages of moisture will take some time in a drying oven for complete removal of water.
AN040/AN320	A portion of sample is digested with nitric acid to decompose organic matter and hydrochloric acid to complete the digestion of metals. The digest is then analysed by ICP OES with metals results reported on the dried sample basis. Based on USEPA method 200.8 and 6010C.
AN040	A portion of sample is digested with Nitric acid to decompose organic matter and Hydrochloric acid to complete the digestion of metals and then filtered for analysis by ASS or ICP as per USEPA Method 200.8.
AN312	Mercury by Cold Vapour AAS in Soils: After digestion with nitric acid, hydrogen peroxide and hydrochloric acid, mercury ions are reduced by stannous chloride reagent in acidic solution to elemental mercury. This mercury vapour is purged by nitrogen into a cold cell in an atomic absorption spectrometer or mercury analyser. Quantification is made by comparing absorbances to those of the calibration standards. Reference APHA 3112/3500
AN403	Total Recoverable Hydrocarbons: Determination of Hydrocarbons by gas chromatography after a solvent extraction. Detection is by flame ionisation detector (FID) that produces an electronic signal in proportion to the combustible matter passing through it. Total Recoverable Hydrocarbons (TRH) are routinely reported as four alkane groupings based on the carbon chain length of the compounds: C6-C9, C10-C14, C15-C28 and C29-C36 and in recognition of the NEPM 1999 (2013), >C10-C16 (F2), >C16-C34 (F3) and >C34-C40 (F4). F2 is reported directly and also corrected by subtracting Naphthalene (from VOC method AN433) where available.
AN403	Additionally, the volatile C6-C9 fraction may be determined by a purge and trap technique and GC/MS because of the potential for volatiles loss. Total Recoverable Hydrocarbons - Silica (TRH-Si) follows the same method of analysis after silica gel cleanup of the solvent extract. Aliphatic/Aromatic Speciation follows the same method of analysis after fractionation of the solvent extract over silica with differential polarity of the eluent solvents.
AN403	The GC/FID method is not well suited to the analysis of refined high boiling point materials (ie lubricating oils or greases) but is particularly suited for measuring diesel, kerosene and petrol if care to control volatility is taken. This method will detect naturally occurring hydrocarbons, lipids, animal fats, phenols and PAHs if they are present at sufficient levels, dependent on the use of specific cleanup/fractionation techniques. Reference USEPA 3510B, 8015B.
AN420	(SVOCs) including OC, OP, PCB, Herbicides, PAH, Phthalates and Speciated Phenols (etc) in soils, sediments and waters are determined by GCMS/ECD technique following appropriate solvent extraction process (Based on USEPA 3500C and 8270D).
AN420	SVOC Compounds: Semi-Volatile Organic Compounds (SVOCs) including OC, OP, PCB, Herbicides, PAH, Phthalates and Speciated Phenols in soils, sediments and waters are determined by GCMS/ECD technique following appropriate solvent extraction process (Based on USEPA 3500C and 8270D).
AN433	VOCs and C6-C9 Hydrocarbons by GC-MS P&T: VOC`s are volatile organic compounds. The sample is presented to a gas chromatograph via a purge and trap (P&T) concentrator and autosampler and is detected with a Mass Spectrometer (MSD). Solid samples are initially extracted with methanol whilst liquid samples are processed directly. References: USEPA 5030B, 8020A, 8260.
AN602	Qualitative identification of chrysotile, amosite and crocidolite in bulk samples by polarised light microscopy (PLM) in conjunction with dispersion staining (DS). AS4964 provides the basis for this document. Unequivocal identification of the asbestos minerals present is made by obtaining sufficient diagnostic `clues`, which provide a reasonable degree of certainty, dispersion staining is a mandatory `clue` for positive identification. If sufficient `clues` are absent, then positive identification of asbestos is not possible. This procedure requires removal of suspect fibres/bundles from the sample which cannot be returned.
AN602	Fibres/material that cannot be unequivocably identified as one of the three asbestos forms, will be reported as unknown mineral fibres (umf) The fibres detected may or may not be asbestos fibres.
AN602	AS4964.2004 Method for the Qualitative Identification of Asbestos in Bulk Samples, Section 8.4, Trace Analysis Criteria, Note 4 states:"Depending upon sample condition and fibre type, the detection limit of this technique has been found to lie generally in the range of 1 in 1,000 to 1 in 10,000 parts by weight, equivalent to 1 to 0.1 g/kg."
AN602	The sample can be reported “no asbestos found at the reporting limit of 0.1 g/kg” (<0.01%w/w) where AN602 section 4.5 of this method has been followed, and if- (a) no trace asbestos fibres have been detected (i.e. no ‘respirable’ fibres): (b) the estimated weight of non-respirable asbestos fibre bundles and/or the estimated weight of asbestos in asbestos-containing materials are found to be less than 0.1g/kg: and (c) these non-respirable asbestos fibre bundles and/or the asbestos containing materials are only visible under stereo-microscope viewing conditions.
AN605	This technique gravimetrically determines the mass of Asbestos Containing Material retained on a 7mm Sieve and assumes that 15% of this ACM is asbestos. This calculated asbestos weight is then calculated as a percentage of the total sample weight.

AN605	This technique also gravimetrically determines the mass of Fibrous Asbestos (FA) and Asbestos Fines (AF) Containing Material retained on and passing a 2mm sieve post 7mm sieving. Assumes that FA and AF are 100% asbestos containing. This calculated asbestos weight is then calculated as a percentage of the total sample weight. This does not include free fibres which are only observed by standard trace analysis as per AN 602.
AN605	Insofar as is technically feasible, this report is consistent with the analytical reporting recommendations in the Western Australian Department of Health Guidelines for the Assessment Remediation and Management of Asbestos - Contaminated Sites in Western Australia - May 2009.

FOOTNOTES

*	NATA accreditation does not cover the performance of this service.	-	Not analysed.	UOM	Unit of Measure.
		NVL	Not validated.	LOR	Limit of Reporting.
**	Indicative data, theoretical holding time exceeded.	IS	Insufficient sample for analysis.	↑↓	Raised/lowered Limit of Reporting.
		LNR	Sample listed, but not received.		

Unless it is reported that sampling has been performed by SGS, the samples have been analysed as received.
Solid samples expressed on a dry weight basis.

Where "Total" analyte groups are reported (for example, Total PAHs, Total OC Pesticides) the total will be calculated as the sum of the individual analytes, with those analytes that are reported as <LOR being assumed to be zero. The summed (Total) limit of reporting is calculated by summing the individual analyte LORs and dividing by two. For example, where 16 individual analytes are being summed and each has an LOR of 0.1 mg/kg, the "Totals" LOR will be 1.6 / 2 (0.8 mg/kg). Where only 2 analytes are being summed, the " Total" LOR will be the sum of those two LORs.

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

If reported, measurement uncertainty follow the ± sign after the analytical result and is expressed as the expanded uncertainty calculated using a coverage factor of 2, providing a level of confidence of approximately 95%, unless stated otherwise in the comments section of this report.

Results reported for samples tested under test methods with codes starting with ARS-SOP, radionuclide or gross radioactivity concentrations are expressed in becquerel (Bq) per unit of mass or volume or per wipe as stated on the report. Becquerel is the SI unit for activity and equals one nuclear transformation per second.
Note that in terms of units of radioactivity:

a. 1 Bq is equivalent to 27 pCi
b. 37 MBq is equivalent to 1 mCi

For results reported for samples tested under test methods with codes starting with ARS-SOP, less than (<) values indicate the detection limit for each radionuclide or parameter for the measurement system used. The respective detection limits have been calculated in accordance with ISO 11929.

The QC and MU criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here: www.sgs.com.au.pv.sgsvr/en-gb/environment.

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ANALYTICAL REPORT

Accreditation No. 2562

CLIENT DETAILS

Contact	Frank Yu
Client	GOLDER ASSOCIATES PTY LTD
Address	Level 8, 40 Mount Street North Sydney NSW 2065
Telephone	0431 063 254
Facsimile	02 9478 3901
Email	FYu@golder.com.au
Project	**19122955 - Gran Central**
Order Number	**PO21564**
Samples	1

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
SGS Reference	**SE196065 R0**
Date Received	01 Aug 2019
Date Reported	09 Aug 2019

COMMENTS

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

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

Asbestos analysed by Approved Identifier Yusuf Kuthpudin .

SIGNATORIES

Akheeqar Beniameen
Chemist

Bennet Lo
Senior Organic Chemist/Metals Chemis

Kamrul Ahsan
Senior Chemist

Ly Kim Ha
Organic Section Head

Ravee Sivasubramaniam
Hygiene Team Leader

RESULTS

Fibre Identification in soil — Method AN602

Laboratory Reference	Client Reference	Matrix	Sample Description	Date Sampled	Fibre Identification	Est.%w/w*
SE196065.001	BH01_0.14-0.18	Soil	378g Clay,Sand,Soil, Rocks	30 Jul 2019	No Asbestos Found	<0.01

Gravimetric Determination of Asbestos in Soil [AN605] Tested: 8/8/2019

PARAMETER	UOM	LOR	BH01_0.14-0.18 SOIL - 30/7/2019 SE196065.001
Total Sample Weight*	g	1	**378**
ACM in >7mm Sample*	g	0.01	<0.01
AF/FA in >2mm to <7mm Sample*	g	0.0001	<0.0001
AF/FA in <2mm Sample*	g	0.0001	<0.0001
Asbestos in soil (>7mm ACM)*	%w/w	0.01	<0.01
Asbestos in soil (>2mm to <7mm AF/FA)*	%w/w	0.001	<0.001
Asbestos in soil (<2mm AF/FA)*	%w/w	0.001	<0.001
Asbestos in soil (<7mm AF/FA)*	%w/w	0.001	<0.001
Fibre Type*	No unit	-	-

METHOD SUMMARY

METHOD	METHODOLOGY SUMMARY
AN602	Qualitative identification of chrysotile, amosite and crocidolite in bulk samples by polarised light microscopy (PLM) in conjunction with dispersion staining (DS). AS4964 provides the basis for this document. Unequivocal identification of the asbestos minerals present is made by obtaining sufficient diagnostic `clues`, which provide a reasonable degree of certainty, dispersion staining is a mandatory `clue` for positive identification. If sufficient `clues` are absent, then positive identification of asbestos is not possible. This procedure requires removal of suspect fibres/bundles from the sample which cannot be returned.
AN602	Fibres/material that cannot be unequivocably identified as one of the three asbestos forms, will be reported as unknown mineral fibres (umf) The fibres detected may or may not be asbestos fibres.
AN602	AS4964.2004 Method for the Qualitative Identification of Asbestos in Bulk Samples , Section 8.4, Trace Analysis Criteria, Note 4 states:"Depending upon sample condition and fibre type, the detection limit of this technique has been found to lie generally in the range of 1 in 1,000 to 1 in 10,000 parts by weight, equivalent to 1 to 0.1 g/kg."
AN602	The sample can be reported “no asbestos found at the reporting limit of 0.1 g/kg” (<0.01%w/w) where AN602 section 4.5 of this method has been followed, and if- (a) no trace asbestos fibres have been detected (i.e. no ‘respirable’ fibres): (b) the estimated weight of non-respirable asbestos fibre bundles and/or the estimated weight of asbestos in asbestos-containing materials are found to be less than 0.1g/kg: and (c) these non-respirable asbestos fibre bundles and/or the asbestos containing materials are only visible under stereo-microscope viewing conditions.
AN605	This technique gravimetrically determines the mass of Asbestos Containing Material retained on a 7mm Sieve and assumes that 15% of this ACM is asbestos. This calculated asbestos weight is then calculated as a percentage of the total sample weight.
AN605	This technique also gravimetrically determines the mass of Fibrous Asbestos (FA) and Asbestos Fines (AF) Containing Material retained on and passing a 2mm sieve post 7mm sieving. Assumes that FA and AF are 100% asbestos containing. This calculated asbestos weight is then calculated as a percentage of the total sample weight. This does not include free fibres which are only observed by standard trace analysis as per AN 602.
AN605	Insofar as is technically feasible, this report is consistent with the analytical reporting recommendations in the Western Australian Department of Health Guidelines for the Assessment Remediation and Management of Asbestos - Contaminated Sites in Western Australia - May 2009.

FOOTNOTES

Amosite	-	Brown Asbestos	NA	-	Not Analysed
Chrysotile	-	White Asbestos	LNR	-	Listed, Not Required
Crocidolite	-	Blue Asbestos	*	-	NATA accreditation does not cover the performance of this service.
Amphiboles	-	Amosite and/or Crocidolite	**	-	Indicative data, theoretical holding time exceeded.

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

Unless it is reported that sampling has been performed by SGS, the samples have been analysed as received.

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

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

The QC and MU criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here: www.sgs.com.au.pv.sgsvr/en-gb/environment.

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STATEMENT OF QA/QC PERFORMANCE

SE196065 R0

CLIENT DETAILS

Contact	Frank Yu
Client	GOLDER ASSOCIATES PTY LTD
Address	Level 8, 40 Mount Street North Sydney NSW 2065
Telephone	0431 063 254
Facsimile	02 9478 3901
Email	FYu@golder.com.au
Project	**19122955 - Gran Central**
Order Number	**PO21564**
Samples	2

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
SGS Reference	**SE196065 R0**
Date Received	01 Aug 2019
Date Reported	14 Aug 2019

COMMENTS

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

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

All Data Quality Objectives were met with the exception of the following:

Matrix Spike	Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES	4 items

SAMPLE SUMMARY

Samples clearly labelled	Yes	Complete documentation received	Yes
Sample container provider	SGS	Sample cooling method	Ice
Samples received in correct containers	Yes	Sample counts by matrix	2 Soil
Date documentation received	2/8/2019@10:20am	Type of documentation received	COC
Samples received in good order	Yes	Samples received without headspace	Yes
Sample temperature upon receipt	4.8°C	Sufficient sample for analysis	Yes
Turnaround time requested	Standard		

HOLDING TIME SUMMARY

SE196065 R0

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

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

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

Fibre Identification in soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH01_0.14-0.18	SE196065.001	LB180495	30 Jul 2019	01 Aug 2019	29 Jul 2020	08 Aug 2019	29 Jul 2020	09 Aug 2019

Gravimetric Determination of Asbestos in Soil

Method: ME-(AU)-[ENV]AN605

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH01_0.14-0.18	SE196065.001	LB180495	30 Jul 2019	01 Aug 2019	26 Jan 2020	08 Aug 2019	26 Jan 2020	09 Aug 2019

Mercury in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH01_0.14-0.18	SE196065.001	LB180332	30 Jul 2019	01 Aug 2019	27 Aug 2019	06 Aug 2019	27 Aug 2019	09 Aug 2019
BH01_1.30-1.40	SE196065.002	LB180332	30 Jul 2019	01 Aug 2019	27 Aug 2019	06 Aug 2019	27 Aug 2019	09 Aug 2019

Moisture Content

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH01_0.14-0.18	SE196065.001	LB180273	30 Jul 2019	01 Aug 2019	13 Aug 2019	06 Aug 2019	11 Aug 2019	07 Aug 2019
BH01_1.30-1.40	SE196065.002	LB180273	30 Jul 2019	01 Aug 2019	13 Aug 2019	06 Aug 2019	11 Aug 2019	07 Aug 2019

OC Pesticides in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH01_0.14-0.18	SE196065.001	LB180272	30 Jul 2019	01 Aug 2019	13 Aug 2019	06 Aug 2019	15 Sep 2019	09 Aug 2019
BH01_1.30-1.40	SE196065.002	LB180272	30 Jul 2019	01 Aug 2019	13 Aug 2019	06 Aug 2019	15 Sep 2019	09 Aug 2019

OP Pesticides in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH01_0.14-0.18	SE196065.001	LB180272	30 Jul 2019	01 Aug 2019	13 Aug 2019	06 Aug 2019	15 Sep 2019	09 Aug 2019
BH01_1.30-1.40	SE196065.002	LB180272	30 Jul 2019	01 Aug 2019	13 Aug 2019	06 Aug 2019	15 Sep 2019	09 Aug 2019

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH01_0.14-0.18	SE196065.001	LB180272	30 Jul 2019	01 Aug 2019	13 Aug 2019	06 Aug 2019	15 Sep 2019	09 Aug 2019
BH01_1.30-1.40	SE196065.002	LB180272	30 Jul 2019	01 Aug 2019	13 Aug 2019	06 Aug 2019	15 Sep 2019	09 Aug 2019

PCBs in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH01_0.14-0.18	SE196065.001	LB180272	30 Jul 2019	01 Aug 2019	13 Aug 2019	06 Aug 2019	15 Sep 2019	09 Aug 2019
BH01_1.30-1.40	SE196065.002	LB180272	30 Jul 2019	01 Aug 2019	13 Aug 2019	06 Aug 2019	15 Sep 2019	09 Aug 2019

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH01_0.14-0.18	SE196065.001	LB180327	30 Jul 2019	01 Aug 2019	26 Jan 2020	06 Aug 2019	26 Jan 2020	09 Aug 2019
BH01_1.30-1.40	SE196065.002	LB180327	30 Jul 2019	01 Aug 2019	26 Jan 2020	06 Aug 2019	26 Jan 2020	09 Aug 2019

TRH (Total Recoverable Hydrocarbons) in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH01_0.14-0.18	SE196065.001	LB180272	30 Jul 2019	01 Aug 2019	13 Aug 2019	06 Aug 2019	15 Sep 2019	08 Aug 2019
BH01_1.30-1.40	SE196065.002	LB180272	30 Jul 2019	01 Aug 2019	13 Aug 2019	06 Aug 2019	15 Sep 2019	08 Aug 2019

VOC's in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH01_0.14-0.18	SE196065.001	LB180271	30 Jul 2019	01 Aug 2019	13 Aug 2019	06 Aug 2019	15 Sep 2019	07 Aug 2019
BH01_1.30-1.40	SE196065.002	LB180271	30 Jul 2019	01 Aug 2019	13 Aug 2019	06 Aug 2019	15 Sep 2019	07 Aug 2019

Volatile Petroleum Hydrocarbons in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH01_0.14-0.18	SE196065.001	LB180271	30 Jul 2019	01 Aug 2019	13 Aug 2019	06 Aug 2019	15 Sep 2019	07 Aug 2019
BH01_1.30-1.40	SE196065.002	LB180271	30 Jul 2019	01 Aug 2019	13 Aug 2019	06 Aug 2019	15 Sep 2019	07 Aug 2019

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

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

OC Pesticides in Soil

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Tetrachloro-m-xylene (TCMX) (Surrogate)	BH01_0.14-0.18	SE196065.001	%	60 - 130%	123
	BH01_1.30-1.40	SE196065.002	%	60 - 130%	121

OP Pesticides in Soil

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2-fluorobiphenyl (Surrogate)	BH01_0.14-0.18	SE196065.001	%	60 - 130%	94
	BH01_1.30-1.40	SE196065.002	%	60 - 130%	94
d14-p-terphenyl (Surrogate)	BH01_0.14-0.18	SE196065.001	%	60 - 130%	92
	BH01_1.30-1.40	SE196065.002	%	60 - 130%	92

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2-fluorobiphenyl (Surrogate)	BH01_0.14-0.18	SE196065.001	%	70 - 130%	94
	BH01_1.30-1.40	SE196065.002	%	70 - 130%	94
d14-p-terphenyl (Surrogate)	BH01_0.14-0.18	SE196065.001	%	70 - 130%	92
	BH01_1.30-1.40	SE196065.002	%	70 - 130%	92
d5-nitrobenzene (Surrogate)	BH01_0.14-0.18	SE196065.001	%	70 - 130%	90
	BH01_1.30-1.40	SE196065.002	%	70 - 130%	92

PCBs in Soil

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Tetrachloro-m-xylene (TCMX) (Surrogate)	BH01_0.14-0.18	SE196065.001	%	60 - 130%	123
	BH01_1.30-1.40	SE196065.002	%	60 - 130%	121

VOC's in Soil

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	BH01_0.14-0.18	SE196065.001	%	60 - 130%	95
	BH01_1.30-1.40	SE196065.002	%	60 - 130%	90
d4-1,2-dichloroethane (Surrogate)	BH01_0.14-0.18	SE196065.001	%	60 - 130%	117
	BH01_1.30-1.40	SE196065.002	%	60 - 130%	110
d8-toluene (Surrogate)	BH01_0.14-0.18	SE196065.001	%	60 - 130%	108
	BH01_1.30-1.40	SE196065.002	%	60 - 130%	93

Volatile Petroleum Hydrocarbons in Soil

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	BH01_0.14-0.18	SE196065.001	%	60 - 130%	95
	BH01_1.30-1.40	SE196065.002	%	60 - 130%	90
d4-1,2-dichloroethane (Surrogate)	BH01_0.14-0.18	SE196065.001	%	60 - 130%	117
	BH01_1.30-1.40	SE196065.002	%	60 - 130%	110
d8-toluene (Surrogate)	BH01_0.14-0.18	SE196065.001	%	60 - 130%	108
	BH01_1.30-1.40	SE196065.002	%	60 - 130%	93

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

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

Mercury in Soil

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

Sample Number	Parameter	Units	LOR	Result
LB180332.001	Mercury	mg/kg	0.05	<0.05

OC Pesticides in Soil

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

Sample Number		Parameter	Units	LOR	Result
LB180272.001		Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1
		Alpha BHC	mg/kg	0.1	<0.1
		Lindane	mg/kg	0.1	<0.1
		Heptachlor	mg/kg	0.1	<0.1
		Aldrin	mg/kg	0.1	<0.1
		Beta BHC	mg/kg	0.1	<0.1
		Delta BHC	mg/kg	0.1	<0.1
		Heptachlor epoxide	mg/kg	0.1	<0.1
		Alpha Endosulfan	mg/kg	0.2	<0.2
		Gamma Chlordane	mg/kg	0.1	<0.1
		Alpha Chlordane	mg/kg	0.1	<0.1
		p,p'-DDE	mg/kg	0.1	<0.1
		Dieldrin	mg/kg	0.2	<0.2
		Endrin	mg/kg	0.2	<0.2
		Beta Endosulfan	mg/kg	0.2	<0.2
		p,p'-DDD	mg/kg	0.1	<0.1
		p,p'-DDT	mg/kg	0.1	<0.1
		Endosulfan sulphate	mg/kg	0.1	<0.1
		Endrin Aldehyde	mg/kg	0.1	<0.1
		Methoxychlor	mg/kg	0.1	<0.1
		Endrin Ketone	mg/kg	0.1	<0.1
		Isodrin	mg/kg	0.1	<0.1
		Mirex	mg/kg	0.1	<0.1
	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	101

OP Pesticides in Soil

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

Sample Number		Parameter	Units	LOR	Result
LB180272.001		Dichlorvos	mg/kg	0.5	<0.5
		Dimethoate	mg/kg	0.5	<0.5
		Diazinon (Dimpylate)	mg/kg	0.5	<0.5
		Fenitrothion	mg/kg	0.2	<0.2
		Malathion	mg/kg	0.2	<0.2
		Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2
		Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2
		Bromophos Ethyl	mg/kg	0.2	<0.2
		Methidathion	mg/kg	0.5	<0.5
		Ethion	mg/kg	0.2	<0.2
		Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2
	Surrogates	2-fluorobiphenyl (Surrogate)	%	-	100
		d14-p-terphenyl (Surrogate)	%	-	102

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Sample Number	Parameter	Units	LOR	Result
LB180272.001	Naphthalene	mg/kg	0.1	<0.1
	2-methylnaphthalene	mg/kg	0.1	<0.1
	1-methylnaphthalene	mg/kg	0.1	<0.1
	Acenaphthylene	mg/kg	0.1	<0.1
	Acenaphthene	mg/kg	0.1	<0.1
	Fluorene	mg/kg	0.1	<0.1
	Phenanthrene	mg/kg	0.1	<0.1
	Anthracene	mg/kg	0.1	<0.1
	Fluoranthene	mg/kg	0.1	<0.1
	Pyrene	mg/kg	0.1	<0.1
	Benzo(a)anthracene	mg/kg	0.1	<0.1
	Chrysene	mg/kg	0.1	<0.1
	Benzo(a)pyrene	mg/kg	0.1	<0.1

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

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

PAH (Polynuclear Aromatic Hydrocarbons) in Soil (continued)

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

Sample Number		Parameter	Units	LOR	Result
LB180272.001		Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1
		Dibenzo(ah)anthracene	mg/kg	0.1	<0.1
		Benzo(ghi)perylene	mg/kg	0.1	<0.1
		Total PAH (18)	mg/kg	0.8	<0.8
	Surrogates	d5-nitrobenzene (Surrogate)	%	-	100
		2-fluorobiphenyl (Surrogate)	%	-	100
		d14-p-terphenyl (Surrogate)	%	-	102

PCBs in Soil

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

Sample Number		Parameter	Units	LOR	Result
LB180272.001		Arochlor 1016	mg/kg	0.2	<0.2
		Arochlor 1221	mg/kg	0.2	<0.2
		Arochlor 1232	mg/kg	0.2	<0.2
		Arochlor 1242	mg/kg	0.2	<0.2
		Arochlor 1248	mg/kg	0.2	<0.2
		Arochlor 1254	mg/kg	0.2	<0.2
		Arochlor 1260	mg/kg	0.2	<0.2
		Arochlor 1262	mg/kg	0.2	<0.2
		Arochlor 1268	mg/kg	0.2	<0.2
		Total PCBs (Arochlors)	mg/kg	1	<1
	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	101

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

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

Sample Number		Parameter	Units	LOR	Result
LB180327.001		Arsenic, As	mg/kg	1	1
		Cadmium, Cd	mg/kg	0.3	<0.3
		Chromium, Cr	mg/kg	0.5	<0.5
		Copper, Cu	mg/kg	0.5	<0.5
		Nickel, Ni	mg/kg	0.5	<0.5
		Lead, Pb	mg/kg	1	<1
		Zinc, Zn	mg/kg	2	<2.0

TRH (Total Recoverable Hydrocarbons) in Soil

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

Sample Number		Parameter	Units	LOR	Result
LB180272.001		TRH C10-C14	mg/kg	20	<20
		TRH C15-C28	mg/kg	45	<45
		TRH C29-C36	mg/kg	45	<45
		TRH C37-C40	mg/kg	100	<100
		TRH C10-C36 Total	mg/kg	110	<110

VOC's in Soil

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

Sample Number		Parameter	Units	LOR	Result
LB180271.001	Monocyclic Aromatic	Benzene	mg/kg	0.1	<0.1
	Hydrocarbons	Toluene	mg/kg	0.1	<0.1
		Ethylbenzene	mg/kg	0.1	<0.1
		m/p-xylene	mg/kg	0.2	<0.2
		o-xylene	mg/kg	0.1	<0.1
	Polycyclic VOCs	Naphthalene	mg/kg	0.1	<0.1
	Surrogates	d4-1,2-dichloroethane (Surrogate)	%	-	118
		d8-toluene (Surrogate)	%	-	94
		Bromofluorobenzene (Surrogate)	%	-	98
	Totals	Total BTEX	mg/kg	0.6	<0.6

Volatile Petroleum Hydrocarbons in Soil

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

Sample Number		Parameter	Units	LOR	Result
LB180271.001		TRH C6-C9	mg/kg	20	<20
	Surrogates	d4-1,2-dichloroethane (Surrogate)	%	-	118

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

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

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

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

Mercury in Soil

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE196071.004	LB180332.014	Mercury	mg/kg	0.05	<0.05	<0.05	200	0

Moisture Content

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE196067.004	LB180273.022	% Moisture	%w/w	0.5	22	18	35	16
SE196071.004	LB180273.026	% Moisture	%w/w	0.5	21	20	35	5
SE196092.004	LB180273.011	% Moisture	%w/w	0.5	0	0	200	0

OC Pesticides in Soil

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE196071.004	LB180272.018		Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	200	0
			Alpha BHC	mg/kg	0.1	<0.1	<0.1	200	0
			Lindane	mg/kg	0.1	<0.1	<0.1	200	0
			Heptachlor	mg/kg	0.1	<0.1	<0.1	200	0
			Aldrin	mg/kg	0.1	<0.1	<0.1	200	0
			Beta BHC	mg/kg	0.1	<0.1	<0.1	200	0
			Delta BHC	mg/kg	0.1	<0.1	<0.1	200	0
			Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	200	0
			o,p'-DDE	mg/kg	0.1	<0.1	<0.1	200	0
			Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	200	0
			Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	200	0
			Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	200	0
			trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	200	0
			p,p'-DDE	mg/kg	0.1	<0.1	<0.1	200	0
			Dieldrin	mg/kg	0.2	<0.2	<0.2	200	0
			Endrin	mg/kg	0.2	<0.2	<0.2	200	0
			o,p'-DDD	mg/kg	0.1	<0.1	<0.1	200	0
			o,p'-DDT	mg/kg	0.1	<0.1	<0.1	200	0
			Beta Endosulfan	mg/kg	0.2	<0.2	<0.2	200	0
			p,p'-DDD	mg/kg	0.1	<0.1	<0.1	200	0
			p,p'-DDT	mg/kg	0.1	<0.1	<0.1	200	0
			Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	200	0
			Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1	200	0
			Methoxychlor	mg/kg	0.1	<0.1	<0.1	200	0
			Endrin Ketone	mg/kg	0.1	<0.1	<0.1	200	0
			Isodrin	mg/kg	0.1	<0.1	<0.1	200	0
			Mirex	mg/kg	0.1	<0.1	<0.1	200	0
			Total CLP OC Pesticides	mg/kg	1	<1	<1	200	0
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.17	0.17	30	1

OP Pesticides in Soil

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE196067.004	LB180272.014		Dichlorvos	mg/kg	0.5	<0.5	<0.5	200	0
			Dimethoate	mg/kg	0.5	<0.5	<0.5	200	0
			Diazinon (Dimpylate)	mg/kg	0.5	<0.5	<0.5	200	0
			Fenitrothion	mg/kg	0.2	<0.2	<0.2	200	0
			Malathion	mg/kg	0.2	<0.2	<0.2	200	0
			Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2	<0.2	200	0
			Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2	<0.2	200	0
			Bromophos Ethyl	mg/kg	0.2	<0.2	<0.2	200	0
			Methidathion	mg/kg	0.5	<0.5	<0.5	200	0
			Ethion	mg/kg	0.2	<0.2	<0.2	200	0
			Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	<0.2	200	0
			Total OP Pesticides*	mg/kg	1.7	<1.7	<1.7	200	0
		Surrogates	2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.5	30	0
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	30	2

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Original	Duplicate	Parameter	Units	LOR

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

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

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

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

PAH (Polynuclear Aromatic Hydrocarbons) in Soil (continued)

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE196067.004	LB180272.014		Naphthalene	mg/kg	0.1	<0.1	<0.1	200	0
			2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	200	0
			1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	200	0
			Acenaphthylene	mg/kg	0.1	<0.1	<0.1	200	0
			Acenaphthene	mg/kg	0.1	<0.1	<0.1	200	0
			Fluorene	mg/kg	0.1	<0.1	<0.1	200	0
			Phenanthrene	mg/kg	0.1	<0.1	<0.1	200	0
			Anthracene	mg/kg	0.1	<0.1	<0.1	200	0
			Fluoranthene	mg/kg	0.1	<0.1	<0.1	200	0
			Pyrene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(a)anthracene	mg/kg	0.1	<0.1	<0.1	200	0
			Chrysene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(a)pyrene	mg/kg	0.1	<0.1	<0.1	200	0
			Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	200	0
			Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	200	0
			Carcinogenic PAHs, BaP TEQ <LOR=0	mg/kg	0.2	<0.2	<0.2	200	0
			Carcinogenic PAHs, BaP TEQ <LOR=LOR	mg/kg	0.3	<0.3	<0.3	134	0
			Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	mg/kg	0.2	<0.2	<0.2	175	0
			Total PAH (18)	mg/kg	0.8	<0.8	<0.8	200	0
		Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.5	0.5	30	0
			2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.5	30	0
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	30	2

PCBs in Soil

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE196071.004	LB180272.018		Arochlor 1016	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1221	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1232	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1242	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1248	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1254	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1260	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1262	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1268	mg/kg	0.2	<0.2	<0.2	200	0
			Total PCBs (Arochlors)	mg/kg	1	<1	<1	200	0
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0	0	30	1

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE196071.004	LB180327.014		Arsenic, As	mg/kg	1	7	10	42	34
			Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	200	0
			Chromium, Cr	mg/kg	0.5	22	30	32	32
			Copper, Cu	mg/kg	0.5	3.4	3.3	45	1
			Nickel, Ni	mg/kg	0.5	<0.5	0.6	135	12
			Lead, Pb	mg/kg	1	14	18	36	25
			Zinc, Zn	mg/kg	2	5.4	6.4	64	17

TRH (Total Recoverable Hydrocarbons) in Soil

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE196067.004	LB180272.014		TRH C10-C14	mg/kg	20	<20	<20	200	0
			TRH C15-C28	mg/kg	45	<45	<45	200	0
			TRH C29-C36	mg/kg	45	<45	<45	200	0
			TRH C37-C40	mg/kg	100	<100	<100	200	0
			TRH C10-C36 Total	mg/kg	110	<110	<110	200	0
			TRH C10-C40 Total (F bands)	mg/kg	210	<210	<210	200	0
		TRH F Bands	TRH >C10-C16	mg/kg	25	<25	<25	200	0
			TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25	<25	200	0
			TRH >C16-C34 (F3)	mg/kg	90	<90	<90	200	0
			TRH >C34-C40 (F4)	mg/kg	120	<120	<120	200	0

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

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

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

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

TRH (Total Recoverable Hydrocarbons) in Soil (continued)

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE196071.004	LB180272.018		TRH C10-C14	mg/kg	20	<20	<20	200	0
			TRH C15-C28	mg/kg	45	<45	<45	200	0
			TRH C29-C36	mg/kg	45	<45	<45	200	0
			TRH C37-C40	mg/kg	100	<100	<100	200	0
			TRH C10-C36 Total	mg/kg	110	<110	<110	200	0
			TRH C10-C40 Total (F bands)	mg/kg	210	<210	<210	200	0
		TRH F Bands	TRH >C10-C16	mg/kg	25	<25	<25	200	0
			TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25	<25	200	0
			TRH >C16-C34 (F3)	mg/kg	90	<90	<90	200	0
			TRH >C34-C40 (F4)	mg/kg	120	<120	<120	200	0

VOC's in Soil

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE196067.002	LB180271.014	Monocyclic	Benzene	mg/kg	0.1	<0.1	<0.1	200	0
		Aromatic	Toluene	mg/kg	0.1	<0.1	<0.1	200	0
			Ethylbenzene	mg/kg	0.1	<0.1	<0.1	200	0
			m/p-xylene	mg/kg	0.2	<0.2	<0.2	200	0
			o-xylene	mg/kg	0.1	<0.1	<0.1	200	0
		Polycyclic	Naphthalene	mg/kg	0.1	<0.1	<0.1	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	5.9	5.9	50	1
			d8-toluene (Surrogate)	mg/kg	-	5.2	5.3	50	2
			Bromofluorobenzene (Surrogate)	mg/kg	-	4.8	4.9	50	3
		Totals	Total Xylenes	mg/kg	0.3	<0.3	<0.3	200	0
			Total BTEX	mg/kg	0.6	<0.6	<0.6	200	0
SE196071.004	LB180271.020	Monocyclic	Benzene	mg/kg	0.1	<0.1	<0.1	200	0
		Aromatic	Toluene	mg/kg	0.1	<0.1	<0.1	200	0
			Ethylbenzene	mg/kg	0.1	<0.1	<0.1	200	0
			m/p-xylene	mg/kg	0.2	<0.2	<0.2	200	0
			o-xylene	mg/kg	0.1	<0.1	<0.1	200	0
		Polycyclic	Naphthalene	mg/kg	0.1	<0.1	<0.1	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	11.2	11.4	50	2
			d8-toluene (Surrogate)	mg/kg	-	9.6	9.6	50	1
			Bromofluorobenzene (Surrogate)	mg/kg	-	9.3	9.4	50	1
		Totals	Total Xylenes	mg/kg	0.3	<0.3	<0.3	200	0
			Total BTEX	mg/kg	0.6	<0.6	<0.6	200	0

Volatile Petroleum Hydrocarbons in Soil

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE196067.002	LB180271.014		TRH C6-C10	mg/kg	25	<25	<25	200	0
			TRH C6-C9	mg/kg	20	<20	<20	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	5.9	5.9	30	1
			d8-toluene (Surrogate)	mg/kg	-	5.2	5.3	30	2
			Bromofluorobenzene (Surrogate)	mg/kg	-	4.8	4.9	30	3
		VPH F Bands	Benzene (F0)	mg/kg	0.1	<0.1	<0.1	200	0
			TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	200	0
SE196071.004	LB180271.020		TRH C6-C10	mg/kg	25	<25	<25	200	0
			TRH C6-C9	mg/kg	20	<20	<20	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	11.2	11.4	30	2
			d8-toluene (Surrogate)	mg/kg	-	9.6	9.6	30	1
			Bromofluorobenzene (Surrogate)	mg/kg	-	9.3	9.4	30	1
		VPH F Bands	Benzene (F0)	mg/kg	0.1	<0.1	<0.1	200	0
			TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	200	0

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

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

Mercury in Soil

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB180332.002	Mercury	mg/kg	0.05	0.23	0.2	70 - 130	113

OC Pesticides in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB180272.002		Heptachlor	mg/kg	0.1	0.2	0.2	60 - 140	108
		Aldrin	mg/kg	0.1	0.2	0.2	60 - 140	112
		Delta BHC	mg/kg	0.1	0.2	0.2	60 - 140	98
		Dieldrin	mg/kg	0.2	0.2	0.2	60 - 140	116
		Endrin	mg/kg	0.2	0.2	0.2	60 - 140	106
		p,p'-DDT	mg/kg	0.1	0.2	0.2	60 - 140	80
	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.15	0.15	40 - 130	101

OP Pesticides in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB180272.002		Dichlorvos	mg/kg	0.5	2.4	2	60 - 140	119
		Diazinon (Dimpylate)	mg/kg	0.5	2.1	2	60 - 140	103
		Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	2.1	2	60 - 140	107
		Ethion	mg/kg	0.2	2.2	2	60 - 140	112
	Surrogates	2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.5	40 - 130	92
		d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	40 - 130	94

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB180272.002		Naphthalene	mg/kg	0.1	4.6	4	60 - 140	115
		Acenaphthylene	mg/kg	0.1	4.7	4	60 - 140	119
		Acenaphthene	mg/kg	0.1	4.4	4	60 - 140	110
		Phenanthrene	mg/kg	0.1	5.0	4	60 - 140	124
		Anthracene	mg/kg	0.1	4.9	4	60 - 140	122
		Fluoranthene	mg/kg	0.1	4.5	4	60 - 140	112
		Pyrene	mg/kg	0.1	4.8	4	60 - 140	121
		Benzo(a)pyrene	mg/kg	0.1	4.9	4	60 - 140	122
	Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.5	0.5	40 - 130	94
		2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.5	40 - 130	92
		d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	40 - 130	94

PCBs in Soil

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB180272.002	Arochlor 1260	mg/kg	0.2	0.5	0.4	60 - 140	114

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB180327.002	Arsenic, As	mg/kg	1	350	336.32	79 - 120	103
	Cadmium, Cd	mg/kg	0.3	430	416.6	69 - 131	104
	Chromium, Cr	mg/kg	0.5	36	35.2	80 - 120	103
	Copper, Cu	mg/kg	0.5	330	370.46	80 - 120	88
	Nickel, Ni	mg/kg	0.5	190	210.88	79 - 120	91
	Lead, Pb	mg/kg	1	95	107.87	79 - 120	88
	Zinc, Zn	mg/kg	2	290	301.27	80 - 121	95

TRH (Total Recoverable Hydrocarbons) in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB180272.002		TRH C10-C14	mg/kg	20	38	40	60 - 140	95
		TRH C15-C28	mg/kg	45	<45	40	60 - 140	83
		TRH C29-C36	mg/kg	45	<45	40	60 - 140	80
	TRH F Bands	TRH >C10-C16	mg/kg	25	36	40	60 - 140	90
		TRH >C16-C34 (F3)	mg/kg	90	<90	40	60 - 140	80
		TRH >C34-C40 (F4)	mg/kg	120	<120	20	60 - 140	80

VOC's in Soil

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

Sample Number	Parameter	Units	LOR

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

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

VOC's in Soil (continued)

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB180271.002	Monocyclic	Benzene	mg/kg	0.1	2.1	2.9	60 - 140	72
	Aromatic	Toluene	mg/kg	0.1	2.0	2.9	60 - 140	70
		Ethylbenzene	mg/kg	0.1	2.4	2.9	60 - 140	81
		m/p-xylene	mg/kg	0.2	4.8	5.8	60 - 140	83
		o-xylene	mg/kg	0.1	2.3	2.9	60 - 140	79
	Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	10.4	10	60 - 140	104
		Bromofluorobenzene (Surrogate)	mg/kg	-	9.4	10	60 - 140	94

Volatile Petroleum Hydrocarbons in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB180271.002		TRH C6-C10	mg/kg	25	<25	24.65	60 - 140	91
		TRH C6-C9	mg/kg	20	21	23.2	60 - 140	89
	Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	10.4	10	60 - 140	104
		Bromofluorobenzene (Surrogate)	mg/kg	-	9.4	10	60 - 140	94
	VPH F Bands	TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	7.25	60 - 140	123

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

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

Mercury in Soil

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

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE196065.001	LB180332.004	Mercury	mg/kg	0.05	0.23	<0.05	0.2	102

OC Pesticides in Soil

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE196092.002	LB180272.019		Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	-	-
			Alpha BHC	mg/kg	0.1	<0.1	<0.1	-	-
			Lindane	mg/kg	0.1	<0.1	<0.1	-	-
			Heptachlor	mg/kg	0.1	0.2	<0.1	0.2	78
			Aldrin	mg/kg	0.1	0.2	<0.1	0.2	86
			Beta BHC	mg/kg	0.1	<0.1	<0.1	-	-
			Delta BHC	mg/kg	0.1	0.2	<0.1	0.2	86
			Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	-	-
			o,p'-DDE	mg/kg	0.1	<0.1	<0.1	-	-
			Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	-	-
			Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	-	-
			Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	-	-
			trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	-	-
			p,p'-DDE	mg/kg	0.1	<0.1	<0.1	-	-
			Dieldrin	mg/kg	0.2	<0.2	<0.2	0.2	94
			Endrin	mg/kg	0.2	<0.2	<0.2	0.2	80
			o,p'-DDD	mg/kg	0.1	<0.1	<0.1	-	-
			o,p'-DDT	mg/kg	0.1	<0.1	<0.1	-	-
			Beta Endosulfan	mg/kg	0.2	<0.2	<0.2	-	-
			p,p'-DDD	mg/kg	0.1	<0.1	<0.1	-	-
			p,p'-DDT	mg/kg	0.1	0.2	<0.1	0.2	81
			Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	-	-
			Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1	-	-
			Methoxychlor	mg/kg	0.1	<0.1	<0.1	-	-
			Endrin Ketone	mg/kg	0.1	<0.1	<0.1	-	-
			Isodrin	mg/kg	0.1	<0.1	<0.1	-	-
			Mirex	mg/kg	0.1	<0.1	<0.1	-	-
			Total CLP OC Pesticides	mg/kg	1	1	<1	-	-
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.14	0.13	-	94

OP Pesticides in Soil

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE196092.002	LB180272.019		Dichlorvos	mg/kg	0.5	2.2	<0.5	2	112
			Dimethoate	mg/kg	0.5	<0.5	<0.5	-	-
			Diazinon (Dimpylate)	mg/kg	0.5	2.0	<0.5	2	101
			Fenitrothion	mg/kg	0.2	<0.2	<0.2	-	-
			Malathion	mg/kg	0.2	<0.2	<0.2	-	-
			Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	2.2	<0.2	2	108
			Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2	<0.2	-	-
			Bromophos Ethyl	mg/kg	0.2	<0.2	<0.2	-	-
			Methidathion	mg/kg	0.5	<0.5	<0.5	-	-
			Ethion	mg/kg	0.2	2.4	<0.2	2	118
			Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	<0.2	-	-
			Total OP Pesticides*	mg/kg	1.7	8.7	<1.7	-	-
		Surrogates	2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.5	-	88
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.4	0.5	-	88

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE196092.002	LB180272.019	Naphthalene	mg/kg	0.1	4.6	<0.1	4	114
		2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	-	-
		1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	-	-
		Acenaphthylene	mg/kg	0.1	4.8	0.2	4	116
		Acenaphthene	mg/kg	0.1	4.3	<0.1	4	108
		Fluorene	mg/kg	0.1	<0.1	<0.1	-	-
		Phenanthrene	mg/kg	0.1	6.1	1.7	4	109

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

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

PAH (Polynuclear Aromatic Hydrocarbons) in Soil (continued)

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE196092.002	LB180272.019		Anthracene	mg/kg	0.1	5.1	0.3	4	120
			Fluoranthene	mg/kg	0.1	6.8	2.7	4	104
			Pyrene	mg/kg	0.1	7.1	2.5	4	115
			Benzo(a)anthracene	mg/kg	0.1	1.2	1.0	-	-
			Chrysene	mg/kg	0.1	1.2	1.1	-	-
			Benzo(b&j)fluoranthene	mg/kg	0.1	1.6	1.6	-	-
			Benzo(k)fluoranthene	mg/kg	0.1	0.5	0.5	-	-
			Benzo(a)pyrene	mg/kg	0.1	6.2	1.3	4	121
			Indeno(1,2,3-cd)pyrene	mg/kg	0.1	0.7	0.7	-	-
			Dibenzo(ah)anthracene	mg/kg	0.1	0.1	0.1	-	-
			Benzo(ghi)perylene	mg/kg	0.1	0.7	0.7	-	-
			Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.2	6.7	1.8	-	-
			Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	6.7	1.8	-	-
			Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	6.7	1.8	-	-
			Total PAH (18)	mg/kg	0.8	51	14	-	-
		Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.4	0.5	-	88
			2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.5	-	88
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.4	0.5	-	88

PCBs in Soil

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE196092.002	LB180272.019		Arochlor 1016	mg/kg	0.2	<0.2	<0.2	-	-
			Arochlor 1221	mg/kg	0.2	<0.2	<0.2	-	-
			Arochlor 1232	mg/kg	0.2	<0.2	<0.2	-	-
			Arochlor 1242	mg/kg	0.2	<0.2	<0.2	-	-
			Arochlor 1248	mg/kg	0.2	<0.2	<0.2	-	-
			Arochlor 1254	mg/kg	0.2	<0.2	<0.2	-	-
			Arochlor 1260	mg/kg	0.2	0.4	<0.2	0.4	106
			Arochlor 1262	mg/kg	0.2	<0.2	<0.2	-	-
			Arochlor 1268	mg/kg	0.2	<0.2	<0.2	-	-
			Total PCBs (Arochlors)	mg/kg	1	<1	<1	-	-
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0	0	-	89

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE196065.001	LB180327.004		Arsenic, As	mg/kg	1	46	6	50	80
			Cadmium, Cd	mg/kg	0.3	45	<0.3	50	91
			Chromium, Cr	mg/kg	0.5	60	22	50	77
			Copper, Cu	mg/kg	0.5	71	37	50	67 ④
			Nickel, Ni	mg/kg	0.5	70	37	50	65 ④
			Lead, Pb	mg/kg	1	54	20	50	68 ④
			Zinc, Zn	mg/kg	2	79	65	50	29 ④

TRH (Total Recoverable Hydrocarbons) in Soil

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE196092.002	LB180272.019		TRH C10-C14	mg/kg	20	46	<20	40	115
			TRH C15-C28	mg/kg	45	90	54	40	90
			TRH C29-C36	mg/kg	45	60	<45	40	83
			TRH C37-C40	mg/kg	100	<100	<100	-	-
			TRH C10-C36 Total	mg/kg	110	200	<110	-	-
			TRH C10-C40 Total (F bands)	mg/kg	210	<210	<210	-	-
		TRH F Bands	TRH >C10-C16	mg/kg	25	48	<25	40	120
			TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	48	<25	-	-
			TRH >C16-C34 (F3)	mg/kg	90	110	<90	40	83
			TRH >C34-C40 (F4)	mg/kg	120	<120	<120	-	-

VOC's in Soil

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE196092.001	LB180271.004	Monocyclic	Benzene	mg/kg	0.1	1.9	<0.1	2.9	63
		Aromatic	Toluene	mg/kg	0.1	1.8	<0.1	2.9	60
			Ethylbenzene	mg/kg	0.1	2.0	<0.1	2.9	66
			m/p-xylene	mg/kg	0.2	4.2	<0.2	5.8	71
			o-xylene	mg/kg	0.1	2.1	<0.1	2.9	72

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

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

VOC's in Soil (continued)

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE196092.001	LB180271.004	Polycyclic	Naphthalene	mg/kg	0.1	<0.1	<0.1	-	-
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	10.8	6.3	-	108
			d8-toluene (Surrogate)	mg/kg	-	8.7	5.5	-	87
			Bromofluorobenzene (Surrogate)	mg/kg	-	9.6	4.9	-	96
		Totals	Total Xylenes	mg/kg	0.3	6.3	<0.3	-	-
			Total BTEX	mg/kg	0.6	12	<0.6	-	-

Volatile Petroleum Hydrocarbons in Soil

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE196092.001	LB180271.004		TRH C6-C10	mg/kg	25	<25	<25	24.65	72
			TRH C6-C9	mg/kg	20	<20	<20	23.2	68
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	10.8	6.3	-	108
			d8-toluene (Surrogate)	mg/kg	-	8.7	5.5	-	87
			Bromofluorobenzene (Surrogate)	mg/kg	-	9.6	4.9	-	96
		VPH F	Benzene (F0)	mg/kg	0.1	1.9	<0.1	-	-
		Bands	TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	7.25	74

MATRIX SPIKE DUPLICATES

SE196065 R0

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

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

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

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

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

No matrix spike duplicates were required for this job.

Samples analysed as received.

Solid samples expressed on a dry weight basis.

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

*	NATA accreditation does not cover the performance of this service.
**	Indicative data, theoretical holding time exceeded.
-	Sample not analysed for this analyte.
IS	Insufficient sample for analysis.
LNR	Sample listed, but not received.
LOR	Limit of reporting.
QFH	QC result is above the upper tolerance.
QFL	QC result is below the lower tolerance.

①	At least 2 of 3 surrogates are within acceptance criteria.
②	RPD failed acceptance criteria due to sample heterogeneity.
③	Results less than 5 times LOR preclude acceptance criteria for RPD.
④	Recovery failed acceptance criteria due to matrix interference.
⑤	Recovery failed acceptance criteria due to the presence of significant concentration of analyte (i.e. the concentration of analyte exceeds the spike level).
⑥	LOR was raised due to sample matrix interference.
⑦	LOR was raised due to dilution of significantly high concentration of analyte in sample.
⑧	Reanalysis of sample in duplicate confirmed sample heterogeneity and inconsistency of results.
⑨	Recovery failed acceptance criteria due to sample heterogeneity.
⑩	LOR was raised due to high conductivity of the sample (required dilution).
†	Refer to Analytical Report comments for further information.

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source: [Untitled].pdf page: 4 SGS Ref: SE196066_COC

E-MAILED 2/8/19 10:25

CHAIN OF CUSTODY & ANALYSIS REQUEST

SGS Environmental Services Sydney
Unit 16, 33 Maddox Street
Alexandria NSW 2015
Telephone No: (02) 85940400
Facsimile No: (02) 85940499
Email: au.samplereceipt.sydney@sgs.com

Lab ID Number: *(please quote on correspondence)*

Site: Gran Central, Granville

Company Name:	Golder Associates Pty Ltd	Project Name/No:	Gran Central - 19122955
Address:	Level 8, 40 Mount Street	Purchase Order No:	PO21564
	North Sydney NSW	Results Required Date:	5 day TAT
		Telephone:	0431 063 254 Fax:
Contact Name:	Frank Yu	Email Results to:	FYu@golder.com.au; sdoyle@golder.com.au
Quotation No:			

SGS ID	Client Sample ID	Sampling Date/ Time	Matrix (Tick as appropriate) Soil Sample	Water Sample	Other	NO. OF CONTAINERS	HOLD	HOLD (Freeze)	CL17 SUITE	ASBESTOS WA DOH NEPM	TRH/BTEX/PAH/HM*8	Notes/Guidelines/LOR/ Special instructions
1	BH02_0.15-0.20	31/7/2019	X			2			X	X		
	BH02_0.20-0.30	31/7/2019	X			2	X					
	BH02_0.30-0.40	31/7/2019	X			2	X					
	BH02_0.60-0.70	31/7/2019	X			2	X					
	BH02_1.10-1.20	31/7/2019	X			2	X					
2	BH02_1.40-1.50	31/7/2019	X			2			X			
	BH02_1.50-1.55	31/7/2019	X			1	X					
	BH02_1.55-1.65	31/7/2019	X			1	X					
	BH02_1.80-1.85	31/7/2019	X			1	X					

Additional Report Formats

- ☐ NEPM
- ☐ CSV
- ☐ ESDAT
- ☐ DQO
- ☐ GO, Guidelines ---------
- ☐ Others _____

SGS EHS Alexandria Laboratory

SE196066 COC

Received: 02 – Aug – 2019

Relinquished By: Frank Yu	Date/Time: 1/8/2019	Received By:	Date/Time: 2/8/19 2:35
Relinquished By:	Date/Time:	Received By:	Date/Time:
Samples Intact: Yes / No	Temperature: 4.1 °C	Sample Security Sealed: Yes / No	Hazards: *e.g. may contain Asbestos*

Comments / Subcontracting details: COC Golder review: SPD 2/8/2019

SAMPLE RECEIPT ADVICE

SE196066

CLIENT DETAILS

Contact	Frank Yu
Client	GOLDER ASSOCIATES PTY LTD
Address	Level 8, 40 Mount Street North Sydney NSW 2065
Telephone	0431 063 254
Facsimile	02 9478 3901
Email	FYu@golder.com.au
Project	**19122955 - Gran Central**
Order Number	**PO21564**
Samples	2

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
Samples Received	Thu 1/8/2019
Report Due	Fri 9/8/2019
SGS Reference	**SE196066**

SUBMISSION DETAILS

This is to confirm that 2 samples were received on Thursday 1/8/2019. Results are expected to be ready by COB Friday 9/8/2019. Please quote SGS reference SE196066 when making enquiries. Refer below for details relating to sample integrity upon receipt.

Samples clearly labelled	Yes	Complete documentation received	Yes
Sample container provider	SGS	Sample cooling method	Ice
Samples received in correct containers	Yes	Sample counts by matrix	2 Soil
Date documentation received	2/8/2019@10:20	Type of documentation received	COC
Samples received in good order	Yes	Samples received without headspace	Yes
Sample temperature upon receipt	4.8°C	Sufficient sample for analysis	Yes
Turnaround time requested	Standard		

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

COMMENTS

7 soil samples have been placed on hold as no tests have been assigned for them by the client. These samples will not be processed.

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SAMPLE RECEIPT ADVICE

SE196066

CLIENT DETAILS

Client GOLDER ASSOCIATES PTY LTD

Project 19122955 - Gran Central

SUMMARY OF ANALYSIS

No.	Sample ID	OC Pesticides in Soil	OP Pesticides in Soil	PAH (Polynuclear Aromatic Hydrocarbons) in Soil	PCBs in Soil	Total Recoverable Elements in Soil/Waste	TRH (Total Recoverable Hydrocarbons) in Soil	VOC's in Soil	Volatile Petroleum Hydrocarbons in Soil
001	BH02_0.15-0.20	29	14	26	11	7	10	11	7
002	BH02_1.40-1.50	29	14	26	11	7	10	11	7

CONTINUED OVERLEAF

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

SAMPLE RECEIPT ADVICE

SE196066

CLIENT DETAILS

Client GOLDER ASSOCIATES PTY LTD

Project 19122955 - Gran Central

SUMMARY OF ANALYSIS

No.	Sample ID	Fibre Identification in soil	Gravimetric Determination of Asbestos in Soil	Mercury in Soil	Moisture Content
001	BH02_0.15-0.20	2	9	1	1
002	BH02_1.40-1.50	-	-	1	1

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

ANALYTICAL REPORT

Accreditation No. 2562

CLIENT DETAILS

Contact	Frank Yu
Client	GOLDER ASSOCIATES PTY LTD
Address	Level 8, 40 Mount Street North Sydney NSW 2065
Telephone	0431 063 254
Facsimile	02 9478 3901
Email	FYu@golder.com.au
Project	**19122955 - Gran Central**
Order Number	**PO21564**
Samples	2

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
SGS Reference	**SE196066 R0**
Date Received	1/8/2019
Date Reported	9/8/2019

COMMENTS

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

Sample # 1:Approx 10x2mm fibre bundles x2 found loose in sample.

Asbestos analysed by Approved Identifier Yusuf Kuthpudin .

SIGNATORIES

Akheeqar Beniameen
Chemist

Bennet Lo
Senior Organic Chemist/Metals Chemist

Kamrul Ahsan
Senior Chemist

Ly Kim Ha
Organic Section Head

Ravee Sivasubramaniam
Hygiene Team Leader

VOC's in Soil [AN433] Tested: 6/8/2019

PARAMETER	UOM	LOR	BH02_0.15-0.20 SOIL - 31/7/2019 SE196066.001	BH02_1.40-1.50 SOIL - 31/7/2019 SE196066.002
Benzene	mg/kg	0.1	<0.1	<0.1
Toluene	mg/kg	0.1	<0.1	<0.1
Ethylbenzene	mg/kg	0.1	<0.1	<0.1
m/p-xylene	mg/kg	0.2	<0.2	<0.2
o-xylene	mg/kg	0.1	<0.1	<0.1
Total Xylenes	mg/kg	0.3	<0.3	<0.3
Total BTEX	mg/kg	0.6	<0.6	<0.6
Naphthalene	mg/kg	0.1	<0.1	<0.1

Volatile Petroleum Hydrocarbons in Soil [AN433] Tested: 6/8/2019

PARAMETER	UOM	LOR	BH02_0.15-0.20 SOIL - 31/7/2019 SE196066.001	BH02_1.40-1.50 SOIL - 31/7/2019 SE196066.002
TRH C6-C9	mg/kg	20	<20	<20
Benzene (F0)	mg/kg	0.1	<0.1	<0.1
TRH C6-C10	mg/kg	25	<25	<25
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25

TRH (Total Recoverable Hydrocarbons) in Soil [AN403] Tested: 6/8/2019

PARAMETER	UOM	LOR	BH02_0.15-0.20 SOIL - 31/7/2019 SE196066.001	BH02_1.40-1.50 SOIL - 31/7/2019 SE196066.002
TRH C10-C14	mg/kg	20	<20	<20
TRH C15-C28	mg/kg	45	**91**	<45
TRH C29-C36	mg/kg	45	**71**	<45
TRH C37-C40	mg/kg	100	<100	<100
TRH >C10-C16	mg/kg	25	<25	<25
TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25	<25
TRH >C16-C34 (F3)	mg/kg	90	**150**	<90
TRH >C34-C40 (F4)	mg/kg	120	<120	<120
TRH C10-C36 Total	mg/kg	110	**160**	<110
TRH C10-C40 Total (F bands)	mg/kg	210	<210	<210

PAH (Polynuclear Aromatic Hydrocarbons) in Soil [AN420] Tested: 6/8/2019

PARAMETER	UOM	LOR	BH02_0.15-0.20 SOIL - 31/7/2019 SE196066.001	BH02_1.40-1.50 SOIL - 31/7/2019 SE196066.002
Naphthalene	mg/kg	0.1	**0.2**	<0.1
2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1
1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1
Acenaphthylene	mg/kg	0.1	**0.2**	<0.1
Acenaphthene	mg/kg	0.1	<0.1	<0.1
Fluorene	mg/kg	0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.1	**1.5**	<0.1
Anthracene	mg/kg	0.1	**0.3**	<0.1
Fluoranthene	mg/kg	0.1	**3.1**	<0.1
Pyrene	mg/kg	0.1	**3.3**	<0.1
Benzo(a)anthracene	mg/kg	0.1	**1.4**	<0.1
Chrysene	mg/kg	0.1	**1.7**	<0.1
Benzo(b&j)fluoranthene	mg/kg	0.1	**2.2**	<0.1
Benzo(k)fluoranthene	mg/kg	0.1	**1.1**	<0.1
Benzo(a)pyrene	mg/kg	0.1	**2.1**	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	**1.2**	<0.1
Dibenzo(ah)anthracene	mg/kg	0.1	**0.2**	<0.1
Benzo(ghi)perylene	mg/kg	0.1	**1.2**	<0.1
Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.2	**2.9**	<0.2
Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	**2.9**	<0.3
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	**2.9**	<0.2
Total PAH (18)	mg/kg	0.8	**20**	<0.8
Total PAH (NEPM/WHO 16)	mg/kg	0.8	**20**	<0.8

OC Pesticides in Soil [AN420] Tested: 6/8/2019

PARAMETER	UOM	LOR	BH02_0.15-0.20 SOIL - 31/7/2019 SE196066.001	BH02_1.40-1.50 SOIL - 31/7/2019 SE196066.002
Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1
Alpha BHC	mg/kg	0.1	<0.1	<0.1
Lindane	mg/kg	0.1	<0.1	<0.1
Heptachlor	mg/kg	0.1	<0.1	<0.1
Aldrin	mg/kg	0.1	<0.1	<0.1
Beta BHC	mg/kg	0.1	<0.1	<0.1
Delta BHC	mg/kg	0.1	<0.1	<0.1
Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1
o,p'-DDE	mg/kg	0.1	<0.1	<0.1
Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2
Gamma Chlordane	mg/kg	0.1	<0.1	<0.1
Alpha Chlordane	mg/kg	0.1	<0.1	<0.1
trans-Nonachlor	mg/kg	0.1	<0.1	<0.1
p,p'-DDE	mg/kg	0.1	<0.1	<0.1
Dieldrin	mg/kg	0.2	<0.2	<0.2
Endrin	mg/kg	0.2	<0.2	<0.2
o,p'-DDD	mg/kg	0.1	<0.1	<0.1
o,p'-DDT	mg/kg	0.1	<0.1	<0.1
Beta Endosulfan	mg/kg	0.2	<0.2	<0.2
p,p'-DDD	mg/kg	0.1	<0.1	<0.1
p,p'-DDT	mg/kg	0.1	<0.1	<0.1
Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1
Methoxychlor	mg/kg	0.1	<0.1	<0.1
Endrin Ketone	mg/kg	0.1	<0.1	<0.1
Isodrin	mg/kg	0.1	<0.1	<0.1
Mirex	mg/kg	0.1	<0.1	<0.1
Total CLP OC Pesticides	mg/kg	1	<1	<1

OP Pesticides in Soil [AN420] Tested: 6/8/2019

PARAMETER	UOM	LOR	BH02_0.15-0.20 SOIL - 31/7/2019 SE196066.001	BH02_1.40-1.50 SOIL - 31/7/2019 SE196066.002
Dichlorvos	mg/kg	0.5	<0.5	<0.5
Dimethoate	mg/kg	0.5	<0.5	<0.5
Diazinon (Dimpylate)	mg/kg	0.5	<0.5	<0.5
Fenitrothion	mg/kg	0.2	<0.2	<0.2
Malathion	mg/kg	0.2	<0.2	<0.2
Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2	<0.2
Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2	<0.2
Bromophos Ethyl	mg/kg	0.2	<0.2	<0.2
Methidathion	mg/kg	0.5	<0.5	<0.5
Ethion	mg/kg	0.2	<0.2	<0.2
Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	<0.2
Total OP Pesticides*	mg/kg	1.7	<1.7	<1.7

PCBs in Soil [AN420] Tested: 6/8/2019

PARAMETER	UOM	LOR	BH02_0.15-0.20 SOIL - 31/7/2019 SE196066.001	BH02_1.40-1.50 SOIL - 31/7/2019 SE196066.002
Arochlor 1016	mg/kg	0.2	<0.2	<0.2
Arochlor 1221	mg/kg	0.2	<0.2	<0.2
Arochlor 1232	mg/kg	0.2	<0.2	<0.2
Arochlor 1242	mg/kg	0.2	<0.2	<0.2
Arochlor 1248	mg/kg	0.2	<0.2	<0.2
Arochlor 1254	mg/kg	0.2	<0.2	<0.2
Arochlor 1260	mg/kg	0.2	<0.2	<0.2
Arochlor 1262	mg/kg	0.2	<0.2	<0.2
Arochlor 1268	mg/kg	0.2	<0.2	<0.2
Total PCBs (Arochlors)	mg/kg	1	<1	<1

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES [AN040/AN320] Tested: 6/8/2019

PARAMETER	UOM	LOR	BH02_0.15-0.20 SOIL - 31/7/2019 SE196066.001	BH02_1.40-1.50 SOIL - 31/7/2019 SE196066.002
Arsenic, As	mg/kg	1	**130**	**2**
Cadmium, Cd	mg/kg	0.3	**2.3**	<0.3
Chromium, Cr	mg/kg	0.5	**26**	**2.5**
Copper, Cu	mg/kg	0.5	**150**	**4.3**
Lead, Pb	mg/kg	1	**930**	**9**
Nickel, Ni	mg/kg	0.5	**22**	<0.5
Zinc, Zn	mg/kg	2	**1300**	**3.2**

Mercury in Soil [AN312] Tested: 6/8/2019

PARAMETER	UOM	LOR	BH02_0.15-0.20 SOIL - 31/7/2019 SE196066.001	BH02_1.40-1.50 SOIL - 31/7/2019 SE196066.002
Mercury	mg/kg	0.05	**1.4**	<0.05

Moisture Content [AN002] Tested: 6/8/2019

PARAMETER	UOM	LOR	BH02_0.15-0.20 SOIL - 31/7/2019 SE196066.001	BH02_1.40-1.50 SOIL - 31/7/2019 SE196066.002
% Moisture	%w/w	0.5	**20**	**18**

Fibre Identification in soil [AN602] Tested: 8/8/2019

PARAMETER	UOM	LOR	BH02_0.15-0.20 SOIL - 31/7/2019 SE196066.001
Asbestos Detected	No unit	-	Yes
Estimated Fibres*	%w/w	0.01	**>0.01**

Gravimetric Determination of Asbestos in Soil [AN605] Tested: 8/8/2019

PARAMETER	UOM	LOR	BH02_0.15-0.20 SOIL - 31/7/2019 SE196066.001
Total Sample Weight*	g	1	**291**
ACM in >7mm Sample*	g	0.01	<0.01
AF/FA in >2mm to <7mm Sample*	g	0.0001	**0.0360**
AF/FA in <2mm Sample*	g	0.0001	<0.0001
Asbestos in soil (>7mm ACM)*	%w/w	0.01	<0.01
Asbestos in soil (>2mm to <7mm AF/FA)*	%w/w	0.001	**0.012**
Asbestos in soil (<2mm AF/FA)*	%w/w	0.001	<0.001
Asbestos in soil (<7mm AF/FA)*	%w/w	0.001	**0.012**
Fibre Type*	No unit	-	-

METHOD	METHODOLOGY SUMMARY
AN002	The test is carried out by drying (at either 40°C or 105°C) a known mass of sample in a weighed evaporating basin. After fully dry the sample is re-weighed. Samples such as sludge and sediment having high percentages of moisture will take some time in a drying oven for complete removal of water.
AN040/AN320	A portion of sample is digested with nitric acid to decompose organic matter and hydrochloric acid to complete the digestion of metals. The digest is then analysed by ICP OES with metals results reported on the dried sample basis. Based on USEPA method 200.8 and 6010C.
AN040	A portion of sample is digested with Nitric acid to decompose organic matter and Hydrochloric acid to complete the digestion of metals and then filtered for analysis by ASS or ICP as per USEPA Method 200.8.
AN312	Mercury by Cold Vapour AAS in Soils: After digestion with nitric acid, hydrogen peroxide and hydrochloric acid, mercury ions are reduced by stannous chloride reagent in acidic solution to elemental mercury. This mercury vapour is purged by nitrogen into a cold cell in an atomic absorption spectrometer or mercury analyser. Quantification is made by comparing absorbances to those of the calibration standards. Reference APHA 3112/3500
AN403	Total Recoverable Hydrocarbons: Determination of Hydrocarbons by gas chromatography after a solvent extraction. Detection is by flame ionisation detector (FID) that produces an electronic signal in proportion to the combustible matter passing through it. Total Recoverable Hydrocarbons (TRH) are routinely reported as four alkane groupings based on the carbon chain length of the compounds: C6-C9, C10-C14, C15-C28 and C29-C36 and in recognition of the NEPM 1999 (2013), >C10-C16 (F2), >C16-C34 (F3) and >C34-C40 (F4). F2 is reported directly and also corrected by subtracting Naphthalene (from VOC method AN433) where available.
AN403	Additionally, the volatile C6-C9 fraction may be determined by a purge and trap technique and GC/MS because of the potential for volatiles loss. Total Recoverable Hydrocarbons - Silica (TRH-Si) follows the same method of analysis after silica gel cleanup of the solvent extract. Aliphatic/Aromatic Speciation follows the same method of analysis after fractionation of the solvent extract over silica with differential polarity of the eluent solvents.
AN403	The GC/FID method is not well suited to the analysis of refined high boiling point materials (ie lubricating oils or greases) but is particularly suited for measuring diesel, kerosene and petrol if care to control volatility is taken. This method will detect naturally occurring hydrocarbons, lipids, animal fats, phenols and PAHs if they are present at sufficient levels, dependent on the use of specific cleanup/fractionation techniques. Reference USEPA 3510B, 8015B.
AN420	(SVOCs) including OC, OP, PCB, Herbicides, PAH, Phthalates and Speciated Phenols (etc) in soils, sediments and waters are determined by GCMS/ECD technique following appropriate solvent extraction process (Based on USEPA 3500C and 8270D).
AN420	SVOC Compounds: Semi-Volatile Organic Compounds (SVOCs) including OC, OP, PCB, Herbicides, PAH, Phthalates and Speciated Phenols in soils, sediments and waters are determined by GCMS/ECD technique following appropriate solvent extraction process (Based on USEPA 3500C and 8270D).
AN433	VOCs and C6-C9 Hydrocarbons by GC-MS P&T: VOC`s are volatile organic compounds. The sample is presented to a gas chromatograph via a purge and trap (P&T) concentrator and autosampler and is detected with a Mass Spectrometer (MSD). Solid samples are initially extracted with methanol whilst liquid samples are processed directly. References: USEPA 5030B, 8020A, 8260.
AN602	Qualitative identification of chrysotile, amosite and crocidolite in bulk samples by polarised light microscopy (PLM) in conjunction with dispersion staining (DS). AS4964 provides the basis for this document. Unequivocal identification of the asbestos minerals present is made by obtaining sufficient diagnostic `clues`, which provide a reasonable degree of certainty, dispersion staining is a mandatory `clue` for positive identification. If sufficient `clues` are absent, then positive identification of asbestos is not possible. This procedure requires removal of suspect fibres/bundles from the sample which cannot be returned.
AN602	Fibres/material that cannot be unequivocably identified as one of the three asbestos forms, will be reported as unknown mineral fibres (umf) The fibres detected may or may not be asbestos fibres.
AN602	AS4964.2004 Method for the Qualitative Identification of Asbestos in Bulk Samples, Section 8.4, Trace Analysis Criteria, Note 4 states:"Depending upon sample condition and fibre type, the detection limit of this technique has been found to lie generally in the range of 1 in 1,000 to 1 in 10,000 parts by weight, equivalent to 1 to 0.1 g/kg."
AN602	The sample can be reported “no asbestos found at the reporting limit of 0.1 g/kg” (<0.01%w/w) where AN602 section 4.5 of this method has been followed, and if- (a) no trace asbestos fibres have been detected (i.e. no ‘respirable’ fibres): (b) the estimated weight of non-respirable asbestos fibre bundles and/or the estimated weight of asbestos in asbestos-containing materials are found to be less than 0.1g/kg: and (c) these non-respirable asbestos fibre bundles and/or the asbestos containing materials are only visible under stereo-microscope viewing conditions.
AN605	This technique gravimetrically determines the mass of Asbestos Containing Material retained on a 7mm Sieve and assumes that 15% of this ACM is asbestos. This calculated asbestos weight is then calculated as a percentage of the total sample weight.

AN605	This technique also gravimetrically determines the mass of Fibrous Asbestos (FA) and Asbestos Fines (AF) Containing Material retained on and passing a 2mm sieve post 7mm sieving. Assumes that FA and AF are 100% asbestos containing. This calculated asbestos weight is then calculated as a percentage of the total sample weight. This does not include free fibres which are only observed by standard trace analysis as per AN 602.
AN605	Insofar as is technically feasible, this report is consistent with the analytical reporting recommendations in the Western Australian Department of Health Guidelines for the Assessment Remediation and Management of Asbestos - Contaminated Sites in Western Australia - May 2009.

FOOTNOTES

*	NATA accreditation does not cover the performance of this service.	-	Not analysed.	UOM	Unit of Measure.
		NVL	Not validated.	LOR	Limit of Reporting.
**	Indicative data, theoretical holding time exceeded.	IS	Insufficient sample for analysis.	↑↓	Raised/lowered Limit of Reporting.
		LNR	Sample listed, but not received.		

Unless it is reported that sampling has been performed by SGS, the samples have been analysed as received.
Solid samples expressed on a dry weight basis.

Where "Total" analyte groups are reported (for example, Total PAHs, Total OC Pesticides) the total will be calculated as the sum of the individual analytes, with those analytes that are reported as <LOR being assumed to be zero. The summed (Total) limit of reporting is calculated by summing the individual analyte LORs and dividing by two. For example, where 16 individual analytes are being summed and each has an LOR of 0.1 mg/kg, the "Totals" LOR will be 1.6 / 2 (0.8 mg/kg). Where only 2 analytes are being summed, the " Total" LOR will be the sum of those two LORs.

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

If reported, measurement uncertainty follow the ± sign after the analytical result and is expressed as the expanded uncertainty calculated using a coverage factor of 2, providing a level of confidence of approximately 95%, unless stated otherwise in the comments section of this report.

Results reported for samples tested under test methods with codes starting with ARS-SOP, radionuclide or gross radioactivity concentrations are expressed in becquerel (Bq) per unit of mass or volume or per wipe as stated on the report. Becquerel is the SI unit for activity and equals one nuclear transformation per second.
Note that in terms of units of radioactivity:

a. 1 Bq is equivalent to 27 pCi
b. 37 MBq is equivalent to 1 mCi

For results reported for samples tested under test methods with codes starting with ARS-SOP, less than (<) values indicate the detection limit for each radionuclide or parameter for the measurement system used. The respective detection limits have been calculated in accordance with ISO 11929.

The QC and MU criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here: www.sgs.com.au.pv.sgsvr/en-gb/environment.

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ANALYTICAL REPORT

Accreditation No. 2562

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Project	**19122955 - Gran Central**
Order Number	**PO21564**
Samples	1

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SGS Reference	**SE196066 R0**
Date Received	01 Aug 2019
Date Reported	09 Aug 2019

COMMENTS

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

Sample # 1:Approx 10x2mm fibre bundles x2 found loose in sample.

Asbestos analysed by Approved Identifier Yusuf Kuthpudin .

SIGNATORIES

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Senior Chemist

Ly Kim Ha
Organic Section Head

Ravee Sivasubramaniam
Hygiene Team Leader

RESULTS

Fibre Identification in soil — Method AN602

Laboratory Reference	Client Reference	Matrix	Sample Description	Date Sampled	Fibre Identification	Est.%w/w*
SE196066.001	BH02_0.15-0.20	Soil	291g Clay, Soil, Rocks	31 Jul 2019	Chrysotile Asbestos Found	>0.01

Gravimetric Determination of Asbestos in Soil [AN605] Tested: 8/8/2019

PARAMETER	UOM	LOR	BH02_0.15-0.20 SOIL - 31/7/2019 SE196066.001
Total Sample Weight*	g	1	**291**
ACM in >7mm Sample*	g	0.01	<0.01
AF/FA in >2mm to <7mm Sample*	g	0.0001	**0.0360**
AF/FA in <2mm Sample*	g	0.0001	<0.0001
Asbestos in soil (>7mm ACM)*	%w/w	0.01	<0.01
Asbestos in soil (>2mm to <7mm AF/FA)*	%w/w	0.001	**0.012**
Asbestos in soil (<2mm AF/FA)*	%w/w	0.001	<0.001
Asbestos in soil (<7mm AF/FA)*	%w/w	0.001	**0.012**
Fibre Type*	No unit	-	-

METHOD	METHODOLOGY SUMMARY
AN602	Qualitative identification of chrysotile, amosite and crocidolite in bulk samples by polarised light microscopy (PLM) in conjunction with dispersion staining (DS). AS4964 provides the basis for this document. Unequivocal identification of the asbestos minerals present is made by obtaining sufficient diagnostic `clues`, which provide a reasonable degree of certainty, dispersion staining is a mandatory `clue` for positive identification. If sufficient `clues` are absent, then positive identification of asbestos is not possible. This procedure requires removal of suspect fibres/bundles from the sample which cannot be returned.
AN602	Fibres/material that cannot be unequivocably identified as one of the three asbestos forms, will be reported as unknown mineral fibres (umf) The fibres detected may or may not be asbestos fibres.
AN602	AS4964.2004 Method for the Qualitative Identification of Asbestos in Bulk Samples , Section 8.4, Trace Analysis Criteria, Note 4 states:"Depending upon sample condition and fibre type, the detection limit of this technique has been found to lie generally in the range of 1 in 1,000 to 1 in 10,000 parts by weight, equivalent to 1 to 0.1 g/kg."
AN602	The sample can be reported “no asbestos found at the reporting limit of 0.1 g/kg” (<0.01%w/w) where AN602 section 4.5 of this method has been followed, and if- (a) no trace asbestos fibres have been detected (i.e. no ‘respirable’ fibres): (b) the estimated weight of non-respirable asbestos fibre bundles and/or the estimated weight of asbestos in asbestos-containing materials are found to be less than 0.1g/kg: and (c) these non-respirable asbestos fibre bundles and/or the asbestos containing materials are only visible under stereo-microscope viewing conditions.
AN605	This technique gravimetrically determines the mass of Asbestos Containing Material retained on a 7mm Sieve and assumes that 15% of this ACM is asbestos. This calculated asbestos weight is then calculated as a percentage of the total sample weight.
AN605	This technique also gravimetrically determines the mass of Fibrous Asbestos (FA) and Asbestos Fines (AF) Containing Material retained on and passing a 2mm sieve post 7mm sieving. Assumes that FA and AF are 100% asbestos containing. This calculated asbestos weight is then calculated as a percentage of the total sample weight. This does not include free fibres which are only observed by standard trace analysis as per AN 602.
AN605	Insofar as is technically feasible, this report is consistent with the analytical reporting recommendations in the Western Australian Department of Health Guidelines for the Assessment Remediation and Management of Asbestos - Contaminated Sites in Western Australia - May 2009.

FOOTNOTES

Amosite	-	Brown Asbestos	NA	-	Not Analysed
Chrysotile	-	White Asbestos	LNR	-	Listed, Not Required
Crocidolite	-	Blue Asbestos	*	-	NATA accreditation does not cover the performance of this service.
Amphiboles	-	Amosite and/or Crocidolite	**	-	Indicative data, theoretical holding time exceeded.

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

Unless it is reported that sampling has been performed by SGS, the samples have been analysed as received.

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

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

The QC and MU criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here: www.sgs.com.au.pv.sgsvr/en-gb/environment.

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STATEMENT OF QA/QC PERFORMANCE

SE196066 R0

CLIENT DETAILS

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Project	**19122955 - Gran Central**
Order Number	**PO21564**
Samples	2

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
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Email	au.environmental.sydney@sgs.com
SGS Reference	**SE196066 R0**
Date Received	01 Aug 2019
Date Reported	14 Aug 2019

COMMENTS

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

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

All Data Quality Objectives were met with the exception of the following:

Matrix Spike	Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES	4 items

SAMPLE SUMMARY

Samples clearly labelled	Yes	Complete documentation received	Yes
Sample container provider	SGS	Sample cooling method	Ice
Samples received in correct containers	Yes	Sample counts by matrix	2 Soil
Date documentation received	2/8/2019@10:20	Type of documentation received	COC
Samples received in good order	Yes	Samples received without headspace	Yes
Sample temperature upon receipt	4.8°C	Sufficient sample for analysis	Yes
Turnaround time requested	Standard		

HOLDING TIME SUMMARY

SE196066 R0

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

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

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

Fibre Identification in soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH02_0.15-0.20	SE196066.001	LB180495	31 Jul 2019	01 Aug 2019	30 Jul 2020	08 Aug 2019	30 Jul 2020	09 Aug 2019

Gravimetric Determination of Asbestos in Soil

Method: ME-(AU)-[ENV]AN605

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH02_0.15-0.20	SE196066.001	LB180495	31 Jul 2019	01 Aug 2019	27 Jan 2020	08 Aug 2019	27 Jan 2020	09 Aug 2019

Mercury in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH02_0.15-0.20	SE196066.001	LB180332	31 Jul 2019	01 Aug 2019	28 Aug 2019	06 Aug 2019	28 Aug 2019	09 Aug 2019
BH02_1.40-1.50	SE196066.002	LB180332	31 Jul 2019	01 Aug 2019	28 Aug 2019	06 Aug 2019	28 Aug 2019	09 Aug 2019

Moisture Content

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH02_0.15-0.20	SE196066.001	LB180273	31 Jul 2019	01 Aug 2019	14 Aug 2019	06 Aug 2019	11 Aug 2019	07 Aug 2019
BH02_1.40-1.50	SE196066.002	LB180273	31 Jul 2019	01 Aug 2019	14 Aug 2019	06 Aug 2019	11 Aug 2019	07 Aug 2019

OC Pesticides in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH02_0.15-0.20	SE196066.001	LB180272	31 Jul 2019	01 Aug 2019	14 Aug 2019	06 Aug 2019	15 Sep 2019	09 Aug 2019
BH02_1.40-1.50	SE196066.002	LB180272	31 Jul 2019	01 Aug 2019	14 Aug 2019	06 Aug 2019	15 Sep 2019	09 Aug 2019

OP Pesticides in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH02_0.15-0.20	SE196066.001	LB180272	31 Jul 2019	01 Aug 2019	14 Aug 2019	06 Aug 2019	15 Sep 2019	09 Aug 2019
BH02_1.40-1.50	SE196066.002	LB180272	31 Jul 2019	01 Aug 2019	14 Aug 2019	06 Aug 2019	15 Sep 2019	09 Aug 2019

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH02_0.15-0.20	SE196066.001	LB180272	31 Jul 2019	01 Aug 2019	14 Aug 2019	06 Aug 2019	15 Sep 2019	09 Aug 2019
BH02_1.40-1.50	SE196066.002	LB180272	31 Jul 2019	01 Aug 2019	14 Aug 2019	06 Aug 2019	15 Sep 2019	09 Aug 2019

PCBs in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH02_0.15-0.20	SE196066.001	LB180272	31 Jul 2019	01 Aug 2019	14 Aug 2019	06 Aug 2019	15 Sep 2019	09 Aug 2019
BH02_1.40-1.50	SE196066.002	LB180272	31 Jul 2019	01 Aug 2019	14 Aug 2019	06 Aug 2019	15 Sep 2019	09 Aug 2019

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH02_0.15-0.20	SE196066.001	LB180327	31 Jul 2019	01 Aug 2019	27 Jan 2020	06 Aug 2019	27 Jan 2020	09 Aug 2019
BH02_1.40-1.50	SE196066.002	LB180327	31 Jul 2019	01 Aug 2019	27 Jan 2020	06 Aug 2019	27 Jan 2020	09 Aug 2019

TRH (Total Recoverable Hydrocarbons) in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH02_0.15-0.20	SE196066.001	LB180272	31 Jul 2019	01 Aug 2019	14 Aug 2019	06 Aug 2019	15 Sep 2019	08 Aug 2019
BH02_1.40-1.50	SE196066.002	LB180272	31 Jul 2019	01 Aug 2019	14 Aug 2019	06 Aug 2019	15 Sep 2019	08 Aug 2019

VOC's in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH02_0.15-0.20	SE196066.001	LB180271	31 Jul 2019	01 Aug 2019	14 Aug 2019	06 Aug 2019	15 Sep 2019	07 Aug 2019
BH02_1.40-1.50	SE196066.002	LB180271	31 Jul 2019	01 Aug 2019	14 Aug 2019	06 Aug 2019	15 Sep 2019	07 Aug 2019

Volatile Petroleum Hydrocarbons in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH02_0.15-0.20	SE196066.001	LB180271	31 Jul 2019	01 Aug 2019	14 Aug 2019	06 Aug 2019	15 Sep 2019	07 Aug 2019
BH02_1.40-1.50	SE196066.002	LB180271	31 Jul 2019	01 Aug 2019	14 Aug 2019	06 Aug 2019	15 Sep 2019	07 Aug 2019

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

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

OC Pesticides in Soil

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Tetrachloro-m-xylene (TCMX) (Surrogate)	BH02_0.15-0.20	SE196066.001	%	60 - 130%	123
	BH02_1.40-1.50	SE196066.002	%	60 - 130%	124

OP Pesticides in Soil

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2-fluorobiphenyl (Surrogate)	BH02_0.15-0.20	SE196066.001	%	60 - 130%	88
	BH02_1.40-1.50	SE196066.002	%	60 - 130%	90
d14-p-terphenyl (Surrogate)	BH02_0.15-0.20	SE196066.001	%	60 - 130%	84
	BH02_1.40-1.50	SE196066.002	%	60 - 130%	90

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2-fluorobiphenyl (Surrogate)	BH02_0.15-0.20	SE196066.001	%	70 - 130%	88
	BH02_1.40-1.50	SE196066.002	%	70 - 130%	90
d14-p-terphenyl (Surrogate)	BH02_0.15-0.20	SE196066.001	%	70 - 130%	84
	BH02_1.40-1.50	SE196066.002	%	70 - 130%	90
d5-nitrobenzene (Surrogate)	BH02_0.15-0.20	SE196066.001	%	70 - 130%	88
	BH02_1.40-1.50	SE196066.002	%	70 - 130%	88

PCBs in Soil

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Tetrachloro-m-xylene (TCMX) (Surrogate)	BH02_0.15-0.20	SE196066.001	%	60 - 130%	123
	BH02_1.40-1.50	SE196066.002	%	60 - 130%	124

VOC's in Soil

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	BH02_0.15-0.20	SE196066.001	%	60 - 130%	86
	BH02_1.40-1.50	SE196066.002	%	60 - 130%	93
d4-1,2-dichloroethane (Surrogate)	BH02_0.15-0.20	SE196066.001	%	60 - 130%	102
	BH02_1.40-1.50	SE196066.002	%	60 - 130%	112
d8-toluene (Surrogate)	BH02_0.15-0.20	SE196066.001	%	60 - 130%	94
	BH02_1.40-1.50	SE196066.002	%	60 - 130%	100

Volatile Petroleum Hydrocarbons in Soil

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	BH02_0.15-0.20	SE196066.001	%	60 - 130%	86
	BH02_1.40-1.50	SE196066.002	%	60 - 130%	93
d4-1,2-dichloroethane (Surrogate)	BH02_0.15-0.20	SE196066.001	%	60 - 130%	102
	BH02_1.40-1.50	SE196066.002	%	60 - 130%	112
d8-toluene (Surrogate)	BH02_0.15-0.20	SE196066.001	%	60 - 130%	94
	BH02_1.40-1.50	SE196066.002	%	60 - 130%	100

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

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

Mercury in Soil

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

Sample Number	Parameter	Units	LOR	Result
LB180332.001	Mercury	mg/kg	0.05	<0.05

OC Pesticides in Soil

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

Sample Number		Parameter	Units	LOR	Result
LB180272.001		Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1
		Alpha BHC	mg/kg	0.1	<0.1
		Lindane	mg/kg	0.1	<0.1
		Heptachlor	mg/kg	0.1	<0.1
		Aldrin	mg/kg	0.1	<0.1
		Beta BHC	mg/kg	0.1	<0.1
		Delta BHC	mg/kg	0.1	<0.1
		Heptachlor epoxide	mg/kg	0.1	<0.1
		Alpha Endosulfan	mg/kg	0.2	<0.2
		Gamma Chlordane	mg/kg	0.1	<0.1
		Alpha Chlordane	mg/kg	0.1	<0.1
		p,p'-DDE	mg/kg	0.1	<0.1
		Dieldrin	mg/kg	0.2	<0.2
		Endrin	mg/kg	0.2	<0.2
		Beta Endosulfan	mg/kg	0.2	<0.2
		p,p'-DDD	mg/kg	0.1	<0.1
		p,p'-DDT	mg/kg	0.1	<0.1
		Endosulfan sulphate	mg/kg	0.1	<0.1
		Endrin Aldehyde	mg/kg	0.1	<0.1
		Methoxychlor	mg/kg	0.1	<0.1
		Endrin Ketone	mg/kg	0.1	<0.1
		Isodrin	mg/kg	0.1	<0.1
		Mirex	mg/kg	0.1	<0.1
	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	101

OP Pesticides in Soil

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

Sample Number		Parameter	Units	LOR	Result
LB180272.001		Dichlorvos	mg/kg	0.5	<0.5
		Dimethoate	mg/kg	0.5	<0.5
		Diazinon (Dimpylate)	mg/kg	0.5	<0.5
		Fenitrothion	mg/kg	0.2	<0.2
		Malathion	mg/kg	0.2	<0.2
		Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2
		Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2
		Bromophos Ethyl	mg/kg	0.2	<0.2
		Methidathion	mg/kg	0.5	<0.5
		Ethion	mg/kg	0.2	<0.2
		Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2
	Surrogates	2-fluorobiphenyl (Surrogate)	%	-	100
		d14-p-terphenyl (Surrogate)	%	-	102

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Sample Number	Parameter	Units	LOR	Result
LB180272.001	Naphthalene	mg/kg	0.1	<0.1
	2-methylnaphthalene	mg/kg	0.1	<0.1
	1-methylnaphthalene	mg/kg	0.1	<0.1
	Acenaphthylene	mg/kg	0.1	<0.1
	Acenaphthene	mg/kg	0.1	<0.1
	Fluorene	mg/kg	0.1	<0.1
	Phenanthrene	mg/kg	0.1	<0.1
	Anthracene	mg/kg	0.1	<0.1
	Fluoranthene	mg/kg	0.1	<0.1
	Pyrene	mg/kg	0.1	<0.1
	Benzo(a)anthracene	mg/kg	0.1	<0.1
	Chrysene	mg/kg	0.1	<0.1
	Benzo(a)pyrene	mg/kg	0.1	<0.1

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

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

PAH (Polynuclear Aromatic Hydrocarbons) in Soil (continued)

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

Sample Number		Parameter	Units	LOR	Result
LB180272.001		Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1
		Dibenzo(ah)anthracene	mg/kg	0.1	<0.1
		Benzo(ghi)perylene	mg/kg	0.1	<0.1
		Total PAH (18)	mg/kg	0.8	<0.8
	Surrogates	d5-nitrobenzene (Surrogate)	%	-	100
		2-fluorobiphenyl (Surrogate)	%	-	100
		d14-p-terphenyl (Surrogate)	%	-	102

PCBs in Soil

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

Sample Number		Parameter	Units	LOR	Result
LB180272.001		Arochlor 1016	mg/kg	0.2	<0.2
		Arochlor 1221	mg/kg	0.2	<0.2
		Arochlor 1232	mg/kg	0.2	<0.2
		Arochlor 1242	mg/kg	0.2	<0.2
		Arochlor 1248	mg/kg	0.2	<0.2
		Arochlor 1254	mg/kg	0.2	<0.2
		Arochlor 1260	mg/kg	0.2	<0.2
		Arochlor 1262	mg/kg	0.2	<0.2
		Arochlor 1268	mg/kg	0.2	<0.2
		Total PCBs (Arochlors)	mg/kg	1	<1
	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	101

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

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

Sample Number		Parameter	Units	LOR	Result
LB180327.001		Arsenic, As	mg/kg	1	1
		Cadmium, Cd	mg/kg	0.3	<0.3
		Chromium, Cr	mg/kg	0.5	<0.5
		Copper, Cu	mg/kg	0.5	<0.5
		Nickel, Ni	mg/kg	0.5	<0.5
		Lead, Pb	mg/kg	1	<1
		Zinc, Zn	mg/kg	2	<2.0

TRH (Total Recoverable Hydrocarbons) in Soil

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

Sample Number		Parameter	Units	LOR	Result
LB180272.001		TRH C10-C14	mg/kg	20	<20
		TRH C15-C28	mg/kg	45	<45
		TRH C29-C36	mg/kg	45	<45
		TRH C37-C40	mg/kg	100	<100
		TRH C10-C36 Total	mg/kg	110	<110

VOC's in Soil

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

Sample Number		Parameter	Units	LOR	Result
LB180271.001	Monocyclic Aromatic	Benzene	mg/kg	0.1	<0.1
	Hydrocarbons	Toluene	mg/kg	0.1	<0.1
		Ethylbenzene	mg/kg	0.1	<0.1
		m/p-xylene	mg/kg	0.2	<0.2
		o-xylene	mg/kg	0.1	<0.1
	Polycyclic VOCs	Naphthalene	mg/kg	0.1	<0.1
	Surrogates	d4-1,2-dichloroethane (Surrogate)	%	-	118
		d8-toluene (Surrogate)	%	-	94
		Bromofluorobenzene (Surrogate)	%	-	98
	Totals	Total BTEX	mg/kg	0.6	<0.6

Volatile Petroleum Hydrocarbons in Soil

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

Sample Number		Parameter	Units	LOR	Result
LB180271.001		TRH C6-C9	mg/kg	20	<20
	Surrogates	d4-1,2-dichloroethane (Surrogate)	%	-	118

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

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

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

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

Mercury in Soil

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE196071.004	LB180332.014	Mercury	mg/kg	0.05	<0.05	<0.05	200	0

Moisture Content

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE196067.004	LB180273.022	% Moisture	%w/w	0.5	22	18	35	16
SE196071.004	LB180273.026	% Moisture	%w/w	0.5	21	20	35	5
SE196092.004	LB180273.011	% Moisture	%w/w	0.5	0	0	200	0

OC Pesticides in Soil

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE196071.004	LB180272.018		Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	200	0
			Alpha BHC	mg/kg	0.1	<0.1	<0.1	200	0
			Lindane	mg/kg	0.1	<0.1	<0.1	200	0
			Heptachlor	mg/kg	0.1	<0.1	<0.1	200	0
			Aldrin	mg/kg	0.1	<0.1	<0.1	200	0
			Beta BHC	mg/kg	0.1	<0.1	<0.1	200	0
			Delta BHC	mg/kg	0.1	<0.1	<0.1	200	0
			Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	200	0
			o,p'-DDE	mg/kg	0.1	<0.1	<0.1	200	0
			Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	200	0
			Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	200	0
			Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	200	0
			trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	200	0
			p,p'-DDE	mg/kg	0.1	<0.1	<0.1	200	0
			Dieldrin	mg/kg	0.2	<0.2	<0.2	200	0
			Endrin	mg/kg	0.2	<0.2	<0.2	200	0
			o,p'-DDD	mg/kg	0.1	<0.1	<0.1	200	0
			o,p'-DDT	mg/kg	0.1	<0.1	<0.1	200	0
			Beta Endosulfan	mg/kg	0.2	<0.2	<0.2	200	0
			p,p'-DDD	mg/kg	0.1	<0.1	<0.1	200	0
			p,p'-DDT	mg/kg	0.1	<0.1	<0.1	200	0
			Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	200	0
			Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1	200	0
			Methoxychlor	mg/kg	0.1	<0.1	<0.1	200	0
			Endrin Ketone	mg/kg	0.1	<0.1	<0.1	200	0
			Isodrin	mg/kg	0.1	<0.1	<0.1	200	0
			Mirex	mg/kg	0.1	<0.1	<0.1	200	0
			Total CLP OC Pesticides	mg/kg	1	<1	<1	200	0
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.17	0.17	30	1

OP Pesticides in Soil

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE196067.004	LB180272.014		Dichlorvos	mg/kg	0.5	<0.5	<0.5	200	0
			Dimethoate	mg/kg	0.5	<0.5	<0.5	200	0
			Diazinon (Dimpylate)	mg/kg	0.5	<0.5	<0.5	200	0
			Fenitrothion	mg/kg	0.2	<0.2	<0.2	200	0
			Malathion	mg/kg	0.2	<0.2	<0.2	200	0
			Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2	<0.2	200	0
			Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2	<0.2	200	0
			Bromophos Ethyl	mg/kg	0.2	<0.2	<0.2	200	0
			Methidathion	mg/kg	0.5	<0.5	<0.5	200	0
			Ethion	mg/kg	0.2	<0.2	<0.2	200	0
			Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	<0.2	200	0
			Total OP Pesticides*	mg/kg	1.7	<1.7	<1.7	200	0
		Surrogates	2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.5	30	0
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	30	2

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Original	Duplicate	Parameter	Units	LOR

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

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

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

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

PAH (Polynuclear Aromatic Hydrocarbons) in Soil (continued)

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE196067.004	LB180272.014		Naphthalene	mg/kg	0.1	<0.1	<0.1	200	0
			2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	200	0
			1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	200	0
			Acenaphthylene	mg/kg	0.1	<0.1	<0.1	200	0
			Acenaphthene	mg/kg	0.1	<0.1	<0.1	200	0
			Fluorene	mg/kg	0.1	<0.1	<0.1	200	0
			Phenanthrene	mg/kg	0.1	<0.1	<0.1	200	0
			Anthracene	mg/kg	0.1	<0.1	<0.1	200	0
			Fluoranthene	mg/kg	0.1	<0.1	<0.1	200	0
			Pyrene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(a)anthracene	mg/kg	0.1	<0.1	<0.1	200	0
			Chrysene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(a)pyrene	mg/kg	0.1	<0.1	<0.1	200	0
			Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	200	0
			Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	200	0
			Carcinogenic PAHs, BaP TEQ <LOR=0	mg/kg	0.2	<0.2	<0.2	200	0
			Carcinogenic PAHs, BaP TEQ <LOR=LOR	mg/kg	0.3	<0.3	<0.3	134	0
			Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	mg/kg	0.2	<0.2	<0.2	175	0
			Total PAH (18)	mg/kg	0.8	<0.8	<0.8	200	0
		Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.5	0.5	30	0
			2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.5	30	0
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	30	2

PCBs in Soil

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE196071.004	LB180272.018		Arochlor 1016	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1221	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1232	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1242	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1248	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1254	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1260	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1262	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1268	mg/kg	0.2	<0.2	<0.2	200	0
			Total PCBs (Arochlors)	mg/kg	1	<1	<1	200	0
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0	0	30	1

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE196071.004	LB180327.014		Arsenic, As	mg/kg	1	7	10	42	34
			Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	200	0
			Chromium, Cr	mg/kg	0.5	22	30	32	32
			Copper, Cu	mg/kg	0.5	3.4	3.3	45	1
			Nickel, Ni	mg/kg	0.5	<0.5	0.6	135	12
			Lead, Pb	mg/kg	1	14	18	36	25
			Zinc, Zn	mg/kg	2	5.4	6.4	64	17

TRH (Total Recoverable Hydrocarbons) in Soil

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE196067.004	LB180272.014		TRH C10-C14	mg/kg	20	<20	<20	200	0
			TRH C15-C28	mg/kg	45	<45	<45	200	0
			TRH C29-C36	mg/kg	45	<45	<45	200	0
			TRH C37-C40	mg/kg	100	<100	<100	200	0
			TRH C10-C36 Total	mg/kg	110	<110	<110	200	0
			TRH C10-C40 Total (F bands)	mg/kg	210	<210	<210	200	0
		TRH F Bands	TRH >C10-C16	mg/kg	25	<25	<25	200	0
			TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25	<25	200	0
			TRH >C16-C34 (F3)	mg/kg	90	<90	<90	200	0
			TRH >C34-C40 (F4)	mg/kg	120	<120	<120	200	0

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

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

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

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

TRH (Total Recoverable Hydrocarbons) in Soil (continued)

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE196071.004	LB180272.018		TRH C10-C14	mg/kg	20	<20	<20	200	0
			TRH C15-C28	mg/kg	45	<45	<45	200	0
			TRH C29-C36	mg/kg	45	<45	<45	200	0
			TRH C37-C40	mg/kg	100	<100	<100	200	0
			TRH C10-C36 Total	mg/kg	110	<110	<110	200	0
			TRH C10-C40 Total (F bands)	mg/kg	210	<210	<210	200	0
		TRH F Bands	TRH >C10-C16	mg/kg	25	<25	<25	200	0
			TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25	<25	200	0
			TRH >C16-C34 (F3)	mg/kg	90	<90	<90	200	0
			TRH >C34-C40 (F4)	mg/kg	120	<120	<120	200	0

VOC's in Soil

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE196067.002	LB180271.014	Monocyclic	Benzene	mg/kg	0.1	<0.1	<0.1	200	0
		Aromatic	Toluene	mg/kg	0.1	<0.1	<0.1	200	0
			Ethylbenzene	mg/kg	0.1	<0.1	<0.1	200	0
			m/p-xylene	mg/kg	0.2	<0.2	<0.2	200	0
			o-xylene	mg/kg	0.1	<0.1	<0.1	200	0
		Polycyclic	Naphthalene	mg/kg	0.1	<0.1	<0.1	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	5.9	5.9	50	1
			d8-toluene (Surrogate)	mg/kg	-	5.2	5.3	50	2
			Bromofluorobenzene (Surrogate)	mg/kg	-	4.8	4.9	50	3
		Totals	Total Xylenes	mg/kg	0.3	<0.3	<0.3	200	0
			Total BTEX	mg/kg	0.6	<0.6	<0.6	200	0
SE196071.004	LB180271.020	Monocyclic	Benzene	mg/kg	0.1	<0.1	<0.1	200	0
		Aromatic	Toluene	mg/kg	0.1	<0.1	<0.1	200	0
			Ethylbenzene	mg/kg	0.1	<0.1	<0.1	200	0
			m/p-xylene	mg/kg	0.2	<0.2	<0.2	200	0
			o-xylene	mg/kg	0.1	<0.1	<0.1	200	0
		Polycyclic	Naphthalene	mg/kg	0.1	<0.1	<0.1	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	11.2	11.4	50	2
			d8-toluene (Surrogate)	mg/kg	-	9.6	9.6	50	1
			Bromofluorobenzene (Surrogate)	mg/kg	-	9.3	9.4	50	1
		Totals	Total Xylenes	mg/kg	0.3	<0.3	<0.3	200	0
			Total BTEX	mg/kg	0.6	<0.6	<0.6	200	0

Volatile Petroleum Hydrocarbons in Soil

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE196067.002	LB180271.014		TRH C6-C10	mg/kg	25	<25	<25	200	0
			TRH C6-C9	mg/kg	20	<20	<20	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	5.9	5.9	30	1
			d8-toluene (Surrogate)	mg/kg	-	5.2	5.3	30	2
			Bromofluorobenzene (Surrogate)	mg/kg	-	4.8	4.9	30	3
		VPH F Bands	Benzene (F0)	mg/kg	0.1	<0.1	<0.1	200	0
			TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	200	0
SE196071.004	LB180271.020		TRH C6-C10	mg/kg	25	<25	<25	200	0
			TRH C6-C9	mg/kg	20	<20	<20	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	11.2	11.4	30	2
			d8-toluene (Surrogate)	mg/kg	-	9.6	9.6	30	1
			Bromofluorobenzene (Surrogate)	mg/kg	-	9.3	9.4	30	1
		VPH F Bands	Benzene (F0)	mg/kg	0.1	<0.1	<0.1	200	0
			TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	200	0

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

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

Mercury in Soil

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB180332.002	Mercury	mg/kg	0.05	0.23	0.2	70 - 130	113

OC Pesticides in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB180272.002		Heptachlor	mg/kg	0.1	0.2	0.2	60 - 140	108
		Aldrin	mg/kg	0.1	0.2	0.2	60 - 140	112
		Delta BHC	mg/kg	0.1	0.2	0.2	60 - 140	98
		Dieldrin	mg/kg	0.2	0.2	0.2	60 - 140	116
		Endrin	mg/kg	0.2	0.2	0.2	60 - 140	106
		p,p'-DDT	mg/kg	0.1	0.2	0.2	60 - 140	80
	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.15	0.15	40 - 130	101

OP Pesticides in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB180272.002		Dichlorvos	mg/kg	0.5	2.4	2	60 - 140	119
		Diazinon (Dimpylate)	mg/kg	0.5	2.1	2	60 - 140	103
		Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	2.1	2	60 - 140	107
		Ethion	mg/kg	0.2	2.2	2	60 - 140	112
	Surrogates	2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.5	40 - 130	92
		d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	40 - 130	94

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB180272.002		Naphthalene	mg/kg	0.1	4.6	4	60 - 140	115
		Acenaphthylene	mg/kg	0.1	4.7	4	60 - 140	119
		Acenaphthene	mg/kg	0.1	4.4	4	60 - 140	110
		Phenanthrene	mg/kg	0.1	5.0	4	60 - 140	124
		Anthracene	mg/kg	0.1	4.9	4	60 - 140	122
		Fluoranthene	mg/kg	0.1	4.5	4	60 - 140	112
		Pyrene	mg/kg	0.1	4.8	4	60 - 140	121
		Benzo(a)pyrene	mg/kg	0.1	4.9	4	60 - 140	122
	Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.5	0.5	40 - 130	94
		2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.5	40 - 130	92
		d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	40 - 130	94

PCBs in Soil

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB180272.002	Arochlor 1260	mg/kg	0.2	0.5	0.4	60 - 140	114

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB180327.002	Arsenic, As	mg/kg	1	350	336.32	79 - 120	103
	Cadmium, Cd	mg/kg	0.3	430	416.6	69 - 131	104
	Chromium, Cr	mg/kg	0.5	36	35.2	80 - 120	103
	Copper, Cu	mg/kg	0.5	330	370.46	80 - 120	88
	Nickel, Ni	mg/kg	0.5	190	210.88	79 - 120	91
	Lead, Pb	mg/kg	1	95	107.87	79 - 120	88
	Zinc, Zn	mg/kg	2	290	301.27	80 - 121	95

TRH (Total Recoverable Hydrocarbons) in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB180272.002		TRH C10-C14	mg/kg	20	38	40	60 - 140	95
		TRH C15-C28	mg/kg	45	<45	40	60 - 140	83
		TRH C29-C36	mg/kg	45	<45	40	60 - 140	80
	TRH F Bands	TRH >C10-C16	mg/kg	25	36	40	60 - 140	90
		TRH >C16-C34 (F3)	mg/kg	90	<90	40	60 - 140	80
		TRH >C34-C40 (F4)	mg/kg	120	<120	20	60 - 140	80

VOC's in Soil

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

Sample Number	Parameter	Units	LOR

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

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

VOC's in Soil (continued)

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB180271.002	Monocyclic	Benzene	mg/kg	0.1	2.1	2.9	60 - 140	72
	Aromatic	Toluene	mg/kg	0.1	2.0	2.9	60 - 140	70
		Ethylbenzene	mg/kg	0.1	2.4	2.9	60 - 140	81
		m/p-xylene	mg/kg	0.2	4.8	5.8	60 - 140	83
		o-xylene	mg/kg	0.1	2.3	2.9	60 - 140	79
	Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	10.4	10	60 - 140	104
		Bromofluorobenzene (Surrogate)	mg/kg	-	9.4	10	60 - 140	94

Volatile Petroleum Hydrocarbons in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB180271.002		TRH C6-C10	mg/kg	25	<25	24.65	60 - 140	91
		TRH C6-C9	mg/kg	20	21	23.2	60 - 140	89
	Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	10.4	10	60 - 140	104
		Bromofluorobenzene (Surrogate)	mg/kg	-	9.4	10	60 - 140	94
	VPH F Bands	TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	7.25	60 - 140	123

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

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

Mercury in Soil

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

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE196065.001	LB180332.004	Mercury	mg/kg	0.05	0.23	<0.05	0.2	102

OC Pesticides in Soil

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE196092.002	LB180272.019		Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	-	-
			Alpha BHC	mg/kg	0.1	<0.1	<0.1	-	-
			Lindane	mg/kg	0.1	<0.1	<0.1	-	-
			Heptachlor	mg/kg	0.1	0.2	<0.1	0.2	78
			Aldrin	mg/kg	0.1	0.2	<0.1	0.2	86
			Beta BHC	mg/kg	0.1	<0.1	<0.1	-	-
			Delta BHC	mg/kg	0.1	0.2	<0.1	0.2	86
			Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	-	-
			o,p'-DDE	mg/kg	0.1	<0.1	<0.1	-	-
			Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	-	-
			Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	-	-
			Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	-	-
			trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	-	-
			p,p'-DDE	mg/kg	0.1	<0.1	<0.1	-	-
			Dieldrin	mg/kg	0.2	<0.2	<0.2	0.2	94
			Endrin	mg/kg	0.2	<0.2	<0.2	0.2	80
			o,p'-DDD	mg/kg	0.1	<0.1	<0.1	-	-
			o,p'-DDT	mg/kg	0.1	<0.1	<0.1	-	-
			Beta Endosulfan	mg/kg	0.2	<0.2	<0.2	-	-
			p,p'-DDD	mg/kg	0.1	<0.1	<0.1	-	-
			p,p'-DDT	mg/kg	0.1	0.2	<0.1	0.2	81
			Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	-	-
			Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1	-	-
			Methoxychlor	mg/kg	0.1	<0.1	<0.1	-	-
			Endrin Ketone	mg/kg	0.1	<0.1	<0.1	-	-
			Isodrin	mg/kg	0.1	<0.1	<0.1	-	-
			Mirex	mg/kg	0.1	<0.1	<0.1	-	-
			Total CLP OC Pesticides	mg/kg	1	1	<1	-	-
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.14	0.13	-	94

OP Pesticides in Soil

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE196092.002	LB180272.019		Dichlorvos	mg/kg	0.5	2.2	<0.5	2	112
			Dimethoate	mg/kg	0.5	<0.5	<0.5	-	-
			Diazinon (Dimpylate)	mg/kg	0.5	2.0	<0.5	2	101
			Fenitrothion	mg/kg	0.2	<0.2	<0.2	-	-
			Malathion	mg/kg	0.2	<0.2	<0.2	-	-
			Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	2.2	<0.2	2	108
			Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2	<0.2	-	-
			Bromophos Ethyl	mg/kg	0.2	<0.2	<0.2	-	-
			Methidathion	mg/kg	0.5	<0.5	<0.5	-	-
			Ethion	mg/kg	0.2	2.4	<0.2	2	118
			Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	<0.2	-	-
			Total OP Pesticides*	mg/kg	1.7	8.7	<1.7	-	-
		Surrogates	2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.5	-	88
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.4	0.5	-	88

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE196092.002	LB180272.019	Naphthalene	mg/kg	0.1	4.6	<0.1	4	114
		2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	-	-
		1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	-	-
		Acenaphthylene	mg/kg	0.1	4.8	0.2	4	116
		Acenaphthene	mg/kg	0.1	4.3	<0.1	4	108
		Fluorene	mg/kg	0.1	<0.1	<0.1	-	-
		Phenanthrene	mg/kg	0.1	6.1	1.7	4	109

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

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

PAH (Polynuclear Aromatic Hydrocarbons) in Soil (continued)

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE196092.002	LB180272.019		Anthracene	mg/kg	0.1	5.1	0.3	4	120
			Fluoranthene	mg/kg	0.1	6.8	2.7	4	104
			Pyrene	mg/kg	0.1	7.1	2.5	4	115
			Benzo(a)anthracene	mg/kg	0.1	1.2	1.0	-	-
			Chrysene	mg/kg	0.1	1.2	1.1	-	-
			Benzo(b&j)fluoranthene	mg/kg	0.1	1.6	1.6	-	-
			Benzo(k)fluoranthene	mg/kg	0.1	0.5	0.5	-	-
			Benzo(a)pyrene	mg/kg	0.1	6.2	1.3	4	121
			Indeno(1,2,3-cd)pyrene	mg/kg	0.1	0.7	0.7	-	-
			Dibenzo(ah)anthracene	mg/kg	0.1	0.1	0.1	-	-
			Benzo(ghi)perylene	mg/kg	0.1	0.7	0.7	-	-
			Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.2	6.7	1.8	-	-
			Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	6.7	1.8	-	-
			Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	6.7	1.8	-	-
			Total PAH (18)	mg/kg	0.8	51	14	-	-
		Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.4	0.5	-	88
			2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.5	-	88
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.4	0.5	-	88

PCBs in Soil

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE196092.002	LB180272.019		Arochlor 1016	mg/kg	0.2	<0.2	<0.2	-	-
			Arochlor 1221	mg/kg	0.2	<0.2	<0.2	-	-
			Arochlor 1232	mg/kg	0.2	<0.2	<0.2	-	-
			Arochlor 1242	mg/kg	0.2	<0.2	<0.2	-	-
			Arochlor 1248	mg/kg	0.2	<0.2	<0.2	-	-
			Arochlor 1254	mg/kg	0.2	<0.2	<0.2	-	-
			Arochlor 1260	mg/kg	0.2	0.4	<0.2	0.4	106
			Arochlor 1262	mg/kg	0.2	<0.2	<0.2	-	-
			Arochlor 1268	mg/kg	0.2	<0.2	<0.2	-	-
			Total PCBs (Arochlors)	mg/kg	1	<1	<1	-	-
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0	0	-	89

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE196065.001	LB180327.004		Arsenic, As	mg/kg	1	46	6	50	80
			Cadmium, Cd	mg/kg	0.3	45	<0.3	50	91
			Chromium, Cr	mg/kg	0.5	60	22	50	77
			Copper, Cu	mg/kg	0.5	71	37	50	67 ④
			Nickel, Ni	mg/kg	0.5	70	37	50	65 ④
			Lead, Pb	mg/kg	1	54	20	50	68 ④
			Zinc, Zn	mg/kg	2	79	65	50	29 ④

TRH (Total Recoverable Hydrocarbons) in Soil

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE196092.002	LB180272.019		TRH C10-C14	mg/kg	20	46	<20	40	115
			TRH C15-C28	mg/kg	45	90	54	40	90
			TRH C29-C36	mg/kg	45	60	<45	40	83
			TRH C37-C40	mg/kg	100	<100	<100	-	-
			TRH C10-C36 Total	mg/kg	110	200	<110	-	-
			TRH C10-C40 Total (F bands)	mg/kg	210	<210	<210	-	-
		TRH F Bands	TRH >C10-C16	mg/kg	25	48	<25	40	120
			TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	48	<25	-	-
			TRH >C16-C34 (F3)	mg/kg	90	110	<90	40	83
			TRH >C34-C40 (F4)	mg/kg	120	<120	<120	-	-

VOC's in Soil

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE196092.001	LB180271.004	Monocyclic	Benzene	mg/kg	0.1	1.9	<0.1	2.9	63
		Aromatic	Toluene	mg/kg	0.1	1.8	<0.1	2.9	60
			Ethylbenzene	mg/kg	0.1	2.0	<0.1	2.9	66
			m/p-xylene	mg/kg	0.2	4.2	<0.2	5.8	71
			o-xylene	mg/kg	0.1	2.1	<0.1	2.9	72

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

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

VOC's in Soil (continued)

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE196092.001	LB180271.004	Polycyclic	Naphthalene	mg/kg	0.1	<0.1	<0.1	-	-
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	10.8	6.3	-	108
			d8-toluene (Surrogate)	mg/kg	-	8.7	5.5	-	87
			Bromofluorobenzene (Surrogate)	mg/kg	-	9.6	4.9	-	96
		Totals	Total Xylenes	mg/kg	0.3	6.3	<0.3	-	-
			Total BTEX	mg/kg	0.6	12	<0.6	-	-

Volatile Petroleum Hydrocarbons in Soil

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE196092.001	LB180271.004		TRH C6-C10	mg/kg	25	<25	<25	24.65	72
			TRH C6-C9	mg/kg	20	<20	<20	23.2	68
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	10.8	6.3	-	108
			d8-toluene (Surrogate)	mg/kg	-	8.7	5.5	-	87
			Bromofluorobenzene (Surrogate)	mg/kg	-	9.6	4.9	-	96
		VPH F	Benzene (F0)	mg/kg	0.1	1.9	<0.1	-	-
		Bands	TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	7.25	74

MATRIX SPIKE DUPLICATES

SE196066 R0

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

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

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

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

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

No matrix spike duplicates were required for this job.

Samples analysed as received.

Solid samples expressed on a dry weight basis.

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

*	NATA accreditation does not cover the performance of this service.
**	Indicative data, theoretical holding time exceeded.
-	Sample not analysed for this analyte.
IS	Insufficient sample for analysis.
LNR	Sample listed, but not received.
LOR	Limit of reporting.
QFH	QC result is above the upper tolerance.
QFL	QC result is below the lower tolerance.

①	At least 2 of 3 surrogates are within acceptance criteria.
②	RPD failed acceptance criteria due to sample heterogeneity.
③	Results less than 5 times LOR preclude acceptance criteria for RPD.
④	Recovery failed acceptance criteria due to matrix interference.
⑤	Recovery failed acceptance criteria due to the presence of significant concentration of analyte (i.e. the concentration of analyte exceeds the spike level).
⑥	LOR was raised due to sample matrix interference.
⑦	LOR was raised due to dilution of significantly high concentration of analyte in sample.
⑧	Reanalysis of sample in duplicate confirmed sample heterogeneity and inconsistency of results.
⑨	Recovery failed acceptance criteria due to sample heterogeneity.
⑩	LOR was raised due to high conductivity of the sample (required dilution).
†	Refer to Analytical Report comments for further information.

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source: [Untitled].pdf page: 6 SGS Ref: SE196067_COC

E-MA... 2/8/19 eic .vp

CHAIN OF CUSTODY & ANALYSIS REQUEST

SGS

SGS Environmental Services Sydney
Unit 16, 33 Maddox Street
Alexandria NSW 2015
Telephone No: (02) 85940400
Facsimile No: (02) 85940499
Email: au.samplereceipt.sydney@sgs.com

Lab ID Number: *(please quote on correspondence)*

Site: Gran Central, Granville

Company Name:	Golder Associates Pty Ltd	Project Name/No:	Gran Central - 19122955
Address:	Level 8, 40 Mount Street	Purchase Order No:	PO21564
	North Sydney NSW	Results Required Date:	5 day TAT
		Telephone:	0431 063 254 Fax:
Contact Name:	Frank Yu	Email Results to:	FYu@golder.com.au; sdoyle@golder.com.au
Quotation No:			

SGS ID	Client Sample ID	Sampling Date/ Time	Matrix (Tick as appropriate) Soil Sample	Water Sample	Other	NO. OF CONTAINERS	HOLD	HOLD (Freeze)	CL17 SUITE	ASBESTOS WA DOH NEPM	TRH/BTEX/PAH/HM*8	Notes/Guidelines/LOR/ Special instructions
1	BH03_0.10-0.20	1/8/2019	X			2				X		
	BH03_0.40-0.50	1/8/2019	X			2						
	BH03_0.50-0.60	1/8/2019	X			1						
2	BH03_0.80-0.90	1/8/2019	X			2			X			
	BH03_1.30-1.40	1/8/2019	X			2						
3	BH03_1.40-1.50	1/8/2019	X			2			X			
	BH03_1.50-1.80	1/8/2019	X			1						
	BH03_1.80-1.95	1/8/2019	X			1						
	BH03_2.00-2.13	1/8/2019	X			1						
4	DU2	1/8/2019				2			X			

ANALYSIS REQUESTED

Additional Report Formats

- ☐ NEPM
- ☐ CSV
- ☐ ESDAT
- ☐ DQO
- ☐ GO, Guidelines ---------
- ☐ Others _____

SGS EHS Alexandria Laboratory
SE196067 COC
Received: 02 – Aug – 2019

Relinquished By: Frank Yu	Date/Time: 1/8/2019	Received By:	Date/Time: 2/8/19 2:35
Relinquished By:	Date/Time:	Received By:	Date/Time:
Samples Intact: *Yes / No*	Temperature: 4.8 °C	Sample Security Sealed: *Yes / No*	Hazards: *e.g. may contain Asbestos*

Comments / Subcontracting details: COC Golder review: SPD 2/8/2019

Yin, Emily (Sydney)

From: Yu, Frank <FYu@golder.com.au>
Sent: Monday, 5 August 2019 12:51 PM
To: AU.SampleReceipt.Sydney (Sydney)
Subject: [EXTERNAL] RE: SE196067 - Gran Central 19122955

Good afternoon Emily,

Thank you for confirming with me.

BH03_0.5-0.6 is a geotechnical sample. It was list on the table by some mistake.

The sample shown on the photo is not for any test at current stage. Could you please put is on hold?

Regards
Frank

Frank Yu (BEng, MEng)
Geotechnical Engineer

Golder Associates Pty Ltd
Level 8, 40 Mount Street, North Sydney, New South Wales 2060, Australia (PO Box 1302, Crows Nest NSW 1585)
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Best Professional Services Firm (revenue > A$200m)
Best Consulting Engineering Firm (revenue > A$200m)

Winner of 29 Financial Review Client Choice Awards

limitations

From: AU.SampleReceipt.Sydney (Sydney) <AU.SampleReceipt.Sydney@sgs.com>
Sent: Monday, 5 August 2019 12:33 PM
To: Yu, Frank <FYu@golder.com.au>
Subject: SE196067 - Gran Central 19122955

EXTERNAL EMAIL

Dear Frank,

BH03_0.50-0.60 not received.
Extra samples on the attached photo received.

Yin, Emily (Sydney)

From: Yu, Frank <FYu@golder.com.au>
Sent: Thursday, 1 August 2019 1:52 PM
To: AU.SampleReceipt.Sydney (Sydney)
Subject: [EXTERNAL] 19122955 - Granville

Hi Emily,

Following our conversation just now.

I think I forget lable a bag of sample (in the sandwich bag). It should be put at the bottom of the blue esky, close to other BH03's samples, the sample number will be BH03_0.1-0.2

The sample is silty clay, dark brown, medium to high plasticity, trace rootlets and wood fibre.

Could you please label it for me?

Please let me know if you cannot find it.

Thank you for your help.

Regards
Frank

Frank Yu (BEng, MEng)
Geotechnical Engineer

Golder Associates Pty Ltd
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Winner of 29 Financial Review Client Choice Awards

limitations

SAMPLE RECEIPT ADVICE

SE196067

CLIENT DETAILS

Contact	Frank Yu
Client	GOLDER ASSOCIATES PTY LTD
Address	Level 8, 40 Mount Street North Sydney NSW 2065
Telephone	0431 063 254
Facsimile	02 9478 3901
Email	FYu@golder.com.au
Project	**19122955 - Gran Central**
Order Number	**PO21564**
Samples	4

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
Samples Received	Thu 1/8/2019
Report Due	Fri 9/8/2019
SGS Reference	**SE196067**

SUBMISSION DETAILS

This is to confirm that 4 samples were received on Thursday 1/8/2019. Results are expected to be ready by COB Friday 9/8/2019. Please quote SGS reference SE196067 when making enquiries. Refer below for details relating to sample integrity upon receipt.

Samples clearly labelled	Yes	Complete documentation received	Yes
Sample container provider	SGS	Sample cooling method	Ice
Samples received in correct containers	Yes	Sample counts by matrix	4 Soil
Date documentation received	2/8/2019@10:20am	Type of documentation received	COC
Samples received in good order	Yes	Samples received without headspace	Yes
Sample temperature upon receipt	4.8°C	Sufficient sample for analysis	Yes
Turnaround time requested	Standard		

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

COMMENTS

5 soil samples have been placed on hold as no tests have been assigned for them by the client. These samples will not be processed.

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SAMPLE RECEIPT ADVICE

SE196067

CLIENT DETAILS

Client GOLDER ASSOCIATES PTY LTD

Project 19122955 - Gran Central

SUMMARY OF ANALYSIS

No.	Sample ID	OC Pesticides in Soil	OP Pesticides in Soil	PAH (Polynuclear Aromatic Hydrocarbons) in Soil	PCBs in Soil	Total Recoverable Elements in Soil/Waste	TRH (Total Recoverable Hydrocarbons) in Soil	VOC's in Soil	Volatile Petroleum Hydrocarbons in Soil
002	BH03_0.80-0.90	29	14	26	11	7	10	11	7
003	BH03_1.40-1.50	29	14	26	11	7	10	11	7
004	DU2	29	14	26	11	7	10	11	7

CONTINUED OVERLEAF

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

SAMPLE RECEIPT ADVICE

SE196067

CLIENT DETAILS

Client GOLDER ASSOCIATES PTY LTD

Project 19122955 - Gran Central

SUMMARY OF ANALYSIS

No.	Sample ID	Fibre Identification in soil	Gravimetric Determination of Asbestos in Soil	Mercury in Soil	Moisture Content
001	BH03_0.10-0.20	2	9	-	-
002	BH03_0.80-0.90	-	-	1	1
003	BH03_1.40-1.50	-	-	1	1
004	DU2	-	-	1	1

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

ANALYTICAL REPORT

Accreditation No. 2562

CLIENT DETAILS

Contact	Frank Yu
Client	GOLDER ASSOCIATES PTY LTD
Address	Level 8, 40 Mount Street North Sydney NSW 2065
Telephone	0431 063 254
Facsimile	02 9478 3901
Email	FYu@golder.com.au
Project	**19122955 - Gran Central**
Order Number	**PO21564**
Samples	4

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
SGS Reference	**SE196067 R0**
Date Received	1/8/2019
Date Reported	9/8/2019

COMMENTS

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

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

Sample #1: Asbestos found in approx 15x5x2mm cement sheet fragments x2.

Asbestos analysed by Approved Identifier Ravee Sivasubramaniam .

SIGNATORIES

Akheeqar Beniameen
Chemist

Bennet Lo
Senior Organic Chemist/Metals Chemist

Kamrul Ahsan
Senior Chemist

Ly Kim Ha
Organic Section Head

Ravee Sivasubramaniam
Hygiene Team Leader

VOC's in Soil [AN433] Tested: 6/8/2019

PARAMETER	UOM	LOR	BH03_0.80-0.90 SOIL - 1/8/2019 SE196067.002	BH03_1.40-1.50 SOIL - 1/8/2019 SE196067.003	DU2 SOIL - 1/8/2019 SE196067.004
Benzene	mg/kg	0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	0.1	<0.1	<0.1	<0.1
Ethylbenzene	mg/kg	0.1	<0.1	<0.1	<0.1
m/p-xylene	mg/kg	0.2	<0.2	<0.2	<0.2
o-xylene	mg/kg	0.1	<0.1	<0.1	<0.1
Total Xylenes	mg/kg	0.3	<0.3	<0.3	<0.3
Total BTEX	mg/kg	0.6	<0.6	<0.6	<0.6
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1

Volatile Petroleum Hydrocarbons in Soil [AN433] Tested: 6/8/2019

PARAMETER	UOM	LOR	BH03_0.80-0.90 SOIL - 1/8/2019 SE196067.002	BH03_1.40-1.50 SOIL - 1/8/2019 SE196067.003	DU2 SOIL - 1/8/2019 SE196067.004
TRH C6-C9	mg/kg	20	<20	<20	<20
Benzene (F0)	mg/kg	0.1	<0.1	<0.1	<0.1
TRH C6-C10	mg/kg	25	<25	<25	<25
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	<25

TRH (Total Recoverable Hydrocarbons) in Soil [AN403] Tested: 6/8/2019

PARAMETER	UOM	LOR	BH03_0.80-0.90 SOIL - 1/8/2019 SE196067.002	BH03_1.40-1.50 SOIL - 1/8/2019 SE196067.003	DU2 SOIL - 1/8/2019 SE196067.004
TRH C10-C14	mg/kg	20	<20	<20	<20
TRH C15-C28	mg/kg	45	<45	<45	<45
TRH C29-C36	mg/kg	45	<45	<45	<45
TRH C37-C40	mg/kg	100	<100	<100	<100
TRH >C10-C16	mg/kg	25	<25	<25	<25
TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25	<25	<25
TRH >C16-C34 (F3)	mg/kg	90	<90	<90	<90
TRH >C34-C40 (F4)	mg/kg	120	<120	<120	<120
TRH C10-C36 Total	mg/kg	110	<110	<110	<110
TRH C10-C40 Total (F bands)	mg/kg	210	<210	<210	<210

PAH (Polynuclear Aromatic Hydrocarbons) in Soil [AN420] Tested: 6/8/2019

PARAMETER	UOM	LOR	BH03_0.80-0.90 SOIL - 1/8/2019 SE196067.002	BH03_1.40-1.50 SOIL - 1/8/2019 SE196067.003	DU2 SOIL - 1/8/2019 SE196067.004
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1
2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1
1-methylnaphthalene	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	0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	0.1	<0.1	<0.1	<0.1
Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	<0.1	<0.1
Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene	mg/kg	0.1	<0.1	<0.1	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	<0.1
Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	<0.1
Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.2	<0.2	<0.2	<0.2
Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	<0.3	<0.3	<0.3
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	<0.2	<0.2	<0.2
Total PAH (18)	mg/kg	0.8	<0.8	<0.8	<0.8
Total PAH (NEPM/WHO 16)	mg/kg	0.8	<0.8	<0.8	<0.8

OC Pesticides in Soil [AN420] Tested: 6/8/2019

PARAMETER	UOM	LOR	BH03_0.80-0.90 SOIL - 1/8/2019 SE196067.002	BH03_1.40-1.50 SOIL - 1/8/2019 SE196067.003	DU2 SOIL - 1/8/2019 SE196067.004
Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	<0.1
Alpha BHC	mg/kg	0.1	<0.1	<0.1	<0.1
Lindane	mg/kg	0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	0.1	<0.1	<0.1	<0.1
Beta BHC	mg/kg	0.1	<0.1	<0.1	<0.1
Delta BHC	mg/kg	0.1	<0.1	<0.1	<0.1
Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	<0.1
o,p'-DDE	mg/kg	0.1	<0.1	<0.1	<0.1
Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	<0.2
Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	<0.1
Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	<0.1
trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	<0.1
p,p'-DDE	mg/kg	0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	0.2	<0.2	<0.2	<0.2
Endrin	mg/kg	0.2	<0.2	<0.2	<0.2
o,p'-DDD	mg/kg	0.1	<0.1	<0.1	<0.1
o,p'-DDT	mg/kg	0.1	<0.1	<0.1	<0.1
Beta Endosulfan	mg/kg	0.2	<0.2	<0.2	<0.2
p,p'-DDD	mg/kg	0.1	<0.1	<0.1	<0.1
p,p'-DDT	mg/kg	0.1	<0.1	<0.1	<0.1
Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	0.1	<0.1	<0.1	<0.1
Endrin Ketone	mg/kg	0.1	<0.1	<0.1	<0.1
Isodrin	mg/kg	0.1	<0.1	<0.1	<0.1
Mirex	mg/kg	0.1	<0.1	<0.1	<0.1
Total CLP OC Pesticides	mg/kg	1	<1	<1	<1

OP Pesticides in Soil [AN420] Tested: 6/8/2019

PARAMETER	UOM	LOR	BH03_0.80-0.90 SOIL - 1/8/2019 SE196067.002	BH03_1.40-1.50 SOIL - 1/8/2019 SE196067.003	DU2 SOIL - 1/8/2019 SE196067.004
Dichlorvos	mg/kg	0.5	<0.5	<0.5	<0.5
Dimethoate	mg/kg	0.5	<0.5	<0.5	<0.5
Diazinon (Dimpylate)	mg/kg	0.5	<0.5	<0.5	<0.5
Fenitrothion	mg/kg	0.2	<0.2	<0.2	<0.2
Malathion	mg/kg	0.2	<0.2	<0.2	<0.2
Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2	<0.2	<0.2
Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2	<0.2	<0.2
Bromophos Ethyl	mg/kg	0.2	<0.2	<0.2	<0.2
Methidathion	mg/kg	0.5	<0.5	<0.5	<0.5
Ethion	mg/kg	0.2	<0.2	<0.2	<0.2
Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	<0.2	<0.2
Total OP Pesticides*	mg/kg	1.7	<1.7	<1.7	<1.7

PCBs in Soil [AN420] Tested: 6/8/2019

PARAMETER	UOM	LOR	BH03_0.80-0.90 SOIL - 1/8/2019 SE196067.002	BH03_1.40-1.50 SOIL - 1/8/2019 SE196067.003	DU2 SOIL - 1/8/2019 SE196067.004
Arochlor 1016	mg/kg	0.2	<0.2	<0.2	<0.2
Arochlor 1221	mg/kg	0.2	<0.2	<0.2	<0.2
Arochlor 1232	mg/kg	0.2	<0.2	<0.2	<0.2
Arochlor 1242	mg/kg	0.2	<0.2	<0.2	<0.2
Arochlor 1248	mg/kg	0.2	<0.2	<0.2	<0.2
Arochlor 1254	mg/kg	0.2	<0.2	<0.2	<0.2
Arochlor 1260	mg/kg	0.2	<0.2	<0.2	<0.2
Arochlor 1262	mg/kg	0.2	<0.2	<0.2	<0.2
Arochlor 1268	mg/kg	0.2	<0.2	<0.2	<0.2
Total PCBs (Arochlors)	mg/kg	1	<1	<1	<1

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES [AN040/AN320] Tested: 6/8/2019

PARAMETER	UOM	LOR	BH03_0.80-0.90 SOIL - 1/8/2019 SE196067.002	BH03_1.40-1.50 SOIL - 1/8/2019 SE196067.003	DU2 SOIL - 1/8/2019 SE196067.004
Arsenic, As	mg/kg	1	**8**	**8**	**5**
Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	<0.3
Chromium, Cr	mg/kg	0.5	**21**	**11**	**17**
Copper, Cu	mg/kg	0.5	**3.4**	**4.6**	**3.7**
Lead, Pb	mg/kg	1	**27**	**28**	**15**
Nickel, Ni	mg/kg	0.5	**0.6**	<0.5	**0.6**
Zinc, Zn	mg/kg	2	**27**	**19**	**21**

Mercury in Soil [AN312] Tested: 6/8/2019

PARAMETER	UOM	LOR	BH03_0.80-0.90 SOIL - 1/8/2019 SE196067.002	BH03_1.40-1.50 SOIL - 1/8/2019 SE196067.003	DU2 SOIL - 1/8/2019 SE196067.004
Mercury	mg/kg	0.05	<0.05	<0.05	<0.05

Moisture Content [AN002] Tested: 6/8/2019

PARAMETER	UOM	LOR	BH03_0.80-0.90 SOIL - 1/8/2019 SE196067.002	BH03_1.40-1.50 SOIL - 1/8/2019 SE196067.003	DU2 SOIL - 1/8/2019 SE196067.004
% Moisture	%w/w	0.5	**19**	**18**	**22**

Fibre Identification in soil [AN602] Tested: 8/8/2019

PARAMETER	UOM	LOR	BH03_0.10-0.20 SOIL - 1/8/2019 SE196067.001
Asbestos Detected	No unit	-	Yes
Estimated Fibres*	%w/w	0.01	**>0.01**

Gravimetric Determination of Asbestos in Soil [AN605] Tested: 8/8/2019

PARAMETER	UOM	LOR	BH03_0.10-0.20 SOIL - 1/8/2019 SE196067.001
Total Sample Weight*	g	1	**280**
ACM in >7mm Sample*	g	0.01	<0.01
AF/FA in >2mm to <7mm Sample*	g	0.0001	**0.108**
AF/FA in <2mm Sample*	g	0.0001	<0.0001
Asbestos in soil (>7mm ACM)*	%w/w	0.01	<0.01
Asbestos in soil (>2mm to <7mm AF/FA)*	%w/w	0.001	**0.039**
Asbestos in soil (<2mm AF/FA)*	%w/w	0.001	<0.001
Asbestos in soil (<7mm AF/FA)*	%w/w	0.001	**0.039**
Fibre Type*	No unit	-	-

METHOD	METHODOLOGY SUMMARY
AN002	The test is carried out by drying (at either 40°C or 105°C) a known mass of sample in a weighed evaporating basin. After fully dry the sample is re-weighed. Samples such as sludge and sediment having high percentages of moisture will take some time in a drying oven for complete removal of water.
AN040/AN320	A portion of sample is digested with nitric acid to decompose organic matter and hydrochloric acid to complete the digestion of metals. The digest is then analysed by ICP OES with metals results reported on the dried sample basis. Based on USEPA method 200.8 and 6010C.
AN040	A portion of sample is digested with Nitric acid to decompose organic matter and Hydrochloric acid to complete the digestion of metals and then filtered for analysis by ASS or ICP as per USEPA Method 200.8.
AN312	Mercury by Cold Vapour AAS in Soils: After digestion with nitric acid, hydrogen peroxide and hydrochloric acid, mercury ions are reduced by stannous chloride reagent in acidic solution to elemental mercury. This mercury vapour is purged by nitrogen into a cold cell in an atomic absorption spectrometer or mercury analyser. Quantification is made by comparing absorbances to those of the calibration standards. Reference APHA 3112/3500
AN403	Total Recoverable Hydrocarbons: Determination of Hydrocarbons by gas chromatography after a solvent extraction. Detection is by flame ionisation detector (FID) that produces an electronic signal in proportion to the combustible matter passing through it. Total Recoverable Hydrocarbons (TRH) are routinely reported as four alkane groupings based on the carbon chain length of the compounds: C6-C9, C10-C14, C15-C28 and C29-C36 and in recognition of the NEPM 1999 (2013), >C10-C16 (F2), >C16-C34 (F3) and >C34-C40 (F4). F2 is reported directly and also corrected by subtracting Naphthalene (from VOC method AN433) where available.
AN403	Additionally, the volatile C6-C9 fraction may be determined by a purge and trap technique and GC/MS because of the potential for volatiles loss. Total Recoverable Hydrocarbons - Silica (TRH-Si) follows the same method of analysis after silica gel cleanup of the solvent extract. Aliphatic/Aromatic Speciation follows the same method of analysis after fractionation of the solvent extract over silica with differential polarity of the eluent solvents.
AN403	The GC/FID method is not well suited to the analysis of refined high boiling point materials (ie lubricating oils or greases) but is particularly suited for measuring diesel, kerosene and petrol if care to control volatility is taken. This method will detect naturally occurring hydrocarbons, lipids, animal fats, phenols and PAHs if they are present at sufficient levels, dependent on the use of specific cleanup/fractionation techniques. Reference USEPA 3510B, 8015B.
AN420	(SVOCs) including OC, OP, PCB, Herbicides, PAH, Phthalates and Speciated Phenols (etc) in soils, sediments and waters are determined by GCMS/ECD technique following appropriate solvent extraction process (Based on USEPA 3500C and 8270D).
AN420	SVOC Compounds: Semi-Volatile Organic Compounds (SVOCs) including OC, OP, PCB, Herbicides, PAH, Phthalates and Speciated Phenols in soils, sediments and waters are determined by GCMS/ECD technique following appropriate solvent extraction process (Based on USEPA 3500C and 8270D).
AN433	VOCs and C6-C9 Hydrocarbons by GC-MS P&T: VOC`s are volatile organic compounds. The sample is presented to a gas chromatograph via a purge and trap (P&T) concentrator and autosampler and is detected with a Mass Spectrometer (MSD). Solid samples are initially extracted with methanol whilst liquid samples are processed directly. References: USEPA 5030B, 8020A, 8260.
AN602	Qualitative identification of chrysotile, amosite and crocidolite in bulk samples by polarised light microscopy (PLM) in conjunction with dispersion staining (DS). AS4964 provides the basis for this document. Unequivocal identification of the asbestos minerals present is made by obtaining sufficient diagnostic `clues`, which provide a reasonable degree of certainty, dispersion staining is a mandatory `clue` for positive identification. If sufficient `clues` are absent, then positive identification of asbestos is not possible. This procedure requires removal of suspect fibres/bundles from the sample which cannot be returned.
AN602	Fibres/material that cannot be unequivocably identified as one of the three asbestos forms, will be reported as unknown mineral fibres (umf) The fibres detected may or may not be asbestos fibres.
AN602	AS4964.2004 Method for the Qualitative Identification of Asbestos in Bulk Samples, Section 8.4, Trace Analysis Criteria, Note 4 states:"Depending upon sample condition and fibre type, the detection limit of this technique has been found to lie generally in the range of 1 in 1,000 to 1 in 10,000 parts by weight, equivalent to 1 to 0.1 g/kg."
AN602	The sample can be reported “no asbestos found at the reporting limit of 0.1 g/kg” (<0.01%w/w) where AN602 section 4.5 of this method has been followed, and if- (a) no trace asbestos fibres have been detected (i.e. no ‘respirable’ fibres): (b) the estimated weight of non-respirable asbestos fibre bundles and/or the estimated weight of asbestos in asbestos-containing materials are found to be less than 0.1g/kg: and (c) these non-respirable asbestos fibre bundles and/or the asbestos containing materials are only visible under stereo-microscope viewing conditions.
AN605	This technique gravimetrically determines the mass of Asbestos Containing Material retained on a 7mm Sieve and assumes that 15% of this ACM is asbestos. This calculated asbestos weight is then calculated as a percentage of the total sample weight.

AN605	This technique also gravimetrically determines the mass of Fibrous Asbestos (FA) and Asbestos Fines (AF) Containing Material retained on and passing a 2mm sieve post 7mm sieving. Assumes that FA and AF are 100% asbestos containing. This calculated asbestos weight is then calculated as a percentage of the total sample weight. This does not include free fibres which are only observed by standard trace analysis as per AN 602.
AN605	Insofar as is technically feasible, this report is consistent with the analytical reporting recommendations in the Western Australian Department of Health Guidelines for the Assessment Remediation and Management of Asbestos - Contaminated Sites in Western Australia - May 2009.

FOOTNOTES

*	NATA accreditation does not cover the performance of this service.	-	Not analysed.	UOM	Unit of Measure.
		NVL	Not validated.	LOR	Limit of Reporting.
**	Indicative data, theoretical holding time exceeded.	IS	Insufficient sample for analysis.	↑↓	Raised/lowered Limit of Reporting.
		LNR	Sample listed, but not received.		

Unless it is reported that sampling has been performed by SGS, the samples have been analysed as received.
Solid samples expressed on a dry weight basis.

Where "Total" analyte groups are reported (for example, Total PAHs, Total OC Pesticides) the total will be calculated as the sum of the individual analytes, with those analytes that are reported as <LOR being assumed to be zero. The summed (Total) limit of reporting is calculated by summing the individual analyte LORs and dividing by two. For example, where 16 individual analytes are being summed and each has an LOR of 0.1 mg/kg, the "Totals" LOR will be 1.6 / 2 (0.8 mg/kg). Where only 2 analytes are being summed, the " Total" LOR will be the sum of those two LORs.

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

If reported, measurement uncertainty follow the ± sign after the analytical result and is expressed as the expanded uncertainty calculated using a coverage factor of 2, providing a level of confidence of approximately 95%, unless stated otherwise in the comments section of this report.

Results reported for samples tested under test methods with codes starting with ARS-SOP, radionuclide or gross radioactivity concentrations are expressed in becquerel (Bq) per unit of mass or volume or per wipe as stated on the report. Becquerel is the SI unit for activity and equals one nuclear transformation per second.
Note that in terms of units of radioactivity:

a. 1 Bq is equivalent to 27 pCi
b. 37 MBq is equivalent to 1 mCi

For results reported for samples tested under test methods with codes starting with ARS-SOP, less than (<) values indicate the detection limit for each radionuclide or parameter for the measurement system used. The respective detection limits have been calculated in accordance with ISO 11929.

The QC and MU criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here: www.sgs.com.au.pv.sgsvr/en-gb/environment.

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ANALYTICAL REPORT

Accreditation No. 2562

CLIENT DETAILS

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Telephone	0431 063 254
Facsimile	02 9478 3901
Email	FYu@golder.com.au
Project	**19122955 - Gran Central**
Order Number	**PO21564**
Samples	1

LABORATORY DETAILS

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Facsimile	+61 2 8594 0499
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SGS Reference	**SE196067 R0**
Date Received	01 Aug 2019
Date Reported	09 Aug 2019

COMMENTS

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

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

Sample #1: Asbestos found in approx 15x5x2mm cement sheet fragments x2.

Asbestos analysed by Approved Identifier Ravee Sivasubramaniam .

SIGNATORIES

Akheeqar Beniameen
Chemist

Bennet Lo
Senior Organic Chemist/Metals Chemis

Kamrul Ahsan
Senior Chemist

Ly Kim Ha
Organic Section Head

Ravee Sivasubramaniam
Hygiene Team Leader

RESULTS

Fibre Identification in soil — Method AN602

Laboratory Reference	Client Reference	Matrix	Sample Description	Date Sampled	Fibre Identification	Est.%w/w*
SE196067.001	BH03_0.10-0.20	Soil	280g Clay,Soil,Rocks	01 Aug 2019	Chrysotile Asbestos Found	>0.01

Gravimetric Determination of Asbestos in Soil [AN605] Tested: 8/8/2019

PARAMETER	UOM	LOR	BH03_0.10-0.20 SOIL - 1/8/2019 SE196067.001
Total Sample Weight*	g	1	**280**
ACM in >7mm Sample*	g	0.01	<0.01
AF/FA in >2mm to <7mm Sample*	g	0.0001	**0.108**
AF/FA in <2mm Sample*	g	0.0001	<0.0001
Asbestos in soil (>7mm ACM)*	%w/w	0.01	<0.01
Asbestos in soil (>2mm to <7mm AF/FA)*	%w/w	0.001	**0.039**
Asbestos in soil (<2mm AF/FA)*	%w/w	0.001	<0.001
Asbestos in soil (<7mm AF/FA)*	%w/w	0.001	**0.039**
Fibre Type*	No unit	-	-

METHOD SUMMARY

METHOD	METHODOLOGY SUMMARY
AN602	Qualitative identification of chrysotile, amosite and crocidolite in bulk samples by polarised light microscopy (PLM) in conjunction with dispersion staining (DS). AS4964 provides the basis for this document. Unequivocal identification of the asbestos minerals present is made by obtaining sufficient diagnostic `clues`, which provide a reasonable degree of certainty, dispersion staining is a mandatory `clue` for positive identification. If sufficient `clues` are absent, then positive identification of asbestos is not possible. This procedure requires removal of suspect fibres/bundles from the sample which cannot be returned.
AN602	Fibres/material that cannot be unequivocably identified as one of the three asbestos forms, will be reported as unknown mineral fibres (umf) The fibres detected may or may not be asbestos fibres.
AN602	AS4964.2004 Method for the Qualitative Identification of Asbestos in Bulk Samples , Section 8.4, Trace Analysis Criteria, Note 4 states:"Depending upon sample condition and fibre type, the detection limit of this technique has been found to lie generally in the range of 1 in 1,000 to 1 in 10,000 parts by weight, equivalent to 1 to 0.1 g/kg."
AN602	The sample can be reported “no asbestos found at the reporting limit of 0.1 g/kg” (<0.01%w/w) where AN602 section 4.5 of this method has been followed, and if- (a) no trace asbestos fibres have been detected (i.e. no ‘respirable’ fibres): (b) the estimated weight of non-respirable asbestos fibre bundles and/or the estimated weight of asbestos in asbestos-containing materials are found to be less than 0.1g/kg: and (c) these non-respirable asbestos fibre bundles and/or the asbestos containing materials are only visible under stereo-microscope viewing conditions.
AN605	This technique gravimetrically determines the mass of Asbestos Containing Material retained on a 7mm Sieve and assumes that 15% of this ACM is asbestos. This calculated asbestos weight is then calculated as a percentage of the total sample weight.
AN605	This technique also gravimetrically determines the mass of Fibrous Asbestos (FA) and Asbestos Fines (AF) Containing Material retained on and passing a 2mm sieve post 7mm sieving. Assumes that FA and AF are 100% asbestos containing. This calculated asbestos weight is then calculated as a percentage of the total sample weight. This does not include free fibres which are only observed by standard trace analysis as per AN 602.
AN605	Insofar as is technically feasible, this report is consistent with the analytical reporting recommendations in the Western Australian Department of Health Guidelines for the Assessment Remediation and Management of Asbestos - Contaminated Sites in Western Australia - May 2009.

FOOTNOTES

Amosite	-	Brown Asbestos	NA	-	Not Analysed
Chrysotile	-	White Asbestos	LNR	-	Listed, Not Required
Crocidolite	-	Blue Asbestos	*	-	NATA accreditation does not cover the performance of this service.
Amphiboles	-	Amosite and/or Crocidolite	**	-	Indicative data, theoretical holding time exceeded.

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

Unless it is reported that sampling has been performed by SGS, the samples have been analysed as received.

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

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

The QC and MU criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here: www.sgs.com.au.pv.sgsvr/en-gb/environment.

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STATEMENT OF QA/QC PERFORMANCE

SE196067 R0

CLIENT DETAILS

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Project	**19122955 - Gran Central**
Order Number	**PO21564**
Samples	4

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SGS Reference	**SE196067 R0**
Date Received	01 Aug 2019
Date Reported	14 Aug 2019

COMMENTS

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

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

All Data Quality Objectives were met with the exception of the following:

Matrix Spike	Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES	4 items

SAMPLE SUMMARY

Samples clearly labelled	Yes	Complete documentation received	Yes
Sample container provider	SGS	Sample cooling method	Ice
Samples received in correct containers	Yes	Sample counts by matrix	4 Soil
Date documentation received	2/8/2019@10:20am	Type of documentation received	COC
Samples received in good order	Yes	Samples received without headspace	Yes
Sample temperature upon receipt	4.8°C	Sufficient sample for analysis	Yes
Turnaround time requested	Standard		

HOLDING TIME SUMMARY

SE196067 R0

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

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

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

Fibre Identification in soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH03_0.10-0.20	SE196067.001	LB180495	01 Aug 2019	01 Aug 2019	31 Jul 2020	08 Aug 2019	31 Jul 2020	09 Aug 2019

Gravimetric Determination of Asbestos in Soil

Method: ME-(AU)-[ENV]AN605

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH03_0.10-0.20	SE196067.001	LB180495	01 Aug 2019	01 Aug 2019	28 Jan 2020	08 Aug 2019	28 Jan 2020	09 Aug 2019

Mercury in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH03_0.80-0.90	SE196067.002	LB180332	01 Aug 2019	01 Aug 2019	29 Aug 2019	06 Aug 2019	29 Aug 2019	09 Aug 2019
BH03_1.40-1.50	SE196067.003	LB180332	01 Aug 2019	01 Aug 2019	29 Aug 2019	06 Aug 2019	29 Aug 2019	09 Aug 2019
DU2	SE196067.004	LB180332	01 Aug 2019	01 Aug 2019	29 Aug 2019	06 Aug 2019	29 Aug 2019	09 Aug 2019

Moisture Content

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH03_0.80-0.90	SE196067.002	LB180273	01 Aug 2019	01 Aug 2019	15 Aug 2019	06 Aug 2019	11 Aug 2019	07 Aug 2019
BH03_1.40-1.50	SE196067.003	LB180273	01 Aug 2019	01 Aug 2019	15 Aug 2019	06 Aug 2019	11 Aug 2019	07 Aug 2019
DU2	SE196067.004	LB180273	01 Aug 2019	01 Aug 2019	15 Aug 2019	06 Aug 2019	11 Aug 2019	07 Aug 2019

OC Pesticides in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH03_0.80-0.90	SE196067.002	LB180272	01 Aug 2019	01 Aug 2019	15 Aug 2019	06 Aug 2019	15 Sep 2019	09 Aug 2019
BH03_1.40-1.50	SE196067.003	LB180272	01 Aug 2019	01 Aug 2019	15 Aug 2019	06 Aug 2019	15 Sep 2019	09 Aug 2019
DU2	SE196067.004	LB180272	01 Aug 2019	01 Aug 2019	15 Aug 2019	06 Aug 2019	15 Sep 2019	09 Aug 2019

OP Pesticides in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH03_0.80-0.90	SE196067.002	LB180272	01 Aug 2019	01 Aug 2019	15 Aug 2019	06 Aug 2019	15 Sep 2019	09 Aug 2019
BH03_1.40-1.50	SE196067.003	LB180272	01 Aug 2019	01 Aug 2019	15 Aug 2019	06 Aug 2019	15 Sep 2019	09 Aug 2019
DU2	SE196067.004	LB180272	01 Aug 2019	01 Aug 2019	15 Aug 2019	06 Aug 2019	15 Sep 2019	09 Aug 2019

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH03_0.80-0.90	SE196067.002	LB180272	01 Aug 2019	01 Aug 2019	15 Aug 2019	06 Aug 2019	15 Sep 2019	09 Aug 2019
BH03_1.40-1.50	SE196067.003	LB180272	01 Aug 2019	01 Aug 2019	15 Aug 2019	06 Aug 2019	15 Sep 2019	09 Aug 2019
DU2	SE196067.004	LB180272	01 Aug 2019	01 Aug 2019	15 Aug 2019	06 Aug 2019	15 Sep 2019	09 Aug 2019

PCBs in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH03_0.80-0.90	SE196067.002	LB180272	01 Aug 2019	01 Aug 2019	15 Aug 2019	06 Aug 2019	15 Sep 2019	09 Aug 2019
BH03_1.40-1.50	SE196067.003	LB180272	01 Aug 2019	01 Aug 2019	15 Aug 2019	06 Aug 2019	15 Sep 2019	09 Aug 2019
DU2	SE196067.004	LB180272	01 Aug 2019	01 Aug 2019	15 Aug 2019	06 Aug 2019	15 Sep 2019	09 Aug 2019

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH03_0.80-0.90	SE196067.002	LB180327	01 Aug 2019	01 Aug 2019	28 Jan 2020	06 Aug 2019	28 Jan 2020	09 Aug 2019
BH03_1.40-1.50	SE196067.003	LB180327	01 Aug 2019	01 Aug 2019	28 Jan 2020	06 Aug 2019	28 Jan 2020	09 Aug 2019
DU2	SE196067.004	LB180327	01 Aug 2019	01 Aug 2019	28 Jan 2020	06 Aug 2019	28 Jan 2020	09 Aug 2019

TRH (Total Recoverable Hydrocarbons) in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH03_0.80-0.90	SE196067.002	LB180272	01 Aug 2019	01 Aug 2019	15 Aug 2019	06 Aug 2019	15 Sep 2019	08 Aug 2019
BH03_1.40-1.50	SE196067.003	LB180272	01 Aug 2019	01 Aug 2019	15 Aug 2019	06 Aug 2019	15 Sep 2019	08 Aug 2019
DU2	SE196067.004	LB180272	01 Aug 2019	01 Aug 2019	15 Aug 2019	06 Aug 2019	15 Sep 2019	08 Aug 2019

VOC's in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH03_0.80-0.90	SE196067.002	LB180271	01 Aug 2019	01 Aug 2019	15 Aug 2019	06 Aug 2019	15 Sep 2019	07 Aug 2019
BH03_1.40-1.50	SE196067.003	LB180271	01 Aug 2019	01 Aug 2019	15 Aug 2019	06 Aug 2019	15 Sep 2019	07 Aug 2019
DU2	SE196067.004	LB180271	01 Aug 2019	01 Aug 2019	15 Aug 2019	06 Aug 2019	15 Sep 2019	07 Aug 2019

Volatile Petroleum Hydrocarbons in Soil

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

Sample Name	Sample No.	QC Ref

HOLDING TIME SUMMARY

SE196067 R0

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

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

Volatile Petroleum Hydrocarbons in Soil (continued)

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH03_0.80-0.90	SE196067.002	LB180271	01 Aug 2019	01 Aug 2019	15 Aug 2019	06 Aug 2019	15 Sep 2019	07 Aug 2019
BH03_1.40-1.50	SE196067.003	LB180271	01 Aug 2019	01 Aug 2019	15 Aug 2019	06 Aug 2019	15 Sep 2019	07 Aug 2019
DU2	SE196067.004	LB180271	01 Aug 2019	01 Aug 2019	15 Aug 2019	06 Aug 2019	15 Sep 2019	07 Aug 2019

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

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

OC Pesticides in Soil

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Tetrachloro-m-xylene (TCMX) (Surrogate)	BH03_0.80-0.90	SE196067.002	%	60 - 130%	95
	BH03_1.40-1.50	SE196067.003	%	60 - 130%	92
	DU2	SE196067.004	%	60 - 130%	85

OP Pesticides in Soil

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2-fluorobiphenyl (Surrogate)	BH03_0.80-0.90	SE196067.002	%	60 - 130%	94
	BH03_1.40-1.50	SE196067.003	%	60 - 130%	94
	DU2	SE196067.004	%	60 - 130%	92
d14-p-terphenyl (Surrogate)	BH03_0.80-0.90	SE196067.002	%	60 - 130%	94
	BH03_1.40-1.50	SE196067.003	%	60 - 130%	92
	DU2	SE196067.004	%	60 - 130%	92

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2-fluorobiphenyl (Surrogate)	BH03_0.80-0.90	SE196067.002	%	70 - 130%	94
	BH03_1.40-1.50	SE196067.003	%	70 - 130%	94
	DU2	SE196067.004	%	70 - 130%	92
d14-p-terphenyl (Surrogate)	BH03_0.80-0.90	SE196067.002	%	70 - 130%	94
	BH03_1.40-1.50	SE196067.003	%	70 - 130%	92
	DU2	SE196067.004	%	70 - 130%	92
d5-nitrobenzene (Surrogate)	BH03_0.80-0.90	SE196067.002	%	70 - 130%	90
	BH03_1.40-1.50	SE196067.003	%	70 - 130%	92
	DU2	SE196067.004	%	70 - 130%	90

PCBs in Soil

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Tetrachloro-m-xylene (TCMX) (Surrogate)	BH03_0.80-0.90	SE196067.002	%	60 - 130%	95
	BH03_1.40-1.50	SE196067.003	%	60 - 130%	92
	DU2	SE196067.004	%	60 - 130%	85

VOC's in Soil

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	BH03_0.80-0.90	SE196067.002	%	60 - 130%	95
	BH03_1.40-1.50	SE196067.003	%	60 - 130%	90
	DU2	SE196067.004	%	60 - 130%	91
d4-1,2-dichloroethane (Surrogate)	BH03_0.80-0.90	SE196067.002	%	60 - 130%	117
	BH03_1.40-1.50	SE196067.003	%	60 - 130%	108
	DU2	SE196067.004	%	60 - 130%	111
d8-toluene (Surrogate)	BH03_0.80-0.90	SE196067.002	%	60 - 130%	104
	BH03_1.40-1.50	SE196067.003	%	60 - 130%	90
	DU2	SE196067.004	%	60 - 130%	97

Volatile Petroleum Hydrocarbons in Soil

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	BH03_0.80-0.90	SE196067.002	%	60 - 130%	95
	BH03_1.40-1.50	SE196067.003	%	60 - 130%	90
	DU2	SE196067.004	%	60 - 130%	91
d4-1,2-dichloroethane (Surrogate)	BH03_0.80-0.90	SE196067.002	%	60 - 130%	117
	BH03_1.40-1.50	SE196067.003	%	60 - 130%	108
	DU2	SE196067.004	%	60 - 130%	111
d8-toluene (Surrogate)	BH03_0.80-0.90	SE196067.002	%	60 - 130%	104
	BH03_1.40-1.50	SE196067.003	%	60 - 130%	90
	DU2	SE196067.004	%	60 - 130%	97

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

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

Mercury in Soil

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

Sample Number	Parameter	Units	LOR	Result
LB180332.001	Mercury	mg/kg	0.05	<0.05

OC Pesticides in Soil

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

Sample Number		Parameter	Units	LOR	Result
LB180272.001		Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1
		Alpha BHC	mg/kg	0.1	<0.1
		Lindane	mg/kg	0.1	<0.1
		Heptachlor	mg/kg	0.1	<0.1
		Aldrin	mg/kg	0.1	<0.1
		Beta BHC	mg/kg	0.1	<0.1
		Delta BHC	mg/kg	0.1	<0.1
		Heptachlor epoxide	mg/kg	0.1	<0.1
		Alpha Endosulfan	mg/kg	0.2	<0.2
		Gamma Chlordane	mg/kg	0.1	<0.1
		Alpha Chlordane	mg/kg	0.1	<0.1
		p,p'-DDE	mg/kg	0.1	<0.1
		Dieldrin	mg/kg	0.2	<0.2
		Endrin	mg/kg	0.2	<0.2
		Beta Endosulfan	mg/kg	0.2	<0.2
		p,p'-DDD	mg/kg	0.1	<0.1
		p,p'-DDT	mg/kg	0.1	<0.1
		Endosulfan sulphate	mg/kg	0.1	<0.1
		Endrin Aldehyde	mg/kg	0.1	<0.1
		Methoxychlor	mg/kg	0.1	<0.1
		Endrin Ketone	mg/kg	0.1	<0.1
		Isodrin	mg/kg	0.1	<0.1
		Mirex	mg/kg	0.1	<0.1
	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	101

OP Pesticides in Soil

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

Sample Number		Parameter	Units	LOR	Result
LB180272.001		Dichlorvos	mg/kg	0.5	<0.5
		Dimethoate	mg/kg	0.5	<0.5
		Diazinon (Dimpylate)	mg/kg	0.5	<0.5
		Fenitrothion	mg/kg	0.2	<0.2
		Malathion	mg/kg	0.2	<0.2
		Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2
		Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2
		Bromophos Ethyl	mg/kg	0.2	<0.2
		Methidathion	mg/kg	0.5	<0.5
		Ethion	mg/kg	0.2	<0.2
		Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2
	Surrogates	2-fluorobiphenyl (Surrogate)	%	-	100
		d14-p-terphenyl (Surrogate)	%	-	102

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Sample Number	Parameter	Units	LOR	Result
LB180272.001	Naphthalene	mg/kg	0.1	<0.1
	2-methylnaphthalene	mg/kg	0.1	<0.1
	1-methylnaphthalene	mg/kg	0.1	<0.1
	Acenaphthylene	mg/kg	0.1	<0.1
	Acenaphthene	mg/kg	0.1	<0.1
	Fluorene	mg/kg	0.1	<0.1
	Phenanthrene	mg/kg	0.1	<0.1
	Anthracene	mg/kg	0.1	<0.1
	Fluoranthene	mg/kg	0.1	<0.1
	Pyrene	mg/kg	0.1	<0.1
	Benzo(a)anthracene	mg/kg	0.1	<0.1
	Chrysene	mg/kg	0.1	<0.1
	Benzo(a)pyrene	mg/kg	0.1	<0.1

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

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

PAH (Polynuclear Aromatic Hydrocarbons) in Soil (continued)

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

Sample Number		Parameter	Units	LOR	Result
LB180272.001		Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1
		Dibenzo(ah)anthracene	mg/kg	0.1	<0.1
		Benzo(ghi)perylene	mg/kg	0.1	<0.1
		Total PAH (18)	mg/kg	0.8	<0.8
	Surrogates	d5-nitrobenzene (Surrogate)	%	-	100
		2-fluorobiphenyl (Surrogate)	%	-	100
		d14-p-terphenyl (Surrogate)	%	-	102

PCBs in Soil

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

Sample Number		Parameter	Units	LOR	Result
LB180272.001		Arochlor 1016	mg/kg	0.2	<0.2
		Arochlor 1221	mg/kg	0.2	<0.2
		Arochlor 1232	mg/kg	0.2	<0.2
		Arochlor 1242	mg/kg	0.2	<0.2
		Arochlor 1248	mg/kg	0.2	<0.2
		Arochlor 1254	mg/kg	0.2	<0.2
		Arochlor 1260	mg/kg	0.2	<0.2
		Arochlor 1262	mg/kg	0.2	<0.2
		Arochlor 1268	mg/kg	0.2	<0.2
		Total PCBs (Arochlors)	mg/kg	1	<1
	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	101

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

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

Sample Number		Parameter	Units	LOR	Result
LB180327.001		Arsenic, As	mg/kg	1	1
		Cadmium, Cd	mg/kg	0.3	<0.3
		Chromium, Cr	mg/kg	0.5	<0.5
		Copper, Cu	mg/kg	0.5	<0.5
		Nickel, Ni	mg/kg	0.5	<0.5
		Lead, Pb	mg/kg	1	<1
		Zinc, Zn	mg/kg	2	<2.0

TRH (Total Recoverable Hydrocarbons) in Soil

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

Sample Number		Parameter	Units	LOR	Result
LB180272.001		TRH C10-C14	mg/kg	20	<20
		TRH C15-C28	mg/kg	45	<45
		TRH C29-C36	mg/kg	45	<45
		TRH C37-C40	mg/kg	100	<100
		TRH C10-C36 Total	mg/kg	110	<110

VOC's in Soil

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

Sample Number		Parameter	Units	LOR	Result
LB180271.001	Monocyclic Aromatic	Benzene	mg/kg	0.1	<0.1
	Hydrocarbons	Toluene	mg/kg	0.1	<0.1
		Ethylbenzene	mg/kg	0.1	<0.1
		m/p-xylene	mg/kg	0.2	<0.2
		o-xylene	mg/kg	0.1	<0.1
	Polycyclic VOCs	Naphthalene	mg/kg	0.1	<0.1
	Surrogates	d4-1,2-dichloroethane (Surrogate)	%	-	118
		d8-toluene (Surrogate)	%	-	94
		Bromofluorobenzene (Surrogate)	%	-	98
	Totals	Total BTEX	mg/kg	0.6	<0.6

Volatile Petroleum Hydrocarbons in Soil

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

Sample Number		Parameter	Units	LOR	Result
LB180271.001		TRH C6-C9	mg/kg	20	<20
	Surrogates	d4-1,2-dichloroethane (Surrogate)	%	-	118

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

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

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

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

Mercury in Soil

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE196071.004	LB180332.014	Mercury	mg/kg	0.05	<0.05	<0.05	200	0

Moisture Content

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE196067.004	LB180273.022	% Moisture	%w/w	0.5	22	18	35	16
SE196071.004	LB180273.026	% Moisture	%w/w	0.5	21	20	35	5
SE196092.004	LB180273.011	% Moisture	%w/w	0.5	0	0	200	0

OC Pesticides in Soil

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE196071.004	LB180272.018		Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	200	0
			Alpha BHC	mg/kg	0.1	<0.1	<0.1	200	0
			Lindane	mg/kg	0.1	<0.1	<0.1	200	0
			Heptachlor	mg/kg	0.1	<0.1	<0.1	200	0
			Aldrin	mg/kg	0.1	<0.1	<0.1	200	0
			Beta BHC	mg/kg	0.1	<0.1	<0.1	200	0
			Delta BHC	mg/kg	0.1	<0.1	<0.1	200	0
			Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	200	0
			o,p'-DDE	mg/kg	0.1	<0.1	<0.1	200	0
			Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	200	0
			Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	200	0
			Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	200	0
			trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	200	0
			p,p'-DDE	mg/kg	0.1	<0.1	<0.1	200	0
			Dieldrin	mg/kg	0.2	<0.2	<0.2	200	0
			Endrin	mg/kg	0.2	<0.2	<0.2	200	0
			o,p'-DDD	mg/kg	0.1	<0.1	<0.1	200	0
			o,p'-DDT	mg/kg	0.1	<0.1	<0.1	200	0
			Beta Endosulfan	mg/kg	0.2	<0.2	<0.2	200	0
			p,p'-DDD	mg/kg	0.1	<0.1	<0.1	200	0
			p,p'-DDT	mg/kg	0.1	<0.1	<0.1	200	0
			Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	200	0
			Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1	200	0
			Methoxychlor	mg/kg	0.1	<0.1	<0.1	200	0
			Endrin Ketone	mg/kg	0.1	<0.1	<0.1	200	0
			Isodrin	mg/kg	0.1	<0.1	<0.1	200	0
			Mirex	mg/kg	0.1	<0.1	<0.1	200	0
			Total CLP OC Pesticides	mg/kg	1	<1	<1	200	0
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.17	0.17	30	1

OP Pesticides in Soil

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE196067.004	LB180272.014		Dichlorvos	mg/kg	0.5	<0.5	<0.5	200	0
			Dimethoate	mg/kg	0.5	<0.5	<0.5	200	0
			Diazinon (Dimpylate)	mg/kg	0.5	<0.5	<0.5	200	0
			Fenitrothion	mg/kg	0.2	<0.2	<0.2	200	0
			Malathion	mg/kg	0.2	<0.2	<0.2	200	0
			Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2	<0.2	200	0
			Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2	<0.2	200	0
			Bromophos Ethyl	mg/kg	0.2	<0.2	<0.2	200	0
			Methidathion	mg/kg	0.5	<0.5	<0.5	200	0
			Ethion	mg/kg	0.2	<0.2	<0.2	200	0
			Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	<0.2	200	0
			Total OP Pesticides*	mg/kg	1.7	<1.7	<1.7	200	0
		Surrogates	2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.5	30	0
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	30	2

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Original	Duplicate	Parameter	Units	LOR

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

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

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

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

PAH (Polynuclear Aromatic Hydrocarbons) in Soil (continued)

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE196067.004	LB180272.014		Naphthalene	mg/kg	0.1	<0.1	<0.1	200	0
			2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	200	0
			1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	200	0
			Acenaphthylene	mg/kg	0.1	<0.1	<0.1	200	0
			Acenaphthene	mg/kg	0.1	<0.1	<0.1	200	0
			Fluorene	mg/kg	0.1	<0.1	<0.1	200	0
			Phenanthrene	mg/kg	0.1	<0.1	<0.1	200	0
			Anthracene	mg/kg	0.1	<0.1	<0.1	200	0
			Fluoranthene	mg/kg	0.1	<0.1	<0.1	200	0
			Pyrene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(a)anthracene	mg/kg	0.1	<0.1	<0.1	200	0
			Chrysene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(a)pyrene	mg/kg	0.1	<0.1	<0.1	200	0
			Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	200	0
			Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	200	0
			Carcinogenic PAHs, BaP TEQ <LOR=0	mg/kg	0.2	<0.2	<0.2	200	0
			Carcinogenic PAHs, BaP TEQ <LOR=LOR	mg/kg	0.3	<0.3	<0.3	134	0
			Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	mg/kg	0.2	<0.2	<0.2	175	0
			Total PAH (18)	mg/kg	0.8	<0.8	<0.8	200	0
		Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.5	0.5	30	0
			2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.5	30	0
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	30	2

PCBs in Soil

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE196071.004	LB180272.018		Arochlor 1016	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1221	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1232	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1242	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1248	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1254	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1260	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1262	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1268	mg/kg	0.2	<0.2	<0.2	200	0
			Total PCBs (Arochlors)	mg/kg	1	<1	<1	200	0
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0	0	30	1

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE196071.004	LB180327.014		Arsenic, As	mg/kg	1	7	10	42	34
			Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	200	0
			Chromium, Cr	mg/kg	0.5	22	30	32	32
			Copper, Cu	mg/kg	0.5	3.4	3.3	45	1
			Nickel, Ni	mg/kg	0.5	<0.5	0.6	135	12
			Lead, Pb	mg/kg	1	14	18	36	25
			Zinc, Zn	mg/kg	2	5.4	6.4	64	17

TRH (Total Recoverable Hydrocarbons) in Soil

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE196067.004	LB180272.014		TRH C10-C14	mg/kg	20	<20	<20	200	0
			TRH C15-C28	mg/kg	45	<45	<45	200	0
			TRH C29-C36	mg/kg	45	<45	<45	200	0
			TRH C37-C40	mg/kg	100	<100	<100	200	0
			TRH C10-C36 Total	mg/kg	110	<110	<110	200	0
			TRH C10-C40 Total (F bands)	mg/kg	210	<210	<210	200	0
		TRH F Bands	TRH >C10-C16	mg/kg	25	<25	<25	200	0
			TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25	<25	200	0
			TRH >C16-C34 (F3)	mg/kg	90	<90	<90	200	0
			TRH >C34-C40 (F4)	mg/kg	120	<120	<120	200	0

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

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

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

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

TRH (Total Recoverable Hydrocarbons) in Soil (continued)

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE196071.004	LB180272.018		TRH C10-C14	mg/kg	20	<20	<20	200	0
			TRH C15-C28	mg/kg	45	<45	<45	200	0
			TRH C29-C36	mg/kg	45	<45	<45	200	0
			TRH C37-C40	mg/kg	100	<100	<100	200	0
			TRH C10-C36 Total	mg/kg	110	<110	<110	200	0
			TRH C10-C40 Total (F bands)	mg/kg	210	<210	<210	200	0
		TRH F Bands	TRH >C10-C16	mg/kg	25	<25	<25	200	0
			TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25	<25	200	0
			TRH >C16-C34 (F3)	mg/kg	90	<90	<90	200	0
			TRH >C34-C40 (F4)	mg/kg	120	<120	<120	200	0

VOC's in Soil

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE196067.002	LB180271.014	Monocyclic	Benzene	mg/kg	0.1	<0.1	<0.1	200	0
		Aromatic	Toluene	mg/kg	0.1	<0.1	<0.1	200	0
			Ethylbenzene	mg/kg	0.1	<0.1	<0.1	200	0
			m/p-xylene	mg/kg	0.2	<0.2	<0.2	200	0
			o-xylene	mg/kg	0.1	<0.1	<0.1	200	0
		Polycyclic	Naphthalene	mg/kg	0.1	<0.1	<0.1	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	11.7	11.9	50	1
			d8-toluene (Surrogate)	mg/kg	-	10.4	10.6	50	2
			Bromofluorobenzene (Surrogate)	mg/kg	-	9.5	9.8	50	3
		Totals	Total Xylenes	mg/kg	0.3	<0.3	<0.3	200	0
			Total BTEX	mg/kg	0.6	<0.6	<0.6	200	0
SE196071.004	LB180271.020	Monocyclic	Benzene	mg/kg	0.1	<0.1	<0.1	200	0
		Aromatic	Toluene	mg/kg	0.1	<0.1	<0.1	200	0
			Ethylbenzene	mg/kg	0.1	<0.1	<0.1	200	0
			m/p-xylene	mg/kg	0.2	<0.2	<0.2	200	0
			o-xylene	mg/kg	0.1	<0.1	<0.1	200	0
		Polycyclic	Naphthalene	mg/kg	0.1	<0.1	<0.1	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	11.2	11.4	50	2
			d8-toluene (Surrogate)	mg/kg	-	9.6	9.6	50	1
			Bromofluorobenzene (Surrogate)	mg/kg	-	9.3	9.4	50	1
		Totals	Total Xylenes	mg/kg	0.3	<0.3	<0.3	200	0
			Total BTEX	mg/kg	0.6	<0.6	<0.6	200	0

Volatile Petroleum Hydrocarbons in Soil

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE196067.002	LB180271.014		TRH C6-C10	mg/kg	25	<25	<25	200	0
			TRH C6-C9	mg/kg	20	<20	<20	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	11.7	11.9	30	1
			d8-toluene (Surrogate)	mg/kg	-	10.4	10.6	30	2
			Bromofluorobenzene (Surrogate)	mg/kg	-	9.5	9.8	30	3
		VPH F Bands	Benzene (F0)	mg/kg	0.1	<0.1	<0.1	200	0
			TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	200	0
SE196071.004	LB180271.020		TRH C6-C10	mg/kg	25	<25	<25	200	0
			TRH C6-C9	mg/kg	20	<20	<20	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	11.2	11.4	30	2
			d8-toluene (Surrogate)	mg/kg	-	9.6	9.6	30	1
			Bromofluorobenzene (Surrogate)	mg/kg	-	9.3	9.4	30	1
		VPH F Bands	Benzene (F0)	mg/kg	0.1	<0.1	<0.1	200	0
			TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	200	0

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

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

Mercury in Soil

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB180332.002	Mercury	mg/kg	0.05	0.23	0.2	70 - 130	113

OC Pesticides in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB180272.002		Heptachlor	mg/kg	0.1	0.2	0.2	60 - 140	108
		Aldrin	mg/kg	0.1	0.2	0.2	60 - 140	112
		Delta BHC	mg/kg	0.1	0.2	0.2	60 - 140	98
		Dieldrin	mg/kg	0.2	0.2	0.2	60 - 140	116
		Endrin	mg/kg	0.2	0.2	0.2	60 - 140	106
		p,p'-DDT	mg/kg	0.1	0.2	0.2	60 - 140	80
	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.15	0.15	40 - 130	101

OP Pesticides in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB180272.002		Dichlorvos	mg/kg	0.5	2.4	2	60 - 140	119
		Diazinon (Dimpylate)	mg/kg	0.5	2.1	2	60 - 140	103
		Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	2.1	2	60 - 140	107
		Ethion	mg/kg	0.2	2.2	2	60 - 140	112
	Surrogates	2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.5	40 - 130	92
		d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	40 - 130	94

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB180272.002		Naphthalene	mg/kg	0.1	4.6	4	60 - 140	115
		Acenaphthylene	mg/kg	0.1	4.7	4	60 - 140	119
		Acenaphthene	mg/kg	0.1	4.4	4	60 - 140	110
		Phenanthrene	mg/kg	0.1	5.0	4	60 - 140	124
		Anthracene	mg/kg	0.1	4.9	4	60 - 140	122
		Fluoranthene	mg/kg	0.1	4.5	4	60 - 140	112
		Pyrene	mg/kg	0.1	4.8	4	60 - 140	121
		Benzo(a)pyrene	mg/kg	0.1	4.9	4	60 - 140	122
	Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.5	0.5	40 - 130	94
		2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.5	40 - 130	92
		d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	40 - 130	94

PCBs in Soil

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB180272.002	Arochlor 1260	mg/kg	0.2	0.5	0.4	60 - 140	114

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB180327.002	Arsenic, As	mg/kg	1	350	336.32	79 - 120	103
	Cadmium, Cd	mg/kg	0.3	430	416.6	69 - 131	104
	Chromium, Cr	mg/kg	0.5	36	35.2	80 - 120	103
	Copper, Cu	mg/kg	0.5	330	370.46	80 - 120	88
	Nickel, Ni	mg/kg	0.5	190	210.88	79 - 120	91
	Lead, Pb	mg/kg	1	95	107.87	79 - 120	88
	Zinc, Zn	mg/kg	2	290	301.27	80 - 121	95

TRH (Total Recoverable Hydrocarbons) in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB180272.002		TRH C10-C14	mg/kg	20	38	40	60 - 140	95
		TRH C15-C28	mg/kg	45	<45	40	60 - 140	83
		TRH C29-C36	mg/kg	45	<45	40	60 - 140	80
	TRH F Bands	TRH >C10-C16	mg/kg	25	36	40	60 - 140	90
		TRH >C16-C34 (F3)	mg/kg	90	<90	40	60 - 140	80
		TRH >C34-C40 (F4)	mg/kg	120	<120	20	60 - 140	80

VOC's in Soil

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

Sample Number	Parameter	Units	LOR

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

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

VOC's in Soil (continued)

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB180271.002	Monocyclic	Benzene	mg/kg	0.1	2.1	2.9	60 - 140	72
	Aromatic	Toluene	mg/kg	0.1	2.0	2.9	60 - 140	70
		Ethylbenzene	mg/kg	0.1	2.4	2.9	60 - 140	81
		m/p-xylene	mg/kg	0.2	4.8	5.8	60 - 140	83
		o-xylene	mg/kg	0.1	2.3	2.9	60 - 140	79
	Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	10.4	10	60 - 140	104
		Bromofluorobenzene (Surrogate)	mg/kg	-	9.4	10	60 - 140	94

Volatile Petroleum Hydrocarbons in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB180271.002		TRH C6-C10	mg/kg	25	<25	24.65	60 - 140	91
		TRH C6-C9	mg/kg	20	21	23.2	60 - 140	89
	Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	10.4	10	60 - 140	104
		Bromofluorobenzene (Surrogate)	mg/kg	-	9.4	10	60 - 140	94
	VPH F Bands	TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	7.25	60 - 140	123

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

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

Mercury in Soil

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

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE196065.001	LB180332.004	Mercury	mg/kg	0.05	0.23	<0.05	0.2	102

OC Pesticides in Soil

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE196092.002	LB180272.019		Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	-	-
			Alpha BHC	mg/kg	0.1	<0.1	<0.1	-	-
			Lindane	mg/kg	0.1	<0.1	<0.1	-	-
			Heptachlor	mg/kg	0.1	0.2	<0.1	0.2	78
			Aldrin	mg/kg	0.1	0.2	<0.1	0.2	86
			Beta BHC	mg/kg	0.1	<0.1	<0.1	-	-
			Delta BHC	mg/kg	0.1	0.2	<0.1	0.2	86
			Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	-	-
			o,p'-DDE	mg/kg	0.1	<0.1	<0.1	-	-
			Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	-	-
			Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	-	-
			Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	-	-
			trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	-	-
			p,p'-DDE	mg/kg	0.1	<0.1	<0.1	-	-
			Dieldrin	mg/kg	0.2	<0.2	<0.2	0.2	94
			Endrin	mg/kg	0.2	<0.2	<0.2	0.2	80
			o,p'-DDD	mg/kg	0.1	<0.1	<0.1	-	-
			o,p'-DDT	mg/kg	0.1	<0.1	<0.1	-	-
			Beta Endosulfan	mg/kg	0.2	<0.2	<0.2	-	-
			p,p'-DDD	mg/kg	0.1	<0.1	<0.1	-	-
			p,p'-DDT	mg/kg	0.1	0.2	<0.1	0.2	81
			Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	-	-
			Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1	-	-
			Methoxychlor	mg/kg	0.1	<0.1	<0.1	-	-
			Endrin Ketone	mg/kg	0.1	<0.1	<0.1	-	-
			Isodrin	mg/kg	0.1	<0.1	<0.1	-	-
			Mirex	mg/kg	0.1	<0.1	<0.1	-	-
			Total CLP OC Pesticides	mg/kg	1	1	<1	-	-
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.14	0.13	-	94

OP Pesticides in Soil

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE196092.002	LB180272.019		Dichlorvos	mg/kg	0.5	2.2	<0.5	2	112
			Dimethoate	mg/kg	0.5	<0.5	<0.5	-	-
			Diazinon (Dimpylate)	mg/kg	0.5	2.0	<0.5	2	101
			Fenitrothion	mg/kg	0.2	<0.2	<0.2	-	-
			Malathion	mg/kg	0.2	<0.2	<0.2	-	-
			Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	2.2	<0.2	2	108
			Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2	<0.2	-	-
			Bromophos Ethyl	mg/kg	0.2	<0.2	<0.2	-	-
			Methidathion	mg/kg	0.5	<0.5	<0.5	-	-
			Ethion	mg/kg	0.2	2.4	<0.2	2	118
			Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	<0.2	-	-
			Total OP Pesticides*	mg/kg	1.7	8.7	<1.7	-	-
		Surrogates	2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.5	-	88
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.4	0.5	-	88

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE196092.002	LB180272.019	Naphthalene	mg/kg	0.1	4.6	<0.1	4	114
		2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	-	-
		1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	-	-
		Acenaphthylene	mg/kg	0.1	4.8	0.2	4	116
		Acenaphthene	mg/kg	0.1	4.3	<0.1	4	108
		Fluorene	mg/kg	0.1	<0.1	<0.1	-	-
		Phenanthrene	mg/kg	0.1	6.1	1.7	4	109

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

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

PAH (Polynuclear Aromatic Hydrocarbons) in Soil (continued)

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE196092.002	LB180272.019		Anthracene	mg/kg	0.1	5.1	0.3	4	120
			Fluoranthene	mg/kg	0.1	6.8	2.7	4	104
			Pyrene	mg/kg	0.1	7.1	2.5	4	115
			Benzo(a)anthracene	mg/kg	0.1	1.2	1.0	-	-
			Chrysene	mg/kg	0.1	1.2	1.1	-	-
			Benzo(b&j)fluoranthene	mg/kg	0.1	1.6	1.6	-	-
			Benzo(k)fluoranthene	mg/kg	0.1	0.5	0.5	-	-
			Benzo(a)pyrene	mg/kg	0.1	6.2	1.3	4	121
			Indeno(1,2,3-cd)pyrene	mg/kg	0.1	0.7	0.7	-	-
			Dibenzo(ah)anthracene	mg/kg	0.1	0.1	0.1	-	-
			Benzo(ghi)perylene	mg/kg	0.1	0.7	0.7	-	-
			Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.2	6.7	1.8	-	-
			Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	6.7	1.8	-	-
			Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	6.7	1.8	-	-
			Total PAH (18)	mg/kg	0.8	51	14	-	-
		Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.4	0.5	-	88
			2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.5	-	88
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.4	0.5	-	88

PCBs in Soil

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE196092.002	LB180272.019		Arochlor 1016	mg/kg	0.2	<0.2	<0.2	-	-
			Arochlor 1221	mg/kg	0.2	<0.2	<0.2	-	-
			Arochlor 1232	mg/kg	0.2	<0.2	<0.2	-	-
			Arochlor 1242	mg/kg	0.2	<0.2	<0.2	-	-
			Arochlor 1248	mg/kg	0.2	<0.2	<0.2	-	-
			Arochlor 1254	mg/kg	0.2	<0.2	<0.2	-	-
			Arochlor 1260	mg/kg	0.2	0.4	<0.2	0.4	106
			Arochlor 1262	mg/kg	0.2	<0.2	<0.2	-	-
			Arochlor 1268	mg/kg	0.2	<0.2	<0.2	-	-
			Total PCBs (Arochlors)	mg/kg	1	<1	<1	-	-
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0	0	-	89

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE196065.001	LB180327.004		Arsenic, As	mg/kg	1	46	6	50	80
			Cadmium, Cd	mg/kg	0.3	45	<0.3	50	91
			Chromium, Cr	mg/kg	0.5	60	22	50	77
			Copper, Cu	mg/kg	0.5	71	37	50	67 ④
			Nickel, Ni	mg/kg	0.5	70	37	50	65 ④
			Lead, Pb	mg/kg	1	54	20	50	68 ④
			Zinc, Zn	mg/kg	2	79	65	50	29 ④

TRH (Total Recoverable Hydrocarbons) in Soil

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE196092.002	LB180272.019		TRH C10-C14	mg/kg	20	46	<20	40	115
			TRH C15-C28	mg/kg	45	90	54	40	90
			TRH C29-C36	mg/kg	45	60	<45	40	83
			TRH C37-C40	mg/kg	100	<100	<100	-	-
			TRH C10-C36 Total	mg/kg	110	200	<110	-	-
			TRH C10-C40 Total (F bands)	mg/kg	210	<210	<210	-	-
		TRH F Bands	TRH >C10-C16	mg/kg	25	48	<25	40	120
			TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	48	<25	-	-
			TRH >C16-C34 (F3)	mg/kg	90	110	<90	40	83
			TRH >C34-C40 (F4)	mg/kg	120	<120	<120	-	-

VOC's in Soil

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE196092.001	LB180271.004	Monocyclic	Benzene	mg/kg	0.1	1.9	<0.1	2.9	63
		Aromatic	Toluene	mg/kg	0.1	1.8	<0.1	2.9	60
			Ethylbenzene	mg/kg	0.1	2.0	<0.1	2.9	66
			m/p-xylene	mg/kg	0.2	4.2	<0.2	5.8	71
			o-xylene	mg/kg	0.1	2.1	<0.1	2.9	72

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

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

VOC's in Soil (continued)

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE196092.001	LB180271.004	Polycyclic	Naphthalene	mg/kg	0.1	<0.1	<0.1	-	-
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	10.8	6.3	-	108
			d8-toluene (Surrogate)	mg/kg	-	8.7	5.5	-	87
			Bromofluorobenzene (Surrogate)	mg/kg	-	9.6	4.9	-	96
		Totals	Total Xylenes	mg/kg	0.3	6.3	<0.3	-	-
			Total BTEX	mg/kg	0.6	12	<0.6	-	-

Volatile Petroleum Hydrocarbons in Soil

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE196092.001	LB180271.004		TRH C6-C10	mg/kg	25	<25	<25	24.65	72
			TRH C6-C9	mg/kg	20	<20	<20	23.2	68
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	10.8	6.3	-	108
			d8-toluene (Surrogate)	mg/kg	-	8.7	5.5	-	87
			Bromofluorobenzene (Surrogate)	mg/kg	-	9.6	4.9	-	96
		VPH F	Benzene (F0)	mg/kg	0.1	1.9	<0.1	-	-
		Bands	TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	7.25	74

MATRIX SPIKE DUPLICATES

SE196067 R0

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

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

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

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

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

No matrix spike duplicates were required for this job.

Samples analysed as received.

Solid samples expressed on a dry weight basis.

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

*	NATA accreditation does not cover the performance of this service.
**	Indicative data, theoretical holding time exceeded.
-	Sample not analysed for this analyte.
IS	Insufficient sample for analysis.
LNR	Sample listed, but not received.
LOR	Limit of reporting.
QFH	QC result is above the upper tolerance.
QFL	QC result is below the lower tolerance.

①	At least 2 of 3 surrogates are within acceptance criteria.
②	RPD failed acceptance criteria due to sample heterogeneity.
③	Results less than 5 times LOR preclude acceptance criteria for RPD.
④	Recovery failed acceptance criteria due to matrix interference.
⑤	Recovery failed acceptance criteria due to the presence of significant concentration of analyte (i.e. the concentration of analyte exceeds the spike level).
⑥	LOR was raised due to sample matrix interference.
⑦	LOR was raised due to dilution of significantly high concentration of analyte in sample.
⑧	Reanalysis of sample in duplicate confirmed sample heterogeneity and inconsistency of results.
⑨	Recovery failed acceptance criteria due to sample heterogeneity.
⑩	LOR was raised due to high conductivity of the sample (required dilution).
†	Refer to Analytical Report comments for further information.

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source: [Untitled].pdf page: 11 SGS Ref: SE196071_COC

E-MAILED 2/8/19

CHAIN OF CUSTODY & ANALYSIS REQUEST

Page _1__ of _1___

SGS Environmental Services Sydney
Unit 16, 33 Maddox Street
Alexandria NSW 2015
Telephone No: (02) 85940400
Facsimile No: (02) 85940499
Email: au.samplereceipt.sydney@sgs.com

Lab ID Number: *(please quote on correspondence)*

Site: Gran Central, Granville

Company Name:	Golder Associates Pty Ltd	Project Name/No:	Gran Central - 19122955
Address:	Level 8, 40 Mount Street	Purchase Order No:	PO21564
	North Sydney NSW	Results Required Date:	5 day TAT
		Telephone:	0431 063 254
			Fax:
Contact Name:	Frank Yu	Email Results to:	FYu@golder.com.au; sdoyle@golder.com.au
Quotation No:			

SGS ID	Client Sample ID	Sampling Date/ Time	Matrix (Tick as appropriate): Soil Sample	Water Sample	Other	NO. OF CONTAINERS	ANALYSIS REQUESTED: HOLD	HOLD (Freeze)	CL17 SUITE	ASBESTOS WA DOH NEPM	TRH/BTEXN/PAH/HM*8	Notes/Guidelines/LOR/ Special instructions
1	BH04_0.10-0.20	29/7/2019	X			2				X		
	BH04_0.25-0.35	29/7/2019	X			2	X					
	BH04_0.55-0.65	29/7/2019	X			2	X					
2	BH04_1.05-1.15	29/7/2019	X			2			X			
	BH04_1.30-1.35	29/7/2019	X			1	X					
3	BH04_1.40-1.50	29/7/2019	X			2			X			
	BH04_1.50-1.95	29/7/2019	X			1	X					
	BH04_2.80-3.00	29/7/2019	X			1	X					
	BH04_3.00-3.15	29/7/2019	X			1	X					
4	DU1	29/7/2019	X			2			X			
5	Rinsate water	29/7/2019		X		4					X	

Additional Report Formats
- ☐ NEPM
- ☐ CSV
- ☐ ESDAT
- ☐ DQO
- ☐ GO, Guidelines ---------
- ☐ Others _____

SGS EHS Alexandria Laboratory

SE196071 COC
Received: 29 – Jul – 2019

Relinquished By: Frank Yu	Date/Time: 29/7/2019	Received By:	Date/Time: 4/8/19 29/7/19 5:50
Relinquished By:	Date/Time:	Received By:	Date/Time:
Samples Intact: Yes / No	Temperature: 1-8 °C	Sample Security Sealed: Yes / No	Hazards: *e.g. may contain Asbestos*

Comments / Subcontracting details: COC Golder review: SPD 2/8/2019

SAMPLE RECEIPT ADVICE

SE196071

CLIENT DETAILS

Contact	Frank Yu
Client	GOLDER ASSOCIATES PTY LTD
Address	Level 8, 40 Mount Street North Sydney NSW 2065
Telephone	0431 063 254
Facsimile	02 9478 3901
Email	FYu@golder.com.au
Project	**19122955 Gran Central**
Order Number	**PO21564**
Samples	5

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
Samples Received	Mon 29/7/2019
Report Due	Fri 9/8/2019
SGS Reference	**SE196071**

SUBMISSION DETAILS

This is to confirm that 5 samples were received on Monday 29/7/2019. Results are expected to be ready by COB Friday 9/8/2019. Please quote SGS reference SE196071 when making enquiries. Refer below for details relating to sample integrity upon receipt.

Samples clearly labelled	Yes	Complete documentation received	Yes
Sample container provider	SGS	Sample cooling method	Ice
Samples received in correct containers	Yes	Sample counts by matrix	4 Soil, 1 Water
Date documentation received	2/8/18@10:20am	Type of documentation received	COC
Samples received in good order	Yes	Samples received without headspace	Yes
Sample temperature upon receipt	4.8°C	Sufficient sample for analysis	Yes
Turnaround time requested	Standard		

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

COMMENTS

6 samples have been placed on hold as no tests have been assigned for them by the client. These samples will not be processed.

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SAMPLE RECEIPT ADVICE

SE196071

CLIENT DETAILS

Client GOLDER ASSOCIATES PTY LTD

Project 19122955 Gran Central

SUMMARY OF ANALYSIS

No.	Sample ID	OC Pesticides in Soil	OP Pesticides in Soil	PAH (Polynuclear Aromatic Hydrocarbons) in Soil	PCBs in Soil	Total Recoverable Elements in Soil/Waste	TRH (Total Recoverable Hydrocarbons) in Soil	VOC's in Soil	Volatile Petroleum Hydrocarbons in Soil
002	BH04_1.05-1.15	29	14	26	11	7	10	11	7
003	BH04_1.40-1.50	29	14	26	11	7	10	11	7
004	DU1	29	14	26	11	7	10	11	7

CONTINUED OVERLEAF

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

SAMPLE RECEIPT ADVICE

SE196071

CLIENT DETAILS

Client GOLDER ASSOCIATES PTY LTD

Project 19122955 Gran Central

SUMMARY OF ANALYSIS

No.	Sample ID	Fibre Identification in soil	Gravimetric Determination of Asbestos in Soil	Mercury in Soil	Moisture Content	VOCs in Water
001	BH04_0.10-0.20	2	9	-	-	-
002	BH04_1.05-1.15	-	-	1	1	-
003	BH04_1.40-1.50	-	-	1	1	-
004	DU1	-	-	1	1	-
005	Rinsate Water	-	-	-	-	11

CONTINUED OVERLEAF

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

SAMPLE RECEIPT ADVICE

SE196071

CLIENT DETAILS

Client GOLDER ASSOCIATES PTY LTD

Project 19122955 Gran Central

SUMMARY OF ANALYSIS

No.	Sample ID	Mercury (dissolved) in Water	PAH (Polynuclear Aromatic Hydrocarbons) in Water	Trace Metals (Dissolved) in Water by ICPMS	TRH (Total Recoverable Hydrocarbons) in Water	Volatile Petroleum Hydrocarbons in Water
005	Rinsate Water	1	22	7	10	7

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

ANALYTICAL REPORT

Accreditation No. 2562

CLIENT DETAILS

Contact	Frank Yu
Client	GOLDER ASSOCIATES PTY LTD
Address	Level 8, 40 Mount Street North Sydney NSW 2065
Telephone	0431 063 254
Facsimile	02 9478 3901
Email	FYu@golder.com.au
Project	**19122955 Gran Central**
Order Number	**PO21564**
Samples	5

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
SGS Reference	**SE196071 R0**
Date Received	29/7/2019
Date Reported	12/8/2019

COMMENTS

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

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

Asbestos analysed by Approved Identifier Ravee Sivasubramaniam .

SIGNATORIES

Akheeqar Beniameen
Chemist

Bennet Lo
Senior Organic Chemist/Metals Chemist

Dong Liang
Metals/Inorganics Team Leader

Kamrul Ahsan
Senior Chemist

Ly Kim Ha
Organic Section Head

Ravee Sivasubramaniam
Hygiene Team Leader

VOC's in Soil [AN433] Tested: 6/8/2019

PARAMETER	UOM	LOR	BH04_1.05-1.15 SOIL - 29/7/2019 SE196071.002	BH04_1.40-1.50 SOIL - 29/7/2019 SE196071.003	DU1 SOIL - 29/7/2019 SE196071.004
Benzene	mg/kg	0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	0.1	<0.1	<0.1	<0.1
Ethylbenzene	mg/kg	0.1	<0.1	<0.1	<0.1
m/p-xylene	mg/kg	0.2	<0.2	<0.2	<0.2
o-xylene	mg/kg	0.1	<0.1	<0.1	<0.1
Total Xylenes	mg/kg	0.3	<0.3	<0.3	<0.3
Total BTEX	mg/kg	0.6	<0.6	<0.6	<0.6
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1

Volatile Petroleum Hydrocarbons in Soil [AN433] Tested: 6/8/2019

PARAMETER	UOM	LOR	BH04_1.05-1.15 SOIL - 29/7/2019 SE196071.002	BH04_1.40-1.50 SOIL - 29/7/2019 SE196071.003	DU1 SOIL - 29/7/2019 SE196071.004
TRH C6-C9	mg/kg	20	<20	<20	<20
Benzene (F0)	mg/kg	0.1	<0.1	<0.1	<0.1
TRH C6-C10	mg/kg	25	<25	<25	<25
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	<25

TRH (Total Recoverable Hydrocarbons) in Soil [AN403] Tested: 6/8/2019

PARAMETER	UOM	LOR	BH04_1.05-1.15 SOIL - 29/7/2019 SE196071.002	BH04_1.40-1.50 SOIL - 29/7/2019 SE196071.003	DU1 SOIL - 29/7/2019 SE196071.004
TRH C10-C14	mg/kg	20	<20	<20	<20
TRH C15-C28	mg/kg	45	**69**	<45	<45
TRH C29-C36	mg/kg	45	**87**	<45	<45
TRH C37-C40	mg/kg	100	<100	<100	<100
TRH >C10-C16	mg/kg	25	<25	<25	<25
TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25	<25	<25
TRH >C16-C34 (F3)	mg/kg	90	**140**	<90	<90
TRH >C34-C40 (F4)	mg/kg	120	<120	<120	<120
TRH C10-C36 Total	mg/kg	110	**160**	<110	<110
TRH C10-C40 Total (F bands)	mg/kg	210	<210	<210	<210

PAH (Polynuclear Aromatic Hydrocarbons) in Soil [AN420] Tested: 6/8/2019

PARAMETER	UOM	LOR	BH04_1.05-1.15 SOIL - 29/7/2019 SE196071.002	BH04_1.40-1.50 SOIL - 29/7/2019 SE196071.003	DU1 SOIL - 29/7/2019 SE196071.004
Naphthalene	mg/kg	0.1	**0.1**	<0.1	<0.1
2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1
1-methylnaphthalene	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	0.1	**0.4**	<0.1	<0.1
Anthracene	mg/kg	0.1	**0.1**	<0.1	<0.1
Fluoranthene	mg/kg	0.1	**1.2**	<0.1	<0.1
Pyrene	mg/kg	0.1	**1.3**	<0.1	<0.1
Benzo(a)anthracene	mg/kg	0.1	**0.7**	<0.1	<0.1
Chrysene	mg/kg	0.1	**0.7**	<0.1	<0.1
Benzo(b&j)fluoranthene	mg/kg	0.1	**1.2**	<0.1	<0.1
Benzo(k)fluoranthene	mg/kg	0.1	**0.5**	<0.1	<0.1
Benzo(a)pyrene	mg/kg	0.1	**1.0**	<0.1	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	**0.6**	<0.1	<0.1
Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.1	**0.6**	<0.1	<0.1
Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.2	**1.3**	<0.2	<0.2
Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	**1.4**	<0.3	<0.3
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	**1.4**	<0.2	<0.2
Total PAH (18)	mg/kg	0.8	**8.4**	<0.8	<0.8
Total PAH (NEPM/WHO 16)	mg/kg	0.8	**8.4**	<0.8	<0.8

OC Pesticides in Soil [AN420] Tested: 6/8/2019

PARAMETER	UOM	LOR	BH04_1.05-1.15 SOIL - 29/7/2019 SE196071.002	BH04_1.40-1.50 SOIL - 29/7/2019 SE196071.003	DU1 SOIL - 29/7/2019 SE196071.004
Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	<0.1
Alpha BHC	mg/kg	0.1	<0.1	<0.1	<0.1
Lindane	mg/kg	0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	0.1	<0.1	<0.1	<0.1
Beta BHC	mg/kg	0.1	<0.1	<0.1	<0.1
Delta BHC	mg/kg	0.1	<0.1	<0.1	<0.1
Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	<0.1
o,p'-DDE	mg/kg	0.1	<0.1	<0.1	<0.1
Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	<0.2
Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	<0.1
Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	<0.1
trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	<0.1
p,p'-DDE	mg/kg	0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	0.2	<0.2	<0.2	<0.2
Endrin	mg/kg	0.2	<0.2	<0.2	<0.2
o,p'-DDD	mg/kg	0.1	<0.1	<0.1	<0.1
o,p'-DDT	mg/kg	0.1	<0.1	<0.1	<0.1
Beta Endosulfan	mg/kg	0.2	<0.2	<0.2	<0.2
p,p'-DDD	mg/kg	0.1	<0.1	<0.1	<0.1
p,p'-DDT	mg/kg	0.1	<0.1	<0.1	<0.1
Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	0.1	<0.1	<0.1	<0.1
Endrin Ketone	mg/kg	0.1	<0.1	<0.1	<0.1
Isodrin	mg/kg	0.1	<0.1	<0.1	<0.1
Mirex	mg/kg	0.1	<0.1	<0.1	<0.1
Total CLP OC Pesticides	mg/kg	1	<1	<1	<1

OP Pesticides in Soil [AN420] Tested: 6/8/2019

PARAMETER	UOM	LOR	BH04_1.05-1.15 SOIL - 29/7/2019 SE196071.002	BH04_1.40-1.50 SOIL - 29/7/2019 SE196071.003	DU1 SOIL - 29/7/2019 SE196071.004
Dichlorvos	mg/kg	0.5	<0.5	<0.5	<0.5
Dimethoate	mg/kg	0.5	<0.5	<0.5	<0.5
Diazinon (Dimpylate)	mg/kg	0.5	<0.5	<0.5	<0.5
Fenitrothion	mg/kg	0.2	<0.2	<0.2	<0.2
Malathion	mg/kg	0.2	<0.2	<0.2	<0.2
Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2	<0.2	<0.2
Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2	<0.2	<0.2
Bromophos Ethyl	mg/kg	0.2	<0.2	<0.2	<0.2
Methidathion	mg/kg	0.5	<0.5	<0.5	<0.5
Ethion	mg/kg	0.2	<0.2	<0.2	<0.2
Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	<0.2	<0.2
Total OP Pesticides*	mg/kg	1.7	<1.7	<1.7	<1.7

PCBs in Soil [AN420] Tested: 6/8/2019

PARAMETER	UOM	LOR	BH04_1.05-1.15 SOIL - 29/7/2019 SE196071.002	BH04_1.40-1.50 SOIL - 29/7/2019 SE196071.003	DU1 SOIL - 29/7/2019 SE196071.004
Arochlor 1016	mg/kg	0.2	<0.2	<0.2	<0.2
Arochlor 1221	mg/kg	0.2	<0.2	<0.2	<0.2
Arochlor 1232	mg/kg	0.2	<0.2	<0.2	<0.2
Arochlor 1242	mg/kg	0.2	<0.2	<0.2	<0.2
Arochlor 1248	mg/kg	0.2	<0.2	<0.2	<0.2
Arochlor 1254	mg/kg	0.2	<0.2	<0.2	<0.2
Arochlor 1260	mg/kg	0.2	<0.2	<0.2	<0.2
Arochlor 1262	mg/kg	0.2	<0.2	<0.2	<0.2
Arochlor 1268	mg/kg	0.2	<0.2	<0.2	<0.2
Total PCBs (Arochlors)	mg/kg	1	<1	<1	<1

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES [AN040/AN320] Tested: 6/8/2019

PARAMETER	UOM	LOR	BH04_1.05-1.15 SOIL - 29/7/2019 SE196071.002	BH04_1.40-1.50 SOIL - 29/7/2019 SE196071.003	DU1 SOIL - 29/7/2019 SE196071.004
Arsenic, As	mg/kg	1	**8**	**7**	**7**
Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	<0.3
Chromium, Cr	mg/kg	0.5	**24**	**11**	**22**
Copper, Cu	mg/kg	0.5	**3.4**	**3.8**	**3.4**
Lead, Pb	mg/kg	1	**14**	**11**	**14**
Nickel, Ni	mg/kg	0.5	<0.5	<0.5	<0.5
Zinc, Zn	mg/kg	2	**5.8**	**3.5**	**5.4**

Mercury in Soil [AN312] Tested: 6/8/2019

PARAMETER	UOM	LOR	BH04_1.05-1.15 SOIL - 29/7/2019 SE196071.002	BH04_1.40-1.50 SOIL - 29/7/2019 SE196071.003	DU1 SOIL - 29/7/2019 SE196071.004
Mercury	mg/kg	0.05	<0.05	<0.05	<0.05

Moisture Content [AN002] Tested: 6/8/2019

PARAMETER	UOM	LOR	BH04_1.05-1.15 SOIL - 29/7/2019 SE196071.002	BH04_1.40-1.50 SOIL - 29/7/2019 SE196071.003	DU1 SOIL - 29/7/2019 SE196071.004
% Moisture	%w/w	0.5	**14**	**18**	**21**

Fibre Identification in soil [AN602] Tested: 8/8/2019

PARAMETER	UOM	LOR	BH04_0.10-0.20 SOIL - 29/7/2019 SE196071.001
Asbestos Detected	No unit	-	No
Estimated Fibres*	%w/w	0.01	<0.01

VOCs in Water [AN433] Tested: 6/8/2019

PARAMETER	UOM	LOR	Rinsate Water WATER - 29/7/2019 SE196071.005
Benzene	µg/L	0.5	<0.5
Toluene	µg/L	0.5	<0.5
Ethylbenzene	µg/L	0.5	<0.5
m/p-xylene	µg/L	1	<1
o-xylene	µg/L	0.5	<0.5
Total Xylenes	µg/L	1.5	<1.5
Total BTEX	µg/L	3	<3
Naphthalene	µg/L	0.5	<0.5

Volatile Petroleum Hydrocarbons in Water [AN433] Tested: 6/8/2019

PARAMETER	UOM	LOR	Rinsate Water WATER - 29/7/2019 SE196071.005
TRH C6-C9	µg/L	40	<40
Benzene (F0)	µg/L	0.5	<0.5
TRH C6-C10	µg/L	50	<50
TRH C6-C10 minus BTEX (F1)	µg/L	50	<50

TRH (Total Recoverable Hydrocarbons) in Water [AN403] Tested: 6/8/2019

PARAMETER	UOM	LOR	Rinsate Water WATER - 29/7/2019 SE196071.005
TRH C10-C14	µg/L	50	<50
TRH C15-C28	µg/L	200	<200
TRH C29-C36	µg/L	200	<200
TRH C37-C40	µg/L	200	<200
TRH >C10-C16	µg/L	60	<60
TRH >C16-C34 (F3)	µg/L	500	<500
TRH >C34-C40 (F4)	µg/L	500	<500
TRH C10-C36	µg/L	450	<450
TRH C10-C40	µg/L	650	<650
TRH >C10-C16 - Naphthalene (F2)	µg/L	60	<60

PAH (Polynuclear Aromatic Hydrocarbons) in Water [AN420] Tested: 6/8/2019

PARAMETER	UOM	LOR	Rinsate Water WATER - 29/7/2019 SE196071.005
Naphthalene	µg/L	0.1	<0.1
2-methylnaphthalene	µg/L	0.1	<0.1
1-methylnaphthalene	µg/L	0.1	<0.1
Acenaphthylene	µg/L	0.1	<0.1
Acenaphthene	µg/L	0.1	<0.1
Fluorene	µg/L	0.1	<0.1
Phenanthrene	µg/L	0.1	<0.1
Anthracene	µg/L	0.1	<0.1
Fluoranthene	µg/L	0.1	<0.1
Pyrene	µg/L	0.1	<0.1
Benzo(a)anthracene	µg/L	0.1	<0.1
Chrysene	µg/L	0.1	<0.1
Benzo(b&j)fluoranthene	µg/L	0.1	<0.1
Benzo(k)fluoranthene	µg/L	0.1	<0.1
Benzo(a)pyrene	µg/L	0.1	<0.1
Indeno(1,2,3-cd)pyrene	µg/L	0.1	<0.1
Dibenzo(ah)anthracene	µg/L	0.1	<0.1
Benzo(ghi)perylene	µg/L	0.1	<0.1
Total PAH (18)	µg/L	1	<1

Trace Metals (Dissolved) in Water by ICPMS [AN318] Tested: 6/8/2019

PARAMETER	UOM	LOR	Rinsate Water WATER - 29/7/2019 SE196071.005
Arsenic, As	µg/L	1	<1
Cadmium, Cd	µg/L	0.1	<0.1
Chromium, Cr	µg/L	1	<1
Copper, Cu	µg/L	1	<1
Lead, Pb	µg/L	1	<1
Nickel, Ni	µg/L	1	<1
Zinc, Zn	µg/L	5	<5

Mercury (dissolved) in Water [AN311(Perth)/AN312] Tested: 6/8/2019

PARAMETER	UOM	LOR	Rinsate Water WATER - 29/7/2019 SE196071.005
Mercury	mg/L	0.0001	<0.0001

METHOD	METHODOLOGY SUMMARY
AN002	The test is carried out by drying (at either 40°C or 105°C) a known mass of sample in a weighed evaporating basin. After fully dry the sample is re-weighed. Samples such as sludge and sediment having high percentages of moisture will take some time in a drying oven for complete removal of water.
AN020	Unpreserved water sample is filtered through a 0.45µm membrane filter and acidified with nitric acid similar to APHA3030B.
AN040/AN320	A portion of sample is digested with nitric acid to decompose organic matter and hydrochloric acid to complete the digestion of metals. The digest is then analysed by ICP OES with metals results reported on the dried sample basis. Based on USEPA method 200.8 and 6010C.
AN040	A portion of sample is digested with Nitric acid to decompose organic matter and Hydrochloric acid to complete the digestion of metals and then filtered for analysis by ASS or ICP as per USEPA Method 200.8.
AN311(Perth)/AN312	Mercury by Cold Vapour AAS in Waters: Mercury ions are reduced by stannous chloride reagent in acidic solution to elemental mercury. This mercury vapour is purged by nitrogen into a cold cell in an atomic absorption spectrometer or mercury analyser. Quantification is made by comparing absorbances to those of the calibration standards. Reference APHA 3112/3500.
AN312	Mercury by Cold Vapour AAS in Soils: After digestion with nitric acid, hydrogen peroxide and hydrochloric acid , mercury ions are reduced by stannous chloride reagent in acidic solution to elemental mercury. This mercury vapour is purged by nitrogen into a cold cell in an atomic absorption spectrometer or mercury analyser . Quantification is made by comparing absorbances to those of the calibration standards. Reference APHA 3112/3500
AN318	Determination of elements at trace level in waters by ICP-MS technique, in accordance with USEPA 6020A.
AN403	Total Recoverable Hydrocarbons: Determination of Hydrocarbons by gas chromatography after a solvent extraction. Detection is by flame ionisation detector (FID) that produces an electronic signal in proportion to the combustible matter passing through it. Total Recoverable Hydrocarbons (TRH) are routinely reported as four alkane groupings based on the carbon chain length of the compounds: C6-C9, C10-C14, C15-C28 and C29-C36 and in recognition of the NEPM 1999 (2013), >C10-C16 (F2), >C16-C34 (F3) and >C34-C40 (F4). F2 is reported directly and also corrected by subtracting Naphthalene (from VOC method AN433) where available.
AN403	Additionally, the volatile C6-C9 fraction may be determined by a purge and trap technique and GC/MS because of the potential for volatiles loss. Total Recoverable Hydrocarbons - Silica (TRH-Si) follows the same method of analysis after silica gel cleanup of the solvent extract. Aliphatic/Aromatic Speciation follows the same method of analysis after fractionation of the solvent extract over silica with differential polarity of the eluent solvents .
AN403	The GC/FID method is not well suited to the analysis of refined high boiling point materials (ie lubricating oils or greases) but is particularly suited for measuring diesel, kerosene and petrol if care to control volatility is taken. This method will detect naturally occurring hydrocarbons, lipids, animal fats, phenols and PAHs if they are present at sufficient levels, dependent on the use of specific cleanup/fractionation techniques. Reference USEPA 3510B, 8015B.
AN420	(SVOCs) including OC, OP, PCB, Herbicides, PAH, Phthalates and Speciated Phenols (etc) in soils, sediments and waters are determined by GCMS/ECD technique following appropriate solvent extraction process (Based on USEPA 3500C and 8270D).
AN420	SVOC Compounds: Semi-Volatile Organic Compounds (SVOCs) including OC, OP, PCB, Herbicides, PAH, Phthalates and Speciated Phenols in soils, sediments and waters are determined by GCMS /ECD technique following appropriate solvent extraction process (Based on USEPA 3500C and 8270D).
AN433	VOCs and C6-C9 Hydrocarbons by GC-MS P&T: VOC`s are volatile organic compounds. The sample is presented to a gas chromatograph via a purge and trap (P&T) concentrator and autosampler and is detected with a Mass Spectrometer (MSD). Solid samples are initially extracted with methanol whilst liquid samples are processed directly. References: USEPA 5030B, 8020A, 8260.
AN602	Qualitative identification of chrysotile, amosite and crocidolite in bulk samples by polarised light microscopy (PLM) in conjunction with dispersion staining (DS). AS4964 provides the basis for this document. Unequivocal identification of the asbestos minerals present is made by obtaining sufficient diagnostic `clues`, which provide a reasonable degree of certainty, dispersion staining is a mandatory `clue` for positive identification. If sufficient `clues` are absent, then positive identification of asbestos is not possible. This procedure requires removal of suspect fibres/bundles from the sample which cannot be returned.
AN602	Fibres/material that cannot be unequivocably identified as one of the three asbestos forms, will be reported as unknown mineral fibres (umf) The fibres detected may or may not be asbestos fibres.
AN602	AS4964.2004 Method for the Qualitative Identification of Asbestos in Bulk Samples, Section 8.4, Trace Analysis Criteria, Note 4 states:"Depending upon sample condition and fibre type, the detection limit of this technique has been found to lie generally in the range of 1 in 1,000 to 1 in 10,000 parts by weight, equivalent to 1 to 0.1 g/kg."

AN602	The sample can be reported “no asbestos found at the reporting limit of 0.1 g/kg” (<0.01%w/w) where AN602 section 4.5 of this method has been followed, and if- (a) no trace asbestos fibres have been detected (i.e. no ‘respirable’ fibres): (b) the estimated weight of non-respirable asbestos fibre bundles and/or the estimated weight of asbestos in asbestos-containing materials are found to be less than 0.1g/kg: and (c) these non-respirable asbestos fibre bundles and/or the asbestos containing materials are only visible under stereo-microscope viewing conditions.

FOOTNOTES

*	NATA accreditation does not cover the performance of this service.	-	Not analysed.	UOM	Unit of Measure.
		NVL	Not validated.	LOR	Limit of Reporting.
**	Indicative data, theoretical holding time exceeded.	IS	Insufficient sample for analysis.	↑↓	Raised/lowered Limit of Reporting.
		LNR	Sample listed, but not received.		

Unless it is reported that sampling has been performed by SGS, the samples have been analysed as received.
Solid samples expressed on a dry weight basis.

Where "Total" analyte groups are reported (for example, Total PAHs, Total OC Pesticides) the total will be calculated as the sum of the individual analytes, with those analytes that are reported as <LOR being assumed to be zero. The summed (Total) limit of reporting is calculated by summing the individual analyte LORs and dividing by two. For example, where 16 individual analytes are being summed and each has an LOR of 0.1 mg/kg, the "Totals" LOR will be 1.6 / 2 (0.8 mg/kg). Where only 2 analytes are being summed, the " Total" LOR will be the sum of those two LORs.

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

If reported, measurement uncertainty follow the ± sign after the analytical result and is expressed as the expanded uncertainty calculated using a coverage factor of 2, providing a level of confidence of approximately 95%, unless stated otherwise in the comments section of this report.

Results reported for samples tested under test methods with codes starting with ARS-SOP, radionuclide or gross radioactivity concentrations are expressed in becquerel (Bq) per unit of mass or volume or per wipe as stated on the report. Becquerel is the SI unit for activity and equals one nuclear transformation per second.
Note that in terms of units of radioactivity:

a. 1 Bq is equivalent to 27 pCi
b. 37 MBq is equivalent to 1 mCi

For results reported for samples tested under test methods with codes starting with ARS-SOP, less than (<) values indicate the detection limit for each radionuclide or parameter for the measurement system used. The respective detection limits have been calculated in accordance with ISO 11929.

The QC and MU criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here: www.sgs.com.au.pv.sgsvr/en-gb/environment.

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ANALYTICAL REPORT

Accreditation No. 2562

CLIENT DETAILS

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Facsimile	02 9478 3901
Email	FYu@golder.com.au
Project	**19122955 Gran Central**
Order Number	**PO21564**
Samples	1

LABORATORY DETAILS

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SGS Reference	**SE196071 R0**
Date Received	29 Jul 2019
Date Reported	12 Aug 2019

COMMENTS

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

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

Asbestos analysed by Approved Identifier Ravee Sivasubramaniam .

SIGNATORIES

Akheeqar Beniameen
Chemist

Bennet Lo
Senior Organic Chemist/Metals Chemis

Dong Liang
Metals/Inorganics Team Leader

Kamrul Ahsan
Senior Chemist

Ly Kim Ha
Organic Section Head

Ravee Sivasubramaniam
Hygiene Team Leader

ANALYTICAL REPORT

RESULTS

Fibre Identification in soil — Method AN602

Laboratory Reference	Client Reference	Matrix	Sample Description	Date Sampled	Fibre Identification	Est.%w/w*
SE196071.001	BH04_0.10-0.20	Soil	166g Clay,Sand,Rocks	29 Jul 2019	No Asbestos Found	<0.01

METHOD SUMMARY

SE196071 R0

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

FOOTNOTES

Amosite	-	Brown Asbestos	NA	-	Not Analysed
Chrysotile	-	White Asbestos	LNR	-	Listed, Not Required
Crocidolite	-	Blue Asbestos	*	-	NATA accreditation does not cover the performance of this service .
Amphiboles	-	Amosite and/or Crocidolite	**	-	Indicative data, theoretical holding time exceeded.

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

Unless it is reported that sampling has been performed by SGS, the samples have been analysed as received.

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

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

The QC and MU criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here: www.sgs.com.au.pv.sgsvr/en-gb/environment.

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STATEMENT OF QA/QC PERFORMANCE

SE196071 R0

CLIENT DETAILS

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Address	Level 8, 40 Mount Street North Sydney NSW 2065
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Project	**19122955 Gran Central**
Order Number	**PO21564**
Samples	5

LABORATORY DETAILS

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Email	au.environmental.sydney@sgs.com
SGS Reference	**SE196071 R0**
Date Received	29 Jul 2019
Date Reported	14 Aug 2019

COMMENTS

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

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

All Data Quality Objectives were met with the exception of the following:

Extraction Date	PAH (Polynuclear Aromatic Hydrocarbons) in Water	1 item
	TRH (Total Recoverable Hydrocarbons) in Water	1 item
	VOCs in Water	1 item
	Volatile Petroleum Hydrocarbons in Water	1 item
METHOD BLANK	VOCs in Water	2 items
	Volatile Petroleum Hydrocarbons in Water	3 items
Matrix Spike	Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES	4 items

SAMPLE SUMMARY

Samples clearly labelled	Yes	Complete documentation received	Yes
Sample container provider	SGS	Sample cooling method	Ice
Samples received in correct containers	Yes	Sample counts by matrix	4 Soil, 1 Water
Date documentation received	2/8/18@10:20am	Type of documentation received	COC
Samples received in good order	Yes	Samples received without headspace	Yes
Sample temperature upon receipt	4.8°C	Sufficient sample for analysis	Yes
Turnaround time requested	Standard		

HOLDING TIME SUMMARY

SE196071 R0

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

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

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

Fibre Identification in soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH04_0.10-0.20	SE196071.001	LB180495	29 Jul 2019	29 Jul 2019	28 Jul 2020	08 Aug 2019	28 Jul 2020	09 Aug 2019

Mercury (dissolved) in Water

Method: ME-(AU)-[ENV]AN311(Perth)/AN312

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
Rinsate Water	SE196071.005	LB180259	29 Jul 2019	29 Jul 2019	26 Aug 2019	06 Aug 2019	26 Aug 2019	06 Aug 2019

Mercury in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH04_1.05-1.15	SE196071.002	LB180332	29 Jul 2019	29 Jul 2019	26 Aug 2019	06 Aug 2019	26 Aug 2019	09 Aug 2019
BH04_1.40-1.50	SE196071.003	LB180332	29 Jul 2019	29 Jul 2019	26 Aug 2019	06 Aug 2019	26 Aug 2019	09 Aug 2019
DU1	SE196071.004	LB180332	29 Jul 2019	29 Jul 2019	26 Aug 2019	06 Aug 2019	26 Aug 2019	09 Aug 2019

Moisture Content

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH04_1.05-1.15	SE196071.002	LB180273	29 Jul 2019	29 Jul 2019	12 Aug 2019	06 Aug 2019	11 Aug 2019	07 Aug 2019
BH04_1.40-1.50	SE196071.003	LB180273	29 Jul 2019	29 Jul 2019	12 Aug 2019	06 Aug 2019	11 Aug 2019	07 Aug 2019
DU1	SE196071.004	LB180273	29 Jul 2019	29 Jul 2019	12 Aug 2019	06 Aug 2019	11 Aug 2019	07 Aug 2019

OC Pesticides in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH04_1.05-1.15	SE196071.002	LB180272	29 Jul 2019	29 Jul 2019	12 Aug 2019	06 Aug 2019	15 Sep 2019	12 Aug 2019
BH04_1.40-1.50	SE196071.003	LB180272	29 Jul 2019	29 Jul 2019	12 Aug 2019	06 Aug 2019	15 Sep 2019	12 Aug 2019
DU1	SE196071.004	LB180272	29 Jul 2019	29 Jul 2019	12 Aug 2019	06 Aug 2019	15 Sep 2019	12 Aug 2019

OP Pesticides in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH04_1.05-1.15	SE196071.002	LB180272	29 Jul 2019	29 Jul 2019	12 Aug 2019	06 Aug 2019	15 Sep 2019	09 Aug 2019
BH04_1.40-1.50	SE196071.003	LB180272	29 Jul 2019	29 Jul 2019	12 Aug 2019	06 Aug 2019	15 Sep 2019	09 Aug 2019
DU1	SE196071.004	LB180272	29 Jul 2019	29 Jul 2019	12 Aug 2019	06 Aug 2019	15 Sep 2019	09 Aug 2019

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH04_1.05-1.15	SE196071.002	LB180272	29 Jul 2019	29 Jul 2019	12 Aug 2019	06 Aug 2019	15 Sep 2019	09 Aug 2019
BH04_1.40-1.50	SE196071.003	LB180272	29 Jul 2019	29 Jul 2019	12 Aug 2019	06 Aug 2019	15 Sep 2019	09 Aug 2019
DU1	SE196071.004	LB180272	29 Jul 2019	29 Jul 2019	12 Aug 2019	06 Aug 2019	15 Sep 2019	09 Aug 2019

PAH (Polynuclear Aromatic Hydrocarbons) in Water

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
Rinsate Water	SE196071.005	LB180241	29 Jul 2019	29 Jul 2019	05 Aug 2019	06 Aug 2019†	15 Sep 2019	07 Aug 2019

PCBs in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH04_1.05-1.15	SE196071.002	LB180272	29 Jul 2019	29 Jul 2019	12 Aug 2019	06 Aug 2019	15 Sep 2019	12 Aug 2019
BH04_1.40-1.50	SE196071.003	LB180272	29 Jul 2019	29 Jul 2019	12 Aug 2019	06 Aug 2019	15 Sep 2019	12 Aug 2019
DU1	SE196071.004	LB180272	29 Jul 2019	29 Jul 2019	12 Aug 2019	06 Aug 2019	15 Sep 2019	12 Aug 2019

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH04_1.05-1.15	SE196071.002	LB180327	29 Jul 2019	29 Jul 2019	25 Jan 2020	06 Aug 2019	25 Jan 2020	09 Aug 2019
BH04_1.40-1.50	SE196071.003	LB180327	29 Jul 2019	29 Jul 2019	25 Jan 2020	06 Aug 2019	25 Jan 2020	09 Aug 2019
DU1	SE196071.004	LB180327	29 Jul 2019	29 Jul 2019	25 Jan 2020	06 Aug 2019	25 Jan 2020	09 Aug 2019

Trace Metals (Dissolved) in Water by ICPMS

Method: ME-(AU)-[ENV]AN318

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
Rinsate Water	SE196071.005	LB180229	29 Jul 2019	29 Jul 2019	25 Jan 2020	06 Aug 2019	25 Jan 2020	06 Aug 2019

TRH (Total Recoverable Hydrocarbons) in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH04_1.05-1.15	SE196071.002	LB180272	29 Jul 2019	29 Jul 2019	12 Aug 2019	06 Aug 2019	15 Sep 2019	08 Aug 2019
BH04_1.40-1.50	SE196071.003	LB180272	29 Jul 2019	29 Jul 2019	12 Aug 2019	06 Aug 2019	15 Sep 2019	08 Aug 2019
DU1	SE196071.004	LB180272	29 Jul 2019	29 Jul 2019	12 Aug 2019	06 Aug 2019	15 Sep 2019	08 Aug 2019

HOLDING TIME SUMMARY

SE196071 R0

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

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

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

TRH (Total Recoverable Hydrocarbons) in Water

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
Rinsate Water	SE196071.005	LB180241	29 Jul 2019	29 Jul 2019	05 Aug 2019	06 Aug 2019†	15 Sep 2019	07 Aug 2019

VOC's in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH04_1.05-1.15	SE196071.002	LB180271	29 Jul 2019	29 Jul 2019	12 Aug 2019	06 Aug 2019	15 Sep 2019	07 Aug 2019
BH04_1.40-1.50	SE196071.003	LB180271	29 Jul 2019	29 Jul 2019	12 Aug 2019	06 Aug 2019	15 Sep 2019	07 Aug 2019
DU1	SE196071.004	LB180271	29 Jul 2019	29 Jul 2019	12 Aug 2019	06 Aug 2019	15 Sep 2019	07 Aug 2019

VOCs in Water

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
Rinsate Water	SE196071.005	LB180300	29 Jul 2019	29 Jul 2019	05 Aug 2019	06 Aug 2019†	15 Sep 2019	07 Aug 2019

Volatile Petroleum Hydrocarbons in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH04_1.05-1.15	SE196071.002	LB180271	29 Jul 2019	29 Jul 2019	12 Aug 2019	06 Aug 2019	15 Sep 2019	07 Aug 2019
BH04_1.40-1.50	SE196071.003	LB180271	29 Jul 2019	29 Jul 2019	12 Aug 2019	06 Aug 2019	15 Sep 2019	07 Aug 2019
DU1	SE196071.004	LB180271	29 Jul 2019	29 Jul 2019	12 Aug 2019	06 Aug 2019	15 Sep 2019	07 Aug 2019

Volatile Petroleum Hydrocarbons in Water

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
Rinsate Water	SE196071.005	LB180300	29 Jul 2019	29 Jul 2019	05 Aug 2019	06 Aug 2019†	15 Sep 2019	07 Aug 2019

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

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

OC Pesticides in Soil

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Tetrachloro-m-xylene (TCMX) (Surrogate)	BH04_1.05-1.15	SE196071.002	%	60 - 130%	110
	BH04_1.40-1.50	SE196071.003	%	60 - 130%	103
	DU1	SE196071.004	%	60 - 130%	112

OP Pesticides in Soil

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2-fluorobiphenyl (Surrogate)	BH04_1.05-1.15	SE196071.002	%	60 - 130%	94
	BH04_1.40-1.50	SE196071.003	%	60 - 130%	86
	DU1	SE196071.004	%	60 - 130%	92
d14-p-terphenyl (Surrogate)	BH04_1.05-1.15	SE196071.002	%	60 - 130%	90
	BH04_1.40-1.50	SE196071.003	%	60 - 130%	86
	DU1	SE196071.004	%	60 - 130%	92

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2-fluorobiphenyl (Surrogate)	BH04_1.05-1.15	SE196071.002	%	70 - 130%	94
	BH04_1.40-1.50	SE196071.003	%	70 - 130%	86
	DU1	SE196071.004	%	70 - 130%	92
d14-p-terphenyl (Surrogate)	BH04_1.05-1.15	SE196071.002	%	70 - 130%	90
	BH04_1.40-1.50	SE196071.003	%	70 - 130%	86
	DU1	SE196071.004	%	70 - 130%	92
d5-nitrobenzene (Surrogate)	BH04_1.05-1.15	SE196071.002	%	70 - 130%	92
	BH04_1.40-1.50	SE196071.003	%	70 - 130%	86
	DU1	SE196071.004	%	70 - 130%	90

PAH (Polynuclear Aromatic Hydrocarbons) in Water

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2-fluorobiphenyl (Surrogate)	Rinsate Water	SE196071.005	%	40 - 130%	60
d14-p-terphenyl (Surrogate)	Rinsate Water	SE196071.005	%	40 - 130%	76
d5-nitrobenzene (Surrogate)	Rinsate Water	SE196071.005	%	40 - 130%	50

PCBs in Soil

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Tetrachloro-m-xylene (TCMX) (Surrogate)	BH04_1.05-1.15	SE196071.002	%	60 - 130%	110
	BH04_1.40-1.50	SE196071.003	%	60 - 130%	103
	DU1	SE196071.004	%	60 - 130%	112

VOC's in Soil

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	BH04_1.05-1.15	SE196071.002	%	60 - 130%	97
	BH04_1.40-1.50	SE196071.003	%	60 - 130%	93
	DU1	SE196071.004	%	60 - 130%	93
d4-1,2-dichloroethane (Surrogate)	BH04_1.05-1.15	SE196071.002	%	60 - 130%	111
	BH04_1.40-1.50	SE196071.003	%	60 - 130%	113
	DU1	SE196071.004	%	60 - 130%	112
d8-toluene (Surrogate)	BH04_1.05-1.15	SE196071.002	%	60 - 130%	105
	BH04_1.40-1.50	SE196071.003	%	60 - 130%	97
	DU1	SE196071.004	%	60 - 130%	96

VOCs in Water

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	Rinsate Water	SE196071.005	%	40 - 130%	91
d4-1,2-dichloroethane (Surrogate)	Rinsate Water	SE196071.005	%	40 - 130%	107
d8-toluene (Surrogate)	Rinsate Water	SE196071.005	%	40 - 130%	101

Volatile Petroleum Hydrocarbons in Soil

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	BH04_1.05-1.15	SE196071.002	%	60 - 130%	97
	BH04_1.40-1.50	SE196071.003	%	60 - 130%	93
	DU1	SE196071.004	%	60 - 130%	93
d4-1,2-dichloroethane (Surrogate)	BH04_1.05-1.15	SE196071.002	%	60 - 130%	111
	BH04_1.40-1.50	SE196071.003	%	60 - 130%	113
	DU1	SE196071.004	%	60 - 130%	112
d8-toluene (Surrogate)	BH04_1.05-1.15	SE196071.002	%	60 - 130%	105

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

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

Volatile Petroleum Hydrocarbons in Soil (continued) — Method: ME-(AU)-[ENV]AN433

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
d8-toluene (Surrogate)	BH04_1.40-1.50	SE196071.003	%	60 - 130%	97
	DU1	SE196071.004	%	60 - 130%	96

Volatile Petroleum Hydrocarbons in Water — Method: ME-(AU)-[ENV]AN433

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	Rinsate Water	SE196071.005	%	40 - 130%	91
d4-1,2-dichloroethane (Surrogate)	Rinsate Water	SE196071.005	%	60 - 130%	107
d8-toluene (Surrogate)	Rinsate Water	SE196071.005	%	40 - 130%	101

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

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

Mercury (dissolved) in Water

Method: ME-(AU)-[ENV]AN311(Perth)/AN312

Sample Number	Parameter	Units	LOR	Result
LB180259.001	Mercury	mg/L	0.0001	<0.0001

Mercury in Soil

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

Sample Number	Parameter	Units	LOR	Result
LB180332.001	Mercury	mg/kg	0.05	<0.05

OC Pesticides in Soil

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

Sample Number		Parameter	Units	LOR	Result
LB180272.001		Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1
		Alpha BHC	mg/kg	0.1	<0.1
		Lindane	mg/kg	0.1	<0.1
		Heptachlor	mg/kg	0.1	<0.1
		Aldrin	mg/kg	0.1	<0.1
		Beta BHC	mg/kg	0.1	<0.1
		Delta BHC	mg/kg	0.1	<0.1
		Heptachlor epoxide	mg/kg	0.1	<0.1
		Alpha Endosulfan	mg/kg	0.2	<0.2
		Gamma Chlordane	mg/kg	0.1	<0.1
		Alpha Chlordane	mg/kg	0.1	<0.1
		p,p'-DDE	mg/kg	0.1	<0.1
		Dieldrin	mg/kg	0.2	<0.2
		Endrin	mg/kg	0.2	<0.2
		Beta Endosulfan	mg/kg	0.2	<0.2
		p,p'-DDD	mg/kg	0.1	<0.1
		p,p'-DDT	mg/kg	0.1	<0.1
		Endosulfan sulphate	mg/kg	0.1	<0.1
		Endrin Aldehyde	mg/kg	0.1	<0.1
		Methoxychlor	mg/kg	0.1	<0.1
		Endrin Ketone	mg/kg	0.1	<0.1
		Isodrin	mg/kg	0.1	<0.1
		Mirex	mg/kg	0.1	<0.1
	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	101

OP Pesticides in Soil

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

Sample Number		Parameter	Units	LOR	Result
LB180272.001		Dichlorvos	mg/kg	0.5	<0.5
		Dimethoate	mg/kg	0.5	<0.5
		Diazinon (Dimpylate)	mg/kg	0.5	<0.5
		Fenitrothion	mg/kg	0.2	<0.2
		Malathion	mg/kg	0.2	<0.2
		Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2
		Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2
		Bromophos Ethyl	mg/kg	0.2	<0.2
		Methidathion	mg/kg	0.5	<0.5
		Ethion	mg/kg	0.2	<0.2
		Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2
	Surrogates	2-fluorobiphenyl (Surrogate)	%	-	100
		d14-p-terphenyl (Surrogate)	%	-	102

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Sample Number	Parameter	Units	LOR	Result
LB180272.001	Naphthalene	mg/kg	0.1	<0.1
	2-methylnaphthalene	mg/kg	0.1	<0.1
	1-methylnaphthalene	mg/kg	0.1	<0.1
	Acenaphthylene	mg/kg	0.1	<0.1
	Acenaphthene	mg/kg	0.1	<0.1
	Fluorene	mg/kg	0.1	<0.1
	Phenanthrene	mg/kg	0.1	<0.1
	Anthracene	mg/kg	0.1	<0.1

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

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

PAH (Polynuclear Aromatic Hydrocarbons) in Soil (continued)

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

Sample Number		Parameter	Units	LOR	Result
LB180272.001		Fluoranthene	mg/kg	0.1	<0.1
		Pyrene	mg/kg	0.1	<0.1
		Benzo(a)anthracene	mg/kg	0.1	<0.1
		Chrysene	mg/kg	0.1	<0.1
		Benzo(a)pyrene	mg/kg	0.1	<0.1
		Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1
		Dibenzo(ah)anthracene	mg/kg	0.1	<0.1
		Benzo(ghi)perylene	mg/kg	0.1	<0.1
		Total PAH (18)	mg/kg	0.8	<0.8
	Surrogates	d5-nitrobenzene (Surrogate)	%	-	100
		2-fluorobiphenyl (Surrogate)	%	-	100
		d14-p-terphenyl (Surrogate)	%	-	102

PAH (Polynuclear Aromatic Hydrocarbons) in Water

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

Sample Number		Parameter	Units	LOR	Result
LB180241.001		Naphthalene	µg/L	0.1	<0.1
		2-methylnaphthalene	µg/L	0.1	<0.1
		1-methylnaphthalene	µg/L	0.1	<0.1
		Acenaphthylene	µg/L	0.1	<0.1
		Acenaphthene	µg/L	0.1	<0.1
		Fluorene	µg/L	0.1	<0.1
		Phenanthrene	µg/L	0.1	<0.1
		Anthracene	µg/L	0.1	<0.1
		Fluoranthene	µg/L	0.1	<0.1
		Pyrene	µg/L	0.1	<0.1
		Benzo(a)anthracene	µg/L	0.1	<0.1
		Chrysene	µg/L	0.1	<0.1
		Benzo(a)pyrene	µg/L	0.1	<0.1
		Indeno(1,2,3-cd)pyrene	µg/L	0.1	<0.1
		Dibenzo(ah)anthracene	µg/L	0.1	<0.1
		Benzo(ghi)perylene	µg/L	0.1	<0.1
	Surrogates	d5-nitrobenzene (Surrogate)	%	-	64
		2-fluorobiphenyl (Surrogate)	%	-	68
		d14-p-terphenyl (Surrogate)	%	-	80

PCBs in Soil

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

Sample Number		Parameter	Units	LOR	Result
LB180272.001		Arochlor 1016	mg/kg	0.2	<0.2
		Arochlor 1221	mg/kg	0.2	<0.2
		Arochlor 1232	mg/kg	0.2	<0.2
		Arochlor 1242	mg/kg	0.2	<0.2
		Arochlor 1248	mg/kg	0.2	<0.2
		Arochlor 1254	mg/kg	0.2	<0.2
		Arochlor 1260	mg/kg	0.2	<0.2
		Arochlor 1262	mg/kg	0.2	<0.2
		Arochlor 1268	mg/kg	0.2	<0.2
		Total PCBs (Arochlors)	mg/kg	1	<1
	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	101

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

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

Sample Number	Parameter	Units	LOR	Result
LB180327.001	Arsenic, As	mg/kg	1	1
	Cadmium, Cd	mg/kg	0.3	<0.3
	Chromium, Cr	mg/kg	0.5	<0.5
	Copper, Cu	mg/kg	0.5	<0.5
	Nickel, Ni	mg/kg	0.5	<0.5
	Lead, Pb	mg/kg	1	<1
	Zinc, Zn	mg/kg	2	<2.0

Trace Metals (Dissolved) in Water by ICPMS

Method: ME-(AU)-[ENV]AN318

Sample Number	Parameter	Units	LOR

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

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

Trace Metals (Dissolved) in Water by ICPMS (continued)

Method: ME-(AU)-[ENV]AN318

Sample Number	Parameter	Units	LOR	Result
LB180229.001	Arsenic, As	µg/L	1	<1
	Cadmium, Cd	µg/L	0.1	<0.1
	Chromium, Cr	µg/L	1	<1
	Copper, Cu	µg/L	1	<1
	Lead, Pb	µg/L	1	<1
	Nickel, Ni	µg/L	1	<1
	Zinc, Zn	µg/L	5	<5

TRH (Total Recoverable Hydrocarbons) in Soil

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

Sample Number	Parameter	Units	LOR	Result
LB180272.001	TRH C10-C14	mg/kg	20	<20
	TRH C15-C28	mg/kg	45	<45
	TRH C29-C36	mg/kg	45	<45
	TRH C37-C40	mg/kg	100	<100
	TRH C10-C36 Total	mg/kg	110	<110

TRH (Total Recoverable Hydrocarbons) in Water

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

Sample Number	Parameter	Units	LOR	Result
LB180241.001	TRH C10-C14	µg/L	50	<50
	TRH C15-C28	µg/L	200	<200
	TRH C29-C36	µg/L	200	<200
	TRH C37-C40	µg/L	200	<200

VOC's in Soil

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

Sample Number		Parameter	Units	LOR	Result
LB180271.001	Monocyclic Aromatic	Benzene	mg/kg	0.1	<0.1
	Hydrocarbons	Toluene	mg/kg	0.1	<0.1
		Ethylbenzene	mg/kg	0.1	<0.1
		m/p-xylene	mg/kg	0.2	<0.2
		o-xylene	mg/kg	0.1	<0.1
	Polycyclic VOCs	Naphthalene	mg/kg	0.1	<0.1
	Surrogates	d4-1,2-dichloroethane (Surrogate)	%	-	118
		d8-toluene (Surrogate)	%	-	94
		Bromofluorobenzene (Surrogate)	%	-	98
	Totals	Total BTEX	mg/kg	0.6	<0.6

VOCs in Water

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

Sample Number		Parameter	Units	LOR	Result
LB180300.001	Monocyclic Aromatic	Benzene	µg/L	0.5	<0.5
	Hydrocarbons	Toluene	µg/L	0.5	<0.5
		Ethylbenzene	µg/L	0.5	<0.5
		m/p-xylene	µg/L	1	<1
		o-xylene	µg/L	0.5	<0.5
	Polycyclic VOCs	Naphthalene	µg/L	0.5	<0.5
	Surrogates	d4-1,2-dichloroethane (Surrogate)	%	-	106
		d8-toluene (Surrogate)	%	-	105
		Bromofluorobenzene (Surrogate)	%	-	100

Volatile Petroleum Hydrocarbons in Soil

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

Sample Number		Parameter	Units	LOR	Result
LB180271.001		TRH C6-C9	mg/kg	20	<20
	Surrogates	d4-1,2-dichloroethane (Surrogate)	%	-	118

Volatile Petroleum Hydrocarbons in Water

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

Sample Number		Parameter	Units	LOR	Result
LB180300.001		TRH C6-C9	µg/L	40	<40
	Surrogates	d4-1,2-dichloroethane (Surrogate)	%	-	106
		d8-toluene (Surrogate)	%	-	105
		Bromofluorobenzene (Surrogate)	%	-	100

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

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

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

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

Mercury (dissolved) in Water

Method: ME-(AU)-[ENV]AN311(Perth)/AN312

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE196102.009	LB180259.008	Mercury	µg/L	0.0001	<0.0001	0.0000	200	66

Mercury in Soil

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE196071.004	LB180332.014	Mercury	mg/kg	0.05	<0.05	<0.05	200	0

Moisture Content

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE196067.004	LB180273.022	% Moisture	%w/w	0.5	22	18	35	16
SE196071.004	LB180273.026	% Moisture	%w/w	0.5	21	20	35	5
SE196092.004	LB180273.011	% Moisture	%w/w	0.5	0	0	200	0

OC Pesticides in Soil

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE196071.004	LB180272.018		Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	200	0
			Alpha BHC	mg/kg	0.1	<0.1	<0.1	200	0
			Lindane	mg/kg	0.1	<0.1	<0.1	200	0
			Heptachlor	mg/kg	0.1	<0.1	<0.1	200	0
			Aldrin	mg/kg	0.1	<0.1	<0.1	200	0
			Beta BHC	mg/kg	0.1	<0.1	<0.1	200	0
			Delta BHC	mg/kg	0.1	<0.1	<0.1	200	0
			Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	200	0
			o,p'-DDE	mg/kg	0.1	<0.1	<0.1	200	0
			Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	200	0
			Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	200	0
			Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	200	0
			trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	200	0
			p,p'-DDE	mg/kg	0.1	<0.1	<0.1	200	0
			Dieldrin	mg/kg	0.2	<0.2	<0.2	200	0
			Endrin	mg/kg	0.2	<0.2	<0.2	200	0
			o,p'-DDD	mg/kg	0.1	<0.1	<0.1	200	0
			o,p'-DDT	mg/kg	0.1	<0.1	<0.1	200	0
			Beta Endosulfan	mg/kg	0.2	<0.2	<0.2	200	0
			p,p'-DDD	mg/kg	0.1	<0.1	<0.1	200	0
			p,p'-DDT	mg/kg	0.1	<0.1	<0.1	200	0
			Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	200	0
			Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1	200	0
			Methoxychlor	mg/kg	0.1	<0.1	<0.1	200	0
			Endrin Ketone	mg/kg	0.1	<0.1	<0.1	200	0
			Isodrin	mg/kg	0.1	<0.1	<0.1	200	0
			Mirex	mg/kg	0.1	<0.1	<0.1	200	0
			Total CLP OC Pesticides	mg/kg	1	<1	<1	200	0
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.17	0.17	30	1

OP Pesticides in Soil

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE196067.004	LB180272.014	Dichlorvos	mg/kg	0.5	<0.5	<0.5	200	0
		Dimethoate	mg/kg	0.5	<0.5	<0.5	200	0
		Diazinon (Dimpylate)	mg/kg	0.5	<0.5	<0.5	200	0
		Fenitrothion	mg/kg	0.2	<0.2	<0.2	200	0
		Malathion	mg/kg	0.2	<0.2	<0.2	200	0
		Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2	<0.2	200	0
		Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2	<0.2	200	0
		Bromophos Ethyl	mg/kg	0.2	<0.2	<0.2	200	0
		Methidathion	mg/kg	0.5	<0.5	<0.5	200	0
		Ethion	mg/kg	0.2	<0.2	<0.2	200	0
		Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	<0.2	200	0
		Total OP Pesticides*	mg/kg	1.7	<1.7	<1.7	200	0

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

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

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

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

OP Pesticides in Soil (continued)

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE196067.004	LB180272.014	Surrogates	2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.5	30	0
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	30	2

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE196067.004	LB180272.014		Naphthalene	mg/kg	0.1	<0.1	<0.1	200	0
			2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	200	0
			1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	200	0
			Acenaphthylene	mg/kg	0.1	<0.1	<0.1	200	0
			Acenaphthene	mg/kg	0.1	<0.1	<0.1	200	0
			Fluorene	mg/kg	0.1	<0.1	<0.1	200	0
			Phenanthrene	mg/kg	0.1	<0.1	<0.1	200	0
			Anthracene	mg/kg	0.1	<0.1	<0.1	200	0
			Fluoranthene	mg/kg	0.1	<0.1	<0.1	200	0
			Pyrene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(a)anthracene	mg/kg	0.1	<0.1	<0.1	200	0
			Chrysene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(a)pyrene	mg/kg	0.1	<0.1	<0.1	200	0
			Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	200	0
			Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	200	0
			Carcinogenic PAHs, BaP TEQ <LOR=0	mg/kg	0.2	<0.2	<0.2	200	0
			Carcinogenic PAHs, BaP TEQ <LOR=LOR	mg/kg	0.3	<0.3	<0.3	134	0
			Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	mg/kg	0.2	<0.2	<0.2	175	0
			Total PAH (18)	mg/kg	0.8	<0.8	<0.8	200	0
		Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.5	0.5	30	0
			2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.5	30	0
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	30	2

PAH (Polynuclear Aromatic Hydrocarbons) in Water

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE196082.002	LB180241.030		Naphthalene	µg/L	0.1	<0.1	<0.1	200	0
			2-methylnaphthalene	µg/L	0.1	<0.1	<0.1	200	0
			1-methylnaphthalene	µg/L	0.1	<0.1	<0.1	200	0
			Acenaphthylene	µg/L	0.1	<0.1	<0.1	200	0
			Acenaphthene	µg/L	0.1	<0.1	<0.1	200	0
			Fluorene	µg/L	0.1	<0.1	<0.1	200	0
			Phenanthrene	µg/L	0.1	<0.1	<0.1	200	0
			Anthracene	µg/L	0.1	<0.1	<0.1	200	0
			Fluoranthene	µg/L	0.1	<0.1	<0.1	200	0
			Pyrene	µg/L	0.1	<0.1	<0.1	200	0
			Benzo(a)anthracene	µg/L	0.1	<0.1	<0.1	200	0
			Chrysene	µg/L	0.1	<0.1	<0.1	200	0
			Benzo(b&j)fluoranthene	µg/L	0.1	<0.1	<0.1	200	0
			Benzo(k)fluoranthene	µg/L	0.1	<0.1	<0.1	200	0
			Benzo(a)pyrene	µg/L	0.1	<0.1	<0.1	200	0
			Indeno(1,2,3-cd)pyrene	µg/L	0.1	<0.1	<0.1	200	0
			Dibenzo(ah)anthracene	µg/L	0.1	<0.1	<0.1	200	0
			Benzo(ghi)perylene	µg/L	0.1	<0.1	<0.1	200	0
		Surrogates	d5-nitrobenzene (Surrogate)	µg/L	-	0.3	0.3	30	10
			2-fluorobiphenyl (Surrogate)	µg/L	-	0.4	0.4	30	8
			d14-p-terphenyl (Surrogate)	µg/L	-	0.4	0.4	30	13

PCBs in Soil

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE196071.004	LB180272.018	Arochlor 1016	mg/kg	0.2	<0.2	<0.2	200	0
		Arochlor 1221	mg/kg	0.2	<0.2	<0.2	200	0
		Arochlor 1232	mg/kg	0.2	<0.2	<0.2	200	0
		Arochlor 1242	mg/kg	0.2	<0.2	<0.2	200	0
		Arochlor 1248	mg/kg	0.2	<0.2	<0.2	200	0

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

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

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

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

PCBs in Soil (continued)

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE196071.004	LB180272.018		Arochlor 1254	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1260	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1262	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1268	mg/kg	0.2	<0.2	<0.2	200	0
			Total PCBs (Arochlors)	mg/kg	1	<1	<1	200	0
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0	0	30	1

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE196071.004	LB180327.014	Arsenic, As	mg/kg	1	7	10	42	34
		Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	200	0
		Chromium, Cr	mg/kg	0.5	22	30	32	32
		Copper, Cu	mg/kg	0.5	3.4	3.3	45	1
		Nickel, Ni	mg/kg	0.5	<0.5	0.6	135	12
		Lead, Pb	mg/kg	1	14	18	36	25
		Zinc, Zn	mg/kg	2	5.4	6.4	64	17

Trace Metals (Dissolved) in Water by ICPMS

Method: ME-(AU)-[ENV]AN318

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE196102.009	LB180229.012	Arsenic, As	µg/L	1	<1	<1	200	0
		Cadmium, Cd	µg/L	0.1	<0.1	<0.1	200	0
		Chromium, Cr	µg/L	1	<1	<1	200	0
		Copper, Cu	µg/L	1	<1	<1	200	0
		Lead, Pb	µg/L	1	<1	<1	200	0
		Nickel, Ni	µg/L	1	<1	<1	200	0
		Zinc, Zn	µg/L	5	<5	<5	200	0

TRH (Total Recoverable Hydrocarbons) in Soil

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE196067.004	LB180272.014		TRH C10-C14	mg/kg	20	<20	<20	200	0
			TRH C15-C28	mg/kg	45	<45	<45	200	0
			TRH C29-C36	mg/kg	45	<45	<45	200	0
			TRH C37-C40	mg/kg	100	<100	<100	200	0
			TRH C10-C36 Total	mg/kg	110	<110	<110	200	0
			TRH C10-C40 Total (F bands)	mg/kg	210	<210	<210	200	0
		TRH F Bands	TRH >C10-C16	mg/kg	25	<25	<25	200	0
			TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25	<25	200	0
			TRH >C16-C34 (F3)	mg/kg	90	<90	<90	200	0
			TRH >C34-C40 (F4)	mg/kg	120	<120	<120	200	0
SE196071.004	LB180272.018		TRH C10-C14	mg/kg	20	<20	<20	200	0
			TRH C15-C28	mg/kg	45	<45	<45	200	0
			TRH C29-C36	mg/kg	45	<45	<45	200	0
			TRH C37-C40	mg/kg	100	<100	<100	200	0
			TRH C10-C36 Total	mg/kg	110	<110	<110	200	0
			TRH C10-C40 Total (F bands)	mg/kg	210	<210	<210	200	0
		TRH F Bands	TRH >C10-C16	mg/kg	25	<25	<25	200	0
			TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25	<25	200	0
			TRH >C16-C34 (F3)	mg/kg	90	<90	<90	200	0
			TRH >C34-C40 (F4)	mg/kg	120	<120	<120	200	0

TRH (Total Recoverable Hydrocarbons) in Water

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE196053.001	LB180241.014		TRH C10-C14	µg/L	50	<50	<50	200	0
			TRH C15-C28	µg/L	200	<200	<200	200	0
			TRH C29-C36	µg/L	200	<200	<200	200	0
			TRH C37-C40	µg/L	200	<200	<200	200	0
			TRH C10-C36	µg/L	450	<450	<450	200	0
			TRH C10-C40	µg/L	650	<650	<650	200	0
		TRH F Bands	TRH >C10-C16	µg/L	60	<60	<60	200	0
			TRH >C10-C16 - Naphthalene (F2)	µg/L	60	<60	<60	200	0
			TRH >C16-C34 (F3)	µg/L	500	<500	<500	200	0
			TRH >C34-C40 (F4)	µg/L	500	<500	<500	200	0
SE196082.002	LB180241.030		TRH C10-C14	µg/L	50	<50	<50	200	0

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

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

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

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

TRH (Total Recoverable Hydrocarbons) in Water (continued)

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE196082.002	LB180241.030		TRH C15-C28	µg/L	200	<200	<200	200	0
			TRH C29-C36	µg/L	200	<200	<200	200	0
			TRH C37-C40	µg/L	200	<200	<200	200	0
			TRH C10-C36	µg/L	450	<450	<450	200	0
			TRH C10-C40	µg/L	650	<650	<650	200	0
		TRH F Bands	TRH >C10-C16	µg/L	60	<60	<60	200	0
			TRH >C10-C16 - Naphthalene (F2)	µg/L	60	<60	<60	200	0
			TRH >C16-C34 (F3)	µg/L	500	<500	<500	200	0
			TRH >C34-C40 (F4)	µg/L	500	<500	<500	200	0

VOC's in Soil

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE196067.002	LB180271.014	Monocyclic	Benzene	mg/kg	0.1	<0.1	<0.1	200	0
		Aromatic	Toluene	mg/kg	0.1	<0.1	<0.1	200	0
			Ethylbenzene	mg/kg	0.1	<0.1	<0.1	200	0
			m/p-xylene	mg/kg	0.2	<0.2	<0.2	200	0
			o-xylene	mg/kg	0.1	<0.1	<0.1	200	0
		Polycyclic	Naphthalene	mg/kg	0.1	<0.1	<0.1	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	5.9	5.9	50	1
			d8-toluene (Surrogate)	mg/kg	-	5.2	5.3	50	2
			Bromofluorobenzene (Surrogate)	mg/kg	-	4.8	4.9	50	3
		Totals	Total Xylenes	mg/kg	0.3	<0.3	<0.3	200	0
			Total BTEX	mg/kg	0.6	<0.6	<0.6	200	0
SE196071.004	LB180271.020	Monocyclic	Benzene	mg/kg	0.1	<0.1	<0.1	200	0
		Aromatic	Toluene	mg/kg	0.1	<0.1	<0.1	200	0
			Ethylbenzene	mg/kg	0.1	<0.1	<0.1	200	0
			m/p-xylene	mg/kg	0.2	<0.2	<0.2	200	0
			o-xylene	mg/kg	0.1	<0.1	<0.1	200	0
		Polycyclic	Naphthalene	mg/kg	0.1	<0.1	<0.1	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	11.2	11.4	50	2
			d8-toluene (Surrogate)	mg/kg	-	9.6	9.6	50	1
			Bromofluorobenzene (Surrogate)	mg/kg	-	9.3	9.4	50	1
		Totals	Total Xylenes	mg/kg	0.3	<0.3	<0.3	200	0
			Total BTEX	mg/kg	0.6	<0.6	<0.6	200	0

VOCs in Water

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE196053.002	LB180300.022	Monocyclic	Benzene	µg/L	0.5	<0.5	0.6228960813	122	22
		Aromatic	Toluene	µg/L	0.5	<0.5	0.3665303924	178	0
			Ethylbenzene	µg/L	0.5	<0.5	0.2752397894	200	0
			m/p-xylene	µg/L	1	1	1.8493296211	93	32
			o-xylene	µg/L	0.5	<0.5	0.3565379873	195	0
		Polycyclic	Naphthalene	µg/L	0.5	1.6	2.1416665269	57	31
		Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	5.3	5.505	30	4
			d8-toluene (Surrogate)	µg/L	-	5.2	4.956	30	5
			Bromofluorobenzene (Surrogate)	µg/L	-	4.9	4.5725	30	7
SE196094.001	LB180300.023	Monocyclic	Benzene	µg/L	0.5	<0.5	0.0274845529	200	0
		Aromatic	Toluene	µg/L	0.5	<0.5	0.1869563601	200	0
			Ethylbenzene	µg/L	0.5	<0.5	0.0161713977	200	0
			m/p-xylene	µg/L	1	<1	0.0537890219	200	0
			o-xylene	µg/L	0.5	<0.5	0.0215012162	200	0
		Polycyclic	Naphthalene	µg/L	0.5	<0.5	0.2597955373	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	5.4	5.41	30	1
			d8-toluene (Surrogate)	µg/L	-	5.2	5.23	30	1
			Bromofluorobenzene (Surrogate)	µg/L	-	4.5	4.5045	30	0

Volatile Petroleum Hydrocarbons in Soil

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE196067.002	LB180271.014		TRH C6-C10	mg/kg	25	<25	<25	200	0
			TRH C6-C9	mg/kg	20	<20	<20	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	5.9	5.9	30	1
			d8-toluene (Surrogate)	mg/kg	-	5.2	5.3	30	2

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

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

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

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

Volatile Petroleum Hydrocarbons in Soil (continued)

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE196067.002	LB180271.014	Surrogates	Bromofluorobenzene (Surrogate)	mg/kg	-	4.8	4.9	30	3
		VPH F Bands	Benzene (F0)	mg/kg	0.1	<0.1	<0.1	200	0
			TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	200	0
SE196071.004	LB180271.020		TRH C6-C10	mg/kg	25	<25	<25	200	0
			TRH C6-C9	mg/kg	20	<20	<20	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	11.2	11.4	30	2
			d8-toluene (Surrogate)	mg/kg	-	9.6	9.6	30	1
			Bromofluorobenzene (Surrogate)	mg/kg	-	9.3	9.4	30	1
		VPH F Bands	Benzene (F0)	mg/kg	0.1	<0.1	<0.1	200	0
			TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	200	0

Volatile Petroleum Hydrocarbons in Water

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE196053.002	LB180300.024		TRH C6-C10	µg/L	50	<50	3.0470450182	200	0
			TRH C6-C9	µg/L	40	<40	2.1977539509	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	5.3	5.505	30	4
			d8-toluene (Surrogate)	µg/L	-	5.2	4.956	30	5
			Bromofluorobenzene (Surrogate)	µg/L	-	4.9	4.5725	30	7
		VPH F Bands	Benzene (F0)	µg/L	0.5	<0.5	0.6228960813	122	22
			TRH C6-C10 minus BTEX (F1)	µg/L	50	<50	-0.4234888534	200	0
SE196094.001	LB180300.025		TRH C6-C10	µg/L	50	<50	0	200	0
			TRH C6-C9	µg/L	40	<40	0	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	5.4	5.41	30	1
			d8-toluene (Surrogate)	µg/L	-	5.2	5.23	30	1
			Bromofluorobenzene (Surrogate)	µg/L	-	4.5	4.5045	30	0
		VPH F Bands	Benzene (F0)	µg/L	0.5	<0.5	0.0274845529	200	0
			TRH C6-C10 minus BTEX (F1)	µg/L	50	<50	-0.3059025490	200	0

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

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

Mercury in Soil

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB180332.002	Mercury	mg/kg	0.05	0.23	0.2	70 - 130	113

OC Pesticides in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB180272.002		Heptachlor	mg/kg	0.1	0.2	0.2	60 - 140	108
		Aldrin	mg/kg	0.1	0.2	0.2	60 - 140	112
		Delta BHC	mg/kg	0.1	0.2	0.2	60 - 140	98
		Dieldrin	mg/kg	0.2	0.2	0.2	60 - 140	116
		Endrin	mg/kg	0.2	0.2	0.2	60 - 140	106
		p,p'-DDT	mg/kg	0.1	0.2	0.2	60 - 140	80
	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.15	0.15	40 - 130	101

OP Pesticides in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB180272.002		Dichlorvos	mg/kg	0.5	2.4	2	60 - 140	119
		Diazinon (Dimpylate)	mg/kg	0.5	2.1	2	60 - 140	103
		Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	2.1	2	60 - 140	107
		Ethion	mg/kg	0.2	2.2	2	60 - 140	112
	Surrogates	2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.5	40 - 130	92
		d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	40 - 130	94

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB180272.002		Naphthalene	mg/kg	0.1	4.6	4	60 - 140	115
		Acenaphthylene	mg/kg	0.1	4.7	4	60 - 140	119
		Acenaphthene	mg/kg	0.1	4.4	4	60 - 140	110
		Phenanthrene	mg/kg	0.1	5.0	4	60 - 140	124
		Anthracene	mg/kg	0.1	4.9	4	60 - 140	122
		Fluoranthene	mg/kg	0.1	4.5	4	60 - 140	112
		Pyrene	mg/kg	0.1	4.8	4	60 - 140	121
		Benzo(a)pyrene	mg/kg	0.1	4.9	4	60 - 140	122
	Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.5	0.5	40 - 130	94
		2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.5	40 - 130	92
		d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	40 - 130	94

PAH (Polynuclear Aromatic Hydrocarbons) in Water

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB180241.002		Naphthalene	µg/L	0.1	32	40	60 - 140	81
		Acenaphthylene	µg/L	0.1	36	40	60 - 140	89
		Acenaphthene	µg/L	0.1	33	40	60 - 140	83
		Phenanthrene	µg/L	0.1	38	40	60 - 140	95
		Anthracene	µg/L	0.1	36	40	60 - 140	89
		Fluoranthene	µg/L	0.1	34	40	60 - 140	85
		Pyrene	µg/L	0.1	39	40	60 - 140	98
		Benzo(a)pyrene	µg/L	0.1	35	40	60 - 140	88
	Surrogates	d5-nitrobenzene (Surrogate)	µg/L	-	0.3	0.5	40 - 130	66
		2-fluorobiphenyl (Surrogate)	µg/L	-	0.4	0.5	40 - 130	70
		d14-p-terphenyl (Surrogate)	µg/L	-	0.4	0.5	40 - 130	78

PCBs in Soil

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB180272.002	Arochlor 1260	mg/kg	0.2	0.5	0.4	60 - 140	114

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB180327.002	Arsenic, As	mg/kg	1	350	336.32	79 - 120	103
	Cadmium, Cd	mg/kg	0.3	430	416.6	69 - 131	104
	Chromium, Cr	mg/kg	0.5	36	35.2	80 - 120	103
	Copper, Cu	mg/kg	0.5	330	370.46	80 - 120	88
	Nickel, Ni	mg/kg	0.5	190	210.88	79 - 120	91

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

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

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES (continued)

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB180327.002	Lead, Pb	mg/kg	1	95	107.87	79 - 120	88
	Zinc, Zn	mg/kg	2	290	301.27	80 - 121	95

Trace Metals (Dissolved) in Water by ICPMS

Method: ME-(AU)-[ENV]AN318

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB180229.002	Arsenic, As	µg/L	1	17	20	80 - 120	84
	Cadmium, Cd	µg/L	0.1	17	20	80 - 120	85
	Chromium, Cr	µg/L	1	21	20	80 - 120	104
	Copper, Cu	µg/L	1	19	20	80 - 120	93
	Lead, Pb	µg/L	1	18	20	80 - 120	88
	Nickel, Ni	µg/L	1	19	20	80 - 120	94
	Zinc, Zn	µg/L	5	16	20	80 - 120	80

TRH (Total Recoverable Hydrocarbons) in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB180272.002		TRH C10-C14	mg/kg	20	38	40	60 - 140	95
		TRH C15-C28	mg/kg	45	<45	40	60 - 140	83
		TRH C29-C36	mg/kg	45	<45	40	60 - 140	80
	TRH F Bands	TRH >C10-C16	mg/kg	25	36	40	60 - 140	90
		TRH >C16-C34 (F3)	mg/kg	90	<90	40	60 - 140	80
		TRH >C34-C40 (F4)	mg/kg	120	<120	20	60 - 140	80

TRH (Total Recoverable Hydrocarbons) in Water

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB180241.002		TRH C10-C14	µg/L	50	970	1200	60 - 140	81
		TRH C15-C28	µg/L	200	1100	1200	60 - 140	93
		TRH C29-C36	µg/L	200	1300	1200	60 - 140	112
	TRH F Bands	TRH >C10-C16	µg/L	60	1100	1200	60 - 140	88
		TRH >C16-C34 (F3)	µg/L	500	1200	1200	60 - 140	97
		TRH >C34-C40 (F4)	µg/L	500	780	600	60 - 140	131

VOC's in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB180271.002	Monocyclic Aromatic	Benzene	mg/kg	0.1	2.1	2.9	60 - 140	72
		Toluene	mg/kg	0.1	2.0	2.9	60 - 140	70
		Ethylbenzene	mg/kg	0.1	2.4	2.9	60 - 140	81
		m/p-xylene	mg/kg	0.2	4.8	5.8	60 - 140	83
		o-xylene	mg/kg	0.1	2.3	2.9	60 - 140	79
	Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	10.4	10	60 - 140	104
		Bromofluorobenzene (Surrogate)	mg/kg	-	9.4	10	60 - 140	94

VOCs in Water

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB180300.002	Monocyclic Aromatic	Benzene	µg/L	0.5	49	45.45	60 - 140	109
		Toluene	µg/L	0.5	60	45.45	60 - 140	132
		Ethylbenzene	µg/L	0.5	57	45.45	60 - 140	125
		m/p-xylene	µg/L	1	120	90.9	60 - 140	129
		o-xylene	µg/L	0.5	56	45.45	60 - 140	124
	Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	6.6	10	60 - 140	132
		d8-toluene (Surrogate)	µg/L	-	5.6	10	60 - 140	112
		Bromofluorobenzene (Surrogate)	µg/L	-	5.0	10	60 - 140	99

Volatile Petroleum Hydrocarbons in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB180271.002		TRH C6-C10	mg/kg	25	<25	24.65	60 - 140	91
		TRH C6-C9	mg/kg	20	21	23.2	60 - 140	89
	Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	10.4	10	60 - 140	104
		Bromofluorobenzene (Surrogate)	mg/kg	-	9.4	10	60 - 140	94
	VPH F Bands	TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	7.25	60 - 140	123

Volatile Petroleum Hydrocarbons in Water

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

Sample Number	Parameter	Units	LOR

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

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

Volatile Petroleum Hydrocarbons in Water (continued) — **Method: ME-(AU)-[ENV]AN433**

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB180300.027		TRH C6-C10	µg/L	50	900	946.63	60 - 140	95
		TRH C6-C9	µg/L	40	760	818.71	60 - 140	93
	Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	4.9	10	60 - 140	98
		d8-toluene (Surrogate)	µg/L	-	5.0	10	60 - 140	99
		Bromofluorobenzene (Surrogate)	µg/L	-	4.9	10	60 - 140	99
	VPH F Bands	TRH C6-C10 minus BTEX (F1)	µg/L	50	580	639.67	60 - 140	90

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

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

Mercury in Soil

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

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE196065.001	LB180332.004	Mercury	mg/kg	0.05	0.23	<0.05	0.2	102

OC Pesticides in Soil

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE196092.002	LB180272.019		Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	-	-
			Alpha BHC	mg/kg	0.1	<0.1	<0.1	-	-
			Lindane	mg/kg	0.1	<0.1	<0.1	-	-
			Heptachlor	mg/kg	0.1	0.2	<0.1	0.2	78
			Aldrin	mg/kg	0.1	0.2	<0.1	0.2	86
			Beta BHC	mg/kg	0.1	<0.1	<0.1	-	-
			Delta BHC	mg/kg	0.1	0.2	<0.1	0.2	86
			Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	-	-
			o,p'-DDE	mg/kg	0.1	<0.1	<0.1	-	-
			Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	-	-
			Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	-	-
			Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	-	-
			trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	-	-
			p,p'-DDE	mg/kg	0.1	<0.1	<0.1	-	-
			Dieldrin	mg/kg	0.2	<0.2	<0.2	0.2	94
			Endrin	mg/kg	0.2	<0.2	<0.2	0.2	80
			o,p'-DDD	mg/kg	0.1	<0.1	<0.1	-	-
			o,p'-DDT	mg/kg	0.1	<0.1	<0.1	-	-
			Beta Endosulfan	mg/kg	0.2	<0.2	<0.2	-	-
			p,p'-DDD	mg/kg	0.1	<0.1	<0.1	-	-
			p,p'-DDT	mg/kg	0.1	0.2	<0.1	0.2	81
			Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	-	-
			Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1	-	-
			Methoxychlor	mg/kg	0.1	<0.1	<0.1	-	-
			Endrin Ketone	mg/kg	0.1	<0.1	<0.1	-	-
			Isodrin	mg/kg	0.1	<0.1	<0.1	-	-
			Mirex	mg/kg	0.1	<0.1	<0.1	-	-
			Total CLP OC Pesticides	mg/kg	1	1	<1	-	-
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.14	0.13	-	94

OP Pesticides in Soil

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE196092.002	LB180272.019		Dichlorvos	mg/kg	0.5	2.2	<0.5	2	112
			Dimethoate	mg/kg	0.5	<0.5	<0.5	-	-
			Diazinon (Dimpylate)	mg/kg	0.5	2.0	<0.5	2	101
			Fenitrothion	mg/kg	0.2	<0.2	<0.2	-	-
			Malathion	mg/kg	0.2	<0.2	<0.2	-	-
			Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	2.2	<0.2	2	108
			Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2	<0.2	-	-
			Bromophos Ethyl	mg/kg	0.2	<0.2	<0.2	-	-
			Methidathion	mg/kg	0.5	<0.5	<0.5	-	-
			Ethion	mg/kg	0.2	2.4	<0.2	2	118
			Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	<0.2	-	-
			Total OP Pesticides*	mg/kg	1.7	8.7	<1.7	-	-
		Surrogates	2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.5	-	88
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.4	0.5	-	88

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE196092.002	LB180272.019	Naphthalene	mg/kg	0.1	4.6	<0.1	4	114
		2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	-	-
		1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	-	-
		Acenaphthylene	mg/kg	0.1	4.8	0.2	4	116
		Acenaphthene	mg/kg	0.1	4.3	<0.1	4	108
		Fluorene	mg/kg	0.1	<0.1	<0.1	-	-
		Phenanthrene	mg/kg	0.1	6.1	1.7	4	109

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

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

PAH (Polynuclear Aromatic Hydrocarbons) in Soil (continued)

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE196092.002	LB180272.019		Anthracene	mg/kg	0.1	5.1	0.3	4	120
			Fluoranthene	mg/kg	0.1	6.8	2.7	4	104
			Pyrene	mg/kg	0.1	7.1	2.5	4	115
			Benzo(a)anthracene	mg/kg	0.1	1.2	1.0	-	-
			Chrysene	mg/kg	0.1	1.2	1.1	-	-
			Benzo(b&j)fluoranthene	mg/kg	0.1	1.6	1.6	-	-
			Benzo(k)fluoranthene	mg/kg	0.1	0.5	0.5	-	-
			Benzo(a)pyrene	mg/kg	0.1	6.2	1.3	4	121
			Indeno(1,2,3-cd)pyrene	mg/kg	0.1	0.7	0.7	-	-
			Dibenzo(ah)anthracene	mg/kg	0.1	0.1	0.1	-	-
			Benzo(ghi)perylene	mg/kg	0.1	0.7	0.7	-	-
			Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.2	6.7	1.8	-	-
			Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	6.7	1.8	-	-
			Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	6.7	1.8	-	-
			Total PAH (18)	mg/kg	0.8	51	14	-	-
		Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.4	0.5	-	88
			2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.5	-	88
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.4	0.5	-	88

PCBs in Soil

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE196092.002	LB180272.019		Arochlor 1016	mg/kg	0.2	<0.2	<0.2	-	-
			Arochlor 1221	mg/kg	0.2	<0.2	<0.2	-	-
			Arochlor 1232	mg/kg	0.2	<0.2	<0.2	-	-
			Arochlor 1242	mg/kg	0.2	<0.2	<0.2	-	-
			Arochlor 1248	mg/kg	0.2	<0.2	<0.2	-	-
			Arochlor 1254	mg/kg	0.2	<0.2	<0.2	-	-
			Arochlor 1260	mg/kg	0.2	0.4	<0.2	0.4	106
			Arochlor 1262	mg/kg	0.2	<0.2	<0.2	-	-
			Arochlor 1268	mg/kg	0.2	<0.2	<0.2	-	-
			Total PCBs (Arochlors)	mg/kg	1	<1	<1	-	-
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0	0	-	89

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE196065.001	LB180327.004		Arsenic, As	mg/kg	1	46	6	50	80
			Cadmium, Cd	mg/kg	0.3	45	<0.3	50	91
			Chromium, Cr	mg/kg	0.5	60	22	50	77
			Copper, Cu	mg/kg	0.5	71	37	50	67 ④
			Nickel, Ni	mg/kg	0.5	70	37	50	65 ④
			Lead, Pb	mg/kg	1	54	20	50	68 ④
			Zinc, Zn	mg/kg	2	79	65	50	29 ④

TRH (Total Recoverable Hydrocarbons) in Soil

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE196092.002	LB180272.019		TRH C10-C14	mg/kg	20	46	<20	40	115
			TRH C15-C28	mg/kg	45	90	54	40	90
			TRH C29-C36	mg/kg	45	60	<45	40	83
			TRH C37-C40	mg/kg	100	<100	<100	-	-
			TRH C10-C36 Total	mg/kg	110	200	<110	-	-
			TRH C10-C40 Total (F bands)	mg/kg	210	<210	<210	-	-
		TRH F Bands	TRH >C10-C16	mg/kg	25	48	<25	40	120
			TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	48	<25	-	-
			TRH >C16-C34 (F3)	mg/kg	90	110	<90	40	83
			TRH >C34-C40 (F4)	mg/kg	120	<120	<120	-	-

VOC's in Soil

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE196092.001	LB180271.004	Monocyclic	Benzene	mg/kg	0.1	1.9	<0.1	2.9	63
		Aromatic	Toluene	mg/kg	0.1	1.8	<0.1	2.9	60
			Ethylbenzene	mg/kg	0.1	2.0	<0.1	2.9	66
			m/p-xylene	mg/kg	0.2	4.2	<0.2	5.8	71
			o-xylene	mg/kg	0.1	2.1	<0.1	2.9	72

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

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

VOC's in Soil (continued)

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE196092.001	LB180271.004	Polycyclic	Naphthalene	mg/kg	0.1	<0.1	<0.1	-	-
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	10.8	6.3	-	108
			d8-toluene (Surrogate)	mg/kg	-	8.7	5.5	-	87
			Bromofluorobenzene (Surrogate)	mg/kg	-	9.6	4.9	-	96
		Totals	Total Xylenes	mg/kg	0.3	6.3	<0.3	-	-
			Total BTEX	mg/kg	0.6	12	<0.6	-	-

VOCs in Water

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE196053.002	LB180300.026	Monocyclic	Benzene	µg/L	0.5	53	<0.5	45.45	115
		Aromatic	Toluene	µg/L	0.5	58	<0.5	45.45	128
			Ethylbenzene	µg/L	0.5	54	<0.5	45.45	119
			m/p-xylene	µg/L	1	110	1	90.9	122
			o-xylene	µg/L	0.5	57	<0.5	45.45	125
		Polycyclic	Naphthalene	µg/L	0.5	63	1.6	-	-
		Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	5.6	5.3	-	112
			d8-toluene (Surrogate)	µg/L	-	5.5	5.2	-	109
			Bromofluorobenzene (Surrogate)	µg/L	-	5.0	4.9	-	99

Volatile Petroleum Hydrocarbons in Soil

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE196092.001	LB180271.004		TRH C6-C10	mg/kg	25	<25	<25	24.65	72
			TRH C6-C9	mg/kg	20	<20	<20	23.2	68
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	10.8	6.3	-	108
			d8-toluene (Surrogate)	mg/kg	-	8.7	5.5	-	87
			Bromofluorobenzene (Surrogate)	mg/kg	-	9.6	4.9	-	96
		VPH F	Benzene (F0)	mg/kg	0.1	1.9	<0.1	-	-
		Bands	TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	7.25	74

Volatile Petroleum Hydrocarbons in Water

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE196053.002	LB180300.026		TRH C6-C10	µg/L	50	820	<50	946.63	87
			TRH C6-C9	µg/L	40	770	<40	818.71	94
		Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	5.6	5.3	-	112
			d8-toluene (Surrogate)	µg/L	-	5.5	5.2	-	109
			Bromofluorobenzene (Surrogate)	µg/L	-	5.0	4.9	-	99
		VPH F	Benzene (F0)	µg/L	0.5	53	<0.5	-	-
		Bands	TRH C6-C10 minus BTEX (F1)	µg/L	50	490	<50	639.67	76

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

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

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

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

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

No matrix spike duplicates were required for this job.

Samples analysed as received.

Solid samples expressed on a dry weight basis.

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

*	NATA accreditation does not cover the performance of this service.
**	Indicative data, theoretical holding time exceeded.
-	Sample not analysed for this analyte.
IS	Insufficient sample for analysis.
LNR	Sample listed, but not received.
LOR	Limit of reporting.
QFH	QC result is above the upper tolerance.
QFL	QC result is below the lower tolerance.

①	At least 2 of 3 surrogates are within acceptance criteria.
②	RPD failed acceptance criteria due to sample heterogeneity.
③	Results less than 5 times LOR preclude acceptance criteria for RPD.
④	Recovery failed acceptance criteria due to matrix interference.
⑤	Recovery failed acceptance criteria due to the presence of significant concentration of analyte (i.e. the concentration of analyte exceeds the spike level).
⑥	LOR was raised due to sample matrix interference.
⑦	LOR was raised due to dilution of significantly high concentration of analyte in sample.
⑧	Reanalysis of sample in duplicate confirmed sample heterogeneity and inconsistency of results.
⑨	Recovery failed acceptance criteria due to sample heterogeneity.
⑩	LOR was raised due to high conductivity of the sample (required dilution).
†	Refer to Analytical Report comments for further information.

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CHAIN OF CUSTODY

SAMPLE CHAIN OF CUSTODY DOCUMENTATION

Sheet..... of.....

Project No:	19122955	Lab Name:	SGS
Site Location:	Good St, Granville	Quote No.	
Sampled By:	Simon Demler.	Order No.:	
Turnaround Time	24hrs ☐ 36hrs ☐	48hrs ☐ 5 Days ☐	Standard ☐ Date Required By:
Delivery	HARD ☐ FAX ☐	DISK ☐	EMAIL ☐ SHAREPOINT ☐
Report	PDF ☐	EXCEL ☐	ESDAT ☐

GEOTECHNICAL ☐

Comments/Special Instructions:

ENVIRONMENTAL ☐

Comments/Special Instructions:

GOLDER ASSOCIATES PTY LTD
Level 8, 40 Mount Street, North Sydney
Project Manager: ~~Ben~~ Ben Caruana

Phone : (02) 9478 3900
Fax : (02) 9478 3901
Reviewed:
Phone 0405 262 936 Email:

ANALYSIS REQUIRED

LAB ID	SAMPLE ID	SAMPLE DEPTH	SAMPLE DATE	SAMPLE TYPE	SAMPLE MATRIX	No CONTAINERS	Level of Contamination	pH	EC	Sulphates	Chlorides	TRH	BTEX	PAH	HM* (8)
	2x 40mL vials							✓	✓	✓	✓	✓	✓	✓	✓
	1x 1L amber bottle														
	2x 200mL														
	2x 500 mL bottle.														

SAMPLE MATRIX = Soil / Sediment / Fill / Water

SAMPLE TYPE = Composite(C) / Disturbed(DS) / Core(CR) / Grab (GS) / Standard Penetraion Test (SPT)

HIGH CONCENTRATION: circle expected parameters in analysis list

	NAME and SIGNATURE	COMPANY	DATE	TIME
RELEASED BY	Simon Demler	GOLDER	9/08/19	12.45PM
RECEIVED BY		SGS	9/8/19	12.45
RELEASED BY				
RECEIVED BY				
RELEASED BY				
RECEIVED BY				

	SIGNATURE	COMPANY	DATE	TIME	Shipment Method
RELEASED BY					Ship ref:
RECEIVED BY					

To Be Filled Out By Analysing Laboratory

Security Seal		Chilled		Bill to:
Suitable Containers		Frozen		Address
Cool Box		Ambient		

LAB. BATCH NUMBER

8/08/2019

THIS FORM IS TO BE SIGNED BY GOLDER STAFF; LSB MANAGER; COURIER/S; LABORATORY ON RECEIPT OF SAMPLES.

SAMPLE RECEIPT ADVICE

SE196280

CLIENT DETAILS

Contact	Ben Caruana
Client	GOLDER ASSOCIATES PTY LTD
Address	Level 8, 40 Mount Street North Sydney NSW 2065
Telephone	0431 063 254
Facsimile	02 9478 3901
Email	BCaruana@golder.com.au
Project	**19122955 - Good St, Granville**
Order Number	(Not specified)
Samples	1

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
Samples Received	Fri 9/8/2019
Report Due	Fri 16/8/2019
SGS Reference	**SE196280**

SUBMISSION DETAILS

This is to confirm that 1 sample was received on Friday 9/8/2019. Results are expected to be ready by COB Friday 16/8/2019. Please quote SGS reference SE196280 when making enquiries. Refer below for details relating to sample integrity upon receipt.

Samples clearly labelled	Yes	Complete documentation received	Yes
Sample container provider	SGS	Sample cooling method	Ice
Samples received in correct containers	Yes	Sample counts by matrix	1 Water
Date documentation received	9/8/2019	Type of documentation received	COC
Samples received in good order	Yes	Samples received without headspace	Yes
Sample temperature upon receipt	0.9°C	Sufficient sample for analysis	Yes
Turnaround time requested	Standard		

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

COMMENTS

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SAMPLE RECEIPT ADVICE

SE196280

CLIENT DETAILS

Client GOLDER ASSOCIATES PTY LTD

Project 19122955 - Good St, Granville

SUMMARY OF ANALYSIS

No.	Sample ID	Anions by Ion Chromatography in Water	Conductivity and TDS by Calculation - Water	PAH (Polynuclear Aromatic Hydrocarbons) in Water	pH in water	Trace Metals (Dissolved) in Water by ICPMS	TRH (Total Recoverable Hydrocarbons) in Water	VOCs in Water	Volatile Petroleum Hydrocarbons in Water
001	19122955	2	1	22	1	7	10	11	7

CONTINUED OVERLEAF

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

SAMPLE RECEIPT ADVICE

SE196280

CLIENT DETAILS

Client GOLDER ASSOCIATES PTY LTD

Project 19122955 - Good St, Granville

SUMMARY OF ANALYSIS

No.	Sample ID	Mercury (dissolved) in Water
001	19122955	1

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

ANALYTICAL REPORT

Accreditation No. 2562

CLIENT DETAILS

Contact	Ben Caruana
Client	GOLDER ASSOCIATES PTY LTD
Address	Level 8, 40 Mount Street North Sydney NSW 2065
Telephone	0431 063 254
Facsimile	02 9478 3901
Email	BCaruana@golder.com.au
Project	**19122955 - Good St, Granville**
Order Number	(Not specified)
Samples	1

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
SGS Reference	**SE196280 R0**
Date Received	9/8/2019
Date Reported	16/8/2019

COMMENTS

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

SIGNATORIES

Akheeqar Beniameen
Chemist

Dong Liang
Metals/Inorganics Team Leader

Ly Kim Ha
Organic Section Head

VOCs in Water [AN433] Tested: 13/8/2019

PARAMETER	UOM	LOR	19122955 WATER - 8/8/2019 SE196280.001
Benzene	µg/L	0.5	<0.5
Toluene	µg/L	0.5	**0.9**
Ethylbenzene	µg/L	0.5	<0.5
m/p-xylene	µg/L	1	<1
o-xylene	µg/L	0.5	<0.5
Total Xylenes	µg/L	1.5	<1.5
Total BTEX	µg/L	3	<3
Naphthalene	µg/L	0.5	<0.5

Volatile Petroleum Hydrocarbons in Water [AN433] Tested: 13/8/2019

PARAMETER	UOM	LOR	19122955 WATER - 8/8/2019 SE196280.001
TRH C6-C9	µg/L	40	<40
Benzene (F0)	µg/L	0.5	<0.5
TRH C6-C10	µg/L	50	<50
TRH C6-C10 minus BTEX (F1)	µg/L	50	<50

TRH (Total Recoverable Hydrocarbons) in Water [AN403] Tested: 12/8/2019

PARAMETER	UOM	LOR	19122955 WATER - 8/8/2019 SE196280.001
TRH C10-C14	µg/L	50	<50
TRH C15-C28	µg/L	200	<200
TRH C29-C36	µg/L	200	<200
TRH C37-C40	µg/L	200	<200
TRH >C10-C16	µg/L	60	<60
TRH >C16-C34 (F3)	µg/L	500	<500
TRH >C34-C40 (F4)	µg/L	500	<500
TRH C10-C36	µg/L	450	<450
TRH C10-C40	µg/L	650	<650
TRH >C10-C16 - Naphthalene (F2)	µg/L	60	<60

PAH (Polynuclear Aromatic Hydrocarbons) in Water [AN420] Tested: 12/8/2019

PARAMETER	UOM	LOR	19122955 WATER - 8/8/2019 SE196280.001
Naphthalene	µg/L	0.1	<0.1
2-methylnaphthalene	µg/L	0.1	<0.1
1-methylnaphthalene	µg/L	0.1	<0.1
Acenaphthylene	µg/L	0.1	<0.1
Acenaphthene	µg/L	0.1	<0.1
Fluorene	µg/L	0.1	<0.1
Phenanthrene	µg/L	0.1	<0.1
Anthracene	µg/L	0.1	<0.1
Fluoranthene	µg/L	0.1	<0.1
Pyrene	µg/L	0.1	<0.1
Benzo(a)anthracene	µg/L	0.1	<0.1
Chrysene	µg/L	0.1	<0.1
Benzo(b&j)fluoranthene	µg/L	0.1	<0.1
Benzo(k)fluoranthene	µg/L	0.1	<0.1
Benzo(a)pyrene	µg/L	0.1	<0.1
Indeno(1,2,3-cd)pyrene	µg/L	0.1	<0.1
Dibenzo(ah)anthracene	µg/L	0.1	<0.1
Benzo(ghi)perylene	µg/L	0.1	<0.1
Total PAH (18)	µg/L	1	<1

Anions by Ion Chromatography in Water [AN245] Tested: 12/8/2019

PARAMETER	UOM	LOR	19122955 WATER - 8/8/2019 SE196280.001
Chloride	mg/L	1	**1100**
Sulfate, SO4	mg/L	1	**660**

pH in water [AN101] Tested: 14/8/2019

PARAMETER	UOM	LOR	19122955 WATER - 8/8/2019 SE196280.001
pH**	No unit	-	**6.4**

Conductivity and TDS by Calculation - Water [AN106] Tested: 14/8/2019

PARAMETER	UOM	LOR	19122955 WATER - 8/8/2019 SE196280.001
Conductivity @ 25 C	µS/cm	2	**4400**

Trace Metals (Dissolved) in Water by ICPMS [AN318] Tested: 12/8/2019

PARAMETER	UOM	LOR	19122955 WATER - 8/8/2019 SE196280.001
Arsenic, As	µg/L	1	<1
Cadmium, Cd	µg/L	0.1	**0.1**
Chromium, Cr	µg/L	1	<1
Copper, Cu	µg/L	1	**3**
Lead, Pb	µg/L	1	<1
Nickel, Ni	µg/L	1	**6**
Zinc, Zn	µg/L	5	**150**

Mercury (dissolved) in Water [AN311(Perth)/AN312] Tested: 13/8/2019

PARAMETER	UOM	LOR	19122955 WATER - 8/8/2019 SE196280.001
Mercury	mg/L	0.0001	<0.0001

METHOD	METHODOLOGY SUMMARY
AN020	Unpreserved water sample is filtered through a 0.45µm membrane filter and acidified with nitric acid similar to APHA3030B.
AN101	pH in Soil Sludge Sediment and Water: pH is measured electrometrically using a combination electrode (glass plus reference electrode) and is calibrated against 3 buffers purchased commercially. For soils, an extract with water is made at a ratio of 1:5 and the pH determined and reported on the extract. Reference APHA 4500-H+.
AN106	Conductivity and TDS by Calculation: Conductivity is measured by meter with temperature compensation and is calibrated against a standard solution of potassium chloride. Conductivity is generally reported as µmhos /cm or µS/cm @ 25°C. For soils, an extract with water is made at a ratio of 1:5 and the EC determined and reported on the extract, or calculated back to the as-received sample. Total Dissolved Salts can be estimated from conductivity using a conversion factor, which for natural waters, is in the range 0.55 to 0.75. SGS use 0.6. Reference APHA 2510 B.
AN106	Salinity may be calculated in terms of NaCl from the sample conductivity. This assumes all soluble salts present , measured by the conductivity, are present as NaCl.
AN245	Anions by Ion Chromatography: A water sample is injected into an eluent stream that passes through the ion chromatographic system where the anions of interest ie Br, Cl, NO2, NO3 and SO4 are separated on their relative affinities for the active sites on the column packing material. Changes to the conductivity and the UV-visible absorbance of the eluent enable identification and quantitation of the anions based on their retention time and peak height or area. APHA 4110 B
AN311(Perth)/AN312	Mercury by Cold Vapour AAS in Waters: Mercury ions are reduced by stannous chloride reagent in acidic solution to elemental mercury. This mercury vapour is purged by nitrogen into a cold cell in an atomic absorption spectrometer or mercury analyser. Quantification is made by comparing absorbances to those of the calibration standards. Reference APHA 3112/3500.
AN318	Determination of elements at trace level in waters by ICP-MS technique, in accordance with USEPA 6020A.
AN403	Total Recoverable Hydrocarbons: Determination of Hydrocarbons by gas chromatography after a solvent extraction. Detection is by flame ionisation detector (FID) that produces an electronic signal in proportion to the combustible matter passing through it. Total Recoverable Hydrocarbons (TRH) are routinely reported as four alkane groupings based on the carbon chain length of the compounds: C6-C9, C10-C14, C15-C28 and C29-C36 and in recognition of the NEPM 1999 (2013), >C10-C16 (F2), >C16-C34 (F3) and >C34-C40 (F4). Where F2 is corrected for Naphthalene, the VOC data for Naphthalene is used.
AN403	Additionally, the volatile C6-C9/C6-C10 fractions may be determined by a purge and trap technique and GC/MS because of the potential for volatiles loss. Total Recoveerable Hydrocarbons - Silica (TRH-Silica) follows the same method of analysis after silica gel cleanup of the solvent extract. Aliphatic/Aromatic Speciation follows the same method of analysis after fractionation of the solvent extract over silica with differential polarity of the eluent solvents.
AN403	The GC/FID method is not well suited to the analysis of refined high boiling point materials (ie lubricating oils or greases) but is particularly suited for measuring diesel, kerosene and petrol if care to control volatility is taken. This method will detect naturally occurring hydrocarbons, lipids, animal fats, phenols and PAHs if they are present at sufficient levels, dependent on the use of specific cleanup/fractionation techniques. Reference USEPA 3510B, 8015B.
AN420	(SVOCs) including OC, OP, PCB, Herbicides, PAH, Phthalates and Speciated Phenols (etc) in soils, sediments and waters are determined by GCMS/ECD technique following appropriate solvent extraction process (Based on USEPA 3500C and 8270D).
AN433	VOCs and C6-C9 Hydrocarbons by GC-MS P&T: VOC`s are volatile organic compounds. The sample is presented to a gas chromatograph via a purge and trap (P&T) concentrator and autosampler and is detected with a Mass Spectrometer (MSD). Solid samples are initially extracted with methanol whilst liquid samples are processed directly. References: USEPA 5030B, 8020A, 8260.

FOOTNOTES

*	NATA accreditation does not cover the performance of this service.	-	Not analysed.	UOM	Unit of Measure.
		NVL	Not validated.	LOR	Limit of Reporting.
**	Indicative data, theoretical holding time exceeded.	IS	Insufficient sample for analysis.	↑↓	Raised/lowered Limit of Reporting.
		LNR	Sample listed, but not received.		

Unless it is reported that sampling has been performed by SGS, the samples have been analysed as received.
Solid samples expressed on a dry weight basis.

Where "Total" analyte groups are reported (for example, Total PAHs, Total OC Pesticides) the total will be calculated as the sum of the individual analytes, with those analytes that are reported as <LOR being assumed to be zero. The summed (Total) limit of reporting is calculated by summing the individual analyte LORs and dividing by two. For example, where 16 individual analytes are being summed and each has an LOR of 0.1 mg/kg, the "Totals" LOR will be 1.6 / 2 (0.8 mg/kg). Where only 2 analytes are being summed, the " Total" LOR will be the sum of those two LORs.

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

If reported, measurement uncertainty follow the ± sign after the analytical result and is expressed as the expanded uncertainty calculated using a coverage factor of 2, providing a level of confidence of approximately 95%, unless stated otherwise in the comments section of this report.

Results reported for samples tested under test methods with codes starting with ARS-SOP, radionuclide or gross radioactivity concentrations are expressed in becquerel (Bq) per unit of mass or volume or per wipe as stated on the report. Becquerel is the SI unit for activity and equals one nuclear transformation per second.
Note that in terms of units of radioactivity:

a. 1 Bq is equivalent to 27 pCi
b. 37 MBq is equivalent to 1 mCi

For results reported for samples tested under test methods with codes starting with ARS-SOP, less than (<) values indicate the detection limit for each radionuclide or parameter for the measurement system used. The respective detection limits have been calculated in accordance with ISO 11929.

The QC and MU criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here: www.sgs.com.au.pv.sgsvr/en-gb/environment.

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STATEMENT OF QA/QC PERFORMANCE

SE196280 R0

CLIENT DETAILS

Contact	Ben Caruana
Client	GOLDER ASSOCIATES PTY LTD
Address	Level 8, 40 Mount Street North Sydney NSW 2065
Telephone	0431 063 254
Facsimile	02 9478 3901
Email	BCaruana@golder.com.au
Project	**19122955 - Good St, Granville**
Order Number	(Not specified)
Samples	1

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
SGS Reference	**SE196280 R0**
Date Received	09 Aug 2019
Date Reported	16 Aug 2019

COMMENTS

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

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

All Data Quality Objectives were met with the exception of the following:

Extraction Date	pH in water	1 item
Analysis Date	pH in water	1 item
METHOD BLANK	VOCs in Water	1 item

SAMPLE SUMMARY

Samples clearly labelled	Yes	Complete documentation received	Yes
Sample container provider	SGS	Sample cooling method	Ice
Samples received in correct containers	Yes	Sample counts by matrix	1 Water
Date documentation received	9/8/2019	Type of documentation received	COC
Samples received in good order	Yes	Samples received without headspace	Yes
Sample temperature upon receipt	0.9°C	Sufficient sample for analysis	Yes
Turnaround time requested	Standard		

HOLDING TIME SUMMARY

SE196280 R0

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

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

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

Anions by Ion Chromatography in Water

Method: ME-(AU)-[ENV]AN245

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
19122955	SE196280.001	LB180670	08 Aug 2019	09 Aug 2019	05 Sep 2019	12 Aug 2019	05 Sep 2019	14 Aug 2019

Conductivity and TDS by Calculation - Water

Method: ME-(AU)-[ENV]AN106

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
19122955	SE196280.001	LB180898	08 Aug 2019	09 Aug 2019	05 Sep 2019	14 Aug 2019	05 Sep 2019	14 Aug 2019

Mercury (dissolved) in Water

Method: ME-(AU)-[ENV]AN311(Perth)/AN312

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
19122955	SE196280.001	LB180738	08 Aug 2019	09 Aug 2019	05 Sep 2019	13 Aug 2019	05 Sep 2019	13 Aug 2019

PAH (Polynuclear Aromatic Hydrocarbons) in Water

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
19122955	SE196280.001	LB180659	08 Aug 2019	09 Aug 2019	15 Aug 2019	12 Aug 2019	21 Sep 2019	14 Aug 2019

pH in water

Method: ME-(AU)-[ENV]AN101

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
19122955	SE196280.001	LB180898	08 Aug 2019	09 Aug 2019	09 Aug 2019	14 Aug 2019†	09 Aug 2019	14 Aug 2019†

Trace Metals (Dissolved) in Water by ICPMS

Method: ME-(AU)-[ENV]AN318

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
19122955	SE196280.001	LB180647	08 Aug 2019	09 Aug 2019	04 Feb 2020	12 Aug 2019	04 Feb 2020	12 Aug 2019

TRH (Total Recoverable Hydrocarbons) in Water

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
19122955	SE196280.001	LB180659	08 Aug 2019	09 Aug 2019	15 Aug 2019	12 Aug 2019	21 Sep 2019	15 Aug 2019

VOCs in Water

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
19122955	SE196280.001	LB180788	08 Aug 2019	09 Aug 2019	15 Aug 2019	13 Aug 2019	22 Sep 2019	16 Aug 2019

Volatile Petroleum Hydrocarbons in Water

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
19122955	SE196280.001	LB180788	08 Aug 2019	09 Aug 2019	15 Aug 2019	13 Aug 2019	22 Sep 2019	16 Aug 2019

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

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

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2-fluorobiphenyl (Surrogate)	19122955	SE196280.001	%	40 - 130%	86
d14-p-terphenyl (Surrogate)	19122955	SE196280.001	%	40 - 130%	94
d5-nitrobenzene (Surrogate)	19122955	SE196280.001	%	40 - 130%	76

VOCs in Water — Method: ME-(AU)-[ENV]AN433

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	19122955	SE196280.001	%	40 - 130%	93
d4-1,2-dichloroethane (Surrogate)	19122955	SE196280.001	%	40 - 130%	92
d8-toluene (Surrogate)	19122955	SE196280.001	%	40 - 130%	108

Volatile Petroleum Hydrocarbons in Water — Method: ME-(AU)-[ENV]AN433

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	19122955	SE196280.001	%	40 - 130%	93
d4-1,2-dichloroethane (Surrogate)	19122955	SE196280.001	%	60 - 130%	92
d8-toluene (Surrogate)	19122955	SE196280.001	%	40 - 130%	108

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

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

Anions by Ion Chromatography in Water

Method: ME-(AU)-[ENV]AN245

Sample Number	Parameter	Units	LOR	Result
LB180670.001	Chloride	mg/L	1	<1.0
	Sulfate, SO4	mg/L	1	<1.0

Conductivity and TDS by Calculation - Water

Method: ME-(AU)-[ENV]AN106

Sample Number	Parameter	Units	LOR	Result
LB180898.001	Conductivity @ 25 C	µS/cm	2	<2

Mercury (dissolved) in Water

Method: ME-(AU)-[ENV]AN311(Perth)/AN312

Sample Number	Parameter	Units	LOR	Result
LB180738.001	Mercury	mg/L	0.0001	<0.0001

PAH (Polynuclear Aromatic Hydrocarbons) in Water

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

Sample Number		Parameter	Units	LOR	Result
LB180659.001		Naphthalene	µg/L	0.1	<0.1
		2-methylnaphthalene	µg/L	0.1	<0.1
		1-methylnaphthalene	µg/L	0.1	<0.1
		Acenaphthylene	µg/L	0.1	<0.1
		Acenaphthene	µg/L	0.1	<0.1
		Fluorene	µg/L	0.1	<0.1
		Phenanthrene	µg/L	0.1	<0.1
		Anthracene	µg/L	0.1	<0.1
		Fluoranthene	µg/L	0.1	<0.1
		Pyrene	µg/L	0.1	<0.1
		Benzo(a)anthracene	µg/L	0.1	<0.1
		Chrysene	µg/L	0.1	<0.1
		Benzo(a)pyrene	µg/L	0.1	<0.1
		Indeno(1,2,3-cd)pyrene	µg/L	0.1	<0.1
		Dibenzo(ah)anthracene	µg/L	0.1	<0.1
		Benzo(ghi)perylene	µg/L	0.1	<0.1
	Surrogates	d5-nitrobenzene (Surrogate)	%	-	72
		2-fluorobiphenyl (Surrogate)	%	-	76
		d14-p-terphenyl (Surrogate)	%	-	88

Trace Metals (Dissolved) in Water by ICPMS

Method: ME-(AU)-[ENV]AN318

Sample Number	Parameter	Units	LOR	Result
LB180647.001	Arsenic, As	µg/L	1	<1
	Cadmium, Cd	µg/L	0.1	<0.1
	Chromium, Cr	µg/L	1	<1
	Copper, Cu	µg/L	1	<1
	Lead, Pb	µg/L	1	<1
	Nickel, Ni	µg/L	1	<1
	Zinc, Zn	µg/L	5	<5

TRH (Total Recoverable Hydrocarbons) in Water

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

Sample Number	Parameter	Units	LOR	Result
LB180659.001	TRH C10-C14	µg/L	50	<50
	TRH C15-C28	µg/L	200	<200
	TRH C29-C36	µg/L	200	<200
	TRH C37-C40	µg/L	200	<200

VOCs in Water

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

Sample Number		Parameter	Units	LOR	Result
LB180788.001	Monocyclic Aromatic	Benzene	µg/L	0.5	<0.5
	Hydrocarbons	Toluene	µg/L	0.5	<0.5
		Ethylbenzene	µg/L	0.5	<0.5
		m/p-xylene	µg/L	1	<1
		o-xylene	µg/L	0.5	<0.5
	Polycyclic VOCs	Naphthalene	µg/L	0.5	<0.5
	Surrogates	d4-1,2-dichloroethane (Surrogate)	%	-	94

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

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

VOCs in Water (continued)

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

Sample Number		Parameter	Units	LOR	Result
LB180788.001	Surrogates	d8-toluene (Surrogate)	%	-	101
		Bromofluorobenzene (Surrogate)	%	-	100

Volatile Petroleum Hydrocarbons in Water

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

Sample Number		Parameter	Units	LOR	Result
LB180788.001		TRH C6-C9	µg/L	40	<40
	Surrogates	d4-1,2-dichloroethane (Surrogate)	%	-	94
		d8-toluene (Surrogate)	%	-	101
		Bromofluorobenzene (Surrogate)	%	-	100

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

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

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

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

Anions by Ion Chromatography in Water

Method: ME-(AU)-[ENV]AN245

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE196280.001	LB180670.007	Chloride	mg/L	1	1100	1100	15	2
		Sulfate, SO4	mg/L	1	660	650	15	2

Conductivity and TDS by Calculation - Water

Method: ME-(AU)-[ENV]AN106

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE196268.001	LB180898.014	Conductivity @ 25 C	µS/cm	2	309.96	312.37	16	1

Mercury (dissolved) in Water

Method: ME-(AU)-[ENV]AN311(Perth)/AN312

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE196199.024	LB180738.014	Mercury	µg/L	0.0001	<0.0001	0.0000	200	39
SE196280.001	LB180738.024	Mercury	µg/L	0.0001	<0.0001	0.0000	200	18

PAH (Polynuclear Aromatic Hydrocarbons) in Water

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE196280.001	LB180659.021		Naphthalene	µg/L	0.1	<0.1	<0.1	200	0
			2-methylnaphthalene	µg/L	0.1	<0.1	<0.1	200	0
			1-methylnaphthalene	µg/L	0.1	<0.1	<0.1	200	0
			Acenaphthylene	µg/L	0.1	<0.1	<0.1	200	0
			Acenaphthene	µg/L	0.1	<0.1	<0.1	200	0
			Fluorene	µg/L	0.1	<0.1	<0.1	200	0
			Phenanthrene	µg/L	0.1	<0.1	<0.1	200	0
			Anthracene	µg/L	0.1	<0.1	<0.1	200	0
			Fluoranthene	µg/L	0.1	<0.1	<0.1	200	0
			Pyrene	µg/L	0.1	<0.1	<0.1	200	0
			Benzo(a)anthracene	µg/L	0.1	<0.1	<0.1	200	0
			Chrysene	µg/L	0.1	<0.1	<0.1	200	0
			Benzo(b&j)fluoranthene	µg/L	0.1	<0.1	<0.1	200	0
			Benzo(k)fluoranthene	µg/L	0.1	<0.1	<0.1	200	0
			Benzo(a)pyrene	µg/L	0.1	<0.1	<0.1	200	0
			Indeno(1,2,3-cd)pyrene	µg/L	0.1	<0.1	<0.1	200	0
			Dibenzo(ah)anthracene	µg/L	0.1	<0.1	<0.1	200	0
			Benzo(ghi)perylene	µg/L	0.1	<0.1	<0.1	200	0
		Surrogates	d5-nitrobenzene (Surrogate)	µg/L	-	0.4	0.3	30	11
			2-fluorobiphenyl (Surrogate)	µg/L	-	0.4	0.4	30	12
			d14-p-terphenyl (Surrogate)	µg/L	-	0.5	0.4	30	9

pH in water

Method: ME-(AU)-[ENV]AN101

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE196268.001	LB180898.014	pH**	pH Units	-	7.821	7.857	16	0

TRH (Total Recoverable Hydrocarbons) in Water

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE196280.001	LB180659.021		TRH C10-C14	µg/L	50	<50	<50	200	0
			TRH C15-C28	µg/L	200	<200	<200	200	0
			TRH C29-C36	µg/L	200	<200	<200	200	0
			TRH C37-C40	µg/L	200	<200	<200	200	0
			TRH C10-C36	µg/L	450	<450	<450	200	0
			TRH C10-C40	µg/L	650	<650	<650	200	0
		TRH F Bands	TRH >C10-C16	µg/L	60	<60	<60	200	0
			TRH >C10-C16 - Naphthalene (F2)	µg/L	60	<60	<60	200	0
			TRH >C16-C34 (F3)	µg/L	500	<500	<500	200	0
			TRH >C34-C40 (F4)	µg/L	500	<500	<500	200	0

VOCs in Water

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

Original	Duplicate	Parameter	Units	LOR

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

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

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

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

VOCs in Water (continued)

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE196268.001	LB180788.015	Monocyclic	Benzene	µg/L	0.5	0.059423505	20.015588997	200	0
		Aromatic	Toluene	µg/L	0.5	0.287823533	20.096827925	200	0
			Ethylbenzene	µg/L	0.5	0.115558821	60.008815389	200	0
			m/p-xylene	µg/L	1	0.395033605	50.029113221	200	0
			o-xylene	µg/L	0.5	0.239111555	00.050733287	200	0
		Polycyclic	Naphthalene	µg/L	0.5	0.04	0.033868792	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	9.496797581	89.605836686	30	1
			d8-toluene (Surrogate)	µg/L	-	10.209183253	30.690727742	30	5
			Bromofluorobenzene (Surrogate)	µg/L	-	8.806243776	88.495609821	30	4
SE196272.006	LB180788.017	Monocyclic	Benzene	µg/L	0.5	0.062073734	00.016664022	200	0
		Aromatic	Toluene	µg/L	0.5	0.113280269	60.097968134	200	0
			Ethylbenzene	µg/L	0.5	0.010999685	10.016346174	200	0
			m/p-xylene	µg/L	1	0.067210912	80.066335763	200	0
			o-xylene	µg/L	0.5	0.013666663	30.020944964	200	0
		Polycyclic	Naphthalene	µg/L	0.5	0.132266771	40.242397276	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	8.345017944	09.647793151	30	14
			d8-toluene (Surrogate)	µg/L	-	10.110902064	00.566453347	30	4
			Bromofluorobenzene (Surrogate)	µg/L	-	8.416335582	98.494069451	30	1

Volatile Petroleum Hydrocarbons in Water

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE196268.001	LB180788.015		TRH C6-C10	µg/L	50	0	0	200	0
			TRH C6-C9	µg/L	40	0	0	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	9.496797581	89.605836686	30	1
			d8-toluene (Surrogate)	µg/L	-	10.209183253	30.690727742	30	5
			Bromofluorobenzene (Surrogate)	µg/L	-	8.806243776	88.495609821	30	4
		VPH F Bands	Benzene (F0)	µg/L	0.5	0.059423505	20.015588997	200	0
			TRH C6-C10 minus BTEX (F1)	µg/L	50	-1.096951020	7-0.201078822	200	0
SE196272.006	LB180788.017	Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	8.345017944	09.647793151	30	14
			d8-toluene (Surrogate)	µg/L	-	10.110902064	00.566453347	30	4
			Bromofluorobenzene (Surrogate)	µg/L	-	8.416335582	98.494069451	30	1
		VPH F Bands	Benzene (F0)	µg/L	0.5	0.062073734	00.016664022	200	0

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

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

Anions by Ion Chromatography in Water

Method: ME-(AU)-[ENV]AN245

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB180670.002	Chloride	mg/L	1	20	20	80 - 120	99
	Sulfate, SO4	mg/L	1	20	20	80 - 120	99

Conductivity and TDS by Calculation - Water

Method: ME-(AU)-[ENV]AN106

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB180898.002	Conductivity @ 25 C	µS/cm	2	320	303	90 - 110	107

PAH (Polynuclear Aromatic Hydrocarbons) in Water

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB180659.002		Naphthalene	µg/L	0.1	29	40	60 - 140	72
		Acenaphthylene	µg/L	0.1	31	40	60 - 140	78
		Acenaphthene	µg/L	0.1	32	40	60 - 140	80
		Phenanthrene	µg/L	0.1	33	40	60 - 140	84
		Anthracene	µg/L	0.1	32	40	60 - 140	80
		Fluoranthene	µg/L	0.1	33	40	60 - 140	83
		Pyrene	µg/L	0.1	32	40	60 - 140	81
		Benzo(a)pyrene	µg/L	0.1	32	40	60 - 140	81
	Surrogates	d5-nitrobenzene (Surrogate)	µg/L	-	0.3	0.5	40 - 130	64
		2-fluorobiphenyl (Surrogate)	µg/L	-	0.3	0.5	40 - 130	66
		d14-p-terphenyl (Surrogate)	µg/L	-	0.4	0.5	40 - 130	72

pH in water

Method: ME-(AU)-[ENV]AN101

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB180898.003	pH**	No unit	-	7.4	7.415	98 - 102	100

Trace Metals (Dissolved) in Water by ICPMS

Method: ME-(AU)-[ENV]AN318

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB180647.002	Arsenic, As	µg/L	1	21	20	80 - 120	105
	Cadmium, Cd	µg/L	0.1	21	20	80 - 120	106
	Chromium, Cr	µg/L	1	21	20	80 - 120	107
	Copper, Cu	µg/L	1	22	20	80 - 120	108
	Lead, Pb	µg/L	1	22	20	80 - 120	112
	Nickel, Ni	µg/L	1	21	20	80 - 120	104
	Zinc, Zn	µg/L	5	21	20	80 - 120	107

TRH (Total Recoverable Hydrocarbons) in Water

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB180659.002		TRH C10-C14	µg/L	50	940	1200	60 - 140	78
		TRH C15-C28	µg/L	200	1000	1200	60 - 140	86
		TRH C29-C36	µg/L	200	1100	1200	60 - 140	93
	TRH F Bands	TRH >C10-C16	µg/L	60	990	1200	60 - 140	83
		TRH >C16-C34 (F3)	µg/L	500	1100	1200	60 - 140	89
		TRH >C34-C40 (F4)	µg/L	500	660	600	60 - 140	109

VOCs in Water

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB180788.002	Monocyclic	Benzene	µg/L	0.5	46	45.45	60 - 140	101
	Aromatic	Toluene	µg/L	0.5	46	45.45	60 - 140	102
		Ethylbenzene	µg/L	0.5	46	45.45	60 - 140	102
		m/p-xylene	µg/L	1	85	90.9	60 - 140	93
		o-xylene	µg/L	0.5	45	45.45	60 - 140	99
	Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	9.4	10	60 - 140	94
		d8-toluene (Surrogate)	µg/L	-	10.6	10	60 - 140	106
		Bromofluorobenzene (Surrogate)	µg/L	-	10.5	10	60 - 140	105

Volatile Petroleum Hydrocarbons in Water

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

Sample Number	Parameter	Units	LOR

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

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

Volatile Petroleum Hydrocarbons in Water (continued) — **Method: ME-(AU)-[ENV]AN433**

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB180788.002		TRH C6-C10	µg/L	50	800	946.63	60 - 140	85
		TRH C6-C9	µg/L	40	700	818.71	60 - 140	86
	Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	9.4	10	60 - 140	94
		d8-toluene (Surrogate)	µg/L	-	10.6	10	60 - 140	106
		Bromofluorobenzene (Surrogate)	µg/L	-	10.5	10	60 - 140	105
	VPH F Bands	TRH C6-C10 minus BTEX (F1)	µg/L	50	540	639.67	60 - 140	84

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

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

Mercury (dissolved) in Water

Method: ME-(AU)-[ENV]AN311(Perth)/AN312

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE196129.001	LB180738.004	Mercury	mg/L	0.0001	0.0064	<0.0001	0.008	80

Trace Metals (Dissolved) in Water by ICPMS

Method: ME-(AU)-[ENV]AN318

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE196268.001	LB180647.004	Arsenic, As	µg/L	1	20	0.202	20	97
		Cadmium, Cd	µg/L	0.1	20	0.013	20	100
		Chromium, Cr	µg/L	1	22	1.838	20	99
		Copper, Cu	µg/L	1	20	0.553	20	99
		Lead, Pb	µg/L	1	21	0.101	20	104
		Nickel, Ni	µg/L	1	20	0.28	20	98
		Zinc, Zn	µg/L	5	23	1.902	20	104

VOCs in Water

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE196280.001	LB180788.016	Monocyclic	Benzene	µg/L	0.5	53	<0.5	45.45	118
		Aromatic	Toluene	µg/L	0.5	55	0.9	45.45	118
			Ethylbenzene	µg/L	0.5	59	<0.5	45.45	130
			m/p-xylene	µg/L	1	120	<1	90.9	136
			o-xylene	µg/L	0.5	56	<0.5	45.45	124
		Polycyclic	Naphthalene	µg/L	0.5	47	<0.5	-	-
		Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	9.1	9.2	-	91
			d8-toluene (Surrogate)	µg/L	-	10.2	10.8	-	102
			Bromofluorobenzene (Surrogate)	µg/L	-	10.9	9.3	-	109

Volatile Petroleum Hydrocarbons in Water

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

QC Sample	Sample Number		Parameter	Units	LOR	Original	Spike	Recovery%
SE196280.001	LB180788.016		TRH C6-C10	µg/L	50	<50	946.63	105
			TRH C6-C9	µg/L	40	<40	818.71	109
		Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	9.2	-	91
			d8-toluene (Surrogate)	µg/L	-	10.8	-	102
			Bromofluorobenzene (Surrogate)	µg/L	-	9.3	-	109
		VPH F	Benzene (F0)	µg/L	0.5	<0.5	-	-
		Bands	TRH C6-C10 minus BTEX (F1)	µg/L	50	<50	639.67	101

MATRIX SPIKE DUPLICATES

SE196280 R0

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

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

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

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

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

No matrix spike duplicates were required for this job.

Samples analysed as received.

Solid samples expressed on a dry weight basis.

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

*	NATA accreditation does not cover the performance of this service.
**	Indicative data, theoretical holding time exceeded.
-	Sample not analysed for this analyte.
IS	Insufficient sample for analysis.
LNR	Sample listed, but not received.
LOR	Limit of reporting.
QFH	QC result is above the upper tolerance.
QFL	QC result is below the lower tolerance.

①	At least 2 of 3 surrogates are within acceptance criteria.
②	RPD failed acceptance criteria due to sample heterogeneity.
③	Results less than 5 times LOR preclude acceptance criteria for RPD.
④	Recovery failed acceptance criteria due to matrix interference.
⑤	Recovery failed acceptance criteria due to the presence of significant concentration of analyte (i.e. the concentration of analyte exceeds the spike level).
⑥	LOR was raised due to sample matrix interference.
⑦	LOR was raised due to dilution of significantly high concentration of analyte in sample.
⑧	Reanalysis of sample in duplicate confirmed sample heterogeneity and inconsistency of results.
⑨	Recovery failed acceptance criteria due to sample heterogeneity.
⑩	LOR was raised due to high conductivity of the sample (required dilution).
†	Refer to Analytical Report comments for further information.

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CHAIN OF CUSTODY FORM - Client

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Unit 7, 17 Willes Rd, Berrimah, NT 0820

Client: Golder Associates	Client Project Name/Number/Site etc (ie report title):
Contact Person: Frank Yu	Gran Central 19122955
Project Mgr: Shane Doyle	PO No.:
Sampler: Frank Yu	Envirolab Quote No. :
Address:	Date results required: Standard T/A
Level 8, 40 Mount Street	Or choose: standard / same day / 1 day / 2 day / 3 day
North Sydney NSW 2060	*Note: Inform lab in advance if urgent turnaround is required - surcharges apply*
Phone: Mob: 0431 063 264	Additional report format: esdat / equis /
Email: fyu@golder.com.au sdoyle@golder.com.au	Lab Comments:

Sample Information					Tests Required												Comments
Envirolab Sample ID	Client Sample ID or information	Depth	Date sampled	Type of sample	Combination 6												Provide as much information about the sample as you can
1	TR1		1/08/2019	Soil	X												

☐ *Please tick the box if observed settled sediment present in water samples is to be included in the extraction and/or analysis*

Relinquished by (Company): F Yu	Received by (Company):	*Lab Use Only*	
Print Name: F Yu	Print Name:	Job number: 223049	Cooling: Ice / Ice pack / None
Date & Time: 2/8/2019	Date & Time: 1535 2/8/19	Temperature: 11.2	Security seal: Intact / Broken / None
Signature:	Signature:	TAT Req - SAME day / 1 / 2 / 3 / 4 / STD	

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	Golder Associates Pty Ltd
Attention	Frank Yu

Sample Login Details

Your reference	Gran Central 19122955
Envirolab Reference	223049
Date Sample Received	02/08/2019
Date Instructions Received	02/08/2019
Date Results Expected to be Reported	09/08/2019

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	1 soil
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	11.2
Cooling Method	Ice
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
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Sample ID	vTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticidesin soil	PCBsin Soil	Acid Extractable metalsin soil
TR1	✓	✓	✓	✓	✓	✓

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.
Please contact the laboratory immediately if observed settled sediment present in water samples is to be included in the extraction and/or analysis (exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS analysis where solids are included by default.
TAT for Micro is dependent on incubation. This varies from 3 to 6 days.

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CERTIFICATE OF ANALYSIS 223049

Client Details

Client	Golder Associates Pty Ltd
Attention	Frank Yu
Address	124 Pacific Highway, St Leonards, NSW, 2065

Sample Details

Your Reference	**Gran Central 19122955**
Number of Samples	1 soil
Date samples received	02/08/2019
Date completed instructions received	02/08/2019

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.

Report Details

Date results requested by	09/08/2019
Date of Issue	09/08/2019

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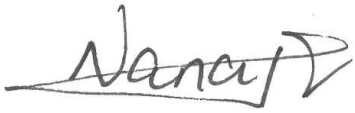
Results Approved By
Jaimie Loa-Kum-Cheung, Metals Supervisor
Steven Luong, Organics Supervisor

Authorised By



Nancy Zhang, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil		
Our Reference		223049-1
Your Reference	UNITS	TR1
Date Sampled		01/08/2019
Type of sample		soil
Date extracted	-	05/08/2019
Date analysed	-	06/08/2019
TRH C_6 - C_9	mg/kg	<25
TRH C_6 - C_{10}	mg/kg	<25
vTPH 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	<3
Surrogate aaa-Trifluorotoluene	%	106

svTRH (C10-C40) in Soil		
Our Reference		223049-1
Your Reference	UNITS	TR1
Date Sampled		01/08/2019
Type of sample		soil
Date extracted	-	05/08/2019
Date analysed	-	08/08/2019
TRH C_{10} - C_{14}	mg/kg	<50
TRH C_{15} - C_{28}	mg/kg	<100
TRH C_{29} - C_{36}	mg/kg	<100
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	%	78

PAHs in Soil		
Our Reference		223049-1
Your Reference	UNITS	TR1
Date Sampled		01/08/2019
Type of sample		soil
Date extracted	-	05/08/2019
Date analysed	-	09/08/2019
Naphthalene	mg/kg	<0.1
Acenaphthylene	mg/kg	<0.1
Acenaphthene	mg/kg	<0.1
Fluorene	mg/kg	<0.1
Phenanthrene	mg/kg	<0.1
Anthracene	mg/kg	<0.1
Fluoranthene	mg/kg	<0.1
Pyrene	mg/kg	<0.1
Benzo(a)anthracene	mg/kg	<0.1
Chrysene	mg/kg	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2
Benzo(a)pyrene	mg/kg	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1
Total +ve PAH's	mg/kg	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5
Surrogate p-Terphenyl-d14	%	81

Organochlorine Pesticides in soil		
Our Reference		223049-1
Your Reference	UNITS	TR1
Date Sampled		01/08/2019
Type of sample		soil
Date extracted	-	05/08/2019
Date analysed	-	05/08/2019
HCB	mg/kg	<0.1
alpha-BHC	mg/kg	<0.1
gamma-BHC	mg/kg	<0.1
beta-BHC	mg/kg	<0.1
Heptachlor	mg/kg	<0.1
delta-BHC	mg/kg	<0.1
Aldrin	mg/kg	<0.1
Heptachlor Epoxide	mg/kg	<0.1
gamma-Chlordane	mg/kg	<0.1
alpha-chlordane	mg/kg	<0.1
Endosulfan I	mg/kg	<0.1
pp-DDE	mg/kg	<0.1
Dieldrin	mg/kg	<0.1
Endrin	mg/kg	<0.1
pp-DDD	mg/kg	<0.1
Endosulfan II	mg/kg	<0.1
pp-DDT	mg/kg	<0.1
Endrin Aldehyde	mg/kg	<0.1
Endosulfan Sulphate	mg/kg	<0.1
Methoxychlor	mg/kg	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1
Surrogate TCMX	%	92

PCBs in Soil		
Our Reference		223049-1
Your Reference	UNITS	TR1
Date Sampled		01/08/2019
Type of sample		soil
Date extracted	-	05/08/2019
Date analysed	-	05/08/2019
Aroclor 1016	mg/kg	<0.1
Aroclor 1221	mg/kg	<0.1
Aroclor 1232	mg/kg	<0.1
Aroclor 1242	mg/kg	<0.1
Aroclor 1248	mg/kg	<0.1
Aroclor 1254	mg/kg	<0.1
Aroclor 1260	mg/kg	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1
Surrogate TCMX	%	92

Acid Extractable metals in soil		
Our Reference		223049-1
Your Reference	UNITS	TR1
Date Sampled		01/08/2019
Type of sample		soil
Date prepared	-	05/08/2019
Date analysed	-	05/08/2019
Arsenic	mg/kg	6
Cadmium	mg/kg	<0.4
Chromium	mg/kg	20
Copper	mg/kg	4
Lead	mg/kg	20
Mercury	mg/kg	<0.1
Nickel	mg/kg	<1
Zinc	mg/kg	20

Moisture		
Our Reference		223049-1
Your Reference	UNITS	TR1
Date Sampled		01/08/2019
Type of sample		soil
Date prepared	-	05/08/2019
Date analysed	-	06/08/2019
Moisture	%	22

Method ID	Methodology Summary
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-021	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.

Method ID	Methodology Summary
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-7	[NT]
Date extracted	-			05/08/2019	[NT]	[NT]	[NT]	[NT]	05/08/2019	[NT]
Date analysed	-			06/08/2019	[NT]	[NT]	[NT]	[NT]	06/08/2019	[NT]
TRH C_6 - C_9	mg/kg	25	Org-016	<25	[NT]	[NT]	[NT]	[NT]	122	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-016	<25	[NT]	[NT]	[NT]	[NT]	122	[NT]
Benzene	mg/kg	0.2	Org-016	<0.2	[NT]	[NT]	[NT]	[NT]	123	[NT]
Toluene	mg/kg	0.5	Org-016	<0.5	[NT]	[NT]	[NT]	[NT]	121	[NT]
Ethylbenzene	mg/kg	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	121	[NT]
m+p-xylene	mg/kg	2	Org-016	<2	[NT]	[NT]	[NT]	[NT]	122	[NT]
o-Xylene	mg/kg	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	120	[NT]
naphthalene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	106	[NT]	[NT]	[NT]	[NT]	111	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-7	[NT]
Date extracted	-			05/08/2019	[NT]	[NT]	[NT]	[NT]	05/08/2019	[NT]
Date analysed	-			08/08/2019	[NT]	[NT]	[NT]	[NT]	08/08/2019	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	133	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	113	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	138	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	133	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	113	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	138	[NT]
Surrogate o-Terphenyl	%		Org-003	86	[NT]	[NT]	[NT]	[NT]	119	[NT]

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-7	[NT]
Date extracted	-			05/08/2019	[NT]	[NT]	[NT]	[NT]	05/08/2019	[NT]
Date analysed	-			09/08/2019	[NT]	[NT]	[NT]	[NT]	09/08/2019	[NT]
Naphthalene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Acenaphthylene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	92	[NT]
Phenanthrene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	94	[NT]
Anthracene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	92	[NT]
Pyrene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	96	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	92	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-012	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012	<0.05	[NT]	[NT]	[NT]	[NT]	90	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	87	[NT]	[NT]	[NT]	[NT]	78	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-7	[NT]
Date extracted	-			05/08/2019	[NT]	[NT]	[NT]	[NT]	05/08/2019	[NT]
Date analysed	-			05/08/2019	[NT]	[NT]	[NT]	[NT]	05/08/2019	[NT]
HCB	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	81	[NT]
gamma-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	84	[NT]
Heptachlor	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	69	[NT]
delta-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	88	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	89	[NT]
gamma-Chlordane	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	99	[NT]
Dieldrin	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	106	[NT]
Endrin	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	83	[NT]
pp-DDD	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	73	[NT]
Endosulfan II	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	70	[NT]
Methoxychlor	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-005	96	[NT]	[NT]	[NT]	[NT]	86	[NT]

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-7	[NT]
Date extracted	-			05/08/2019	[NT]	[NT]	[NT]	[NT]	05/08/2019	[NT]
Date analysed	-			05/08/2019	[NT]	[NT]	[NT]	[NT]	05/08/2019	[NT]
Aroclor 1016	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	109	[NT]
Aroclor 1260	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-006	96	[NT]	[NT]	[NT]	[NT]	86	[NT]

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-7	[NT]
Date prepared	-			05/08/2019	[NT]	[NT]	[NT]	[NT]	05/08/2019	[NT]
Date analysed	-			05/08/2019	[NT]	[NT]	[NT]	[NT]	05/08/2019	[NT]
Arsenic	mg/kg	4	Metals-020	<4	[NT]	[NT]	[NT]	[NT]	109	[NT]
Cadmium	mg/kg	0.4	Metals-020	<0.4	[NT]	[NT]	[NT]	[NT]	101	[NT]
Chromium	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	109	[NT]
Copper	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	108	[NT]
Lead	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	108	[NT]
Mercury	mg/kg	0.1	Metals-021	<0.1	[NT]	[NT]	[NT]	[NT]	97	[NT]
Nickel	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	105	[NT]
Zinc	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	106	[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: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

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.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

CHAIN OF CUSTODY & ANALYSIS REQUEST

Page _1__ of _1___

SGS Environmental Services Sydney
Unit 16, 33 Maddox Street
Alexandria NSW 2015
Telephone No: (02) 85940400
Facsimile No: (02) 85940499
Email: au.samplereceipt.sydney@sgs.com

Lab ID Number: *(please quote on correspondence)*

Site: Gran Central, Granville

Company Name:	Golder Associates Pty Ltd	Project Name/No:	Gran Central - 19130799
Address:	Level 8, 40 Mount Street	Purchase Order No:	PO23977
	North Sydney NSW	Results Required Date:	5 day TAT
		Telephone:	0437 099 883 Fax:
Contact Name:	Cameron Williams	Email Results to:	cawilliams@golder.com.au; sdoyle@golder.com.au
Quotation No:			

E-MAILED 13/11/19@11:27am

SGS ID	Client Sample ID	Sampling Date/ Time	Matrix (Tick as appropriate) Soil Sample	Water Sample	Other ___	NO. OF CONTAINERS	HOLD	HOLD (Freeze)	CL17 SUITE	ASBESTOS WA DOH NEPM	TRH/BTEXN/PAH/HM* 8	TRH F1/ BTEXN (CL4 SUITE)							Notes/Guidelines/LOR/ Special instructions
1	BH103/201103/2001	11/11 – 08:45				1			X										0.08-0.10m HA
2	BH103/201103/2002	11/11 – 08:50				1				X									0.10-0.15m HA – Zip Lock
	BH103/201103/2004	11/11 – 9:20				1	X												0.60-0.65m HA – Zip Lock
	BH103/201103/2003	11/11 – 9:15				1	X												0.58-0.60m HA
3	BH103/201103/2005	11/11 – 9:40				1			X										1.1-1.25m HA
	BH103/201103/2006	11/11 – 9:40				1	X												1.1-1.25m HA
	BH103/201103/2007	11/11 – 10:20				1	X												1.5-1.75m SPT
	BH103/201103/2008	11/11 – 13:00				1	X												4.09-4.39m SPT – Handled without gloves, likely grease and drilling mud ingress also.
4	Trip blank					1						X							
5	Trip spike					1						X							SB199950

Additional Report Formats

- ☐ NEPM
- ☐ CSV
- ☐ ESDAT
- ☐ DQO
- ☐ GO, Guidelines ---------
- ☐ Others _____

Relinquished By: Cameron Williams	Date/Time: 11/11 – 16:30	Received By: Courier	Date/Time: 11/11 – 16:30
Relinquished By:	Date/Time:	Received By:	Date/Time: 11/11/19 @ 4:30
Samples Intact: *Yes / No*	Temperature: °C	Sample Security Sealed: *Yes / No*	Hazards: *e.g. may contain Asbestos*

Comments / Subcontracting details: COC Golder review: SPD 13/11/2019

SAMPLE RECEIPT ADVICE

SE199950

CLIENT DETAILS

Contact	Cameron Williams
Client	GOLDER ASSOCIATES PTY LTD
Address	124 Pacific Hwy (PO Box 1302, CROWS NEST, NSW 2065) NSW 2065
Telephone	02 9478 3900
Facsimile	02 9478 3901
Email	cawilliams@golder.com.au
Project	**19130799 - Gran Central**
Order Number	**PO23977**
Samples	5

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
Samples Received	Wed 13/11/2019
Report Due	Wed 20/11/2019
SGS Reference	**SE199950**

SUBMISSION DETAILS

This is to confirm that 5 samples were received on Wednesday 13/11/2019. Results are expected to be ready by COB Wednesday 20/11/2019. Please quote SGS reference SE199950 when making enquiries. Refer below for details relating to sample integrity upon receipt.

Samples clearly labelled	Yes	Complete documentation received	Yes
Sample container provider	SGS	Sample cooling method	Ice Bricks
Samples received in correct containers	Yes	Sample counts by matrix	5 Soil
Date documentation received	13/11/2019@11:27am	Type of documentation received	COC
Samples received in good order	Yes	Samples received without headspace	Yes
Sample temperature upon receipt	5.3°C	Sufficient sample for analysis	Yes
Turnaround time requested	Standard		

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

COMMENTS

5 soil samples have been placed on hold as no tests have been assigned for them by the client. These samples will not be processed.

This document is issued by the Company under its General Conditions of Service accessible at www.sgs.com/en/Terms-and-Conditions.aspx. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein.

SAMPLE RECEIPT ADVICE

SE199950

CLIENT DETAILS

Client GOLDER ASSOCIATES PTY LTD

Project 19130799 - Gran Central

SUMMARY OF ANALYSIS

No.	Sample ID	OC Pesticides in Soil	OP Pesticides in Soil	PAH (Polynuclear Aromatic Hydrocarbons) in Soil	PCBs in Soil	Total Recoverable Elements in Soil/Waste	TRH (Total Recoverable Hydrocarbons) in Soil	VOC's in Soil	Volatile Petroleum Hydrocarbons in Soil
001	BH103/201103/2001	29	14	26	11	7	10	11	7
003	BH103/201103/2005	29	14	26	11	7	10	11	7
004	Trip Blank	-	-	-	-	-	-	11	7
005	Trip Spike	-	-	-	-	-	-	11	-

CONTINUED OVERLEAF

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

SAMPLE RECEIPT ADVICE

SE199950

CLIENT DETAILS

Client GOLDER ASSOCIATES PTY LTD

Project 19130799 - Gran Central

SUMMARY OF ANALYSIS

No.	Sample ID	Fibre Identification in soil	Gravimetric Determination of Asbestos in Soil	Mercury in Soil	Moisture Content
001	BH103/201103/2001	-	-	1	1
002	BH103/201103/2002	2	9	-	-
003	BH103/201103/2005	-	-	1	1
004	Trip Blank	-	-	-	1

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

ANALYTICAL REPORT

Accreditation No. 2562

CLIENT DETAILS

Contact	Cameron Williams
Client	GOLDER ASSOCIATES PTY LTD
Address	124 Pacific Hwy (PO Box 1302, CROWS NEST, NSW 2065) NSW 2065
Telephone	02 9478 3900
Facsimile	02 9478 3901
Email	cawilliams@golder.com.au
Project	**19130799 - Gran Central**
Order Number	**PO23977**
Samples	5

LABORATORY DETAILS

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Laboratory	SGS Alexandria Environmental
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SGS Reference	**SE199950 R0**
Date Received	13/11/2019
Date Reported	20/11/2019

COMMENTS

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

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

Sample #2: Approx 9-10mm x 2mm fibre bundles found loose in sample.

Asbestos analysed by Approved Identifier Yusuf Kuthpudin.

SIGNATORIES

Bennet LO
Senior Organic Chemist/Metals Chemist

Dong LIANG
Metals/Inorganics Team Leader

Ly Kim HA
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Hygiene Team Leader

VOC's in Soil [AN433] Tested: 15/11/2019

PARAMETER	UOM	LOR	BH103/201103/2001 SOIL - 11/11/19 8:45 SE199950.001	BH103/201103/2005 SOIL - 11/11/19 9:40 SE199950.003	Trip Blank SOIL - 11/11/2019 SE199950.004	Trip Spike SOIL - 11/11/2019 SE199950.005
Benzene	mg/kg	0.1	<0.1	<0.1	<0.1	[100%]
Toluene	mg/kg	0.1	<0.1	<0.1	<0.1	[96%]
Ethylbenzene	mg/kg	0.1	<0.1	<0.1	<0.1	[97%]
m/p-xylene	mg/kg	0.2	<0.2	<0.2	<0.2	[95%]
o-xylene	mg/kg	0.1	<0.1	<0.1	<0.1	[92%]
Total Xylenes	mg/kg	0.3	<0.3	<0.3	<0.3	-
Total BTEX	mg/kg	0.6	<0.6	<0.6	<0.6	-
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	-

Volatile Petroleum Hydrocarbons in Soil [AN433] Tested: 15/11/2019

PARAMETER	UOM	LOR	BH103/201103/2001 SOIL - 11/11/19 8:45 SE199950.001	BH103/201103/2005 SOIL - 11/11/19 9:40 SE199950.003	Trip Blank SOIL - 11/11/2019 SE199950.004
TRH C6-C9	mg/kg	20	<20	<20	<20
Benzene (F0)	mg/kg	0.1	<0.1	<0.1	<0.1
TRH C6-C10	mg/kg	25	<25	<25	<25
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	<25

TRH (Total Recoverable Hydrocarbons) in Soil [AN403] Tested: 15/11/2019

PARAMETER	UOM	LOR	BH103/201103/2001 SOIL - 11/11/19 8:45 SE199950.001	BH103/201103/2005 SOIL - 11/11/19 9:40 SE199950.003
TRH C10-C14	mg/kg	20	<20	<20
TRH C15-C28	mg/kg	45	<45	<45
TRH C29-C36	mg/kg	45	<45	<45
TRH C37-C40	mg/kg	100	<100	<100
TRH >C10-C16	mg/kg	25	<25	<25
TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25	<25
TRH >C16-C34 (F3)	mg/kg	90	<90	<90
TRH >C34-C40 (F4)	mg/kg	120	<120	<120
TRH C10-C36 Total	mg/kg	110	<110	<110
TRH >C10-C40 Total (F bands)	mg/kg	210	<210	<210

PAH (Polynuclear Aromatic Hydrocarbons) in Soil [AN420] Tested: 15/11/2019

PARAMETER	UOM	LOR	BH103/201103/2001 SOIL - 11/11/19 8:45 SE199950.001	BH103/201103/2005 SOIL - 11/11/19 9:40 SE199950.003
Naphthalene	mg/kg	0.1	<0.1	<0.1
2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1
1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1
Acenaphthylene	mg/kg	0.1	**0.1**	<0.1
Acenaphthene	mg/kg	0.1	<0.1	<0.1
Fluorene	mg/kg	0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.1	**0.2**	<0.1
Anthracene	mg/kg	0.1	**0.1**	<0.1
Fluoranthene	mg/kg	0.1	**0.8**	<0.1
Pyrene	mg/kg	0.1	**0.9**	<0.1
Benzo(a)anthracene	mg/kg	0.1	**0.5**	<0.1
Chrysene	mg/kg	0.1	**0.5**	<0.1
Benzo(b&j)fluoranthene	mg/kg	0.1	**0.7**	<0.1
Benzo(k)fluoranthene	mg/kg	0.1	**0.3**	<0.1
Benzo(a)pyrene	mg/kg	0.1	**0.7**	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	**0.4**	<0.1
Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.1	**0.4**	<0.1
Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.2	**0.9**	<0.2
Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	**1.0**	<0.3
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	**0.9**	<0.2
Total PAH (18)	mg/kg	0.8	**5.6**	<0.8
Total PAH (NEPM/WHO 16)	mg/kg	0.8	**5.6**	<0.8

OC Pesticides in Soil [AN420] Tested: 15/11/2019

PARAMETER	UOM	LOR	BH103/201103/2001 SOIL - 11/11/19 8:45 SE199950.001	BH103/201103/2005 SOIL - 11/11/19 9:40 SE199950.003
Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1
Alpha BHC	mg/kg	0.1	<0.1	<0.1
Lindane	mg/kg	0.1	<0.1	<0.1
Heptachlor	mg/kg	0.1	<0.1	<0.1
Aldrin	mg/kg	0.1	<0.1	<0.1
Beta BHC	mg/kg	0.1	<0.1	<0.1
Delta BHC	mg/kg	0.1	<0.1	<0.1
Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1
o,p'-DDE	mg/kg	0.1	<0.1	<0.1
Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2
Gamma Chlordane	mg/kg	0.1	<0.1	<0.1
Alpha Chlordane	mg/kg	0.1	<0.1	<0.1
trans-Nonachlor	mg/kg	0.1	<0.1	<0.1
p,p'-DDE	mg/kg	0.1	<0.1	<0.1
Dieldrin	mg/kg	0.2	<0.2	<0.2
Endrin	mg/kg	0.2	<0.2	<0.2
o,p'-DDD	mg/kg	0.1	<0.1	<0.1
o,p'-DDT	mg/kg	0.1	<0.1	<0.1
Beta Endosulfan	mg/kg	0.2	<0.2	<0.2
p,p'-DDD	mg/kg	0.1	<0.1	<0.1
p,p'-DDT	mg/kg	0.1	<0.1	<0.1
Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1
Methoxychlor	mg/kg	0.1	<0.1	<0.1
Endrin Ketone	mg/kg	0.1	<0.1	<0.1
Isodrin	mg/kg	0.1	<0.1	<0.1
Mirex	mg/kg	0.1	<0.1	<0.1
Total CLP OC Pesticides	mg/kg	1	<1	<1

OP Pesticides in Soil [AN420] Tested: 15/11/2019

PARAMETER	UOM	LOR	BH103/201103/2001 SOIL - 11/11/19 8:45 SE199950.001	BH103/201103/2005 SOIL - 11/11/19 9:40 SE199950.003
Dichlorvos	mg/kg	0.5	<0.5	<0.5
Dimethoate	mg/kg	0.5	<0.5	<0.5
Diazinon (Dimpylate)	mg/kg	0.5	<0.5	<0.5
Fenitrothion	mg/kg	0.2	<0.2	<0.2
Malathion	mg/kg	0.2	<0.2	<0.2
Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2	<0.2
Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2	<0.2
Bromophos Ethyl	mg/kg	0.2	<0.2	<0.2
Methidathion	mg/kg	0.5	<0.5	<0.5
Ethion	mg/kg	0.2	<0.2	<0.2
Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	<0.2
Total OP Pesticides*	mg/kg	1.7	<1.7	<1.7

PCBs in Soil [AN420] Tested: 15/11/2019

PARAMETER	UOM	LOR	BH103/201103/2001 SOIL - 11/11/19 8:45 SE199950.001	BH103/201103/2005 SOIL - 11/11/19 9:40 SE199950.003
Arochlor 1016	mg/kg	0.2	<0.2	<0.2
Arochlor 1221	mg/kg	0.2	<0.2	<0.2
Arochlor 1232	mg/kg	0.2	<0.2	<0.2
Arochlor 1242	mg/kg	0.2	<0.2	<0.2
Arochlor 1248	mg/kg	0.2	<0.2	<0.2
Arochlor 1254	mg/kg	0.2	<0.2	<0.2
Arochlor 1260	mg/kg	0.2	<0.2	<0.2
Arochlor 1262	mg/kg	0.2	<0.2	<0.2
Arochlor 1268	mg/kg	0.2	<0.2	<0.2
Total PCBs (Arochlors)	mg/kg	1	<1	<1

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES [AN040/AN320] Tested: 15/11/2019

PARAMETER	UOM	LOR	BH103/201103/2001 SOIL - 11/11/19 8:45 SE199950.001	BH103/201103/2005 SOIL - 11/11/19 9:40 SE199950.003
Arsenic, As	mg/kg	1	**14**	**5**
Cadmium, Cd	mg/kg	0.3	**0.6**	<0.3
Chromium, Cr	mg/kg	0.5	**22**	**18**
Copper, Cu	mg/kg	0.5	**150**	**2.8**
Lead, Pb	mg/kg	1	**790**	**16**
Nickel, Ni	mg/kg	0.5	**10**	<0.5
Zinc, Zn	mg/kg	2	**590**	**9.4**

Mercury in Soil [AN312] Tested: 15/11/2019

PARAMETER	UOM	LOR	BH103/201103/2001 SOIL - 11/11/19 8:45 SE199950.001	BH103/201103/2005 SOIL - 11/11/19 9:40 SE199950.003
Mercury	mg/kg	0.05	**1.1**	<0.05

Moisture Content [AN002] Tested: 15/11/2019

PARAMETER	UOM	LOR	BH103/201103/2001 SOIL - 11/11/19 8:45 SE199950.001	BH103/201103/2005 SOIL - 11/11/19 9:40 SE199950.003	Trip Blank SOIL - 11/11/2019 SE199950.004
% Moisture	%w/w	1	**8.3**	**18.0**	<1.0

Fibre Identification in soil [AN602] Tested: 18/11/2019

PARAMETER	UOM	LOR	BH103/201103/2002 SOIL - 11/11/19 8:50 SE199950.002
Asbestos Detected	No unit	-	Yes
Estimated Fibres*	%w/w	0.01	<0.01

Gravimetric Determination of Asbestos in Soil [AN605] Tested: 18/11/2019

PARAMETER	UOM	LOR	BH103/201103/2002 SOIL - 11/11/19 8:50 SE199950.002
Total Sample Weight*	g	1	**575**
ACM in >7mm Sample*	g	0.01	<0.01
AF/FA in >2mm to <7mm Sample*	g	0.0001	**0.0139**
AF/FA in <2mm Sample*	g	0.0001	<0.0001
Asbestos in soil (>7mm ACM)*	%w/w	0.01	<0.01
Asbestos in soil (>2mm to <7mm AF/FA)*	%w/w	0.001	**0.002**
Asbestos in soil (<2mm AF/FA)*	%w/w	0.001	<0.001
Asbestos in soil (<7mm AF/FA)*	%w/w	0.001	**0.002**
Fibre Type*	No unit	-	-

METHOD	METHODOLOGY SUMMARY
AN002	The test is carried out by drying (at either 40°C or 105°C) a known mass of sample in a weighed evaporating basin. After fully dry the sample is re-weighed. Samples such as sludge and sediment having high percentages of moisture will take some time in a drying oven for complete removal of water.
AN040/AN320	A portion of sample is digested with nitric acid to decompose organic matter and hydrochloric acid to complete the digestion of metals. The digest is then analysed by ICP OES with metals results reported on the dried sample basis. Based on USEPA method 200.8 and 6010C.
AN040	A portion of sample is digested with Nitric acid to decompose organic matter and Hydrochloric acid to complete the digestion of metals and then filtered for analysis by ASS or ICP as per USEPA Method 200.8.
AN312	Mercury by Cold Vapour AAS in Soils: After digestion with nitric acid, hydrogen peroxide and hydrochloric acid, mercury ions are reduced by stannous chloride reagent in acidic solution to elemental mercury. This mercury vapour is purged by nitrogen into a cold cell in an atomic absorption spectrometer or mercury analyser. Quantification is made by comparing absorbances to those of the calibration standards. Reference APHA 3112/3500
AN403	Total Recoverable Hydrocarbons: Determination of Hydrocarbons by gas chromatography after a solvent extraction. Detection is by flame ionisation detector (FID) that produces an electronic signal in proportion to the combustible matter passing through it. Total Recoverable Hydrocarbons (TRH) are routinely reported as four alkane groupings based on the carbon chain length of the compounds: C6-C9, C10-C14, C15-C28 and C29-C36 and in recognition of the NEPM 1999 (2013), >C10-C16 (F2), >C16-C34 (F3) and >C34-C40 (F4). F2 is reported directly and also corrected by subtracting Naphthalene (from VOC method AN433) where available.
AN403	Additionally, the volatile C6-C9 fraction may be determined by a purge and trap technique and GC/MS because of the potential for volatiles loss. Total Recoverable Hydrocarbons - Silica (TRH-Si) follows the same method of analysis after silica gel cleanup of the solvent extract. Aliphatic/Aromatic Speciation follows the same method of analysis after fractionation of the solvent extract over silica with differential polarity of the eluent solvents.
AN403	The GC/FID method is not well suited to the analysis of refined high boiling point materials (ie lubricating oils or greases) but is particularly suited for measuring diesel, kerosene and petrol if care to control volatility is taken. This method will detect naturally occurring hydrocarbons, lipids, animal fats, phenols and PAHs if they are present at sufficient levels, dependent on the use of specific cleanup/fractionation techniques. Reference USEPA 3510B, 8015B.
AN420	(SVOCs) including OC, OP, PCB, Herbicides, PAH, Phthalates and Speciated Phenols (etc) in soils, sediments and waters are determined by GCMS/ECD technique following appropriate solvent extraction process (Based on USEPA 3500C and 8270D).
AN420	SVOC Compounds: Semi-Volatile Organic Compounds (SVOCs) including OC, OP, PCB, Herbicides, PAH, Phthalates and Speciated Phenols in soils, sediments and waters are determined by GCMS/ECD technique following appropriate solvent extraction process (Based on USEPA 3500C and 8270D).
AN433	VOCs and C6-C9 Hydrocarbons by GC-MS P&T: VOC`s are volatile organic compounds. The sample is presented to a gas chromatograph via a purge and trap (P&T) concentrator and autosampler and is detected with a Mass Spectrometer (MSD). Solid samples are initially extracted with methanol whilst liquid samples are processed directly. References: USEPA 5030B, 8020A, 8260.
AN602	Qualitative identification of chrysotile, amosite and crocidolite in bulk samples by polarised light microscopy (PLM) in conjunction with dispersion staining (DS). AS4964 provides the basis for this document. Unequivocal identification of the asbestos minerals present is made by obtaining sufficient diagnostic `clues`, which provide a reasonable degree of certainty, dispersion staining is a mandatory `clue` for positive identification. If sufficient `clues` are absent, then positive identification of asbestos is not possible. This procedure requires removal of suspect fibres/bundles from the sample which cannot be returned.
AN602	Fibres/material that cannot be unequivocably identified as one of the three asbestos forms, will be reported as unknown mineral fibres (umf) The fibres detected may or may not be asbestos fibres.
AN602	AS4964.2004 Method for the Qualitative Identification of Asbestos in Bulk Samples, Section 8.4, Trace Analysis Criteria, Note 4 states:"Depending upon sample condition and fibre type, the detection limit of this technique has been found to lie generally in the range of 1 in 1,000 to 1 in 10,000 parts by weight, equivalent to 1 to 0.1 g/kg."
AN602	The sample can be reported “no asbestos found at the reporting limit of 0.1 g/kg” (<0.01%w/w) where AN602 section 4.5 of this method has been followed, and if- (a) no trace asbestos fibres have been detected (i.e. no ‘respirable’ fibres): (b) the estimated weight of non-respirable asbestos fibre bundles and/or the estimated weight of asbestos in asbestos-containing materials are found to be less than 0.1g/kg: and (c) these non-respirable asbestos fibre bundles and/or the asbestos containing materials are only visible under stereo-microscope viewing conditions.
AN605	This technique gravimetrically determines the mass of Asbestos Containing Material retained on a 7mm Sieve and assumes that 15% of this ACM is asbestos. This calculated asbestos weight is then calculated as a percentage of the total sample weight.

AN605	This technique also gravimetrically determines the mass of Fibrous Asbestos (FA) and Asbestos Fines (AF) Containing Material retained on and passing a 2mm sieve post 7mm sieving. Assumes that FA and AF are 100% asbestos containing. This calculated asbestos weight is then calculated as a percentage of the total sample weight. This does not include free fibres which are only observed by standard trace analysis as per AN 602.
AN605	Insofar as is technically feasible, this report is consistent with the analytical reporting recommendations in the Western Australian Department of Health Guidelines for the Assessment Remediation and Management of Asbestos - Contaminated Sites in Western Australia - May 2009.

FOOTNOTES

*	NATA accreditation does not cover the performance of this service.	-	Not analysed.	UOM	Unit of Measure.
		NVL	Not validated.	LOR	Limit of Reporting.
**	Indicative data, theoretical holding time exceeded.	IS	Insufficient sample for analysis.	↑↓	Raised/lowered Limit of Reporting.
		LNR	Sample listed, but not received.		

Unless it is reported that sampling has been performed by SGS, the samples have been analysed as received.
Solid samples expressed on a dry weight basis.

Where "Total" analyte groups are reported (for example, Total PAHs, Total OC Pesticides) the total will be calculated as the sum of the individual analytes, with those analytes that are reported as <LOR being assumed to be zero. The summed (Total) limit of reporting is calculated by summing the individual analyte LORs and dividing by two. For example, where 16 individual analytes are being summed and each has an LOR of 0.1 mg/kg, the "Totals" LOR will be 1.6 / 2 (0.8 mg/kg). Where only 2 analytes are being summed, the " Total" LOR will be the sum of those two LORs.

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

If reported, measurement uncertainty follow the ± sign after the analytical result and is expressed as the expanded uncertainty calculated using a coverage factor of 2, providing a level of confidence of approximately 95%, unless stated otherwise in the comments section of this report.

Results reported for samples tested under test methods with codes starting with ARS-SOP, radionuclide or gross radioactivity concentrations are expressed in becquerel (Bq) per unit of mass or volume or per wipe as stated on the report. Becquerel is the SI unit for activity and equals one nuclear transformation per second.
Note that in terms of units of radioactivity:

a. 1 Bq is equivalent to 27 pCi
b. 37 MBq is equivalent to 1 mCi

For results reported for samples tested under test methods with codes starting with ARS-SOP, less than (<) values indicate the detection limit for each radionuclide or parameter for the measurement system used. The respective detection limits have been calculated in accordance with ISO 11929.

The QC and MU criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here: www.sgs.com.au.pv.sgsvr/en-gb/environment.

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ANALYTICAL REPORT

Accreditation No. 2562

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Project	**19130799 - Gran Central**
Order Number	**PO23977**
Samples	1

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SGS Reference	**SE199950 R0**
Date Received	13 Nov 2019
Date Reported	20 Nov 2019

COMMENTS

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

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

Sample #2: Approx 9-10mm x 2mm fibre bundles found loose in sample.

Asbestos analysed by Approved Identifier Yusuf Kuthpudin.

SIGNATORIES

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Organic Section Head

Ravee SIVASUBRAMANIAM
Hygiene Team Leader

RESULTS

Fibre Identification in soil — Method AN602

Laboratory Reference	Client Reference	Matrix	Sample Description	Date Sampled	Fibre Identification	Est.%w/w*
SE199950.002	BH103/201103/2002	Soil	575g Clay, Sand, Soil, Rocks	11 Nov 2019	Chrysotile & Crocidolite Asbestos Found	<0.01

Gravimetric Determination of Asbestos in Soil [AN605] Tested: 18/11/2019

PARAMETER	UOM	LOR	BH103/201103/2002 SOIL - 11/11/19 8:50 SE199950.002
Total Sample Weight*	g	1	**575**
ACM in >7mm Sample*	g	0.01	<0.01
AF/FA in >2mm to <7mm Sample*	g	0.0001	**0.0139**
AF/FA in <2mm Sample*	g	0.0001	<0.0001
Asbestos in soil (>7mm ACM)*	%w/w	0.01	<0.01
Asbestos in soil (>2mm to <7mm AF/FA)*	%w/w	0.001	**0.002**
Asbestos in soil (<2mm AF/FA)*	%w/w	0.001	<0.001
Asbestos in soil (<7mm AF/FA)*	%w/w	0.001	**0.002**
Fibre Type*	No unit	-	-

METHOD SUMMARY

METHOD	METHODOLOGY SUMMARY
AN602	Qualitative identification of chrysotile, amosite and crocidolite in bulk samples by polarised light microscopy (PLM) in conjunction with dispersion staining (DS). AS4964 provides the basis for this document. Unequivocal identification of the asbestos minerals present is made by obtaining sufficient diagnostic `clues`, which provide a reasonable degree of certainty, dispersion staining is a mandatory `clue` for positive identification. If sufficient `clues` are absent, then positive identification of asbestos is not possible. This procedure requires removal of suspect fibres/bundles from the sample which cannot be returned.
AN602	Fibres/material that cannot be unequivocably identified as one of the three asbestos forms, will be reported as unknown mineral fibres (umf) The fibres detected may or may not be asbestos fibres.
AN602	AS4964.2004 Method for the Qualitative Identification of Asbestos in Bulk Samples , Section 8.4, Trace Analysis Criteria, Note 4 states:"Depending upon sample condition and fibre type, the detection limit of this technique has been found to lie generally in the range of 1 in 1,000 to 1 in 10,000 parts by weight, equivalent to 1 to 0.1 g/kg."
AN602	The sample can be reported “no asbestos found at the reporting limit of 0.1 g/kg” (<0.01%w/w) where AN602 section 4.5 of this method has been followed, and if- (a) no trace asbestos fibres have been detected (i.e. no ‘respirable’ fibres): (b) the estimated weight of non-respirable asbestos fibre bundles and/or the estimated weight of asbestos in asbestos-containing materials are found to be less than 0.1g/kg: and (c) these non-respirable asbestos fibre bundles and/or the asbestos containing materials are only visible under stereo-microscope viewing conditions.
AN605	This technique gravimetrically determines the mass of Asbestos Containing Material retained on a 7mm Sieve and assumes that 15% of this ACM is asbestos. This calculated asbestos weight is then calculated as a percentage of the total sample weight.
AN605	This technique also gravimetrically determines the mass of Fibrous Asbestos (FA) and Asbestos Fines (AF) Containing Material retained on and passing a 2mm sieve post 7mm sieving. Assumes that FA and AF are 100% asbestos containing. This calculated asbestos weight is then calculated as a percentage of the total sample weight. This does not include free fibres which are only observed by standard trace analysis as per AN 602.
AN605	Insofar as is technically feasible, this report is consistent with the analytical reporting recommendations in the Western Australian Department of Health Guidelines for the Assessment Remediation and Management of Asbestos - Contaminated Sites in Western Australia - May 2009.

FOOTNOTES

Amosite	-	Brown Asbestos	NA	-	Not Analysed
Chrysotile	-	White Asbestos	LNR	-	Listed, Not Required
Crocidolite	-	Blue Asbestos	*	-	NATA accreditation does not cover the performance of this service.
Amphiboles	-	Amosite and/or Crocidolite	**	-	Indicative data, theoretical holding time exceeded.

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

Unless it is reported that sampling has been performed by SGS, the samples have been analysed as received.

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

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

The QC and MU criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here: www.sgs.com.au.pv.sgsvr/en-gb/environment.

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STATEMENT OF QA/QC PERFORMANCE

SE199950 R0

CLIENT DETAILS

Contact	Cameron Williams
Client	GOLDER ASSOCIATES PTY LTD
Address	124 Pacific Hwy (PO Box 1302, CROWS NEST, NSW 2065) NSW 2065
Telephone	02 9478 3900
Facsimile	02 9478 3901
Email	cawilliams@golder.com.au
Project	**19130799 - Gran Central**
Order Number	**PO23977**
Samples	5

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
SGS Reference	**SE199950 R0**
Date Received	13 Nov 2019
Date Reported	20 Nov 2019

COMMENTS

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

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

All Data Quality Objectives were met with the exception of the following:

Duplicate	PAH (Polynuclear Aromatic Hydrocarbons) in Soil	1 item
Matrix Spike	Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES	1 item

SAMPLE SUMMARY

Samples clearly labelled	Yes	Complete documentation received	Yes
Sample container provider	SGS	Sample cooling method	Ice Bricks
Samples received in correct containers	Yes	Sample counts by matrix	5 Soil
Date documentation received	13/11/2019@11:27a	Type of documentation received	COC
Samples received in good order	Yes	Samples received without headspace	Yes
Sample temperature upon receipt	5.3°C	Sufficient sample for analysis	Yes
Turnaround time requested	Standard		

HOLDING TIME SUMMARY

SE199950 R0

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

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

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

Fibre Identification in soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH103/201103/2002	SE199950.002	LB187934	11 Nov 2019	13 Nov 2019	10 Nov 2020	18 Nov 2019	10 Nov 2020	20 Nov 2019

Gravimetric Determination of Asbestos in Soil

Method: ME-(AU)-[ENV]AN605

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH103/201103/2002	SE199950.002	LB187934	11 Nov 2019	13 Nov 2019	09 May 2020	18 Nov 2019	09 May 2020	20 Nov 2019

Mercury in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH103/201103/2001	SE199950.001	LB187787	11 Nov 2019	13 Nov 2019	09 Dec 2019	15 Nov 2019	09 Dec 2019	19 Nov 2019
BH103/201103/2005	SE199950.003	LB187787	11 Nov 2019	13 Nov 2019	09 Dec 2019	15 Nov 2019	09 Dec 2019	19 Nov 2019

Moisture Content

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH103/201103/2001	SE199950.001	LB187765	11 Nov 2019	13 Nov 2019	25 Nov 2019	15 Nov 2019	20 Nov 2019	18 Nov 2019
BH103/201103/2005	SE199950.003	LB187765	11 Nov 2019	13 Nov 2019	25 Nov 2019	15 Nov 2019	20 Nov 2019	18 Nov 2019
Trip Blank	SE199950.004	LB187765	11 Nov 2019	13 Nov 2019	25 Nov 2019	15 Nov 2019	20 Nov 2019	18 Nov 2019

OC Pesticides in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH103/201103/2001	SE199950.001	LB187764	11 Nov 2019	13 Nov 2019	25 Nov 2019	15 Nov 2019	25 Dec 2019	19 Nov 2019
BH103/201103/2005	SE199950.003	LB187764	11 Nov 2019	13 Nov 2019	25 Nov 2019	15 Nov 2019	25 Dec 2019	19 Nov 2019

OP Pesticides in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH103/201103/2001	SE199950.001	LB187764	11 Nov 2019	13 Nov 2019	25 Nov 2019	15 Nov 2019	25 Dec 2019	18 Nov 2019
BH103/201103/2005	SE199950.003	LB187764	11 Nov 2019	13 Nov 2019	25 Nov 2019	15 Nov 2019	25 Dec 2019	18 Nov 2019

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH103/201103/2001	SE199950.001	LB187764	11 Nov 2019	13 Nov 2019	25 Nov 2019	15 Nov 2019	25 Dec 2019	18 Nov 2019
BH103/201103/2005	SE199950.003	LB187764	11 Nov 2019	13 Nov 2019	25 Nov 2019	15 Nov 2019	25 Dec 2019	18 Nov 2019

PCBs in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH103/201103/2001	SE199950.001	LB187764	11 Nov 2019	13 Nov 2019	25 Nov 2019	15 Nov 2019	25 Dec 2019	19 Nov 2019
BH103/201103/2005	SE199950.003	LB187764	11 Nov 2019	13 Nov 2019	25 Nov 2019	15 Nov 2019	25 Dec 2019	19 Nov 2019

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH103/201103/2001	SE199950.001	LB187786	11 Nov 2019	13 Nov 2019	09 May 2020	15 Nov 2019	09 May 2020	19 Nov 2019
BH103/201103/2005	SE199950.003	LB187786	11 Nov 2019	13 Nov 2019	09 May 2020	15 Nov 2019	09 May 2020	19 Nov 2019

TRH (Total Recoverable Hydrocarbons) in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH103/201103/2001	SE199950.001	LB187764	11 Nov 2019	13 Nov 2019	25 Nov 2019	15 Nov 2019	25 Dec 2019	18 Nov 2019
BH103/201103/2005	SE199950.003	LB187764	11 Nov 2019	13 Nov 2019	25 Nov 2019	15 Nov 2019	25 Dec 2019	18 Nov 2019

VOC's in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH103/201103/2001	SE199950.001	LB187763	11 Nov 2019	13 Nov 2019	25 Nov 2019	15 Nov 2019	25 Dec 2019	18 Nov 2019
BH103/201103/2005	SE199950.003	LB187763	11 Nov 2019	13 Nov 2019	25 Nov 2019	15 Nov 2019	25 Dec 2019	18 Nov 2019
Trip Blank	SE199950.004	LB187763	11 Nov 2019	13 Nov 2019	25 Nov 2019	15 Nov 2019	25 Dec 2019	18 Nov 2019
Trip Spike	SE199950.005	LB187763	11 Nov 2019	13 Nov 2019	25 Nov 2019	15 Nov 2019	25 Dec 2019	18 Nov 2019

Volatile Petroleum Hydrocarbons in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH103/201103/2001	SE199950.001	LB187763	11 Nov 2019	13 Nov 2019	25 Nov 2019	15 Nov 2019	25 Dec 2019	18 Nov 2019
BH103/201103/2005	SE199950.003	LB187763	11 Nov 2019	13 Nov 2019	25 Nov 2019	15 Nov 2019	25 Dec 2019	18 Nov 2019
Trip Blank	SE199950.004	LB187763	11 Nov 2019	13 Nov 2019	25 Nov 2019	15 Nov 2019	25 Dec 2019	18 Nov 2019
Trip Spike	SE199950.005	LB187763	11 Nov 2019	13 Nov 2019	25 Nov 2019	15 Nov 2019	25 Dec 2019	20 Nov 2019

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

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

OC Pesticides in Soil

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Tetrachloro-m-xylene (TCMX) (Surrogate)	BH103/201103/2001	SE199950.001	%	60 - 130%	83
	BH103/201103/2005	SE199950.003	%	60 - 130%	89

OP Pesticides in Soil

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2-fluorobiphenyl (Surrogate)	BH103/201103/2001	SE199950.001	%	60 - 130%	83
	BH103/201103/2005	SE199950.003	%	60 - 130%	82
d14-p-terphenyl (Surrogate)	BH103/201103/2001	SE199950.001	%	60 - 130%	90
	BH103/201103/2005	SE199950.003	%	60 - 130%	85

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2-fluorobiphenyl (Surrogate)	BH103/201103/2001	SE199950.001	%	70 - 130%	83
	BH103/201103/2005	SE199950.003	%	70 - 130%	82
d14-p-terphenyl (Surrogate)	BH103/201103/2001	SE199950.001	%	70 - 130%	90
	BH103/201103/2005	SE199950.003	%	70 - 130%	85
d5-nitrobenzene (Surrogate)	BH103/201103/2001	SE199950.001	%	70 - 130%	89
	BH103/201103/2005	SE199950.003	%	70 - 130%	81

PCBs in Soil

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Tetrachloro-m-xylene (TCMX) (Surrogate)	BH103/201103/2001	SE199950.001	%	60 - 130%	83
	BH103/201103/2005	SE199950.003	%	60 - 130%	89

VOC's in Soil

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	BH103/201103/2001	SE199950.001	%	60 - 130%	70
	BH103/201103/2005	SE199950.003	%	60 - 130%	73
	Trip Blank	SE199950.004	%	60 - 130%	73
	Trip Spike	SE199950.005	%	60 - 130%	81
d4-1,2-dichloroethane (Surrogate)	BH103/201103/2001	SE199950.001	%	60 - 130%	80
	BH103/201103/2005	SE199950.003	%	60 - 130%	80
	Trip Blank	SE199950.004	%	60 - 130%	89
	Trip Spike	SE199950.005	%	60 - 130%	82
d8-toluene (Surrogate)	BH103/201103/2001	SE199950.001	%	60 - 130%	81
	BH103/201103/2005	SE199950.003	%	60 - 130%	82
	Trip Blank	SE199950.004	%	60 - 130%	88
	Trip Spike	SE199950.005	%	60 - 130%	83

Volatile Petroleum Hydrocarbons in Soil

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	BH103/201103/2001	SE199950.001	%	60 - 130%	70
	BH103/201103/2005	SE199950.003	%	60 - 130%	73
	Trip Blank	SE199950.004	%	60 - 130%	73
d4-1,2-dichloroethane (Surrogate)	BH103/201103/2001	SE199950.001	%	60 - 130%	80
	BH103/201103/2005	SE199950.003	%	60 - 130%	80
	Trip Blank	SE199950.004	%	60 - 130%	89
d8-toluene (Surrogate)	BH103/201103/2001	SE199950.001	%	60 - 130%	81
	BH103/201103/2005	SE199950.003	%	60 - 130%	82
	Trip Blank	SE199950.004	%	60 - 130%	88

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

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

Mercury in Soil

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

Sample Number	Parameter	Units	LOR	Result
LB187787.001	Mercury	mg/kg	0.05	<0.05

OC Pesticides in Soil

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

Sample Number		Parameter	Units	LOR	Result
LB187764.001		Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1
		Alpha BHC	mg/kg	0.1	<0.1
		Lindane	mg/kg	0.1	<0.1
		Heptachlor	mg/kg	0.1	<0.1
		Aldrin	mg/kg	0.1	<0.1
		Beta BHC	mg/kg	0.1	<0.1
		Delta BHC	mg/kg	0.1	<0.1
		Heptachlor epoxide	mg/kg	0.1	<0.1
		Alpha Endosulfan	mg/kg	0.2	<0.2
		Gamma Chlordane	mg/kg	0.1	<0.1
		Alpha Chlordane	mg/kg	0.1	<0.1
		p,p'-DDE	mg/kg	0.1	<0.1
		Dieldrin	mg/kg	0.2	<0.2
		Endrin	mg/kg	0.2	<0.2
		Beta Endosulfan	mg/kg	0.2	<0.2
		p,p'-DDD	mg/kg	0.1	<0.1
		p,p'-DDT	mg/kg	0.1	<0.1
		Endosulfan sulphate	mg/kg	0.1	<0.1
		Endrin Aldehyde	mg/kg	0.1	<0.1
		Methoxychlor	mg/kg	0.1	<0.1
		Endrin Ketone	mg/kg	0.1	<0.1
		Isodrin	mg/kg	0.1	<0.1
		Mirex	mg/kg	0.1	<0.1
	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	83

OP Pesticides in Soil

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

Sample Number		Parameter	Units	LOR	Result
LB187764.001		Dichlorvos	mg/kg	0.5	<0.5
		Dimethoate	mg/kg	0.5	<0.5
		Diazinon (Dimpylate)	mg/kg	0.5	<0.5
		Fenitrothion	mg/kg	0.2	<0.2
		Malathion	mg/kg	0.2	<0.2
		Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2
		Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2
		Bromophos Ethyl	mg/kg	0.2	<0.2
		Methidathion	mg/kg	0.5	<0.5
		Ethion	mg/kg	0.2	<0.2
		Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2
	Surrogates	2-fluorobiphenyl (Surrogate)	%	-	97
		d14-p-terphenyl (Surrogate)	%	-	102

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Sample Number	Parameter	Units	LOR	Result
LB187764.001	Naphthalene	mg/kg	0.1	<0.1
	2-methylnaphthalene	mg/kg	0.1	<0.1
	1-methylnaphthalene	mg/kg	0.1	<0.1
	Acenaphthylene	mg/kg	0.1	<0.1
	Acenaphthene	mg/kg	0.1	<0.1
	Fluorene	mg/kg	0.1	<0.1
	Phenanthrene	mg/kg	0.1	<0.1
	Anthracene	mg/kg	0.1	<0.1
	Fluoranthene	mg/kg	0.1	<0.1
	Pyrene	mg/kg	0.1	<0.1
	Benzo(a)anthracene	mg/kg	0.1	<0.1
	Chrysene	mg/kg	0.1	<0.1
	Benzo(a)pyrene	mg/kg	0.1	<0.1

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

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

PAH (Polynuclear Aromatic Hydrocarbons) in Soil (continued)

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

Sample Number		Parameter	Units	LOR	Result
LB187764.001		Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1
		Dibenzo(ah)anthracene	mg/kg	0.1	<0.1
		Benzo(ghi)perylene	mg/kg	0.1	<0.1
		Total PAH (18)	mg/kg	0.8	<0.8
	Surrogates	d5-nitrobenzene (Surrogate)	%	-	99
		2-fluorobiphenyl (Surrogate)	%	-	97
		d14-p-terphenyl (Surrogate)	%	-	102

PCBs in Soil

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

Sample Number		Parameter	Units	LOR	Result
LB187764.001		Arochlor 1016	mg/kg	0.2	<0.2
		Arochlor 1221	mg/kg	0.2	<0.2
		Arochlor 1232	mg/kg	0.2	<0.2
		Arochlor 1242	mg/kg	0.2	<0.2
		Arochlor 1248	mg/kg	0.2	<0.2
		Arochlor 1254	mg/kg	0.2	<0.2
		Arochlor 1260	mg/kg	0.2	<0.2
		Arochlor 1262	mg/kg	0.2	<0.2
		Arochlor 1268	mg/kg	0.2	<0.2
		Total PCBs (Arochlors)	mg/kg	1	<1
	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	83

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

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

Sample Number		Parameter	Units	LOR	Result
LB187786.001		Arsenic, As	mg/kg	1	<1
		Cadmium, Cd	mg/kg	0.3	<0.3
		Chromium, Cr	mg/kg	0.5	<0.5
		Copper, Cu	mg/kg	0.5	<0.5
		Nickel, Ni	mg/kg	0.5	<0.5
		Lead, Pb	mg/kg	1	<1
		Zinc, Zn	mg/kg	2	<2.0

TRH (Total Recoverable Hydrocarbons) in Soil

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

Sample Number		Parameter	Units	LOR	Result
LB187764.001		TRH C10-C14	mg/kg	20	<20
		TRH C15-C28	mg/kg	45	<45
		TRH C29-C36	mg/kg	45	<45
		TRH C37-C40	mg/kg	100	<100
		TRH C10-C36 Total	mg/kg	110	<110

VOC's in Soil

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

Sample Number		Parameter	Units	LOR	Result
LB187763.001	Monocyclic Aromatic	Benzene	mg/kg	0.1	<0.1
	Hydrocarbons	Toluene	mg/kg	0.1	<0.1
		Ethylbenzene	mg/kg	0.1	<0.1
		m/p-xylene	mg/kg	0.2	<0.2
		o-xylene	mg/kg	0.1	<0.1
	Polycyclic VOCs	Naphthalene	mg/kg	0.1	<0.1
	Surrogates	d4-1,2-dichloroethane (Surrogate)	%	-	98
		d8-toluene (Surrogate)	%	-	97
		Bromofluorobenzene (Surrogate)	%	-	88
	Totals	Total BTEX	mg/kg	0.6	<0.6

Volatile Petroleum Hydrocarbons in Soil

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

Sample Number		Parameter	Units	LOR	Result
LB187763.001		TRH C6-C9	mg/kg	20	<20
	Surrogates	d4-1,2-dichloroethane (Surrogate)	%	-	98

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

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

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

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

Mercury in Soil

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE199978.003	LB187787.024	Mercury	mg/kg	0.05	0.13	0.13	67	0
SE199989.005	LB187787.014	Mercury	mg/kg	0.05	<0.05	<0.05	200	0

Moisture Content

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE199941.001	LB187765.011	% Moisture	%w/w	1	4.67117393973	3.5888077858	54	26
SE199976.007	LB187765.020	% Moisture	%w/w	1	4.65293668954	4.6542553191	51	0

OC Pesticides in Soil

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE199976.005	LB187764.025		Hexachlorobenzene (HCB)	mg/kg	0.1	0	0	200	0
			Alpha BHC	mg/kg	0.1	0	0	200	0
			Lindane	mg/kg	0.1	0	0	200	0
			Heptachlor	mg/kg	0.1	0	0	200	0
			Aldrin	mg/kg	0.1	0	0	200	0
			Beta BHC	mg/kg	0.1	0	0	200	0
			Delta BHC	mg/kg	0.1	0	0	200	0
			Heptachlor epoxide	mg/kg	0.1	0	0	200	0
			o,p'-DDE	mg/kg	0.1	0	0	200	0
			Alpha Endosulfan	mg/kg	0.2	0	0	200	0
			Gamma Chlordane	mg/kg	0.1	0	0	200	0
			Alpha Chlordane	mg/kg	0.1	0	0	200	0
			trans-Nonachlor	mg/kg	0.1	0	0	200	0
			p,p'-DDE	mg/kg	0.1	0	0	200	0
			Dieldrin	mg/kg	0.2	0	0	200	0
			Endrin	mg/kg	0.2	0	0	200	0
			o,p'-DDD	mg/kg	0.1	0	0	200	0
			o,p'-DDT	mg/kg	0.1	0	0	200	0
			Beta Endosulfan	mg/kg	0.2	0	0	200	0
			p,p'-DDD	mg/kg	0.1	0	0	200	0
			p,p'-DDT	mg/kg	0.1	0	0	200	0
			Endosulfan sulphate	mg/kg	0.1	0	0	200	0
			Endrin Aldehyde	mg/kg	0.1	0	0	200	0
			Methoxychlor	mg/kg	0.1	0	0	200	0
			Endrin Ketone	mg/kg	0.1	0	0	200	0
			Isodrin	mg/kg	0.1	0	0	200	0
			Mirex	mg/kg	0.1	0	0	200	0
			Total CLP OC Pesticides	mg/kg	1	0	0	200	0
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.125	0.13	30	4
SE199976.007	LB187764.022		Hexachlorobenzene (HCB)	mg/kg	0.1	0	0	200	0
			Alpha BHC	mg/kg	0.1	0	0	200	0
			Lindane	mg/kg	0.1	0	0	200	0
			Heptachlor	mg/kg	0.1	0	0	200	0
			Aldrin	mg/kg	0.1	0	0	200	0
			Beta BHC	mg/kg	0.1	0	0	200	0
			Delta BHC	mg/kg	0.1	0	0	200	0
			Heptachlor epoxide	mg/kg	0.1	0	0	200	0
			o,p'-DDE	mg/kg	0.1	0	0	200	0
			Alpha Endosulfan	mg/kg	0.2	0	0	200	0
			Gamma Chlordane	mg/kg	0.1	0	0	200	0
			Alpha Chlordane	mg/kg	0.1	0	0	200	0
			trans-Nonachlor	mg/kg	0.1	0	0	200	0
			p,p'-DDE	mg/kg	0.1	0	0	200	0
			Dieldrin	mg/kg	0.2	0	0	200	0
			Endrin	mg/kg	0.2	0	0	200	0
			o,p'-DDD	mg/kg	0.1	0	0	200	0
			o,p'-DDT	mg/kg	0.1	0	0	200	0
			Beta Endosulfan	mg/kg	0.2	0	0	200	0
			p,p'-DDD	mg/kg	0.1	0	0	200	0

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

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

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

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

OC Pesticides in Soil (continued)

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE199976.007	LB187764.022		p,p'-DDT	mg/kg	0.1	0	0	200	0
			Endosulfan sulphate	mg/kg	0.1	0	0	200	0
			Endrin Aldehyde	mg/kg	0.1	0	0	200	0
			Methoxychlor	mg/kg	0.1	0	0	200	0
			Endrin Ketone	mg/kg	0.1	0	0	200	0
			Isodrin	mg/kg	0.1	0	0	200	0
			Mirex	mg/kg	0.1	0	0	200	0
			Total CLP OC Pesticides	mg/kg	1	0	0	200	0
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.128	0.126	30	2

OP Pesticides in Soil

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE199976.001	LB187764.024		Dichlorvos	mg/kg	0.5	0	0	200	0
			Dimethoate	mg/kg	0.5	0.004598814	5 0.0050853387	200	0
			Diazinon (Dimpylate)	mg/kg	0.5	0	0	200	0
			Fenitrothion	mg/kg	0.2	0.021055718	6 0	200	0
			Malathion	mg/kg	0.2	0.016022956	3 0.0083185333	200	0
			Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	0	0.1420463302	200	0
			Parathion-ethyl (Parathion)	mg/kg	0.2	0	0.1113387779	200	0
			Bromophos Ethyl	mg/kg	0.2	0	0	200	0
			Methidathion	mg/kg	0.5	0	0.0070988437	200	0
			Ethion	mg/kg	0.2	0	0	200	0
			Azinphos-methyl (Guthion)	mg/kg	0.2	0	0.1090468740	200	0
			Total OP Pesticides*	mg/kg	1.7	0	0	200	0
		Surrogates	2-fluorobiphenyl (Surrogate)	mg/kg	-	0.420956528	0 0.4192835598	30	0
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.423250441	5 0.4255705274	30	1
SE199976.007	LB187764.022		Dichlorvos	mg/kg	0.5	0	0	200	0
			Dimethoate	mg/kg	0.5	0.002785932	5 0.0035156173	200	0
			Diazinon (Dimpylate)	mg/kg	0.5	0	0.0029407332	200	0
			Fenitrothion	mg/kg	0.2	0.017871523	2 0.0127347439	200	0
			Malathion	mg/kg	0.2	0.014608731	9 0.0055406979	200	0
			Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	0.012200580	4 0	200	0
			Parathion-ethyl (Parathion)	mg/kg	0.2	0.010250788	0 0.0077168145	200	0
			Bromophos Ethyl	mg/kg	0.2	0	0	200	0
			Methidathion	mg/kg	0.5	0	0	200	0
			Ethion	mg/kg	0.2	0.084055744	5 0	200	0
			Azinphos-methyl (Guthion)	mg/kg	0.2	0	0.0014159627	200	0
			Total OP Pesticides*	mg/kg	1.7	0	0	200	0
		Surrogates	2-fluorobiphenyl (Surrogate)	mg/kg	-	0.435219858	6 0.4612407003	30	6
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.411625999	8 0.4271412187	30	4

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE199976.001	LB187764.024	Naphthalene	mg/kg	0.1	0.050416413	3 0.0486445571	200	0
		2-methylnaphthalene	mg/kg	0.1	0.018040375	9 0.0200503266	200	0
		1-methylnaphthalene	mg/kg	0.1	0.015472567	7 0.0167473268	200	0
		Acenaphthylene	mg/kg	0.1	0.219920372	6 0.2303513889	74	5
		Acenaphthene	mg/kg	0.1	0.039131272	9 0.0779619182	200	0
		Fluorene	mg/kg	0.1	0.054124648	3 0.0773322661	182	0
		Phenanthrene	mg/kg	0.1	1.429210901	0 1.9156437029	36	29
		Anthracene	mg/kg	0.1	0.319659482	9 0.5720125685	52	57 ⑨
		Fluoranthene	mg/kg	0.1	3.909302114	4 4.6882079595	32	18
		Pyrene	mg/kg	0.1	3.678197782	2 4.5039546815	32	20
		Benzo(a)anthracene	mg/kg	0.1	1.891828163	7 2.3047989127	35	20
		Chrysene	mg/kg	0.1	1.932657550	2 2.1936103323	35	13
		Benzo(b&j)fluoranthene	mg/kg	0.1	2.539128874	5 2.9286999128	34	14
		Benzo(k)fluoranthene	mg/kg	0.1	0.994166715	2 1.1386945016	39	14
		Benzo(a)pyrene	mg/kg	0.1	2.399308273	2 2.5370426478	34	6
		Indeno(1,2,3-cd)pyrene	mg/kg	0.1	1.191093095	2 1.2800525972	38	7
		Dibenzo(ah)anthracene	mg/kg	0.1	0.170678345	1 0.1931352479	85	12
		Benzo(ghi)perylene	mg/kg	0.1	1.035535076	9 1.1276013513	39	9
		Carcinogenic PAHs, BaP TEQ <LOR=0	mg/kg	0.2	3.270054129	4 3.5247307514	16	7

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

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

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

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

PAH (Polynuclear Aromatic Hydrocarbons) in Soil (continued)

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE199976.001	LB187764.024		Carcinogenic PAHs, BaP TEQ <LOR=LOR	mg/kg	0.3	3.27005412943.5247307514		19	7
			Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	mg/kg	0.2	3.27005412943.5247307514		16	7
			Total PAH (18)	mg/kg	0.8	21.79832574625.5749672691		33	16
		Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.42479369330.4339708914		30	2
			2-fluorobiphenyl (Surrogate)	mg/kg	-	0.42095652800.4192835598		30	0
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.42325044150.4255705274		30	1
SE199976.007	LB187764.022		Naphthalene	mg/kg	0.1	0.04121207850.0404649476		200	0
			2-methylnaphthalene	mg/kg	0.1	0.01431966170.0133299344		200	0
			1-methylnaphthalene	mg/kg	0.1	0.01210489190.0103618992		200	0
			Acenaphthylene	mg/kg	0.1	0.08762319100.0999926877		137	0
			Acenaphthene	mg/kg	0.1	0.00668354930.0076090577		200	0
			Fluorene	mg/kg	0.1	0.00634492520.0066797553		200	0
			Phenanthrene	mg/kg	0.1	0.28618690840.3179267509		63	11
			Anthracene	mg/kg	0.1	0.08951727610.0950000978		138	0
			Fluoranthene	mg/kg	0.1	0.66799061960.8531036627		43	24
			Pyrene	mg/kg	0.1	0.67982640770.9432125962		42	32
			Benzo(a)anthracene	mg/kg	0.1	0.34440190090.4256309197		56	21
			Chrysene	mg/kg	0.1	0.36363631840.4348032680		55	18
			Benzo(b&j)fluoranthene	mg/kg	0.1	0.48798230010.5972040489		48	20
			Benzo(k)fluoranthene	mg/kg	0.1	0.20627353860.2554815225		73	21
			Benzo(a)pyrene	mg/kg	0.1	0.41674475140.5448077082		51	27
			Indeno(1,2,3-cd)pyrene	mg/kg	0.1	0.22824051910.2898133439		69	24
			Dibenzo(ah)anthracene	mg/kg	0.1	0.03557477360.0411102324		200	0
			Benzo(ghi)perylene	mg/kg	0.1	0.21908903060.2567824840		72	16
			Carcinogenic PAHs, BaP TEQ <LOR=0	mg/kg	0.2	0.54959165930.7082121473		42	25
			Carcinogenic PAHs, BaP TEQ <LOR=LOR	mg/kg	0.3	0.64959165930.8082121473		51	22
			Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	mg/kg	0.2	0.59959165930.7582121473		39	23
			Total PAH (18)	mg/kg	0.8	3.90367058034.9155222855		48	23
		Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.44640977290.4643167268		30	4
			2-fluorobiphenyl (Surrogate)	mg/kg	-	0.43521985860.4612407003		30	6
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.41162599980.4271412187		30	4

PCBs in Soil

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE199976.005	LB187764.025		Arochlor 1016	mg/kg	0.2	0	0	200	0
			Arochlor 1221	mg/kg	0.2	0	0	200	0
			Arochlor 1232	mg/kg	0.2	0	0	200	0
			Arochlor 1242	mg/kg	0.2	0	0	200	0
			Arochlor 1248	mg/kg	0.2	0	0	200	0
			Arochlor 1254	mg/kg	0.2	0	0	200	0
			Arochlor 1260	mg/kg	0.2	0	0	200	0
			Arochlor 1262	mg/kg	0.2	0	0	200	0
			Arochlor 1268	mg/kg	0.2	0	0	200	0
			Total PCBs (Arochlors)	mg/kg	1	0	0	200	0
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.125	0.13	30	4
SE199976.007	LB187764.022		Arochlor 1016	mg/kg	0.2	0	0	200	0
			Arochlor 1221	mg/kg	0.2	0	0	200	0
			Arochlor 1232	mg/kg	0.2	0	0	200	0
			Arochlor 1242	mg/kg	0.2	0	0	200	0
			Arochlor 1248	mg/kg	0.2	0	0	200	0
			Arochlor 1254	mg/kg	0.2	0	0	200	0
			Arochlor 1260	mg/kg	0.2	0	0	200	0
			Arochlor 1262	mg/kg	0.2	0	0	200	0
			Arochlor 1268	mg/kg	0.2	0	0	200	0
			Total PCBs (Arochlors)	mg/kg	1	0	0	200	0
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.128	0.126	30	2

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

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

Original	Duplicate		Parameter	Units	LOR

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

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

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

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

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES (continued)

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE199978.003	LB187786.024	Arsenic, As	mg/kg	1	4	4	57	8
		Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	200	0
		Chromium, Cr	mg/kg	0.5	5.6	6.6	38	16
		Copper, Cu	mg/kg	0.5	20	21	32	5
		Nickel, Ni	mg/kg	0.5	1.9	2.1	55	11
		Lead, Pb	mg/kg	1	120	120	31	1
		Zinc, Zn	mg/kg	2	100	110	32	9
SE199989.005	LB187786.014	Arsenic, As	mg/kg	1	5	5	49	2
		Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	200	0
		Chromium, Cr	mg/kg	0.5	11	11	35	6
		Copper, Cu	mg/kg	0.5	6.9	8.4	37	19
		Nickel, Ni	mg/kg	0.5	1.5	1.7	61	12
		Lead, Pb	mg/kg	1	16	16	36	0
		Zinc, Zn	mg/kg	2	7	8	58	18

TRH (Total Recoverable Hydrocarbons) in Soil

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE199976.001	LB187764.024		TRH C10-C14	mg/kg	20	0	0	200	0
			TRH C15-C28	mg/kg	45	52	62	109	18
			TRH C29-C36	mg/kg	45	60	71	99	17
			TRH C37-C40	mg/kg	100	0	0	200	0
			TRH C10-C36 Total	mg/kg	110	112	133	120	17
			TRH >C10-C40 Total (F bands)	mg/kg	210	95	112	200	0
		TRH F Bands	TRH >C10-C16	mg/kg	25	0	0	200	0
			TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	0	0	200	0
			TRH >C16-C34 (F3)	mg/kg	90	95	112	117	16
			TRH >C34-C40 (F4)	mg/kg	120	0	0	200	0
SE199976.007	LB187764.022		TRH C10-C14	mg/kg	20	0	0	200	0
			TRH C15-C28	mg/kg	45	0	0	200	0
			TRH C29-C36	mg/kg	45	0	0	200	0
			TRH C37-C40	mg/kg	100	0	0	200	0
			TRH C10-C36 Total	mg/kg	110	0	0	200	0
			TRH >C10-C40 Total (F bands)	mg/kg	210	0	0	200	0
		TRH F Bands	TRH >C10-C16	mg/kg	25	0	0	200	0
			TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	0	0	200	0
			TRH >C16-C34 (F3)	mg/kg	90	0	0	200	0
			TRH >C34-C40 (F4)	mg/kg	120	0	0	200	0

VOC's in Soil

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE199976.007	LB187763.023	Monocyclic Aromatic	Benzene	mg/kg	0.1	0	0	200	0
			Toluene	mg/kg	0.1	0.041842912	0.0404457654	200	0
			Ethylbenzene	mg/kg	0.1	0.000721208	0.0010014515	200	0
			m/p-xylene	mg/kg	0.2	0.002611413	0.0027620657	200	0
			o-xylene	mg/kg	0.1	0.002457692	0.0012058705	200	0
		Polycyclic	Naphthalene	mg/kg	0.1	0.005031453	0.0050315756	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	8.957541254	6.3935104631	50	5
			d8-toluene (Surrogate)	mg/kg	-	9.264146168	3.8054951226	50	5
			Bromofluorobenzene (Surrogate)	mg/kg	-	7.396809110	4.7.6272214225	50	3
		Totals	Total Xylenes	mg/kg	0.3	0.005118833	0.0039679363	200	0
			Total BTEX	mg/kg	0.6	0	0	200	0
SE199978.003	LB187763.014	Monocyclic Aromatic	Benzene	mg/kg	0.1	<0.1	<0.1	200	0
			Toluene	mg/kg	0.1	<0.1	<0.1	200	0
			Ethylbenzene	mg/kg	0.1	<0.1	<0.1	200	0
			m/p-xylene	mg/kg	0.2	<0.2	<0.2	200	0
			o-xylene	mg/kg	0.1	<0.1	<0.1	200	0
		Polycyclic	Naphthalene	mg/kg	0.1	<0.1	<0.1	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	8.3	8.2	50	2
			d8-toluene (Surrogate)	mg/kg	-	7.9	8.3	50	4
			Bromofluorobenzene (Surrogate)	mg/kg	-	7.1	7.3	50	2
		Totals	Total Xylenes	mg/kg	0.3	<0.3	<0.3	200	0
			Total BTEX	mg/kg	0.6	<0.6	<0.6	200	0

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

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

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

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

Volatile Petroleum Hydrocarbons in Soil — **Method: ME-(AU)-[ENV]AN433**

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE199976.007	LB187763.023		TRH C6-C10	mg/kg	25	0.310944329	0.4504266983	200	0
			TRH C6-C9	mg/kg	20	0.329679775	0.4818423272	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	8.957541254	9.3935104631	30	5
			d8-toluene (Surrogate)	mg/kg	-	9.264146168	8.8054951226	30	5
			Bromofluorobenzene (Surrogate)	mg/kg	-	7.396809110	7.6272214225	30	3
		VPH F Bands	Benzene (F0)	mg/kg	0.1	0	0	200	0
			TRH C6-C10 minus BTEX (F1)	mg/kg	25	0.310944329	0.4504266983	200	0
SE199978.003	LB187763.014		TRH C6-C10	mg/kg	25	<25	<25	200	0
			TRH C6-C9	mg/kg	20	<20	<20	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	8.3	8.2	30	2
			d8-toluene (Surrogate)	mg/kg	-	7.9	8.3	30	4
			Bromofluorobenzene (Surrogate)	mg/kg	-	7.1	7.3	30	2
		VPH F Bands	Benzene (F0)	mg/kg	0.1	<0.1	<0.1	200	0
			TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	200	0

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

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

Mercury in Soil

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB187787.002	Mercury	mg/kg	0.05	0.21	0.2	70 - 130	104

OC Pesticides in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB187764.002		Heptachlor	mg/kg	0.1	0.2	0.2	60 - 140	108
		Aldrin	mg/kg	0.1	0.2	0.2	60 - 140	106
		Delta BHC	mg/kg	0.1	0.2	0.2	60 - 140	104
		Dieldrin	mg/kg	0.2	0.2	0.2	60 - 140	105
		Endrin	mg/kg	0.2	0.2	0.2	60 - 140	100
		p,p'-DDT	mg/kg	0.1	0.2	0.2	60 - 140	75
	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.12	0.15	40 - 130	83

OP Pesticides in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB187764.002		Dichlorvos	mg/kg	0.5	1.7	2	60 - 140	85
		Diazinon (Dimpylate)	mg/kg	0.5	1.7	2	60 - 140	87
		Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	1.7	2	60 - 140	85
		Ethion	mg/kg	0.2	1.4	2	60 - 140	68
	Surrogates	2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.5	40 - 130	81
		d14-p-terphenyl (Surrogate)	mg/kg	-	0.4	0.5	40 - 130	80

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB187764.002		Naphthalene	mg/kg	0.1	3.9	4	60 - 140	98
		Acenaphthylene	mg/kg	0.1	3.8	4	60 - 140	96
		Acenaphthene	mg/kg	0.1	4.1	4	60 - 140	104
		Phenanthrene	mg/kg	0.1	4.3	4	60 - 140	107
		Anthracene	mg/kg	0.1	3.9	4	60 - 140	99
		Fluoranthene	mg/kg	0.1	4.0	4	60 - 140	99
		Pyrene	mg/kg	0.1	4.0	4	60 - 140	100
		Benzo(a)pyrene	mg/kg	0.1	4.1	4	60 - 140	102
	Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.4	0.5	40 - 130	79
		2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.5	40 - 130	81
		d14-p-terphenyl (Surrogate)	mg/kg	-	0.4	0.5	40 - 130	80

PCBs in Soil

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB187764.002	Arochlor 1260	mg/kg	0.2	0.4	0.4	60 - 140	95

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB187786.002	Arsenic, As	mg/kg	1	320	318.22	80 - 120	101
	Cadmium, Cd	mg/kg	0.3	4.0	4.62	80 - 120	87
	Chromium, Cr	mg/kg	0.5	34	38.31	80 - 120	90
	Copper, Cu	mg/kg	0.5	290	290	80 - 120	102
	Nickel, Ni	mg/kg	0.5	190	187	80 - 120	100
	Lead, Pb	mg/kg	1	93	89.9	80 - 120	103
	Zinc, Zn	mg/kg	2	270	273	80 - 120	98

TRH (Total Recoverable Hydrocarbons) in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB187764.002		TRH C10-C14	mg/kg	20	37	40	60 - 140	93
		TRH C15-C28	mg/kg	45	<45	40	60 - 140	88
		TRH C29-C36	mg/kg	45	<45	40	60 - 140	75
	TRH F Bands	TRH >C10-C16	mg/kg	25	37	40	60 - 140	93
		TRH >C16-C34 (F3)	mg/kg	90	<90	40	60 - 140	80
		TRH >C34-C40 (F4)	mg/kg	120	<120	20	60 - 140	80

VOC's in Soil

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

Sample Number	Parameter	Units	LOR

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

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

VOC's in Soil (continued)

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB187763.002	Monocyclic	Benzene	mg/kg	0.1	4.5	5	60 - 140	91
	Aromatic	Toluene	mg/kg	0.1	4.4	5	60 - 140	88
		Ethylbenzene	mg/kg	0.1	4.3	5	60 - 140	86
		m/p-xylene	mg/kg	0.2	9.2	10	60 - 140	92
		o-xylene	mg/kg	0.1	4.6	5	60 - 140	91
	Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	7.9	10	70 - 130	79
		d8-toluene (Surrogate)	mg/kg	-	9.2	10	70 - 130	92
		Bromofluorobenzene (Surrogate)	mg/kg	-	9.2	10	70 - 130	92

Volatile Petroleum Hydrocarbons in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB187763.002		TRH C6-C10	mg/kg	25	67	92.5	60 - 140	73
		TRH C6-C9	mg/kg	20	65	80	60 - 140	81
	Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	7.9	10	70 - 130	79
		Bromofluorobenzene (Surrogate)	mg/kg	-	9.2	10	70 - 130	92
	VPH F Bands	TRH C6-C10 minus BTEX (F1)	mg/kg	25	40	62.5	60 - 140	64

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

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

Mercury in Soil

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

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE200015.001	LB187787.004	Mercury	mg/kg	0.05	0.19	<0.05	0.2	94

OC Pesticides in Soil

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE199950.001	LB187764.023		Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	-	-
			Alpha BHC	mg/kg	0.1	<0.1	<0.1	-	-
			Lindane	mg/kg	0.1	<0.1	<0.1	-	-
			Heptachlor	mg/kg	0.1	0.2	<0.1	0.2	111
			Aldrin	mg/kg	0.1	0.2	<0.1	0.2	106
			Beta BHC	mg/kg	0.1	<0.1	<0.1	-	-
			Delta BHC	mg/kg	0.1	0.2	<0.1	0.2	105
			Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	-	-
			o,p'-DDE	mg/kg	0.1	<0.1	<0.1	-	-
			Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	-	-
			Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	-	-
			Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	-	-
			trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	-	-
			p,p'-DDE	mg/kg	0.1	<0.1	<0.1	-	-
			Dieldrin	mg/kg	0.2	0.3	<0.2	0.2	125
			Endrin	mg/kg	0.2	0.2	<0.2	0.2	105
			o,p'-DDD	mg/kg	0.1	<0.1	<0.1	-	-
			o,p'-DDT	mg/kg	0.1	<0.1	<0.1	-	-
			Beta Endosulfan	mg/kg	0.2	<0.2	<0.2	-	-
			p,p'-DDD	mg/kg	0.1	<0.1	<0.1	-	-
			p,p'-DDT	mg/kg	0.1	0.2	<0.1	0.2	85
			Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	-	-
			Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1	-	-
			Methoxychlor	mg/kg	0.1	<0.1	<0.1	-	-
			Endrin Ketone	mg/kg	0.1	<0.1	<0.1	-	-
			Isodrin	mg/kg	0.1	<0.1	<0.1	-	-
			Mirex	mg/kg	0.1	<0.1	<0.1	-	-
			Total CLP OC Pesticides	mg/kg	1	1	<1	-	-
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.13	0.12	-	85

OP Pesticides in Soil

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE199950.001	LB187764.023		Dichlorvos	mg/kg	0.5	2.0	<0.5	2	99
			Dimethoate	mg/kg	0.5	<0.5	<0.5	-	-
			Diazinon (Dimpylate)	mg/kg	0.5	2.1	<0.5	2	106
			Fenitrothion	mg/kg	0.2	<0.2	<0.2	-	-
			Malathion	mg/kg	0.2	<0.2	<0.2	-	-
			Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	2.1	<0.2	2	103
			Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2	<0.2	-	-
			Bromophos Ethyl	mg/kg	0.2	<0.2	<0.2	-	-
			Methidathion	mg/kg	0.5	<0.5	<0.5	-	-
			Ethion	mg/kg	0.2	2.0	<0.2	2	100
			Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	<0.2	-	-
			Total OP Pesticides*	mg/kg	1.7	8.2	<1.7	-	-
		Surrogates	2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.4	-	81
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.4	0.4	-	83

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE199950.001	LB187764.023	Naphthalene	mg/kg	0.1	4.3	<0.1	4	106
		2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	-	-
		1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	-	-
		Acenaphthylene	mg/kg	0.1	4.7	0.1	4	114
		Acenaphthene	mg/kg	0.1	4.4	<0.1	4	111
		Fluorene	mg/kg	0.1	0.1	<0.1	-	-
		Phenanthrene	mg/kg	0.1	5.7	0.2	4	136

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

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

PAH (Polynuclear Aromatic Hydrocarbons) in Soil (continued)

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE199950.001	LB187764.023		Anthracene	mg/kg	0.1	4.7	0.1	4	116
			Fluoranthene	mg/kg	0.1	5.6	0.8	4	120
			Pyrene	mg/kg	0.1	5.9	0.9	4	125
			Benzo(a)anthracene	mg/kg	0.1	0.7	0.5	-	-
			Chrysene	mg/kg	0.1	0.7	0.5	-	-
			Benzo(b&j)fluoranthene	mg/kg	0.1	0.9	0.7	-	-
			Benzo(k)fluoranthene	mg/kg	0.1	0.4	0.3	-	-
			Benzo(a)pyrene	mg/kg	0.1	5.3	0.7	4	115
			Indeno(1,2,3-cd)pyrene	mg/kg	0.1	0.4	0.4	-	-
			Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1	-	-
			Benzo(ghi)perylene	mg/kg	0.1	0.4	0.4	-	-
			Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.2	5.5	0.9	-	-
			Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	5.6	1.0	-	-
			Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	5.6	0.9	-	-
			Total PAH (18)	mg/kg	0.8	44	5.6	-	-
		Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.4	0.4	-	85
			2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.4	-	81
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.4	0.4	-	83

PCBs in Soil

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE199950.001	LB187764.023		Arochlor 1016	mg/kg	0.2	<0.2	<0.2	-	-
			Arochlor 1221	mg/kg	0.2	<0.2	<0.2	-	-
			Arochlor 1232	mg/kg	0.2	<0.2	<0.2	-	-
			Arochlor 1242	mg/kg	0.2	<0.2	<0.2	-	-
			Arochlor 1248	mg/kg	0.2	<0.2	<0.2	-	-
			Arochlor 1254	mg/kg	0.2	<0.2	<0.2	-	-
			Arochlor 1260	mg/kg	0.2	0.4	<0.2	0.4	110
			Arochlor 1262	mg/kg	0.2	<0.2	<0.2	-	-
			Arochlor 1268	mg/kg	0.2	<0.2	<0.2	-	-
			Total PCBs (Arochlors)	mg/kg	1	<1	<1	-	-
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0	0	-	84

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

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

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE200015.001	LB187786.004	Arsenic, As	mg/kg	1	49	<1	50	98
		Cadmium, Cd	mg/kg	0.3	44	<0.3	50	88
		Chromium, Cr	mg/kg	0.5	48	<0.5	50	95
		Copper, Cu	mg/kg	0.5	60	1.4	50	117
		Nickel, Ni	mg/kg	0.5	50	0.6	50	99
		Lead, Pb	mg/kg	1	56	1	50	110
		Zinc, Zn	mg/kg	2	110	15	50	184 ⑨

TRH (Total Recoverable Hydrocarbons) in Soil

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE199950.001	LB187764.023		TRH C10-C14	mg/kg	20	39	<20	40	98
			TRH C15-C28	mg/kg	45	<45	<45	40	105
			TRH C29-C36	mg/kg	45	<45	<45	40	110
			TRH C37-C40	mg/kg	100	<100	<100	-	-
			TRH C10-C36 Total	mg/kg	110	<110	<110	-	-
			TRH >C10-C40 Total (F bands)	mg/kg	210	<210	<210	-	-
		TRH F Bands	TRH >C10-C16	mg/kg	25	38	<25	40	95
			TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	38	<25	-	-
			TRH >C16-C34 (F3)	mg/kg	90	<90	<90	40	108
			TRH >C34-C40 (F4)	mg/kg	120	<120	<120	-	-

VOC's in Soil

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE199863.001	LB187763.004	Monocyclic	Benzene	mg/kg	0.1	4.4	<0.1	5	87
		Aromatic	Toluene	mg/kg	0.1	4.1	<0.1	5	82
			Ethylbenzene	mg/kg	0.1	4.1	<0.1	5	82
			m/p-xylene	mg/kg	0.2	8.6	<0.2	10	86
			o-xylene	mg/kg	0.1	4.4	<0.1	5	88

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

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

VOC's in Soil (continued)

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE199863.001	LB187763.004	Polycyclic	Naphthalene	mg/kg	0.1	4.1	<0.1	-	-
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	7.2	9.2	10	72
			d8-toluene (Surrogate)	mg/kg	-	8.2	8.9	10	82
			Bromofluorobenzene (Surrogate)	mg/kg	-	8.6	8.1	10	86
		Totals	Total Xylenes	mg/kg	0.3	13	<0.3	-	-
			Total BTEX	mg/kg	0.6	26	<0.6	-	-

Volatile Petroleum Hydrocarbons in Soil

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE199863.001	LB187763.004		TRH C6-C10	mg/kg	25	96	<25	92.5	104
			TRH C6-C9	mg/kg	20	86	<20	80	108
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	7.2	9.2	10	72
			d8-toluene (Surrogate)	mg/kg	-	8.2	8.9	10	82
			Bromofluorobenzene (Surrogate)	mg/kg	-	8.6	8.1	-	86
		VPH F	Benzene (F0)	mg/kg	0.1	4.4	<0.1	-	-
		Bands	TRH C6-C10 minus BTEX (F1)	mg/kg	25	70	<25	62.5	112

MATRIX SPIKE DUPLICATES

SE199950 R0

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

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

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

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

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

No matrix spike duplicates were required for this job.

Samples analysed as received.

Solid samples expressed on a dry weight basis.

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

*	NATA accreditation does not cover the performance of this service.
**	Indicative data, theoretical holding time exceeded.
-	Sample not analysed for this analyte.
IS	Insufficient sample for analysis.
LNR	Sample listed, but not received.
LOR	Limit of reporting.
QFH	QC result is above the upper tolerance.
QFL	QC result is below the lower tolerance.

①	At least 2 of 3 surrogates are within acceptance criteria.
②	RPD failed acceptance criteria due to sample heterogeneity.
③	Results less than 5 times LOR preclude acceptance criteria for RPD.
④	Recovery failed acceptance criteria due to matrix interference.
⑤	Recovery failed acceptance criteria due to the presence of significant concentration of analyte (i.e. the concentration of analyte exceeds the spike level).
⑥	LOR was raised due to sample matrix interference.
⑦	LOR was raised due to dilution of significantly high concentration of analyte in sample.
⑧	Reanalysis of sample in duplicate confirmed sample heterogeneity and inconsistency of results.
⑨	Recovery failed acceptance criteria due to sample heterogeneity.
⑩	LOR was raised due to high conductivity of the sample (required dilution).
†	Refer to Analytical Report comments for further information.

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Please consider the environment before printing this email.

-----Original Message-----
From: AU.Environmental.Sydney (Sydney) <AU.Environmental.Sydney@sgs.com>
Sent: Tuesday, 10 December 2019 11:42 AM
To: Doyle, Shane <SDoyle@golder.com.au>
Cc: Williams, Cameron <CaWilliams@golder.com.au>
Subject: RE: [EXTERNAL] RE: Report Job SE199950, your reference 19130799 - Gran Central, order number PO23977

Hi Shane

Not a problem. When do you need the results?

Regards,

Paul Harley
Environment, Health & Safety
Client Manager

Phone: +61 (0)2 8594 0400
Direct: +61 (0)2 8594 0449
Mobile: +61 (0)4 0797 2867

SGS EHS Alexandria Laboratory
SE199950A COC
Received: 10 – Dec – 2019

SGS Sydney will be closed Wednesday 25th and Thursday 26th of December We will also be closed Wednesday 1st of January 2020 for New Year's Day.
The last day for receiving BODs will be Thursday the 19th of December (due to the 5-day incubation time).
SGS Sydney Shut Down Period will be Monday 30th of December 2019 to Friday 10th of January 2020 - Please Note: Skeleton staff on site to accept samples and to conduct short holding time analysis (No Fast Turnarounds during this period).
Monday 13th of January 2020 - Normal trading resumes.

-----Original Message-----
From: Doyle, Shane <SDoyle@golder.com.au>
Sent: Tuesday, 10 December 2019 11:39 AM
To: Harley, Paul (Sydney) <Paul.Harley@sgs.com>
Cc: AU.Environmental.Sydney (Sydney) <AU.Environmental.Sydney@sgs.com>; Williams, Cameron <CaWilliams@golder.com.au>
Subject: [EXTERNAL] RE: Report Job SE199950, your reference 19130799 - Gran Central, order number PO23977

*** WARNING: this message is from an EXTERNAL SENDER. Please be cautious, particularly with links and attachments. ***

Paul

Could you schedule TCLP analysis for lead for sample ID BH103/201103/2001, your reference SE1999950.001.

Please cite PO23977 on the invoice

Regards

Shane

Shane Doyle (BSc[Chem], MSc[EnvTox], MRACI CChem) Principal Environmental Scientist

Golder Associates Pty Ltd
Level 8, 40 Mount Street, North Sydney, New South Wales 2060, Australia (PO Box 1302, Crows Nest NSW 1585)
T: +61 2 9478 3900 | D: +61 2 9478 3917 | M: +61 412 068 218 | golder.com LinkedIn | Instagram | Facebook | Twitter

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-----Original Message-----
From: AU.Environmental.Sydney@SGS.com <AU.Environmental.Sydney@SGS.com>
Sent: Wednesday, 20 November 2019 4:33 PM
To: Williams, Cameron <CaWilliams@golder.com.au>; Doyle, Shane <SDoyle@golder.com.au>
Subject: Report Job SE199950, your reference 19130799 - Gran Central, order number PO23977

EXTERNAL EMAIL

Dear Cameron,

Please find attached the report for SGS job SE199950, your reference 19130799 - Gran Central, order number PO23977.

-IMPORTANT INFORMATION ABOUT YOUR REPORT- To align with NEPM 1999 (2013), SGS Environmental has changed the way Silica Gel Clean-up of TRH extracts is reported. TPH Silica Gel has now become TRH – Silica. NEPM 1999(2013) seeks to clarify TRH and TPH in Schedule B3, 10.2.7.

If you have any questions or concerns, please don't hesitate to contact your SGS Client Services representative.

Regards,
Paul Harley
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Yin, Emily (Sydney)

From: AU.Environmental.Sydney (Sydney)
Sent: Tuesday, 10 December 2019 11:50 AM
To: AU.SampleReceipt.Sydney (Sydney)
Subject: FW: [EXTERNAL] RE: Report Job SE199950, your reference 19130799 - Gran Central, order number PO23977

Please book in TCLP on standard TAT

Regards,

Paul Harley
Environment, Health & Safety
Client Manager

Phone: +61 (0)2 8594 0400
Direct: +61 (0)2 8594 0449
Mobile: +61 (0)4 0797 2867

SGS Sydney will be closed Wednesday 25th and Thursday 26th of December We will also be closed Wednesday 1st of January 2020 for New Year's Day.
The last day for receiving BODs will be Thursday the 19th of December (due to the 5-day incubation time).
SGS Sydney Shut Down Period will be Monday 30th of December 2019 to Friday 10th of January 2020 - Please Note: Skeleton staff on site to accept samples and to conduct short holding time analysis (No Fast Turnarounds during this period).
Monday 13th of January 2020 - Normal trading resumes.

-----Original Message-----
From: Doyle, Shane <SDoyle@golder.com.au>
Sent: Tuesday, 10 December 2019 11:43 AM
To: AU.Environmental.Sydney (Sydney) <AU.Environmental.Sydney@sgs.com>
Subject: RE: [EXTERNAL] RE: Report Job SE199950, your reference 19130799 - Gran Central, order number PO23977

*** WARNING: this message is from an EXTERNAL SENDER. Please be cautious, particularly with links and attachments. ***

There's no rush, standard turnaround is fine

Thanks

Shane Doyle (BSc[Chem], MSc[EnvTox], MRACI CChem) Principal Environmental Scientist

Golder Associates Pty Ltd
Level 8, 40 Mount Street, North Sydney, New South Wales 2060, Australia (PO Box 1302, Crows Nest NSW 1585)
T: +61 2 9478 3900 | D: +61 2 9478 3917 | M: +61 412 068 218 | golder.com LinkedIn | Instagram | Facebook | Twitter

Work Safe, Home Safe

SAMPLE RECEIPT ADVICE

SE199950A

CLIENT DETAILS

Contact	Cameron Williams
Client	GOLDER ASSOCIATES PTY LTD
Address	124 Pacific Hwy (PO Box 1302, CROWS NEST, NSW 2065) NSW 2065
Telephone	02 9478 3900
Facsimile	02 9478 3901
Email	cawilliams@golder.com.au
Project	**19130799 - Gran Central - Additional**
Order Number	**PO23977**
Samples	5

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
Samples Received	Tue 10/12/2019
Report Due	Tue 17/12/2019
SGS Reference	**SE199950A**

SUBMISSION DETAILS

This is to confirm that 5 samples were received on Tuesday 10/12/2019. Results are expected to be ready by COB Tuesday 17/12/2019. Please quote SGS reference SE199950A when making enquiries. Refer below for details relating to sample integrity upon receipt.

Samples clearly labelled	Yes	Complete documentation received	Yes
Sample container provider	SGS	Sample cooling method	Ice Bricks
Samples received in correct containers	Yes	Sample counts by matrix	1 Soil
Date documentation received	10/12/2019@11:39am	Type of documentation received	Email
Samples received in good order	Yes	Samples received without headspace	Yes
Sample temperature upon receipt	5.3°C	Sufficient sample for analysis	Yes
Turnaround time requested	Standard		

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

COMMENTS

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SAMPLE RECEIPT ADVICE

SE199950A

CLIENT DETAILS

Client GOLDER ASSOCIATES PTY LTD

Project 19130799 - Gran Central - Additional

SUMMARY OF ANALYSIS

No.	Sample ID	Metals in TCLP Extract by ICPOES	TCLP (Toxicity Characteristic Leaching
001	BH103/201103/2001	1	6

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

ANALYTICAL REPORT

Accreditation No. 2562

CLIENT DETAILS

Contact	Cameron Williams
Client	GOLDER ASSOCIATES PTY LTD
Address	124 Pacific Hwy (PO Box 1302, CROWS NEST, NSW 2065) NSW 2065
Telephone	02 9478 3900
Facsimile	02 9478 3901
Email	cawilliams@golder.com.au
Project	**19130799 - Gran Central - Additional**
Order Number	**PO23977**
Samples	5

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
SGS Reference	**SE199950A R0**
Date Received	10/12/2019
Date Reported	17/12/2019

COMMENTS

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

SIGNATORIES

Bennet LO
Senior Organic Chemist/Metals Chemist

TCLP (Toxicity Characteristic Leaching Procedure) for Metals [AN006] Tested: 16/12/2019

PARAMETER	UOM	LOR	BH103/201103/2001 SOIL - 11/11/19 8:45 SE199950A.001
pH 1:20	pH Units	-	**7.3**
pH 1:20 plus HCL	pH Units	-	**1.9**
Extraction Solution Used	No unit	-	**1**
Mass of Sample Used*	g	-	**13**
Volume of ExtractionSolution Used*	mL	-	**250**
pH TCLP after 18 hours	pH Units	-	**5.4**

Metals in TCLP Extract by ICPOES [AN320] Tested: 17/12/2019

PARAMETER	UOM	LOR	BH103/201103/2001 SOIL - 11/11/19 8:45 SE199950A.001
Lead, Pb	mg/L	0.02	**0.62**

METHOD	METHODOLOGY SUMMARY
AN006	Contaminants of interest in a waste material are leached out of the waste with a selected leaching solution under controlled conditions. The ratio of sample to extraction fluid is 100g to 2L (1 to 20 by mass). The concentration of each contaminant of interest is determined in the leachate by appropriate methods after separation from the sample by filtering. Base on USEPA 1311.
AN006	Extraction Fluid #1: This fluid is made by combining 128.6mL of dilute sodium hydroxide solution and 11.5mL glacial acetic acid with water and diluting to a volume of 2 litres. The pH of this fluid should be 4.93 ± 0.05.
AN006	Extraction Fluid #2: This fluid is made by diluting 5.7mL glacial acetic acid with water to a volume of 1 litre. The pH of this fluid should be 2.88 ± 0.05.
AN020	Unpreserved water sample is filtered through a 0.45µm membrane filter and acidified with nitric acid similar to APHA3030B.
AN320	Metals by ICP-OES: Samples are preserved with 10% nitric acid for a wide range of metals and some non-metals. This solution is measured by Inductively Coupled Plasma. Solutions are aspirated into an argon plasma at 8000-10000K and emit characteristic energy or light as a result of electron transitions through unique energy levels. The emitted light is focused onto a diffraction grating where it is separated into components .
AN320	Photomultipliers or CCDs are used to measure the light intensity at specific wavelengths. This intensity is directly proportional to concentration. Corrections are required to compensate for spectral overlap between elements . Reference APHA 3120 B.

FOOTNOTES

*	NATA accreditation does not cover the performance of this service.	-	Not analysed.	UOM	Unit of Measure.
		NVL	Not validated.	LOR	Limit of Reporting.
**	Indicative data, theoretical holding time exceeded.	IS	Insufficient sample for analysis.	↑↓	Raised/lowered Limit of Reporting.
		LNR	Sample listed, but not received.		

Unless it is reported that sampling has been performed by SGS, the samples have been analysed as received.
Solid samples expressed on a dry weight basis.

Where "Total" analyte groups are reported (for example, Total PAHs, Total OC Pesticides) the total will be calculated as the sum of the individual analytes, with those analytes that are reported as <LOR being assumed to be zero. The summed (Total) limit of reporting is calculated by summing the individual analyte LORs and dividing by two. For example, where 16 individual analytes are being summed and each has an LOR of 0.1 mg/kg, the "Totals" LOR will be 1.6 / 2 (0.8 mg/kg). Where only 2 analytes are being summed, the " Total" LOR will be the sum of those two LORs.

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

If reported, measurement uncertainty follow the ± sign after the analytical result and is expressed as the expanded uncertainty calculated using a coverage factor of 2, providing a level of confidence of approximately 95%, unless stated otherwise in the comments section of this report.

Results reported for samples tested under test methods with codes starting with ARS-SOP, radionuclide or gross radioactivity concentrations are expressed in becquerel (Bq) per unit of mass or volume or per wipe as stated on the report. Becquerel is the SI unit for activity and equals one nuclear transformation per second.
Note that in terms of units of radioactivity:

a. 1 Bq is equivalent to 27 pCi
b. 37 MBq is equivalent to 1 mCi

For results reported for samples tested under test methods with codes starting with ARS-SOP, less than (<) values indicate the detection limit for each radionuclide or parameter for the measurement system used. The respective detection limits have been calculated in accordance with ISO 11929.

The QC and MU criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here: www.sgs.com.au.pv.sgsvr/en-gb/environment.

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STATEMENT OF QA/QC PERFORMANCE

SE199950A R0

CLIENT DETAILS

Contact	Cameron Williams
Client	GOLDER ASSOCIATES PTY LTD
Address	124 Pacific Hwy (PO Box 1302, CROWS NEST, NSW 2065) NSW 2065
Telephone	02 9478 3900
Facsimile	02 9478 3901
Email	cawilliams@golder.com.au
Project	**19130799 - Gran Central - Additional**
Order Number	**PO23977**
Samples	5

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
SGS Reference	**SE199950A R0**
Date Received	10 Dec 2019
Date Reported	17 Dec 2019

COMMENTS

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

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

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

SAMPLE SUMMARY

Samples clearly labelled	Yes	Complete documentation received	Yes
Sample container provider	SGS	Sample cooling method	Ice Bricks
Samples received in correct containers	Yes	Sample counts by matrix	1 Soil
Date documentation received	10/12/2019@11:39a	Type of documentation received	Email
Samples received in good order	Yes	Samples received without headspace	Yes
Sample temperature upon receipt	5.3°C	Sufficient sample for analysis	Yes
Turnaround time requested	Standard		

HOLDING TIME SUMMARY

SE199950A R0

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

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

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

Metals in TCLP Extract by ICPOES

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH103/201103/2001	SE199950A.001	LB190142	11 Nov 2019	10 Dec 2019	09 May 2020	17 Dec 2019	09 May 2020	17 Dec 2019

TCLP (Toxicity Characteristic Leaching Procedure) for Metals

Method: ME-(AU)-[ENV]AN006

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH103/201103/2001	SE199950A.001	LB190051	11 Nov 2019	10 Dec 2019	09 May 2020	16 Dec 2019	09 May 2020	17 Dec 2019

SURROGATES

SE199950A R0

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

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

No surrogates were required for this job.

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

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

Metals in TCLP Extract by ICPOES — **Method: ME-(AU)-[ENV]AN320**

Sample Number	Parameter	Units	LOR	Result
LB190142.001	Lead, Pb	mg/L	0.02	<0.02

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

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

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

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

No duplicates were required for this job.

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

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

Metals in TCLP Extract by ICPOES — **Method: ME-(AU)-[ENV]AN320**

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB190142.002	Lead, Pb	mg/L	0.02	0.48	0.5	80 - 120	97

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

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

No matrix spikes were required for this job.

MATRIX SPIKE DUPLICATES

SE199950A R0

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

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

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

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

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

No matrix spike duplicates were required for this job.

Samples analysed as received.

Solid samples expressed on a dry weight basis.

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

*	NATA accreditation does not cover the performance of this service.
**	Indicative data, theoretical holding time exceeded.
-	Sample not analysed for this analyte.
IS	Insufficient sample for analysis.
LNR	Sample listed, but not received.
LOR	Limit of reporting.
QFH	QC result is above the upper tolerance.
QFL	QC result is below the lower tolerance.

①	At least 2 of 3 surrogates are within acceptance criteria.
②	RPD failed acceptance criteria due to sample heterogeneity.
③	Results less than 5 times LOR preclude acceptance criteria for RPD.
④	Recovery failed acceptance criteria due to matrix interference.
⑤	Recovery failed acceptance criteria due to the presence of significant concentration of analyte (i.e. the concentration of analyte exceeds the spike level).
⑥	LOR was raised due to sample matrix interference.
⑦	LOR was raised due to dilution of significantly high concentration of analyte in sample.
⑧	Reanalysis of sample in duplicate confirmed sample heterogeneity and inconsistency of results.
⑨	Recovery failed acceptance criteria due to sample heterogeneity.
⑩	LOR was raised due to high conductivity of the sample (required dilution).
†	Refer to relevant report comments for further information.

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source: [Untitled].pdf page: 1 SGS Ref: SE200602_COC

SAMPLE CHAIN OF CUSTODY DOCUMENTATION

Sheet 1 of 1

Project No:	19130799	Lab Name:	SGS
Site Location:	Granville Development	Quote No.	-
Sampled By:	AL	Order No.:	PO23977
Turnaround Time	24hrs / 36hrs / 48hrs / 5 Days / Standard ☒	Date Required By:	
Delivery Option	HARD / FAX / DISK / EMAIL ☒ / BULLETIN BOARD		
Report Format	PDF ☒ / EXCEL ☒ / ESDAT ☒		

Comments/Special Instructions:

Please email results to:

edoyle@golder.com.au, cawilliams@golder.com.au

GOLDER ASSOCIATES PTY LTD
Level 10 Mount Street, North Sydney, NSW
Project Manager: Cameron Williams
Job Contact: Cameron Williams
Phone: (02) 9478 3900
Fax: (02) 9478 3901
Reviewed: Shane Locke
Phone: 61437099883 Email: [redacted]

Golder Associates

ANALYSIS REQUIRED

LAB ID	SAMPLE ID	SAMPLE DATE	SAMPLE TIME	SAMPLE MATRIX	No CONTAINERS	Level of Contamination (Low/High/Unknown)	HOLD	XCLIT SUITE
1	BH104_050-058	15-11-19	11:20	Soil	1	L	X	X
	BH104_145-150	15-11-19	12:00	Soil	1	L	X	
	BH105_047-049	15-11-19	13:40	Soil	1	L	X	
	BH105_130-132	15-11-19	14:30	Soil	1	L	X	

SGS EHS Alexandria Laboratory

SE200602 COC
Received: 18 – Nov – 2019

SAMPLE MATRIX = Soil/Sediment/Fill/Water/Other

SAMPLE TYPE = Composite(C)/Discrete(DC)/Disturbed(DS)/Core(CR), Grab Sample HIGH CONCENTRATION: circle expected parameters in analysis list

	SIGNATURE	COMPANY	DATE	TIME
RELEASED BY	Alex L.	Golder	18/11/19	2:30
RECEIVED BY	[signature]	SGS	18/11	3:45
RELEASED BY				
RECEIVED BY				
RELEASED BY				
RECEIVED BY				

	SIGNATURE	COMPANY	DATE	TIME	Method of Shipment
RELEASED BY					Shipping Ref
RECEIVED BY					

To Be Filled Out By Analysing Laboratory

Security Seal		Chilled	LAB. BATCH NUMBER		
Suitable Containers		Frozen		Bill to:	
Cool Box		Ambient		Address	

RL3
SNTD04
Feb 2011

THIS FORM IS TO BE SIGNED BY GOLDER STAFF; COURIER/S; LABORATORY ON RECEIPT OF SAMPLES.

SAMPLE RECEIPT ADVICE

SE200602

CLIENT DETAILS

Contact	Cameron Williams
Client	GOLDER ASSOCIATES PTY LTD
Address	124 Pacific Hwy (PO Box 1302, CROWS NEST, NSW 2065) NSW 2065
Telephone	02 9478 3900
Facsimile	02 9478 3901
Email	cawilliams@golder.com.au
Project	**19130799 Granville Development**
Order Number	**PO23977**
Samples	1

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
Samples Received	Mon 18/11/2019
Report Due	Fri 6/12/2019
SGS Reference	**SE200602**

SUBMISSION DETAILS

This is to confirm that 1 sample was received on Monday 18/ 11/2019. Results are expected to be ready by COB Friday 6/12/2019. Please quote SGS reference SE200602 when making enquiries. Refer below for details relating to sample integrity upon receipt.

Samples clearly labelled	Yes	Complete documentation received	Yes
Sample container provider	SGS	Sample cooling method	Ice
Samples received in correct containers	Yes	Sample counts by matrix	1 Soil
Date documentation received	18/11/2019	Type of documentation received	COC
Samples received in good order	Yes	Samples received without headspace	Yes
Sample temperature upon receipt	1.1°C	Sufficient sample for analysis	Yes
Turnaround time requested	Standard		

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

COMMENTS

3 samples have been placed on hold as no tests have been assigned for them by the client. These samples will not be processed.

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SAMPLE RECEIPT ADVICE

SE200602

CLIENT DETAILS

Client GOLDER ASSOCIATES PTY LTD

Project 19130799 Granville Development

SUMMARY OF ANALYSIS

No.	Sample ID	OC Pesticides in Soil	OP Pesticides in Soil	PAH (Polynuclear Aromatic Hydrocarbons) in Soil	PCBs in Soil	Total Recoverable Elements in Soil/Waste	TRH (Total Recoverable Hydrocarbons) in Soil	VOC's in Soil	Volatile Petroleum Hydrocarbons in Soil
001	BH104_0.50-0.58	29	14	26	11	7	10	11	7

CONTINUED OVERLEAF

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

SAMPLE RECEIPT ADVICE

SE200602

CLIENT DETAILS

Client GOLDER ASSOCIATES PTY LTD

Project 19130799 Granville Development

SUMMARY OF ANALYSIS

No.	Sample ID	Mercury in Soil	Moisture Content
001	BH104_0.50-0.58	1	1

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

ANALYTICAL REPORT

Accreditation No. 2562

CLIENT DETAILS

Contact	Cameron Williams
Client	GOLDER ASSOCIATES PTY LTD
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Project	**19130799 Granville Development**
Order Number	**PO23977**
Samples	1

LABORATORY DETAILS

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SGS Reference	**SE200602 R0**
Date Received	18/11/2019
Date Reported	6/12/2019

COMMENTS

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

SIGNATORIES

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Chemist

Dong LIANG
Metals/Inorganics Team Leader

Huong CRAWFORD
Production Manager

Ly Kim HA
Organic Section Head

VOC's in Soil [AN433] Tested: 3/12/2019

PARAMETER	UOM	LOR	BH104_0.50-0.58 SOIL - 15/11/19 11:20 SE200602.001
Benzene	mg/kg	0.1	<0.1
Toluene	mg/kg	0.1	<0.1
Ethylbenzene	mg/kg	0.1	<0.1
m/p-xylene	mg/kg	0.2	<0.2
o-xylene	mg/kg	0.1	<0.1
Total Xylenes	mg/kg	0.3	<0.3
Total BTEX	mg/kg	0.6	<0.6
Naphthalene	mg/kg	0.1	<0.1

Volatile Petroleum Hydrocarbons in Soil [AN433] Tested: 3/12/2019

PARAMETER	UOM	LOR	BH104_0.50-0.58 SOIL - 15/11/19 11:20 SE200602.001
TRH C6-C9	mg/kg	20	<20
Benzene (F0)	mg/kg	0.1	<0.1
TRH C6-C10	mg/kg	25	<25
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25

TRH (Total Recoverable Hydrocarbons) in Soil [AN403] Tested: 3/12/2019

PARAMETER	UOM	LOR	BH104_0.50-0.58 SOIL - 15/11/19 11:20 SE200602.001
TRH C10-C14	mg/kg	20	<20
TRH C15-C28	mg/kg	45	<45
TRH C29-C36	mg/kg	45	<45
TRH C37-C40	mg/kg	100	<100
TRH >C10-C16	mg/kg	25	<25
TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25
TRH >C16-C34 (F3)	mg/kg	90	<90
TRH >C34-C40 (F4)	mg/kg	120	<120
TRH C10-C36 Total	mg/kg	110	<110
TRH >C10-C40 Total (F bands)	mg/kg	210	<210

PAH (Polynuclear Aromatic Hydrocarbons) in Soil [AN420] Tested: 3/12/2019

PARAMETER	UOM	LOR	BH104_0.50-0.58 SOIL - 15/11/19 11:20 SE200602.001
Naphthalene	mg/kg	0.1	<0.1
2-methylnaphthalene	mg/kg	0.1	<0.1
1-methylnaphthalene	mg/kg	0.1	<0.1
Acenaphthylene	mg/kg	0.1	<0.1
Acenaphthene	mg/kg	0.1	<0.1
Fluorene	mg/kg	0.1	<0.1
Phenanthrene	mg/kg	0.1	<0.1
Anthracene	mg/kg	0.1	<0.1
Fluoranthene	mg/kg	0.1	<0.1
Pyrene	mg/kg	0.1	<0.1
Benzo(a)anthracene	mg/kg	0.1	<0.1
Chrysene	mg/kg	0.1	<0.1
Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1
Benzo(k)fluoranthene	mg/kg	0.1	<0.1
Benzo(a)pyrene	mg/kg	0.1	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1
Dibenzo(ah)anthracene	mg/kg	0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.1	<0.1
Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.2	<0.2
Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	<0.3
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	<0.2
Total PAH (18)	mg/kg	0.8	<0.8
Total PAH (NEPM/WHO 16)	mg/kg	0.8	<0.8

OC Pesticides in Soil [AN420] Tested: 3/12/2019

PARAMETER	UOM	LOR	BH104_0.50-0.58 SOIL - 15/11/19 11:20 SE200602.001
Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1
Alpha BHC	mg/kg	0.1	<0.1
Lindane	mg/kg	0.1	<0.1
Heptachlor	mg/kg	0.1	<0.1
Aldrin	mg/kg	0.1	<0.1
Beta BHC	mg/kg	0.1	<0.1
Delta BHC	mg/kg	0.1	<0.1
Heptachlor epoxide	mg/kg	0.1	<0.1
o,p'-DDE	mg/kg	0.1	<0.1
Alpha Endosulfan	mg/kg	0.2	<0.2
Gamma Chlordane	mg/kg	0.1	<0.1
Alpha Chlordane	mg/kg	0.1	<0.1
trans-Nonachlor	mg/kg	0.1	<0.1
p,p'-DDE	mg/kg	0.1	<0.1
Dieldrin	mg/kg	0.2	<0.2
Endrin	mg/kg	0.2	<0.2
o,p'-DDD	mg/kg	0.1	<0.1
o,p'-DDT	mg/kg	0.1	<0.1
Beta Endosulfan	mg/kg	0.2	<0.2
p,p'-DDD	mg/kg	0.1	<0.1
p,p'-DDT	mg/kg	0.1	<0.1
Endosulfan sulphate	mg/kg	0.1	<0.1
Endrin Aldehyde	mg/kg	0.1	<0.1
Methoxychlor	mg/kg	0.1	<0.1
Endrin Ketone	mg/kg	0.1	<0.1
Isodrin	mg/kg	0.1	<0.1
Mirex	mg/kg	0.1	<0.1
Total CLP OC Pesticides	mg/kg	1	<1

OP Pesticides in Soil [AN420] Tested: 3/12/2019

PARAMETER	UOM	LOR	BH104_0.50-0.58 SOIL - 15/11/19 11:20 SE200602.001
Dichlorvos	mg/kg	0.5	<0.5
Dimethoate	mg/kg	0.5	<0.5
Diazinon (Dimpylate)	mg/kg	0.5	<0.5
Fenitrothion	mg/kg	0.2	<0.2
Malathion	mg/kg	0.2	<0.2
Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2
Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2
Bromophos Ethyl	mg/kg	0.2	<0.2
Methidathion	mg/kg	0.5	<0.5
Ethion	mg/kg	0.2	<0.2
Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2
Total OP Pesticides*	mg/kg	1.7	<1.7

PCBs in Soil [AN420] Tested: 3/12/2019

PARAMETER	UOM	LOR	BH104_0.50-0.58 SOIL - 15/11/19 11:20 SE200602.001
Arochlor 1016	mg/kg	0.2	<0.2
Arochlor 1221	mg/kg	0.2	<0.2
Arochlor 1232	mg/kg	0.2	<0.2
Arochlor 1242	mg/kg	0.2	<0.2
Arochlor 1248	mg/kg	0.2	<0.2
Arochlor 1254	mg/kg	0.2	<0.2
Arochlor 1260	mg/kg	0.2	<0.2
Arochlor 1262	mg/kg	0.2	<0.2
Arochlor 1268	mg/kg	0.2	<0.2
Total PCBs (Arochlors)	mg/kg	1	<1

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES [AN040/AN320] Tested: 4/12/2019

PARAMETER	UOM	LOR	BH104_0.50-0.58 SOIL - 15/11/19 11:20 SE200602.001
Arsenic, As	mg/kg	1	**9**
Cadmium, Cd	mg/kg	0.3	<0.3
Chromium, Cr	mg/kg	0.5	**23**
Copper, Cu	mg/kg	0.5	**3.5**
Lead, Pb	mg/kg	1	**15**
Nickel, Ni	mg/kg	0.5	**0.7**
Zinc, Zn	mg/kg	2	**11**

Mercury in Soil [AN312] Tested: 4/12/2019

PARAMETER	UOM	LOR	BH104_0.50-0.58 SOIL - 15/11/19 11:20 SE200602.001
Mercury	mg/kg	0.05	<0.05

Moisture Content [AN002] Tested: 3/12/2019

PARAMETER	UOM	LOR	BH104_0.50-0.58 SOIL - 15/11/19 11:20 SE200602.001
% Moisture	%w/w	1	**20.7**

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

FOOTNOTES

*	NATA accreditation does not cover the performance of this service.	-	Not analysed.	UOM	Unit of Measure.
		NVL	Not validated.	LOR	Limit of Reporting.
**	Indicative data, theoretical holding time exceeded.	IS	Insufficient sample for analysis.	↑↓	Raised/lowered Limit of Reporting.
		LNR	Sample listed, but not received.		

Unless it is reported that sampling has been performed by SGS, the samples have been analysed as received.
Solid samples expressed on a dry weight basis.

Where "Total" analyte groups are reported (for example, Total PAHs, Total OC Pesticides) the total will be calculated as the sum of the individual analytes, with those analytes that are reported as <LOR being assumed to be zero. The summed (Total) limit of reporting is calculated by summing the individual analyte LORs and dividing by two. For example, where 16 individual analytes are being summed and each has an LOR of 0.1 mg/kg, the "Totals" LOR will be 1.6 / 2 (0.8 mg/kg). Where only 2 analytes are being summed, the " Total" LOR will be the sum of those two LORs.

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

If reported, measurement uncertainty follow the ± sign after the analytical result and is expressed as the expanded uncertainty calculated using a coverage factor of 2, providing a level of confidence of approximately 95%, unless stated otherwise in the comments section of this report.

Results reported for samples tested under test methods with codes starting with ARS-SOP, radionuclide or gross radioactivity concentrations are expressed in becquerel (Bq) per unit of mass or volume or per wipe as stated on the report. Becquerel is the SI unit for activity and equals one nuclear transformation per second.
Note that in terms of units of radioactivity:

a. 1 Bq is equivalent to 27 pCi
b. 37 MBq is equivalent to 1 mCi

For results reported for samples tested under test methods with codes starting with ARS-SOP, less than (<) values indicate the detection limit for each radionuclide or parameter for the measurement system used. The respective detection limits have been calculated in accordance with ISO 11929.

The QC and MU criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here: www.sgs.com.au.pv.sgsvr/en-gb/environment.

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STATEMENT OF QA/QC PERFORMANCE

SE200602 R0

CLIENT DETAILS

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Email	cawilliams@golder.com.au
Project	**19130799 Granville Development**
Order Number	**PO23977**
Samples	1

LABORATORY DETAILS

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SGS Reference	**SE200602 R0**
Date Received	18 Nov 2019
Date Reported	17 Feb 2020

COMMENTS

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

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

All Data Quality Objectives were met with the exception of the following:

Extraction Date	Moisture Content	1 item
	OC Pesticides in Soil	1 item
	OP Pesticides in Soil	1 item
	PAH (Polynuclear Aromatic Hydrocarbons) in Soil	1 item
	PCBs in Soil	1 item
	TRH (Total Recoverable Hydrocarbons) in Soil	1 item
	VOC's in Soil	1 item
	Volatile Petroleum Hydrocarbons in Soil	1 item
Duplicate	Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES	2 items
Matrix Spike	TRH (Total Recoverable Hydrocarbons) in Soil	5 items
	VOC's in Soil	1 item
	Volatile Petroleum Hydrocarbons in Soil	1 item

SAMPLE SUMMARY

Samples clearly labelled	Yes	Complete documentation received	Yes
Sample container provider	SGS	Sample cooling method	Ice
Samples received in correct containers	Yes	Sample counts by matrix	1 Soil
Date documentation received	18/11/2019	Type of documentation received	COC
Samples received in good order	Yes	Samples received without headspace	Yes
Sample temperature upon receipt	1.1°C	Sufficient sample for analysis	Yes
Turnaround time requested	Standard		

HOLDING TIME SUMMARY

SE200602 R0

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

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

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

Mercury in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH104_0.50-0.58	SE200602.001	LB189047	15 Nov 2019	18 Nov 2019	13 Dec 2019	04 Dec 2019	13 Dec 2019	06 Dec 2019

Moisture Content

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH104_0.50-0.58	SE200602.001	LB188983	15 Nov 2019	18 Nov 2019	29 Nov 2019	03 Dec 2019†	08 Dec 2019	05 Dec 2019

OC Pesticides in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH104_0.50-0.58	SE200602.001	LB188980	15 Nov 2019	18 Nov 2019	29 Nov 2019	03 Dec 2019†	12 Jan 2020	06 Dec 2019

OP Pesticides in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH104_0.50-0.58	SE200602.001	LB188980	15 Nov 2019	18 Nov 2019	29 Nov 2019	03 Dec 2019†	12 Jan 2020	06 Dec 2019

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH104_0.50-0.58	SE200602.001	LB188980	15 Nov 2019	18 Nov 2019	29 Nov 2019	03 Dec 2019†	12 Jan 2020	06 Dec 2019

PCBs in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH104_0.50-0.58	SE200602.001	LB188980	15 Nov 2019	18 Nov 2019	29 Nov 2019	03 Dec 2019†	12 Jan 2020	06 Dec 2019

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH104_0.50-0.58	SE200602.001	LB189043	15 Nov 2019	18 Nov 2019	13 May 2020	04 Dec 2019	13 May 2020	06 Dec 2019

TRH (Total Recoverable Hydrocarbons) in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH104_0.50-0.58	SE200602.001	LB188980	15 Nov 2019	18 Nov 2019	29 Nov 2019	03 Dec 2019†	12 Jan 2020	05 Dec 2019

VOC's in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH104_0.50-0.58	SE200602.001	LB188981	15 Nov 2019	18 Nov 2019	29 Nov 2019	03 Dec 2019†	12 Jan 2020	05 Dec 2019

Volatile Petroleum Hydrocarbons in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH104_0.50-0.58	SE200602.001	LB188981	15 Nov 2019	18 Nov 2019	29 Nov 2019	03 Dec 2019†	12 Jan 2020	05 Dec 2019

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

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

OC Pesticides in Soil

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Tetrachloro-m-xylene (TCMX) (Surrogate)	BH104_0.50-0.58	SE200602.001	%	60 - 130%	103

OP Pesticides in Soil

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2-fluorobiphenyl (Surrogate)	BH104_0.50-0.58	SE200602.001	%	60 - 130%	91
d14-p-terphenyl (Surrogate)	BH104_0.50-0.58	SE200602.001	%	60 - 130%	75

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2-fluorobiphenyl (Surrogate)	BH104_0.50-0.58	SE200602.001	%	70 - 130%	91
d14-p-terphenyl (Surrogate)	BH104_0.50-0.58	SE200602.001	%	70 - 130%	75
d5-nitrobenzene (Surrogate)	BH104_0.50-0.58	SE200602.001	%	70 - 130%	87

PCBs in Soil

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Tetrachloro-m-xylene (TCMX) (Surrogate)	BH104_0.50-0.58	SE200602.001	%	60 - 130%	103

VOC's in Soil

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	BH104_0.50-0.58	SE200602.001	%	60 - 130%	103
d4-1,2-dichloroethane (Surrogate)	BH104_0.50-0.58	SE200602.001	%	60 - 130%	91
d8-toluene (Surrogate)	BH104_0.50-0.58	SE200602.001	%	60 - 130%	79

Volatile Petroleum Hydrocarbons in Soil

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	BH104_0.50-0.58	SE200602.001	%	60 - 130%	103
d4-1,2-dichloroethane (Surrogate)	BH104_0.50-0.58	SE200602.001	%	60 - 130%	91
d8-toluene (Surrogate)	BH104_0.50-0.58	SE200602.001	%	60 - 130%	79

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

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

Mercury in Soil

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

Sample Number	Parameter	Units	LOR	Result
LB189047.001	Mercury	mg/kg	0.05	<0.05

OC Pesticides in Soil

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

Sample Number		Parameter	Units	LOR	Result
LB188980.001		Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1
		Alpha BHC	mg/kg	0.1	<0.1
		Lindane	mg/kg	0.1	<0.1
		Heptachlor	mg/kg	0.1	<0.1
		Aldrin	mg/kg	0.1	<0.1
		Beta BHC	mg/kg	0.1	<0.1
		Delta BHC	mg/kg	0.1	<0.1
		Heptachlor epoxide	mg/kg	0.1	<0.1
		Alpha Endosulfan	mg/kg	0.2	<0.2
		Gamma Chlordane	mg/kg	0.1	<0.1
		Alpha Chlordane	mg/kg	0.1	<0.1
		p,p'-DDE	mg/kg	0.1	<0.1
		Dieldrin	mg/kg	0.2	<0.2
		Endrin	mg/kg	0.2	<0.2
		Beta Endosulfan	mg/kg	0.2	<0.2
		p,p'-DDD	mg/kg	0.1	<0.1
		p,p'-DDT	mg/kg	0.1	<0.1
		Endosulfan sulphate	mg/kg	0.1	<0.1
		Endrin Aldehyde	mg/kg	0.1	<0.1
		Methoxychlor	mg/kg	0.1	<0.1
		Endrin Ketone	mg/kg	0.1	<0.1
		Isodrin	mg/kg	0.1	<0.1
		Mirex	mg/kg	0.1	<0.1
	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	90

OP Pesticides in Soil

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

Sample Number		Parameter	Units	LOR	Result
LB188980.001		Dichlorvos	mg/kg	0.5	<0.5
		Dimethoate	mg/kg	0.5	<0.5
		Diazinon (Dimpylate)	mg/kg	0.5	<0.5
		Fenitrothion	mg/kg	0.2	<0.2
		Malathion	mg/kg	0.2	<0.2
		Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2
		Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2
		Bromophos Ethyl	mg/kg	0.2	<0.2
		Methidathion	mg/kg	0.5	<0.5
		Ethion	mg/kg	0.2	<0.2
		Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2
	Surrogates	2-fluorobiphenyl (Surrogate)	%	-	104
		d14-p-terphenyl (Surrogate)	%	-	96

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Sample Number	Parameter	Units	LOR	Result
LB188980.001	Naphthalene	mg/kg	0.1	<0.1
	2-methylnaphthalene	mg/kg	0.1	<0.1
	1-methylnaphthalene	mg/kg	0.1	<0.1
	Acenaphthylene	mg/kg	0.1	<0.1
	Acenaphthene	mg/kg	0.1	<0.1
	Fluorene	mg/kg	0.1	<0.1
	Phenanthrene	mg/kg	0.1	<0.1
	Anthracene	mg/kg	0.1	<0.1
	Fluoranthene	mg/kg	0.1	<0.1
	Pyrene	mg/kg	0.1	<0.1
	Benzo(a)anthracene	mg/kg	0.1	<0.1
	Chrysene	mg/kg	0.1	<0.1
	Benzo(a)pyrene	mg/kg	0.1	<0.1

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

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

PAH (Polynuclear Aromatic Hydrocarbons) in Soil (continued)

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

Sample Number		Parameter	Units	LOR	Result
LB188980.001		Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1
		Dibenzo(ah)anthracene	mg/kg	0.1	<0.1
		Benzo(ghi)perylene	mg/kg	0.1	<0.1
		Total PAH (18)	mg/kg	0.8	<0.8
	Surrogates	d5-nitrobenzene (Surrogate)	%	-	82
		2-fluorobiphenyl (Surrogate)	%	-	104
		d14-p-terphenyl (Surrogate)	%	-	96

PCBs in Soil

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

Sample Number		Parameter	Units	LOR	Result
LB188980.001		Arochlor 1016	mg/kg	0.2	<0.2
		Arochlor 1221	mg/kg	0.2	<0.2
		Arochlor 1232	mg/kg	0.2	<0.2
		Arochlor 1242	mg/kg	0.2	<0.2
		Arochlor 1248	mg/kg	0.2	<0.2
		Arochlor 1254	mg/kg	0.2	<0.2
		Arochlor 1260	mg/kg	0.2	<0.2
		Arochlor 1262	mg/kg	0.2	<0.2
		Arochlor 1268	mg/kg	0.2	<0.2
		Total PCBs (Arochlors)	mg/kg	1	<1
	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	90

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

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

Sample Number		Parameter	Units	LOR	Result
LB189043.001		Arsenic, As	mg/kg	1	<1
		Cadmium, Cd	mg/kg	0.3	<0.3
		Chromium, Cr	mg/kg	0.5	<0.5
		Copper, Cu	mg/kg	0.5	<0.5
		Nickel, Ni	mg/kg	0.5	<0.5
		Lead, Pb	mg/kg	1	<1
		Zinc, Zn	mg/kg	2	<2.0

TRH (Total Recoverable Hydrocarbons) in Soil

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

Sample Number		Parameter	Units	LOR	Result
LB188980.001		TRH C10-C14	mg/kg	20	<20
		TRH C15-C28	mg/kg	45	<45
		TRH C29-C36	mg/kg	45	<45
		TRH C37-C40	mg/kg	100	<100
		TRH C10-C36 Total	mg/kg	110	<110

VOC's in Soil

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

Sample Number		Parameter	Units	LOR	Result
LB188981.001	Monocyclic Aromatic	Benzene	mg/kg	0.1	<0.1
	Hydrocarbons	Toluene	mg/kg	0.1	<0.1
		Ethylbenzene	mg/kg	0.1	<0.1
		m/p-xylene	mg/kg	0.2	<0.2
		o-xylene	mg/kg	0.1	<0.1
	Polycyclic VOCs	Naphthalene	mg/kg	0.1	<0.1
	Surrogates	d4-1,2-dichloroethane (Surrogate)	%	-	115
		d8-toluene (Surrogate)	%	-	105
		Bromofluorobenzene (Surrogate)	%	-	93
	Totals	Total BTEX	mg/kg	0.6	<0.6

Volatile Petroleum Hydrocarbons in Soil

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

Sample Number		Parameter	Units	LOR	Result
LB188981.001		TRH C6-C9	mg/kg	20	<20
	Surrogates	d4-1,2-dichloroethane (Surrogate)	%	-	115

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

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

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

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

Mercury in Soil

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE200646.008	LB189047.014	Mercury	mg/kg	0.05	<0.05	0.07	116	32
SE200646.015	LB189047.022	Mercury	mg/kg	0.05	<0.05	<0.05	200	0

Moisture Content

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE200654.006	LB188983.011	% Moisture	%w/w	1	14.9	13.0	37	13
SE200655.006	LB188983.018	% Moisture	%w/w	1	15.9	16.9	36	6

OC Pesticides in Soil

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE200654.005	LB188980.014		Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	200	0
			Alpha BHC	mg/kg	0.1	<0.1	<0.1	200	0
			Lindane	mg/kg	0.1	<0.1	<0.1	200	0
			Heptachlor	mg/kg	0.1	<0.1	<0.1	200	0
			Aldrin	mg/kg	0.1	<0.1	<0.1	200	0
			Beta BHC	mg/kg	0.1	<0.1	<0.1	200	0
			Delta BHC	mg/kg	0.1	<0.1	<0.1	200	0
			Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	200	0
			o,p'-DDE	mg/kg	0.1	<0.1	<0.1	200	0
			Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	200	0
			Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	200	0
			Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	200	0
			trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	200	0
			p,p'-DDE	mg/kg	0.1	<0.1	<0.1	200	0
			Dieldrin	mg/kg	0.2	<0.2	<0.2	200	0
			Endrin	mg/kg	0.2	<0.2	<0.2	200	0
			o,p'-DDD	mg/kg	0.1	<0.1	<0.1	200	0
			o,p'-DDT	mg/kg	0.1	<0.1	<0.1	200	0
			Beta Endosulfan	mg/kg	0.2	<0.2	<0.2	200	0
			p,p'-DDD	mg/kg	0.1	<0.1	<0.1	200	0
			p,p'-DDT	mg/kg	0.1	<0.1	<0.1	200	0
			Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	200	0
			Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1	200	0
			Methoxychlor	mg/kg	0.1	<0.1	<0.1	200	0
			Endrin Ketone	mg/kg	0.1	<0.1	<0.1	200	0
			Isodrin	mg/kg	0.1	<0.1	<0.1	200	0
			Mirex	mg/kg	0.1	<0.1	<0.1	200	0
			Total CLP OC Pesticides	mg/kg	1	<1	<1	200	0
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.14	0.14	30	1

OP Pesticides in Soil

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE200654.005	LB188980.014		Dichlorvos	mg/kg	0.5	<0.5	<0.5	200	0
			Dimethoate	mg/kg	0.5	<0.5	<0.5	200	0
			Diazinon (Dimpylate)	mg/kg	0.5	<0.5	<0.5	200	0
			Fenitrothion	mg/kg	0.2	<0.2	<0.2	200	0
			Malathion	mg/kg	0.2	<0.2	<0.2	200	0
			Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2	<0.2	200	0
			Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2	<0.2	200	0
			Bromophos Ethyl	mg/kg	0.2	<0.2	<0.2	200	0
			Methidathion	mg/kg	0.5	<0.5	<0.5	200	0
			Ethion	mg/kg	0.2	<0.2	<0.2	200	0
			Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	<0.2	200	0
			Total OP Pesticides*	mg/kg	1.7	<1.7	<1.7	200	0
		Surrogates	2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.5	30	7
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.4	30	18
SE200655.006	LB188980.024		Dichlorvos	mg/kg	0.5	<0.5	0.0047116906	200	0
			Dimethoate	mg/kg	0.5	<0.5	0	200	0
			Diazinon (Dimpylate)	mg/kg	0.5	<0.5	0.0086790707	200	0

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

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

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

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

OP Pesticides in Soil (continued)

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE200655.006	LB188980.024		Fenitrothion	mg/kg	0.2	<0.2	0	200	0
			Malathion	mg/kg	0.2	<0.2	0	200	0
			Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2	0	200	0
			Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2	0	200	0
			Bromophos Ethyl	mg/kg	0.2	<0.2	0	200	0
			Methidathion	mg/kg	0.5	<0.5	0	200	0
			Ethion	mg/kg	0.2	<0.2	0	200	0
			Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	0	200	0
			Total OP Pesticides*	mg/kg	1.7	<1.7	0	200	0
		Surrogates	2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.4039264610	30	11
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.4	0.3567057203	30	13

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE200654.005	LB188980.014		Naphthalene	mg/kg	0.1	<0.1	<0.1	200	0
			2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	200	0
			1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	200	0
			Acenaphthylene	mg/kg	0.1	<0.1	<0.1	200	0
			Acenaphthene	mg/kg	0.1	<0.1	<0.1	200	0
			Fluorene	mg/kg	0.1	<0.1	<0.1	200	0
			Phenanthrene	mg/kg	0.1	<0.1	<0.1	200	0
			Anthracene	mg/kg	0.1	<0.1	<0.1	200	0
			Fluoranthene	mg/kg	0.1	<0.1	<0.1	200	0
			Pyrene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(a)anthracene	mg/kg	0.1	<0.1	<0.1	200	0
			Chrysene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(a)pyrene	mg/kg	0.1	<0.1	<0.1	200	0
			Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	200	0
			Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	200	0
			Carcinogenic PAHs, BaP TEQ <LOR=0	mg/kg	0.2	<0.2	<0.2	200	0
			Carcinogenic PAHs, BaP TEQ <LOR=LOR	mg/kg	0.3	<0.3	<0.3	134	0
			Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	mg/kg	0.2	<0.2	<0.2	175	0
			Total PAH (18)	mg/kg	0.8	<0.8	<0.8	200	0
		Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.4	0.4	30	10
			2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.5	30	7
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.4	30	18
SE200655.006	LB188980.025		Naphthalene	mg/kg	0.1	<0.1	0.0007293272	200	0
			2-methylnaphthalene	mg/kg	0.1	<0.1	0	200	0
			1-methylnaphthalene	mg/kg	0.1	<0.1	0	200	0
			Acenaphthylene	mg/kg	0.1	<0.1	0.0018172347	200	0
			Acenaphthene	mg/kg	0.1	<0.1	0.0007437923	200	0
			Fluorene	mg/kg	0.1	<0.1	0.0017191079	200	0
			Phenanthrene	mg/kg	0.1	<0.1	0.0012924362	200	0
			Anthracene	mg/kg	0.1	<0.1	0.0008078174	200	0
			Fluoranthene	mg/kg	0.1	<0.1	0	200	0
			Pyrene	mg/kg	0.1	<0.1	0.0005768370	200	0
			Benzo(a)anthracene	mg/kg	0.1	<0.1	0.0056490272	200	0
			Chrysene	mg/kg	0.1	<0.1	0.0053080121	200	0
			Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	0	200	0
			Benzo(k)fluoranthene	mg/kg	0.1	<0.1	0	200	0
			Benzo(a)pyrene	mg/kg	0.1	<0.1	0.0058717730	200	0
			Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	0	200	0
			Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	0	200	0
			Benzo(ghi)perylene	mg/kg	0.1	<0.1	0	200	0
			Carcinogenic PAHs, BaP TEQ <LOR=0	mg/kg	0.2	<0.2	0	200	0
				TEQ (mg/kg)	0.2	<0.2	0	200	0
			Carcinogenic PAHs, BaP TEQ <LOR=LOR	mg/kg	0.3	<0.3	0.242	134	0
				TEQ (mg/kg)	0.3	<0.3	0.242	134	0

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

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

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

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

PAH (Polynuclear Aromatic Hydrocarbons) in Soil (continued)

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE200655.006	LB188980.025		Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	mg/kg	0.2	<0.2	0.121	175	0
				TEQ (mg/kg)	0.2	<0.2	0.121	175	0
			Total PAH (18)	mg/kg	0.8	<0.8	0	200	0
		Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.4	0.3650544384	30	15
			2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.4039264610	30	11
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.4	0.3567057203	30	13

PCBs in Soil

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE200654.005	LB188980.014		Arochlor 1016	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1221	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1232	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1242	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1248	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1254	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1260	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1262	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1268	mg/kg	0.2	<0.2	<0.2	200	0
			Total PCBs (Arochlors)	mg/kg	1	<1	<1	200	0
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0	0	30	1

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE200642.001	LB189043.024		Chromium, Cr	mg/kg	0.5	7.8	6.3	37	21
			Copper, Cu	mg/kg	0.5	6.7	8.1	37	19
			Lead, Pb	mg/kg	1	6	6	47	5
			Zinc, Zn	mg/kg	2	17	16	42	3
SE200646.008	LB189043.014		Arsenic, As	mg/kg	1	10	9	41	7
			Cadmium, Cd	mg/kg	0.3	0.5	<0.3	107	51
			Chromium, Cr	mg/kg	0.5	17	18	33	6
			Copper, Cu	mg/kg	0.5	23	17	33	33
			Nickel, Ni	mg/kg	0.5	16	15	33	7
			Lead, Pb	mg/kg	1	51	27	33	61 ②
			Zinc, Zn	mg/kg	2	98	70	32	34 ②

TRH (Total Recoverable Hydrocarbons) in Soil

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE200654.005	LB188980.014		TRH C10-C14	mg/kg	20	<20	<20	200	0
			TRH C15-C28	mg/kg	45	<45	<45	200	0
			TRH C29-C36	mg/kg	45	<45	<45	200	0
			TRH C37-C40	mg/kg	100	<100	<100	200	0
			TRH C10-C36 Total	mg/kg	110	<110	<110	200	0
			TRH >C10-C40 Total (F bands)	mg/kg	210	<210	<210	200	0
		TRH F Bands	TRH >C10-C16	mg/kg	25	<25	<25	200	0
			TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25	<25	200	0
			TRH >C16-C34 (F3)	mg/kg	90	<90	<90	200	0
			TRH >C34-C40 (F4)	mg/kg	120	<120	<120	200	0
SE200655.006	LB188980.025		TRH C10-C14	mg/kg	20	<20	0	200	0
			TRH C15-C28	mg/kg	45	<45	0	200	0
			TRH C29-C36	mg/kg	45	<45	0	200	0
			TRH C37-C40	mg/kg	100	<100	0	200	0
			TRH C10-C36 Total	mg/kg	110	<110	0	200	0
			TRH >C10-C40 Total (F bands)	mg/kg	210	<210	0	200	0
		TRH F Bands	TRH >C10-C16	mg/kg	25	<25	0	200	0
			TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25	0	200	0
			TRH >C16-C34 (F3)	mg/kg	90	<90	0	200	0
			TRH >C34-C40 (F4)	mg/kg	120	<120	0	200	0

VOC's in Soil

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

Original	Duplicate	Parameter	Units	LOR

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

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

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

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

VOC's in Soil (continued)

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE200654.005	LB188981.014	Monocyclic	Benzene	mg/kg	0.1	<0.1	<0.1	200	0
		Aromatic	Toluene	mg/kg	0.1	<0.1	<0.1	200	0
			Ethylbenzene	mg/kg	0.1	<0.1	<0.1	200	0
			m/p-xylene	mg/kg	0.2	<0.2	<0.2	200	0
			o-xylene	mg/kg	0.1	<0.1	<0.1	200	0
		Polycyclic	Naphthalene	mg/kg	0.1	<0.1	<0.1	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	7.1	7.3	50	3
			d8-toluene (Surrogate)	mg/kg	-	7.7	7.9	50	2
			Bromofluorobenzene (Surrogate)	mg/kg	-	7.7	7.5	50	2
		Totals	Total Xylenes	mg/kg	0.3	<0.3	<0.3	200	0
			Total BTEX	mg/kg	0.6	<0.6	<0.6	200	0
SE200655.006	LB188981.022	Monocyclic	Benzene	mg/kg	0.1	<0.1	<0.1	200	0
		Aromatic	Toluene	mg/kg	0.1	<0.1	<0.1	200	0
			Ethylbenzene	mg/kg	0.1	<0.1	<0.1	200	0
			m/p-xylene	mg/kg	0.2	<0.2	<0.2	200	0
			o-xylene	mg/kg	0.1	<0.1	<0.1	200	0
		Polycyclic	Naphthalene	mg/kg	0.1	<0.1	<0.1	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	7.2	7.4	50	2
			d8-toluene (Surrogate)	mg/kg	-	7.8	8.0	50	3
			Bromofluorobenzene (Surrogate)	mg/kg	-	7.4	7.8	50	5
		Totals	Total Xylenes	mg/kg	0.3	<0.3	<0.3	200	0
			Total BTEX	mg/kg	0.6	<0.6	<0.6	200	0

Volatile Petroleum Hydrocarbons in Soil

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE200654.005	LB188981.014		TRH C6-C10	mg/kg	25	<25	<25	200	0
			TRH C6-C9	mg/kg	20	<20	<20	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	7.1	7.3	30	3
			d8-toluene (Surrogate)	mg/kg	-	7.7	7.9	30	2
			Bromofluorobenzene (Surrogate)	mg/kg	-	7.7	7.5	30	2
		VPH F Bands	Benzene (F0)	mg/kg	0.1	<0.1	<0.1	200	0
			TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	200	0
SE200655.006	LB188981.022		TRH C6-C10	mg/kg	25	<25	<25	200	0
			TRH C6-C9	mg/kg	20	<20	<20	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	7.2	7.4	30	2
			d8-toluene (Surrogate)	mg/kg	-	7.8	8.0	30	3
			Bromofluorobenzene (Surrogate)	mg/kg	-	7.4	7.8	30	5
		VPH F Bands	Benzene (F0)	mg/kg	0.1	<0.1	<0.1	200	0
			TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	200	0

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

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

Mercury in Soil

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB189047.002	Mercury	mg/kg	0.05	0.22	0.2	70 - 130	111

OC Pesticides in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB188980.002		Heptachlor	mg/kg	0.1	0.2	0.2	60 - 140	100
		Aldrin	mg/kg	0.1	0.2	0.2	60 - 140	105
		Delta BHC	mg/kg	0.1	0.2	0.2	60 - 140	95
		Dieldrin	mg/kg	0.2	0.2	0.2	60 - 140	100
		Endrin	mg/kg	0.2	0.2	0.2	60 - 140	100
		p,p'-DDT	mg/kg	0.1	0.1	0.2	60 - 140	70
	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.14	0.15	40 - 130	90

OP Pesticides in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB188980.002		Dichlorvos	mg/kg	0.5	1.3	2	60 - 140	67
		Diazinon (Dimpylate)	mg/kg	0.5	1.6	2	60 - 140	81
		Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	1.5	2	60 - 140	74
		Ethion	mg/kg	0.2	1.3	2	60 - 140	67
	Surrogates	2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.5	40 - 130	86
		d14-p-terphenyl (Surrogate)	mg/kg	-	0.4	0.5	40 - 130	82

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB188980.002		Naphthalene	mg/kg	0.1	3.6	4	60 - 140	89
		Acenaphthylene	mg/kg	0.1	3.8	4	60 - 140	95
		Acenaphthene	mg/kg	0.1	3.7	4	60 - 140	94
		Phenanthrene	mg/kg	0.1	3.7	4	60 - 140	92
		Anthracene	mg/kg	0.1	3.6	4	60 - 140	90
		Fluoranthene	mg/kg	0.1	3.6	4	60 - 140	89
		Pyrene	mg/kg	0.1	3.8	4	60 - 140	94
		Benzo(a)pyrene	mg/kg	0.1	3.9	4	60 - 140	97
	Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.4	0.5	40 - 130	82
		2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.5	40 - 130	86
		d14-p-terphenyl (Surrogate)	mg/kg	-	0.4	0.5	40 - 130	82

PCBs in Soil

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB188980.002	Arochlor 1260	mg/kg	0.2	0.4	0.4	60 - 140	95

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB189043.002	Arsenic, As	mg/kg	1	320	318.22	80 - 120	102
	Cadmium, Cd	mg/kg	0.3	4.8	5.41	80 - 120	104
	Chromium, Cr	mg/kg	0.5	38	38.31	80 - 120	100
	Copper, Cu	mg/kg	0.5	300	290	80 - 120	102
	Nickel, Ni	mg/kg	0.5	190	187	80 - 120	100
	Lead, Pb	mg/kg	1	92	89.9	80 - 120	103
	Zinc, Zn	mg/kg	2	260	273	80 - 120	96

TRH (Total Recoverable Hydrocarbons) in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB188980.002		TRH C10-C14	mg/kg	20	50	40	60 - 140	125
		TRH C15-C28	mg/kg	45	46	40	60 - 140	115
		TRH C29-C36	mg/kg	45	<45	40	60 - 140	105
	TRH F Bands	TRH >C10-C16	mg/kg	25	49	40	60 - 140	123
		TRH >C16-C34 (F3)	mg/kg	90	<90	40	60 - 140	115
		TRH >C34-C40 (F4)	mg/kg	120	<120	20	60 - 140	100

VOC's in Soil

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

Sample Number	Parameter	Units	LOR

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

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

VOC's in Soil (continued)

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB188981.002	Monocyclic	Benzene	mg/kg	0.1	3.9	5	60 - 140	79
	Aromatic	Toluene	mg/kg	0.1	3.8	5	60 - 140	77
		Ethylbenzene	mg/kg	0.1	4.3	5	60 - 140	87
		m/p-xylene	mg/kg	0.2	8.3	10	60 - 140	83
		o-xylene	mg/kg	0.1	4.2	5	60 - 140	84
	Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	9.4	10	70 - 130	94
		d8-toluene (Surrogate)	mg/kg	-	8.6	10	70 - 130	86
		Bromofluorobenzene (Surrogate)	mg/kg	-	9.4	10	70 - 130	94

Volatile Petroleum Hydrocarbons in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB188981.002		TRH C6-C10	mg/kg	25	65	92.5	60 - 140	70
		TRH C6-C9	mg/kg	20	57	80	60 - 140	71
	Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	9.4	10	70 - 130	94
		Bromofluorobenzene (Surrogate)	mg/kg	-	9.4	10	70 - 130	94
	VPH F Bands	TRH C6-C10 minus BTEX (F1)	mg/kg	25	40	62.5	60 - 140	64

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

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

Mercury in Soil

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

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE200602.001	LB189047.004	Mercury	mg/kg	0.05	0.20	<0.05	0.2	98

OC Pesticides in Soil

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE199470A.01	LB188980.024		Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	-	-
4			Alpha BHC	mg/kg	0.1	<0.1	<0.1	-	-
			Lindane	mg/kg	0.1	<0.1	<0.1	-	-
			Heptachlor	mg/kg	0.1	0.2	<0.1	0.2	95
			Aldrin	mg/kg	0.1	0.2	<0.1	0.2	100
			Beta BHC	mg/kg	0.1	<0.1	<0.1	-	-
			Delta BHC	mg/kg	0.1	0.2	<0.1	0.2	100
			Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	-	-
			o,p'-DDE	mg/kg	0.1	<0.1	<0.1	-	-
			Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	-	-
			Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	-	-
			Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	-	-
			trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	-	-
			p,p'-DDE	mg/kg	0.1	<0.1	<0.1	-	-
			Dieldrin	mg/kg	0.2	0.2	<0.2	0.2	105
			Endrin	mg/kg	0.2	0.2	<0.2	0.2	110
			o,p'-DDD	mg/kg	0.1	<0.1	<0.1	-	-
			o,p'-DDT	mg/kg	0.1	<0.1	<0.1	-	-
			Beta Endosulfan	mg/kg	0.2	<0.2	<0.2	-	-
			p,p'-DDD	mg/kg	0.1	<0.1	<0.1	-	-
			p,p'-DDT	mg/kg	0.1	0.2	<0.1	0.2	80
			Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	-	-
			Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1	-	-
			Methoxychlor	mg/kg	0.1	<0.1	<0.1	-	-
			Endrin Ketone	mg/kg	0.1	<0.1	<0.1	-	-
			Isodrin	mg/kg	0.1	<0.1	<0.1	-	-
			Mirex	mg/kg	0.1	<0.1	<0.1	-	-
			Total CLP OC Pesticides	mg/kg	1	1	<1	-	-
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.14	0.14	-	92

PCBs in Soil

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE199470A.01	LB188980.024		Arochlor 1016	mg/kg	0.2	<0.2	<0.2	-	-
4			Arochlor 1221	mg/kg	0.2	<0.2	<0.2	-	-
			Arochlor 1232	mg/kg	0.2	<0.2	<0.2	-	-
			Arochlor 1242	mg/kg	0.2	<0.2	<0.2	-	-
			Arochlor 1248	mg/kg	0.2	<0.2	<0.2	-	-
			Arochlor 1254	mg/kg	0.2	<0.2	<0.2	-	-
			Arochlor 1260	mg/kg	0.2	0.5	<0.2	0.4	135
			Arochlor 1262	mg/kg	0.2	<0.2	<0.2	-	-
			Arochlor 1268	mg/kg	0.2	<0.2	<0.2	-	-
			Total PCBs (Arochlors)	mg/kg	1	<1	<1	-	-
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0	0	-	90

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

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

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE200602.001	LB189043.004	Arsenic, As	mg/kg	1	50	9	50	82
		Cadmium, Cd	mg/kg	0.3	42	<0.3	50	85
		Chromium, Cr	mg/kg	0.5	64	23	50	82
		Copper, Cu	mg/kg	0.5	48	3.5	50	90
		Nickel, Ni	mg/kg	0.5	46	0.7	50	91
		Lead, Pb	mg/kg	1	56	15	50	81
		Zinc, Zn	mg/kg	2	52	11	50	82

TRH (Total Recoverable Hydrocarbons) in Soil

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

QC Sample	Sample Number	Parameter	Units	LOR

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

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

TRH (Total Recoverable Hydrocarbons) in Soil (continued)

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE199470A.01	LB188980.024		TRH C10-C14	mg/kg	20	95	<20	40	215 ⑤
4			TRH C15-C28	mg/kg	45	1400	450	40	2340 ⑤
			TRH C29-C36	mg/kg	45	1500	650	40	2138 ⑤
			TRH C37-C40	mg/kg	100	520	120	-	-
			TRH C10-C36 Total	mg/kg	110	3000	1100	-	-
			TRH >C10-C40 Total (F bands)	mg/kg	210	3500	1200	-	-
		TRH F Bands	TRH >C10-C16	mg/kg	25	130	<25	40	278 ⑤
			TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	130	<25	-	-
			TRH >C16-C34 (F3)	mg/kg	90	2400	900	40	3685 ⑤
			TRH >C34-C40 (F4)	mg/kg	120	980	310	-	-

VOC's in Soil

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE200645.001	LB188981.004	Monocyclic	Benzene	mg/kg	0.1	3.6	<0.1	5	73
		Aromatic	Toluene	mg/kg	0.1	3.3	<0.1	5	64
			Ethylbenzene	mg/kg	0.1	4.0	<0.1	5	80
			m/p-xylene	mg/kg	0.2	8.5	<0.2	10	84
			o-xylene	mg/kg	0.1	3.6	<0.1	5	71
		Polycyclic	Naphthalene	mg/kg	0.1	4.6	<0.1	-	-
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	8.5	9.8	10	85
			d8-toluene (Surrogate)	mg/kg	-	6.7	8.0	10	67 ①
			Bromofluorobenzene (Surrogate)	mg/kg	-	7.2	8.3	10	72
		Totals	Total Xylenes	mg/kg	0.3	12	<0.3	-	-
			Total BTEX	mg/kg	0.6	23	<0.6	-	-

Volatile Petroleum Hydrocarbons in Soil

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE200645.001	LB188981.004		TRH C6-C10	mg/kg	25	75	<25	92.5	72
			TRH C6-C9	mg/kg	20	61	<20	80	72
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	8.5	9.8	10	85
			d8-toluene (Surrogate)	mg/kg	-	6.7	8.0	10	67 ①
			Bromofluorobenzene (Surrogate)	mg/kg	-	7.2	8.3	-	72
		VPH F	Benzene (F0)	mg/kg	0.1	3.6	<0.1	-	-
		Bands	TRH C6-C10 minus BTEX (F1)	mg/kg	25	52	<25	62.5	70

MATRIX SPIKE DUPLICATES

SE200602 R0

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

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

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

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

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

No matrix spike duplicates were required for this job.

Samples analysed as received.

Solid samples expressed on a dry weight basis.

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

*	NATA accreditation does not cover the performance of this service.
**	Indicative data, theoretical holding time exceeded.
-	Sample not analysed for this analyte.
IS	Insufficient sample for analysis.
LNR	Sample listed, but not received.
LOR	Limit of reporting.
QFH	QC result is above the upper tolerance.
QFL	QC result is below the lower tolerance.

①	At least 2 of 3 surrogates are within acceptance criteria.
②	RPD failed acceptance criteria due to sample heterogeneity.
③	Results less than 5 times LOR preclude acceptance criteria for RPD.
④	Recovery failed acceptance criteria due to matrix interference.
⑤	Recovery failed acceptance criteria due to the presence of significant concentration of analyte (i.e. the concentration of analyte exceeds the spike level).
⑥	LOR was raised due to sample matrix interference.
⑦	LOR was raised due to dilution of significantly high concentration of analyte in sample.
⑧	Reanalysis of sample in duplicate confirmed sample heterogeneity and inconsistency of results.
⑨	Recovery failed acceptance criteria due to sample heterogeneity.
⑩	LOR was raised due to high conductivity of the sample (required dilution).
†	Refer to relevant report comments for further information.

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CHAIN OF CUSTODY & ANALYSIS REQUEST

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Company Name:	Golder Associates Pty Ltd	Project Name/No:	Gran Central - 19130799
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		Telephone:	0437 099 883
Contact Name:	Cameron Williams	Fax:	
Quotation No:		Email Results to:	cawilliams@golder.com.au; sdoyle@golder.com.au

SGS ID	Client Sample ID	Sampling Date/ Time	Matrix (Tick as appropriate)			NO. OF CONTAINERS	ANALYSIS REQUESTED												Additional Report Formats
			Soil Sample	Water Sample	Other___		HOLD	HOLD (Freeze)	CL17 SUITE	ASBESTOS WA DOH NEPM	TRH/BTEXN/PAH/HM* 8	TRH F1/BTEXN (CL4 SUITE)							☐ NEPM ☐ CSV ☐ ESDAT ☐ DQO ☐ GO, Guidelines --------- ☐ Others _____
1	BH101_0.15-0.17	14/11	✓			3			✓	✓									Notes/Guidelines/LOR/ Special instructions
	BH101_0.45-0.50	14/11	✓			3	✓												
	BH101_1.05-1.15	14/11	✓			3	✓												
2	BH101_1.55-2.0	14/11	✓			2			✓										
	BH101_2.8-3.25	14/11	✓			2	✓												
3	RB	14/11		✓		4					✓								
4	TS	14/11			✓	1						✓							
5	TB	14/11			✓	1						✓							

Relinquished By: Cameron Williams	Date/Time: 14/11 – 13:50	Received By: Eddie – Capital Transport	Date/Time: 14/11 – 13:50
Relinquished By:	Date/Time:	Received By: J.L - SGS	Date/Time: 14/11/19 3:05pm
Samples Intact: (Yes) / No	Temperature: 4.6 °C	Sample Security Sealed: Yes / No	Hazards: *e.g. may contain Asbestos*

Comments / Subcontracting details: COC Golder review: SPD 15/11/2019

SE200614

CHAIN OF CUSTODY & ANALYSIS REQUEST

Page _1__ of _1___

SGS Environmental Services Sydney
Unit 16, 33 Maddox Street
Alexandria NSW 2015
Telephone No: (02) 85940400
Facsimile No: (02) 85940499
Email: au.samplereceipt.sydney@sgs.com

Lab ID Number: *(please quote on correspondence)*

Site: Gran Central, Granville

Company Name:	Golder Associates Pty Ltd	Project Name/No:	Gran Central - 19130799
Address:	Level 8, 40 Mount Street	Purchase Order No:	PO23977
	North Sydney NSW	Results Required Date:	5 day TAT
		Telephone:	Fax:
Contact Name:		Email Results to:	cawilliams@golder.com.au; sdoyle@golder.com.au
Quotation No:			

SGS ID	Client Sample ID	Sampling Date/ Time	Matrix (Tick as appropriate) Soil Sample	Water Sample	Other___	NO. OF CONTAINERS	ANALYSIS REQUESTED HOLD	HOLD (Freeze)	CL17 SUITE	ASBESTOS WA DOH NEPM	TRH/BTEXN/PAH/HM* 8							
	BH101_0.15-0.17	14/11	✓			3	✓											
	BH101_0.45-0.50	14/11	✓			3	✓											
	BH101_1.05-1.15	14/11	✓			3	✓											
	BH101_1.55-2.0	14/11	✓			2	✓											
	BH101_2.8-3.25	14/11	✓			2	✓											
	RB	14/11		✓		4	✓											
	TS	14/11			✓	1	✓											
	TB	14/11			✓	1	✓											

Additional Report Formats

- ☐ NEPM
- ☐ CSV
- ☐ ESDAT
- ☐ DQO
- ☐ GO, Guidelines ---------
- ☐ Others _____

Notes/Guidelines/LOR/ Special instructions

E-MAILED
14/11/19 2.01pm

Relinquished By: Cameron Williams	Date/Time: 14/11 – 13:50	Received By: Eddie – Capital Transport	Date/Time: 14/11 – 13:50
Relinquished By:	Date/Time:	Received By:	Date/Time: 14/11/19 @ 3.05
Samples Intact: *Yes / No*	Temperature: °C	Sample Security Sealed: *Yes / No*	Hazards: *e.g. may contain Asbestos*

Comments / Subcontracting details: COC Golder review:

SAMPLE RECEIPT ADVICE

SE200614

CLIENT DETAILS

Contact	Cameron Williams
Client	GOLDER ASSOCIATES PTY LTD
Address	124 Pacific Hwy (PO Box 1302, CROWS NEST, NSW 2065) NSW 2065
Telephone	02 9478 3900
Facsimile	02 9478 3901
Email	cawilliams@golder.com.au
Project	**19130799 Gran Central**
Order Number	**PO23977**
Samples	5

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
Samples Received	Thu 14/11/2019
Report Due	Thu 5/12/2019
SGS Reference	**SE200614**

SUBMISSION DETAILS

This is to confirm that 5 samples were received on Thursday 14/11/2019. Results are expected to be ready by COB Thursday 5/12/2019.
Please quote SGS reference SE200614 when making enquiries. Refer below for details relating to sample integrity upon receipt.

Samples clearly labelled	Yes	Complete documentation received	Yes
Sample container provider	SGS	Sample cooling method	Ice
Samples received in correct containers	Yes	Sample counts by matrix	4 Soil, 1 Water
Date documentation received	14/11/2019	Type of documentation received	COC
Samples received in good order	Yes	Samples received without headspace	**No**
Sample temperature upon receipt	4.6°C	Sufficient sample for analysis	Yes
Turnaround time requested	Standard		

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

COMMENTS

This document is issued by the Company under its General Conditions of Service accessible at www.sgs.com/en/Terms-and-Conditions.aspx. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein.

SAMPLE RECEIPT ADVICE

SE200614

CLIENT DETAILS

Client GOLDER ASSOCIATES PTY LTD

Project 19130799 Gran Central

SUMMARY OF ANALYSIS

No.	Sample ID	OC Pesticides in Soil	OP Pesticides in Soil	PAH (Polynuclear Aromatic Hydrocarbons) in Soil	PCBs in Soil	Total Recoverable Elements in Soil/Waste	TRH (Total Recoverable Hydrocarbons) in Soil	VOC's in Soil	Volatile Petroleum Hydrocarbons in Soil
001	BH101_0.15-0.17	29	14	26	11	7	10	11	7
002	BH101_1.55-2.0	29	14	26	11	7	10	11	7
004	TS	-	-	-	-	-	-	11	-
005	TB	-	-	-	-	-	-	11	7

CONTINUED OVERLEAF

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

SAMPLE RECEIPT ADVICE

SE200614

CLIENT DETAILS

Client GOLDER ASSOCIATES PTY LTD

Project 19130799 Gran Central

SUMMARY OF ANALYSIS

No.	Sample ID	Fibre Identification in soil	Gravimetric Determination of Asbestos in Soil	Mercury in Soil	Moisture Content
001	BH101_0.15-0.17	2	9	1	1
002	BH101_1.55-2.0	-	-	1	1
005	TB	-	-	-	1

CONTINUED OVERLEAF

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

SAMPLE RECEIPT ADVICE

SE200614

CLIENT DETAILS

Client GOLDER ASSOCIATES PTY LTD

Project 19130799 Gran Central

SUMMARY OF ANALYSIS

No.	Sample ID	Mercury (dissolved) in Water	PAH (Polynuclear Aromatic Hydrocarbons) in Water	Trace Metals (Dissolved) in Water by ICPMS	TRH (Total Recoverable Hydrocarbons) in Water	VOCs in Water	Volatile Petroleum Hydrocarbons in Water
003	RB	1	22	7	9	11	7

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

ANALYTICAL REPORT

Accreditation No. 2562

CLIENT DETAILS

Contact	Cameron Williams
Client	GOLDER ASSOCIATES PTY LTD
Address	124 Pacific Hwy (PO Box 1302, CROWS NEST, NSW 2065) NSW 2065
Telephone	02 9478 3900
Facsimile	02 9478 3901
Email	cawilliams@golder.com.au
Project	**19130799 Gran Central**
Order Number	**PO23977**
Samples	5

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
SGS Reference	**SE200614 R0**
Date Received	14/11/2019
Date Reported	5/12/2019

COMMENTS

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

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

Asbestos analysed by Approved Identifier Yusuf Kuthpudin .

SIGNATORIES

Akheeqar BENIAMEEN
Chemist

Dong LIANG
Metals/Inorganics Team Leader

Huong CRAWFORD
Production Manager

Ly Kim HA
Organic Section Head

Ravee SIVASUBRAMANIAM
Hygiene Team Leader

VOC's in Soil [AN433] Tested: 2/12/2019

PARAMETER	UOM	LOR	BH101_0.15-0.17 SOIL - 14/11/2019 SE200614.001	BH101_1.55-2.0 SOIL - 14/11/2019 SE200614.002	TS SOIL - 14/11/2019 SE200614.004	TB SOIL - 14/11/2019 SE200614.005
Benzene	mg/kg	0.1	<0.1	<0.1	[93%]	<0.1
Toluene	mg/kg	0.1	<0.1	<0.1	[92%]	<0.1
Ethylbenzene	mg/kg	0.1	<0.1	<0.1	[93%]	<0.1
m/p-xylene	mg/kg	0.2	<0.2	<0.2	[93%]	<0.2
o-xylene	mg/kg	0.1	<0.1	<0.1	[95%]	<0.1
Total Xylenes	mg/kg	0.3	<0.3	<0.3	-	<0.3
Total BTEX	mg/kg	0.6	<0.6	<0.6	-	<0.6
Naphthalene	mg/kg	0.1	<0.1	<0.1	-	<0.1

Volatile Petroleum Hydrocarbons in Soil [AN433] Tested: 2/12/2019

PARAMETER	UOM	LOR	BH101_0.15-0.17 SOIL - 14/11/2019 SE200614.001	BH101_1.55-2.0 SOIL - 14/11/2019 SE200614.002	TB SOIL - 14/11/2019 SE200614.005
TRH C6-C9	mg/kg	20	<20	<20	<20
Benzene (F0)	mg/kg	0.1	<0.1	<0.1	<0.1
TRH C6-C10	mg/kg	25	<25	<25	<25
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	<25

TRH (Total Recoverable Hydrocarbons) in Soil [AN403] Tested: 2/12/2019

PARAMETER	UOM	LOR	BH101_0.15-0.17 SOIL - 14/11/2019 SE200614.001	BH101_1.55-2.0 SOIL - 14/11/2019 SE200614.002
TRH C10-C14	mg/kg	20	<20	<20
TRH C15-C28	mg/kg	45	<45	<45
TRH C29-C36	mg/kg	45	<45	<45
TRH C37-C40	mg/kg	100	<100	<100
TRH >C10-C16	mg/kg	25	<25	<25
TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25	<25
TRH >C16-C34 (F3)	mg/kg	90	<90	<90
TRH >C34-C40 (F4)	mg/kg	120	<120	<120
TRH C10-C36 Total	mg/kg	110	<110	<110
TRH >C10-C40 Total (F bands)	mg/kg	210	<210	<210

PAH (Polynuclear Aromatic Hydrocarbons) in Soil [AN420] Tested: 2/12/2019

PARAMETER	UOM	LOR	BH101_0.15-0.17 SOIL - 14/11/2019 SE200614.001	BH101_1.55-2.0 SOIL - 14/11/2019 SE200614.002
Naphthalene	mg/kg	0.1	<0.1	<0.1
2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1
1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1
Acenaphthylene	mg/kg	0.1	<0.1	<0.1
Acenaphthene	mg/kg	0.1	<0.1	<0.1
Fluorene	mg/kg	0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.1	<0.1	<0.1
Anthracene	mg/kg	0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.1	**0.5**	<0.1
Pyrene	mg/kg	0.1	**0.7**	<0.1
Benzo(a)anthracene	mg/kg	0.1	**0.3**	<0.1
Chrysene	mg/kg	0.1	**0.4**	<0.1
Benzo(b&j)fluoranthene	mg/kg	0.1	**0.5**	<0.1
Benzo(k)fluoranthene	mg/kg	0.1	**0.2**	<0.1
Benzo(a)pyrene	mg/kg	0.1	**0.5**	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	**0.2**	<0.1
Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.1	**0.2**	<0.1
Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.2	**0.6**	<0.2
Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	**0.7**	<0.3
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	**0.6**	<0.2
Total PAH (18)	mg/kg	0.8	**3.4**	<0.8
Total PAH (NEPM/WHO 16)	mg/kg	0.8	**3.4**	<0.8

OC Pesticides in Soil [AN420] Tested: 2/12/2019

PARAMETER	UOM	LOR	BH101_0.15-0.17 SOIL - 14/11/2019 SE200614.001	BH101_1.55-2.0 SOIL - 14/11/2019 SE200614.002
Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1
Alpha BHC	mg/kg	0.1	<0.1	<0.1
Lindane	mg/kg	0.1	<0.1	<0.1
Heptachlor	mg/kg	0.1	<0.1	<0.1
Aldrin	mg/kg	0.1	<0.1	<0.1
Beta BHC	mg/kg	0.1	<0.1	<0.1
Delta BHC	mg/kg	0.1	<0.1	<0.1
Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1
o,p'-DDE	mg/kg	0.1	<0.1	<0.1
Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2
Gamma Chlordane	mg/kg	0.1	<0.1	<0.1
Alpha Chlordane	mg/kg	0.1	<0.1	<0.1
trans-Nonachlor	mg/kg	0.1	<0.1	<0.1
p,p'-DDE	mg/kg	0.1	<0.1	<0.1
Dieldrin	mg/kg	0.2	<0.2	<0.2
Endrin	mg/kg	0.2	<0.2	<0.2
o,p'-DDD	mg/kg	0.1	<0.1	<0.1
o,p'-DDT	mg/kg	0.1	<0.1	<0.1
Beta Endosulfan	mg/kg	0.2	<0.2	<0.2
p,p'-DDD	mg/kg	0.1	<0.1	<0.1
p,p'-DDT	mg/kg	0.1	<0.1	<0.1
Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1
Methoxychlor	mg/kg	0.1	<0.1	<0.1
Endrin Ketone	mg/kg	0.1	<0.1	<0.1
Isodrin	mg/kg	0.1	<0.1	<0.1
Mirex	mg/kg	0.1	<0.1	<0.1
Total CLP OC Pesticides	mg/kg	1	<1	<1

OP Pesticides in Soil [AN420] Tested: 2/12/2019

PARAMETER	UOM	LOR	BH101_0.15-0.17 SOIL - 14/11/2019 SE200614.001	BH101_1.55-2.0 SOIL - 14/11/2019 SE200614.002
Dichlorvos	mg/kg	0.5	<0.5	<0.5
Dimethoate	mg/kg	0.5	<0.5	<0.5
Diazinon (Dimpylate)	mg/kg	0.5	<0.5	<0.5
Fenitrothion	mg/kg	0.2	<0.2	<0.2
Malathion	mg/kg	0.2	<0.2	<0.2
Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2	<0.2
Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2	<0.2
Bromophos Ethyl	mg/kg	0.2	<0.2	<0.2
Methidathion	mg/kg	0.5	<0.5	<0.5
Ethion	mg/kg	0.2	<0.2	<0.2
Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	<0.2
Total OP Pesticides*	mg/kg	1.7	<1.7	<1.7

PCBs in Soil [AN420] Tested: 2/12/2019

PARAMETER	UOM	LOR	BH101_0.15-0.17 SOIL - 14/11/2019 SE200614.001	BH101_1.55-2.0 SOIL - 14/11/2019 SE200614.002
Arochlor 1016	mg/kg	0.2	<0.2	<0.2
Arochlor 1221	mg/kg	0.2	<0.2	<0.2
Arochlor 1232	mg/kg	0.2	<0.2	<0.2
Arochlor 1242	mg/kg	0.2	<0.2	<0.2
Arochlor 1248	mg/kg	0.2	<0.2	<0.2
Arochlor 1254	mg/kg	0.2	<0.2	<0.2
Arochlor 1260	mg/kg	0.2	<0.2	<0.2
Arochlor 1262	mg/kg	0.2	<0.2	<0.2
Arochlor 1268	mg/kg	0.2	<0.2	<0.2
Total PCBs (Arochlors)	mg/kg	1	<1	<1

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES [AN040/AN320] Tested: 2/12/2019

PARAMETER	UOM	LOR	BH101_0.15-0.17 SOIL - 14/11/2019 SE200614.001	BH101_1.55-2.0 SOIL - 14/11/2019 SE200614.002
Arsenic, As	mg/kg	1	**2**	**2**
Cadmium, Cd	mg/kg	0.3	<0.3	<0.3
Chromium, Cr	mg/kg	0.5	**7.3**	**15**
Copper, Cu	mg/kg	0.5	**24**	**2.8**
Lead, Pb	mg/kg	1	**38**	**11**
Nickel, Ni	mg/kg	0.5	**30**	<0.5
Zinc, Zn	mg/kg	2	**71**	**3.8**

Mercury in Soil [AN312] Tested: 2/12/2019

PARAMETER	UOM	LOR	BH101_0.15-0.17 SOIL - 14/11/2019 SE200614.001	BH101_1.55-2.0 SOIL - 14/11/2019 SE200614.002
Mercury	mg/kg	0.05	<0.05	<0.05

Moisture Content [AN002] Tested: 2/12/2019

PARAMETER	UOM	LOR	BH101_0.15-0.17 SOIL - 14/11/2019 SE200614.001	BH101_1.55-2.0 SOIL - 14/11/2019 SE200614.002	TB SOIL - 14/11/2019 SE200614.005
% Moisture	%w/w	1	**13.0**	**18.4**	<1.0

Fibre Identification in soil [AN602] Tested: 4/12/2019

PARAMETER	UOM	LOR	BH101_0.15-0.17 SOIL - 14/11/2019 SE200614.001
Asbestos Detected	No unit	-	No
Estimated Fibres*	%w/w	0.01	<0.01

Gravimetric Determination of Asbestos in Soil [AN605] Tested: 4/12/2019

PARAMETER	UOM	LOR	BH101_0.15-0.17 SOIL - 14/11/2019 SE200614.001
Total Sample Weight*	g	1	**523**
ACM in >7mm Sample*	g	0.01	<0.01
AF/FA in >2mm to <7mm Sample*	g	0.0001	<0.0001
AF/FA in <2mm Sample*	g	0.0001	<0.0001
Asbestos in soil (>7mm ACM)*	%w/w	0.01	<0.01
Asbestos in soil (>2mm to <7mm AF/FA)*	%w/w	0.001	<0.001
Asbestos in soil (<2mm AF/FA)*	%w/w	0.001	<0.001
Asbestos in soil (<7mm AF/FA)*	%w/w	0.001	<0.001
Fibre Type*	No unit	-	-

VOCs in Water [AN433] Tested: 3/12/2019

PARAMETER	UOM	LOR	RB WATER - 14/11/2019 SE200614.003
Benzene	µg/L	0.5	<0.5
Toluene	µg/L	0.5	<0.5
Ethylbenzene	µg/L	0.5	<0.5
m/p-xylene	µg/L	1	<1
o-xylene	µg/L	0.5	<0.5
Total Xylenes	µg/L	1.5	<1.5
Total BTEX	µg/L	3	<3
Naphthalene	µg/L	0.5	<0.5

Volatile Petroleum Hydrocarbons in Water [AN433] Tested: 3/12/2019

PARAMETER	UOM	LOR	RB WATER - 14/11/2019 SE200614.003
TRH C6-C9	µg/L	40	<40
Benzene (F0)	µg/L	0.5	<0.5
TRH C6-C10	µg/L	50	<50
TRH C6-C10 minus BTEX (F1)	µg/L	50	<50

TRH (Total Recoverable Hydrocarbons) in Water [AN403] Tested: 3/12/2019

PARAMETER	UOM	LOR	RB WATER - 14/11/2019 SE200614.003
TRH C10-C14	µg/L	50	<50
TRH C15-C28	µg/L	200	**320**
TRH C29-C36	µg/L	200	<200
TRH C37-C40	µg/L	200	<200
TRH >C10-C16	µg/L	60	<60
TRH >C10-C16 - Naphthalene (F2)	µg/L	60	<60
TRH >C16-C34 (F3)	µg/L	500	<500
TRH >C34-C40 (F4)	µg/L	500	<500
TRH C10-C40	µg/L	320	<320

PAH (Polynuclear Aromatic Hydrocarbons) in Water [AN420] Tested: 3/12/2019

PARAMETER	UOM	LOR	RB WATER - 14/11/2019 SE200614.003
Naphthalene	µg/L	0.1	<0.1
2-methylnaphthalene	µg/L	0.1	<0.1
1-methylnaphthalene	µg/L	0.1	<0.1
Acenaphthylene	µg/L	0.1	<0.1
Acenaphthene	µg/L	0.1	<0.1
Fluorene	µg/L	0.1	<0.1
Phenanthrene	µg/L	0.1	<0.1
Anthracene	µg/L	0.1	<0.1
Fluoranthene	µg/L	0.1	**0.1**
Pyrene	µg/L	0.1	<0.1
Benzo(a)anthracene	µg/L	0.1	<0.1
Chrysene	µg/L	0.1	<0.1
Benzo(b&j)fluoranthene	µg/L	0.1	<0.1
Benzo(k)fluoranthene	µg/L	0.1	<0.1
Benzo(a)pyrene	µg/L	0.1	<0.1
Indeno(1,2,3-cd)pyrene	µg/L	0.1	<0.1
Dibenzo(ah)anthracene	µg/L	0.1	<0.1
Benzo(ghi)perylene	µg/L	0.1	<0.1
Total PAH (18)	µg/L	1	<1

Trace Metals (Dissolved) in Water by ICPMS [AN318] Tested: 3/12/2019

PARAMETER	UOM	LOR	RB WATER - 14/11/2019 SE200614.003
Arsenic, As	µg/L	1	<1
Cadmium, Cd	µg/L	0.1	<0.1
Chromium, Cr	µg/L	1	**1**
Copper, Cu	µg/L	1	**3**
Lead, Pb	µg/L	1	**2**
Nickel, Ni	µg/L	1	<1
Zinc, Zn	µg/L	5	**10**

Mercury (dissolved) in Water [AN311(Perth)/AN312] Tested: 3/12/2019

PARAMETER	UOM	LOR	RB WATER - 14/11/2019 SE200614.003
Mercury	mg/L	0.0001	<0.0001

METHOD	METHODOLOGY SUMMARY
AN002	The test is carried out by drying (at either 40°C or 105°C) a known mass of sample in a weighed evaporating basin. After fully dry the sample is re-weighed. Samples such as sludge and sediment having high percentages of moisture will take some time in a drying oven for complete removal of water.
AN020	Unpreserved water sample is filtered through a 0.45µm membrane filter and acidified with nitric acid similar to APHA3030B.
AN040/AN320	A portion of sample is digested with nitric acid to decompose organic matter and hydrochloric acid to complete the digestion of metals. The digest is then analysed by ICP OES with metals results reported on the dried sample basis. Based on USEPA method 200.8 and 6010C.
AN040	A portion of sample is digested with Nitric acid to decompose organic matter and Hydrochloric acid to complete the digestion of metals and then filtered for analysis by ASS or ICP as per USEPA Method 200.8.
AN311(Perth)/AN312	Mercury by Cold Vapour AAS in Waters: Mercury ions are reduced by stannous chloride reagent in acidic solution to elemental mercury. This mercury vapour is purged by nitrogen into a cold cell in an atomic absorption spectrometer or mercury analyser. Quantification is made by comparing absorbances to those of the calibration standards. Reference APHA 3112/3500.
AN312	Mercury by Cold Vapour AAS in Soils: After digestion with nitric acid, hydrogen peroxide and hydrochloric acid , mercury ions are reduced by stannous chloride reagent in acidic solution to elemental mercury. This mercury vapour is purged by nitrogen into a cold cell in an atomic absorption spectrometer or mercury analyser . Quantification is made by comparing absorbances to those of the calibration standards. Reference APHA 3112/3500
AN318	Determination of elements at trace level in waters by ICP-MS technique, in accordance with USEPA 6020A.
AN403	Total Recoverable Hydrocarbons: Determination of Hydrocarbons by gas chromatography after a solvent extraction. Detection is by flame ionisation detector (FID) that produces an electronic signal in proportion to the combustible matter passing through it. Total Recoverable Hydrocarbons (TRH) are routinely reported as four alkane groupings based on the carbon chain length of the compounds: C6-C9, C10-C14, C15-C28 and C29-C36 and in recognition of the NEPM 1999 (2013), >C10-C16 (F2), >C16-C34 (F3) and >C34-C40 (F4). F2 is reported directly and also corrected by subtracting Naphthalene (from VOC method AN433) where available.
AN403	Additionally, the volatile C6-C9 fraction may be determined by a purge and trap technique and GC /MS because of the potential for volatiles loss. Total Recoverable Hydrocarbons - Silica (TRH-Si) follows the same method of analysis after silica gel cleanup of the solvent extract. Aliphatic/Aromatic Speciation follows the same method of analysis after fractionation of the solvent extract over silica with differential polarity of the eluent solvents .
AN403	The GC/FID method is not well suited to the analysis of refined high boiling point materials (ie lubricating oils or greases) but is particularly suited for measuring diesel, kerosene and petrol if care to control volatility is taken. This method will detect naturally occurring hydrocarbons, lipids, animal fats, phenols and PAHs if they are present at sufficient levels, dependent on the use of specific cleanup /fractionation techniques. Reference USEPA 3510B, 8015B.
AN420	(SVOCs) including OC, OP, PCB, Herbicides, PAH, Phthalates and Speciated Phenols (etc) in soils, sediments and waters are determined by GCMS/ECD technique following appropriate solvent extraction process (Based on USEPA 3500C and 8270D).
AN420	SVOC Compounds: Semi-Volatile Organic Compounds (SVOCs) including OC, OP, PCB, Herbicides, PAH, Phthalates and Speciated Phenols in soils, sediments and waters are determined by GCMS /ECD technique following appropriate solvent extraction process (Based on USEPA 3500C and 8270D).
AN433	VOCs and C6-C9 Hydrocarbons by GC-MS P&T: VOC`s are volatile organic compounds. The sample is presented to a gas chromatograph via a purge and trap (P&T) concentrator and autosampler and is detected with a Mass Spectrometer (MSD). Solid samples are initially extracted with methanol whilst liquid samples are processed directly. References: USEPA 5030B, 8020A, 8260.
AN602	Qualitative identification of chrysotile, amosite and crocidolite in bulk samples by polarised light microscopy (PLM) in conjunction with dispersion staining (DS). AS4964 provides the basis for this document. Unequivocal identification of the asbestos minerals present is made by obtaining sufficient diagnostic `clues`, which provide a reasonable degree of certainty, dispersion staining is a mandatory `clue` for positive identification. If sufficient `clues` are absent, then positive identification of asbestos is not possible. This procedure requires removal of suspect fibres/bundles from the sample which cannot be returned.
AN602	Fibres/material that cannot be unequivocably identified as one of the three asbestos forms, will be reported as unknown mineral fibres (umf) The fibres detected may or may not be asbestos fibres.
AN602	AS4964.2004 Method for the Qualitative Identification of Asbestos in Bulk Samples, Section 8.4, Trace Analysis Criteria, Note 4 states:"Depending upon sample condition and fibre type, the detection limit of this technique has been found to lie generally in the range of 1 in 1,000 to 1 in 10,000 parts by weight, equivalent to 1 to 0.1 g/kg."

AN602	The sample can be reported "no asbestos found at the reporting limit of 0.1 g/kg" (<0.01%w/w) where AN602 section 4.5 of this method has been followed, and if- (a) no trace asbestos fibres have been detected (i.e. no 'respirable' fibres): (b) the estimated weight of non-respirable asbestos fibre bundles and/or the estimated weight of asbestos in asbestos-containing materials are found to be less than 0.1g/kg: and (c) these non-respirable asbestos fibre bundles and/or the asbestos containing materials are only visible under stereo-microscope viewing conditions.
AN605	This technique gravimetrically determines the mass of Asbestos Containing Material retained on a 7mm Sieve and assumes that 15% of this ACM is asbestos. This calculated asbestos weight is then calculated as a percentage of the total sample weight.
AN605	This technique also gravimetrically determines the mass of Fibrous Asbestos (FA) and Asbestos Fines (AF) Containing Material retained on and passing a 2mm sieve post 7mm sieving. Assumes that FA and AF are 100% asbestos containing. This calculated asbestos weight is then calculated as a percentage of the total sample weight. This does not include free fibres which are only observed by standard trace analysis as per AN 602.
AN605	Insofar as is technically feasible, this report is consistent with the analytical reporting recommendations in the Western Australian Department of Health Guidelines for the Assessment Remediation and Management of Asbestos - Contaminated Sites in Western Australia - May 2009.

FOOTNOTES

*	NATA accreditation does not cover the performance of this service.	-	Not analysed.	UOM	Unit of Measure.
		NVL	Not validated.	LOR	Limit of Reporting.
**	Indicative data, theoretical holding time exceeded.	IS	Insufficient sample for analysis.	↑↓	Raised/lowered Limit of Reporting.
		LNR	Sample listed, but not received.		

Unless it is reported that sampling has been performed by SGS, the samples have been analysed as received.
Solid samples expressed on a dry weight basis.

Where "Total" analyte groups are reported (for example, Total PAHs, Total OC Pesticides) the total will be calculated as the sum of the individual analytes, with those analytes that are reported as <LOR being assumed to be zero. The summed (Total) limit of reporting is calculated by summing the individual analyte LORs and dividing by two. For example, where 16 individual analytes are being summed and each has an LOR of 0.1 mg/kg, the "Totals" LOR will be 1.6 / 2 (0.8 mg/kg). Where only 2 analytes are being summed, the " Total" LOR will be the sum of those two LORs.

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

If reported, measurement uncertainty follow the ± sign after the analytical result and is expressed as the expanded uncertainty calculated using a coverage factor of 2, providing a level of confidence of approximately 95%, unless stated otherwise in the comments section of this report.

Results reported for samples tested under test methods with codes starting with ARS-SOP, radionuclide or gross radioactivity concentrations are expressed in becquerel (Bq) per unit of mass or volume or per wipe as stated on the report. Becquerel is the SI unit for activity and equals one nuclear transformation per second.
Note that in terms of units of radioactivity:

a. 1 Bq is equivalent to 27 pCi
b. 37 MBq is equivalent to 1 mCi

For results reported for samples tested under test methods with codes starting with ARS-SOP, less than (<) values indicate the detection limit for each radionuclide or parameter for the measurement system used. The respective detection limits have been calculated in accordance with ISO 11929.

The QC and MU criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here: www.sgs.com.au.pv.sgsvr/en-gb/environment.

This document is issued by the Company under its General Conditions of Service accessible at www.sgs.com/en/Terms-and-Conditions.aspx. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein.

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STATEMENT OF QA/QC PERFORMANCE

SE200614 R0

CLIENT DETAILS

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Address	124 Pacific Hwy (PO Box 1302, CROWS NEST, NSW 2065) NSW 2065
Telephone	02 9478 3900
Facsimile	02 9478 3901
Email	cawilliams@golder.com.au
Project	**19130799 Gran Central**
Order Number	**PO23977**
Samples	5

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
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Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
SGS Reference	**SE200614 R0**
Date Received	14 Nov 2019
Date Reported	05 Dec 2019

COMMENTS

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

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

All Data Quality Objectives were met with the exception of the following:

Extraction Date	Moisture Content	3 items
	OC Pesticides in Soil	2 items
	OP Pesticides in Soil	2 items
	PAH (Polynuclear Aromatic Hydrocarbons) in Soil	2 items
	PAH (Polynuclear Aromatic Hydrocarbons) in Water	1 item
	PCBs in Soil	2 items
	TRH (Total Recoverable Hydrocarbons) in Soil	2 items
	TRH (Total Recoverable Hydrocarbons) in Water	1 item
	VOC's in Soil	4 items
	VOCs in Water	1 item
	Volatile Petroleum Hydrocarbons in Soil	3 items
	Volatile Petroleum Hydrocarbons in Water	1 item
Matrix Spike	OC Pesticides in Soil	1 item

SAMPLE SUMMARY

HOLDING TIME SUMMARY

SE200614 R0

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

Extraction and analysis holding time due dates listed are calculated from the date sampled, although holding times may be extended after laboratory extraction for some analytes. The due dates are the suggested dates that samples may be held before extraction or analysis and still be considered valid.

Extraction and analysis dates are shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria. If the sampled date is not supplied then compliance with criteria cannot be determined. If the received date is after one or both due dates then holding time will fail by default.

Fibre Identification in soil

Method: ME-(AU)-[ENV]AN602

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH101_0.15-0.17	SE200614.001	LB189077	14 Nov 2019	14 Nov 2019	13 Nov 2020	04 Dec 2019	13 Nov 2020	05 Dec 2019

Gravimetric Determination of Asbestos in Soil

Method: ME-(AU)-[ENV]AN605

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH101_0.15-0.17	SE200614.001	LB189077	14 Nov 2019	14 Nov 2019	12 May 2020	04 Dec 2019	12 May 2020	05 Dec 2019

Mercury (dissolved) in Water

Method: ME-(AU)-[ENV]AN311(Perth)/AN312

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
RB	SE200614.003	LB188911	14 Nov 2019	14 Nov 2019	12 Dec 2019	03 Dec 2019	12 Dec 2019	03 Dec 2019

Mercury in Soil

Method: ME-(AU)-[ENV]AN312

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH101_0.15-0.17	SE200614.001	LB188903	14 Nov 2019	14 Nov 2019	12 Dec 2019	02 Dec 2019	12 Dec 2019	04 Dec 2019
BH101_1.55-2.0	SE200614.002	LB188903	14 Nov 2019	14 Nov 2019	12 Dec 2019	02 Dec 2019	12 Dec 2019	04 Dec 2019

Moisture Content

Method: ME-(AU)-[ENV]AN002

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH101_0.15-0.17	SE200614.001	LB188895	14 Nov 2019	14 Nov 2019	28 Nov 2019	02 Dec 2019†	07 Dec 2019	03 Dec 2019
BH101_1.55-2.0	SE200614.002	LB188895	14 Nov 2019	14 Nov 2019	28 Nov 2019	02 Dec 2019†	07 Dec 2019	03 Dec 2019
TB	SE200614.005	LB188895	14 Nov 2019	14 Nov 2019	28 Nov 2019	02 Dec 2019†	07 Dec 2019	03 Dec 2019

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH101_0.15-0.17	SE200614.001	LB188894	14 Nov 2019	14 Nov 2019	28 Nov 2019	02 Dec 2019†	11 Jan 2020	03 Dec 2019
BH101_1.55-2.0	SE200614.002	LB188894	14 Nov 2019	14 Nov 2019	28 Nov 2019	02 Dec 2019†	11 Jan 2020	03 Dec 2019

OP Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH101_0.15-0.17	SE200614.001	LB188894	14 Nov 2019	14 Nov 2019	28 Nov 2019	02 Dec 2019†	11 Jan 2020	04 Dec 2019
BH101_1.55-2.0	SE200614.002	LB188894	14 Nov 2019	14 Nov 2019	28 Nov 2019	02 Dec 2019†	11 Jan 2020	04 Dec 2019

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN420

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH101_0.15-0.17	SE200614.001	LB188894	14 Nov 2019	14 Nov 2019	28 Nov 2019	02 Dec 2019†	11 Jan 2020	04 Dec 2019
BH101_1.55-2.0	SE200614.002	LB188894	14 Nov 2019	14 Nov 2019	28 Nov 2019	02 Dec 2019†	11 Jan 2020	04 Dec 2019

PAH (Polynuclear Aromatic Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN420

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
RB	SE200614.003	LB188931	14 Nov 2019	14 Nov 2019	21 Nov 2019	03 Dec 2019†	12 Jan 2020	04 Dec 2019

PCBs in Soil

Method: ME-(AU)-[ENV]AN420

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH101_0.15-0.17	SE200614.001	LB188894	14 Nov 2019	14 Nov 2019	28 Nov 2019	02 Dec 2019†	11 Jan 2020	05 Dec 2019
BH101_1.55-2.0	SE200614.002	LB188894	14 Nov 2019	14 Nov 2019	28 Nov 2019	02 Dec 2019†	11 Jan 2020	05 Dec 2019

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

Method: ME-(AU)-[ENV]AN040/AN320

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH101_0.15-0.17	SE200614.001	LB188901	14 Nov 2019	14 Nov 2019	12 May 2020	02 Dec 2019	12 May 2020	04 Dec 2019
BH101_1.55-2.0	SE200614.002	LB188901	14 Nov 2019	14 Nov 2019	12 May 2020	02 Dec 2019	12 May 2020	04 Dec 2019

Trace Metals (Dissolved) in Water by ICPMS

Method: ME-(AU)-[ENV]AN318

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
RB	SE200614.003	LB188925	14 Nov 2019	14 Nov 2019	12 May 2020	03 Dec 2019	12 May 2020	03 Dec 2019

TRH (Total Recoverable Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN403

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH101_0.15-0.17	SE200614.001	LB188894	14 Nov 2019	14 Nov 2019	28 Nov 2019	02 Dec 2019†	11 Jan 2020	04 Dec 2019
BH101_1.55-2.0	SE200614.002	LB188894	14 Nov 2019	14 Nov 2019	28 Nov 2019	02 Dec 2019†	11 Jan 2020	04 Dec 2019

TRH (Total Recoverable Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN403

Sample Name	Sample No.	QC Ref

HOLDING TIME SUMMARY

SE200614 R0

SGS holding time criteria are drawn from current regulations and are highly dependent on sample container preservation as specified in the SGS “Field Sampling Guide for Containers and Holding Time” (ref: GU-(AU)-ENV.001). Soil samples guidelines are derived from NEPM "Schedule B(3) Guideline on Laboratory Analysis of Potentially Contaminated Soils". Water sample guidelines are derived from "AS/NZS 5667.1 : 1998 Water Quality - sampling part 1" and APHA "Standard Methods for the Examination of Water and Wastewater" 21st edition 2005.

Extraction and analysis holding time due dates listed are calculated from the date sampled, although holding times may be extended after laboratory extraction for some analytes. The due dates are the suggested dates that samples may be held before extraction or analysis and still be considered valid.

Extraction and analysis dates are shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria. If the sampled date is not supplied then compliance with criteria cannot be determined. If the received date is after one or both due dates then holding time will fail by default.

TRH (Total Recoverable Hydrocarbons) in Water (continued)

Method: ME-(AU)-[ENV]AN403

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
RB	SE200614.003	LB188931	14 Nov 2019	14 Nov 2019	21 Nov 2019	03 Dec 2019†	12 Jan 2020	04 Dec 2019

VOC's in Soil

Method: ME-(AU)-[ENV]AN433

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH101_0.15-0.17	SE200614.001	LB188893	14 Nov 2019	14 Nov 2019	28 Nov 2019	02 Dec 2019†	11 Jan 2020	04 Dec 2019
BH101_1.55-2.0	SE200614.002	LB188893	14 Nov 2019	14 Nov 2019	28 Nov 2019	02 Dec 2019†	11 Jan 2020	04 Dec 2019
TS	SE200614.004	LB188893	14 Nov 2019	14 Nov 2019	28 Nov 2019	02 Dec 2019†	11 Jan 2020	04 Dec 2019
TB	SE200614.005	LB188893	14 Nov 2019	14 Nov 2019	28 Nov 2019	02 Dec 2019†	11 Jan 2020	04 Dec 2019

VOCs in Water

Method: ME-(AU)-[ENV]AN433

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
RB	SE200614.003	LB188926	14 Nov 2019	14 Nov 2019	21 Nov 2019	03 Dec 2019†	12 Jan 2020	05 Dec 2019

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH101_0.15-0.17	SE200614.001	LB188893	14 Nov 2019	14 Nov 2019	28 Nov 2019	02 Dec 2019†	11 Jan 2020	04 Dec 2019
BH101_1.55-2.0	SE200614.002	LB188893	14 Nov 2019	14 Nov 2019	28 Nov 2019	02 Dec 2019†	11 Jan 2020	04 Dec 2019
TS	SE200614.004	LB188893	14 Nov 2019	14 Nov 2019	28 Nov 2019	02 Dec 2019†	11 Jan 2020	04 Dec 2019
TB	SE200614.005	LB188893	14 Nov 2019	14 Nov 2019	28 Nov 2019	02 Dec 2019†	11 Jan 2020	04 Dec 2019

Volatile Petroleum Hydrocarbons in Water

Method: ME-(AU)-[ENV]AN433

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
RB	SE200614.003	LB188926	14 Nov 2019	14 Nov 2019	21 Nov 2019	03 Dec 2019†	12 Jan 2020	05 Dec 2019

Surrogate results are evaluated against upper and lower limit criteria established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). At least two of three routine level soil sample surrogate spike recoveries for BTEX/VOC are to be within 70-130% where control charts have not been developed and within the established control limits for charted surrogates. Matrix effects may void this as an acceptance criterion. Water sample surrogate spike recoveries are to be within 40-130%. The presence of emulsions, surfactants and particulates may void this as an acceptance criterion.

Result is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Tetrachloro-m-xylene (TCMX) (Surrogate)	BH101_0.15-0.17	SE200614.001	%	60 - 130%	98
	BH101_1.55-2.0	SE200614.002	%	60 - 130%	84

OP Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2-fluorobiphenyl (Surrogate)	BH101_0.15-0.17	SE200614.001	%	60 - 130%	90
	BH101_1.55-2.0	SE200614.002	%	60 - 130%	88
d14-p-terphenyl (Surrogate)	BH101_0.15-0.17	SE200614.001	%	60 - 130%	83
	BH101_1.55-2.0	SE200614.002	%	60 - 130%	85

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN420

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2-fluorobiphenyl (Surrogate)	BH101_0.15-0.17	SE200614.001	%	70 - 130%	90
	BH101_1.55-2.0	SE200614.002	%	70 - 130%	88
d14-p-terphenyl (Surrogate)	BH101_0.15-0.17	SE200614.001	%	70 - 130%	83
	BH101_1.55-2.0	SE200614.002	%	70 - 130%	85
d5-nitrobenzene (Surrogate)	BH101_0.15-0.17	SE200614.001	%	70 - 130%	90
	BH101_1.55-2.0	SE200614.002	%	70 - 130%	90

PAH (Polynuclear Aromatic Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN420

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2-fluorobiphenyl (Surrogate)	RB	SE200614.003	%	40 - 130%	44
d14-p-terphenyl (Surrogate)	RB	SE200614.003	%	40 - 130%	60
d5-nitrobenzene (Surrogate)	RB	SE200614.003	%	40 - 130%	42

PCBs in Soil

Method: ME-(AU)-[ENV]AN420

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Tetrachloro-m-xylene (TCMX) (Surrogate)	BH101_0.15-0.17	SE200614.001	%	60 - 130%	98
	BH101_1.55-2.0	SE200614.002	%	60 - 130%	84

VOC's in Soil

Method: ME-(AU)-[ENV]AN433

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	BH101_0.15-0.17	SE200614.001	%	60 - 130%	89
	BH101_1.55-2.0	SE200614.002	%	60 - 130%	93
	TS	SE200614.004	%	60 - 130%	86
	TB	SE200614.005	%	60 - 130%	89
d4-1,2-dichloroethane (Surrogate)	BH101_0.15-0.17	SE200614.001	%	60 - 130%	88
	BH101_1.55-2.0	SE200614.002	%	60 - 130%	93
	TS	SE200614.004	%	60 - 130%	94
	TB	SE200614.005	%	60 - 130%	94
d8-toluene (Surrogate)	BH101_0.15-0.17	SE200614.001	%	60 - 130%	89
	BH101_1.55-2.0	SE200614.002	%	60 - 130%	94
	TS	SE200614.004	%	60 - 130%	96
	TB	SE200614.005	%	60 - 130%	93

VOCs in Water

Method: ME-(AU)-[ENV]AN433

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	RB	SE200614.003	%	40 - 130%	96
d4-1,2-dichloroethane (Surrogate)	RB	SE200614.003	%	40 - 130%	106
d8-toluene (Surrogate)	RB	SE200614.003	%	40 - 130%	90

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	BH101_0.15-0.17	SE200614.001	%	60 - 130%	89
	BH101_1.55-2.0	SE200614.002	%	60 - 130%	93
	TB	SE200614.005	%	60 - 130%	89
d4-1,2-dichloroethane (Surrogate)	BH101_0.15-0.17	SE200614.001	%	60 - 130%	88
	BH101_1.55-2.0	SE200614.002	%	60 - 130%	93
	TB	SE200614.005	%	60 - 130%	94
d8-toluene (Surrogate)	BH101_0.15-0.17	SE200614.001	%	60 - 130%	89
	BH101_1.55-2.0	SE200614.002	%	60 - 130%	94
	TB	SE200614.005	%	60 - 130%	93

Surrogate results are evaluated against upper and lower limit criteria established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). At least two of three routine level soil sample surrogate spike recoveries for BTEX/VOC are to be within 70-130% where control charts have not been developed and within the established control limits for charted surrogates. Matrix effects may void this as an acceptance criterion. Water sample surrogate spike recoveries are to be within 40-130%. The presence of emulsions, surfactants and particulates may void this as an acceptance criterion.

Result is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Volatile Petroleum Hydrocarbons in Water — **Method: ME-(AU)-[ENV]AN433**

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	RB	SE200614.003	%	40 - 130%	96
d4-1,2-dichloroethane (Surrogate)	RB	SE200614.003	%	60 - 130%	106
d8-toluene (Surrogate)	RB	SE200614.003	%	40 - 130%	90

Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, typically 2.5 times the statistically determined method detection limit (MDL).

Result is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Mercury (dissolved) in Water

Method: ME-(AU)-[ENV]AN311(Perth)/AN312

Sample Number	Parameter	Units	LOR	Result
LB188911.001	Mercury	mg/L	0.0001	<0.0001

Mercury in Soil

Method: ME-(AU)-[ENV]AN312

Sample Number	Parameter	Units	LOR	Result
LB188903.001	Mercury	mg/kg	0.05	<0.05

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result
LB188894.001		Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1
		Alpha BHC	mg/kg	0.1	<0.1
		Lindane	mg/kg	0.1	<0.1
		Heptachlor	mg/kg	0.1	<0.1
		Aldrin	mg/kg	0.1	<0.1
		Beta BHC	mg/kg	0.1	<0.1
		Delta BHC	mg/kg	0.1	<0.1
		Heptachlor epoxide	mg/kg	0.1	<0.1
		Alpha Endosulfan	mg/kg	0.2	<0.2
		Gamma Chlordane	mg/kg	0.1	<0.1
		Alpha Chlordane	mg/kg	0.1	<0.1
		p,p'-DDE	mg/kg	0.1	<0.1
		Dieldrin	mg/kg	0.2	<0.2
		Endrin	mg/kg	0.2	<0.2
		Beta Endosulfan	mg/kg	0.2	<0.2
		p,p'-DDD	mg/kg	0.1	<0.1
		p,p'-DDT	mg/kg	0.1	<0.1
		Endosulfan sulphate	mg/kg	0.1	<0.1
		Endrin Aldehyde	mg/kg	0.1	<0.1
		Methoxychlor	mg/kg	0.1	<0.1
		Endrin Ketone	mg/kg	0.1	<0.1
		Isodrin	mg/kg	0.1	<0.1
		Mirex	mg/kg	0.1	<0.1
	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	97

OP Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result
LB188894.001		Dichlorvos	mg/kg	0.5	<0.5
		Dimethoate	mg/kg	0.5	<0.5
		Diazinon (Dimpylate)	mg/kg	0.5	<0.5
		Fenitrothion	mg/kg	0.2	<0.2
		Malathion	mg/kg	0.2	<0.2
		Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2
		Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2
		Bromophos Ethyl	mg/kg	0.2	<0.2
		Methidathion	mg/kg	0.5	<0.5
		Ethion	mg/kg	0.2	<0.2
		Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2
	Surrogates	2-fluorobiphenyl (Surrogate)	%	-	86
		d14-p-terphenyl (Surrogate)	%	-	87

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number	Parameter	Units	LOR	Result
LB188894.001	Naphthalene	mg/kg	0.1	<0.1
	2-methylnaphthalene	mg/kg	0.1	<0.1
	1-methylnaphthalene	mg/kg	0.1	<0.1
	Acenaphthylene	mg/kg	0.1	<0.1
	Acenaphthene	mg/kg	0.1	<0.1
	Fluorene	mg/kg	0.1	<0.1
	Phenanthrene	mg/kg	0.1	<0.1
	Anthracene	mg/kg	0.1	<0.1

Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, typically 2.5 times the statistically determined method detection limit (MDL).

Result is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

PAH (Polynuclear Aromatic Hydrocarbons) in Soil (continued)

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result
LB188894.001		Fluoranthene	mg/kg	0.1	<0.1
		Pyrene	mg/kg	0.1	<0.1
		Benzo(a)anthracene	mg/kg	0.1	<0.1
		Chrysene	mg/kg	0.1	<0.1
		Benzo(a)pyrene	mg/kg	0.1	<0.1
		Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1
		Dibenzo(ah)anthracene	mg/kg	0.1	<0.1
		Benzo(ghi)perylene	mg/kg	0.1	<0.1
		Total PAH (18)	mg/kg	0.8	<0.8
	Surrogates	d5-nitrobenzene (Surrogate)	%	-	92
		2-fluorobiphenyl (Surrogate)	%	-	86
		d14-p-terphenyl (Surrogate)	%	-	87

PAH (Polynuclear Aromatic Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result
LB188931.001		Naphthalene	µg/L	0.1	<0.1
		2-methylnaphthalene	µg/L	0.1	<0.1
		1-methylnaphthalene	µg/L	0.1	<0.1
		Acenaphthylene	µg/L	0.1	<0.1
		Acenaphthene	µg/L	0.1	<0.1
		Fluorene	µg/L	0.1	<0.1
		Phenanthrene	µg/L	0.1	<0.1
		Anthracene	µg/L	0.1	<0.1
		Fluoranthene	µg/L	0.1	<0.1
		Pyrene	µg/L	0.1	<0.1
		Benzo(a)anthracene	µg/L	0.1	<0.1
		Chrysene	µg/L	0.1	<0.1
		Benzo(a)pyrene	µg/L	0.1	<0.1
		Indeno(1,2,3-cd)pyrene	µg/L	0.1	<0.1
		Dibenzo(ah)anthracene	µg/L	0.1	<0.1
		Benzo(ghi)perylene	µg/L	0.1	<0.1
	Surrogates	d5-nitrobenzene (Surrogate)	%	-	102
		2-fluorobiphenyl (Surrogate)	%	-	102
		d14-p-terphenyl (Surrogate)	%	-	98

PCBs in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result
LB188894.001		Arochlor 1016	mg/kg	0.2	<0.2
		Arochlor 1221	mg/kg	0.2	<0.2
		Arochlor 1232	mg/kg	0.2	<0.2
		Arochlor 1242	mg/kg	0.2	<0.2
		Arochlor 1248	mg/kg	0.2	<0.2
		Arochlor 1254	mg/kg	0.2	<0.2
		Arochlor 1260	mg/kg	0.2	<0.2
		Arochlor 1262	mg/kg	0.2	<0.2
		Arochlor 1268	mg/kg	0.2	<0.2
		Total PCBs (Arochlors)	mg/kg	1	<1
	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	97

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

Method: ME-(AU)-[ENV]AN040/AN320

Sample Number	Parameter	Units	LOR	Result
LB188901.001	Arsenic, As	mg/kg	1	<1
	Cadmium, Cd	mg/kg	0.3	<0.3
	Chromium, Cr	mg/kg	0.5	<0.5
	Copper, Cu	mg/kg	0.5	<0.5
	Nickel, Ni	mg/kg	0.5	<0.5
	Lead, Pb	mg/kg	1	<1
	Zinc, Zn	mg/kg	2	<2.0

Trace Metals (Dissolved) in Water by ICPMS

Method: ME-(AU)-[ENV]AN318

Sample Number	Parameter	Units	LOR

Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, typically 2.5 times the statistically determined method detection limit (MDL).

Result is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Trace Metals (Dissolved) in Water by ICPMS (continued)

Method: ME-(AU)-[ENV]AN318

Sample Number	Parameter	Units	LOR	Result
LB188925.001	Arsenic, As	µg/L	1	<1
	Cadmium, Cd	µg/L	0.1	<0.1
	Chromium, Cr	µg/L	1	<1
	Copper, Cu	µg/L	1	<1
	Lead, Pb	µg/L	1	<1
	Nickel, Ni	µg/L	1	<1
	Zinc, Zn	µg/L	5	<5

TRH (Total Recoverable Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN403

Sample Number	Parameter	Units	LOR	Result
LB188894.001	TRH C10-C14	mg/kg	20	<20
	TRH C15-C28	mg/kg	45	<45
	TRH C29-C36	mg/kg	45	<45
	TRH C37-C40	mg/kg	100	<100
	TRH C10-C36 Total	mg/kg	110	<110

TRH (Total Recoverable Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN403

Sample Number	Parameter	Units	LOR	Result
LB188931.001	TRH C10-C14	µg/L	50	<50
	TRH C15-C28	µg/L	200	<200
	TRH C29-C36	µg/L	200	<200
	TRH C37-C40	µg/L	200	<200

VOC's in Soil

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result
LB188893.001	Monocyclic Aromatic	Benzene	mg/kg	0.1	<0.1
	Hydrocarbons	Toluene	mg/kg	0.1	<0.1
		Ethylbenzene	mg/kg	0.1	<0.1
		m/p-xylene	mg/kg	0.2	<0.2
		o-xylene	mg/kg	0.1	<0.1
	Polycyclic VOCs	Naphthalene	mg/kg	0.1	<0.1
	Surrogates	d4-1,2-dichloroethane (Surrogate)	%	-	98
		d8-toluene (Surrogate)	%	-	98
		Bromofluorobenzene (Surrogate)	%	-	98
	Totals	Total BTEX	mg/kg	0.6	<0.6

VOCs in Water

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result
LB188926.001	Monocyclic Aromatic	Benzene	µg/L	0.5	<0.5
	Hydrocarbons	Toluene	µg/L	0.5	<0.5
		Ethylbenzene	µg/L	0.5	<0.5
		m/p-xylene	µg/L	1	<1
		o-xylene	µg/L	0.5	<0.5
	Polycyclic VOCs	Naphthalene	µg/L	0.5	<0.5
	Surrogates	d4-1,2-dichloroethane (Surrogate)	%	-	102
		d8-toluene (Surrogate)	%	-	120
		Bromofluorobenzene (Surrogate)	%	-	110

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result
LB188893.001		TRH C6-C9	mg/kg	20	<20
	Surrogates	d4-1,2-dichloroethane (Surrogate)	%	-	98

Volatile Petroleum Hydrocarbons in Water

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result
LB188926.001		TRH C6-C9	µg/L	40	<40
	Surrogates	d4-1,2-dichloroethane (Surrogate)	%	-	102
		d8-toluene (Surrogate)	%	-	120
		Bromofluorobenzene (Surrogate)	%	-	110

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Mercury (dissolved) in Water

Method: ME-(AU)-[ENV]AN311(Perth)/AN312

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE200615.004	LB188911.008	Mercury	µg/L	0.0001	0.0344	0.0366	156	6

Mercury in Soil

Method: ME-(AU)-[ENV]AN312

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE200611.031	LB188903.014	Mercury	mg/kg	0.05	0.14	0.14	66	0
SE200614.002	LB188903.022	Mercury	mg/kg	0.05	<0.05	<0.05	200	0

Moisture Content

Method: ME-(AU)-[ENV]AN002

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE200614.002	LB188895.022	% Moisture	%w/w	1	18.4	18.5	35	1
SE200614.005	LB188895.024	% Moisture	%w/w	1	<1.0	<1.0	200	0
SE200633.003	LB188895.011	% Moisture	%w/w	1	14.3	14.5	37	1

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE200614.002	LB188894.023		Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	200	0
			Alpha BHC	mg/kg	0.1	<0.1	<0.1	200	0
			Lindane	mg/kg	0.1	<0.1	<0.1	200	0
			Heptachlor	mg/kg	0.1	<0.1	<0.1	200	0
			Aldrin	mg/kg	0.1	<0.1	<0.1	200	0
			Beta BHC	mg/kg	0.1	<0.1	<0.1	200	0
			Delta BHC	mg/kg	0.1	<0.1	<0.1	200	0
			Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	200	0
			o,p'-DDE	mg/kg	0.1	<0.1	<0.1	200	0
			Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	200	0
			Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	200	0
			Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	200	0
			trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	200	0
			p,p'-DDE	mg/kg	0.1	<0.1	<0.1	200	0
			Dieldrin	mg/kg	0.2	<0.2	<0.2	200	0
			Endrin	mg/kg	0.2	<0.2	<0.2	200	0
			o,p'-DDD	mg/kg	0.1	<0.1	<0.1	200	0
			o,p'-DDT	mg/kg	0.1	<0.1	<0.1	200	0
			Beta Endosulfan	mg/kg	0.2	<0.2	<0.2	200	0
			p,p'-DDD	mg/kg	0.1	<0.1	<0.1	200	0
			p,p'-DDT	mg/kg	0.1	<0.1	<0.1	200	0
			Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	200	0
			Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1	200	0
			Methoxychlor	mg/kg	0.1	<0.1	<0.1	200	0
			Endrin Ketone	mg/kg	0.1	<0.1	<0.1	200	0
			Isodrin	mg/kg	0.1	<0.1	<0.1	200	0
			Mirex	mg/kg	0.1	<0.1	<0.1	200	0
			Total CLP OC Pesticides	mg/kg	1	<1	<1	200	0
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.13	0.13	30	5
SE200633.003	LB188894.014		Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	200	0
			Alpha BHC	mg/kg	0.1	<0.1	<0.1	200	0
			Lindane	mg/kg	0.1	<0.1	<0.1	200	0
			Heptachlor	mg/kg	0.1	<0.1	<0.1	200	0
			Aldrin	mg/kg	0.1	<0.1	<0.1	200	0
			Beta BHC	mg/kg	0.1	<0.1	<0.1	200	0
			Delta BHC	mg/kg	0.1	<0.1	<0.1	200	0
			Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	200	0
			o,p'-DDE	mg/kg	0.1	<0.1	<0.1	200	0
			Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	200	0
			Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	200	0
			Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	200	0
			trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	200	0
			p,p'-DDE	mg/kg	0.1	<0.1	<0.1	200	0

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

OC Pesticides in Soil (continued)

Method: ME-(AU)-[ENV]AN420

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE200633.003	LB188894.014		Dieldrin	mg/kg	0.2	<0.2	<0.2	200	0
			Endrin	mg/kg	0.2	<0.2	<0.2	200	0
			o,p'-DDD	mg/kg	0.1	<0.1	<0.1	200	0
			o,p'-DDT	mg/kg	0.1	<0.1	<0.1	200	0
			Beta Endosulfan	mg/kg	0.2	<0.2	<0.2	200	0
			p,p'-DDD	mg/kg	0.1	<0.1	<0.1	200	0
			p,p'-DDT	mg/kg	0.1	<0.1	<0.1	200	0
			Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	200	0
			Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1	200	0
			Methoxychlor	mg/kg	0.1	<0.1	<0.1	200	0
			Endrin Ketone	mg/kg	0.1	<0.1	<0.1	200	0
			Isodrin	mg/kg	0.1	<0.1	<0.1	200	0
			Mirex	mg/kg	0.1	<0.1	<0.1	200	0
			Total CLP OC Pesticides	mg/kg	1	<1	<1	200	0
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.13	0.12	30	3

OP Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE200614.002	LB188894.023		Dichlorvos	mg/kg	0.5	<0.5	<0.5	200	0
			Dimethoate	mg/kg	0.5	<0.5	<0.5	200	0
			Diazinon (Dimpylate)	mg/kg	0.5	<0.5	<0.5	200	0
			Fenitrothion	mg/kg	0.2	<0.2	<0.2	200	0
			Malathion	mg/kg	0.2	<0.2	<0.2	200	0
			Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2	<0.2	200	0
			Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2	<0.2	200	0
			Bromophos Ethyl	mg/kg	0.2	<0.2	<0.2	200	0
			Methidathion	mg/kg	0.5	<0.5	<0.5	200	0
			Ethion	mg/kg	0.2	<0.2	<0.2	200	0
			Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	<0.2	200	0
			Total OP Pesticides*	mg/kg	1.7	<1.7	<1.7	200	0
		Surrogates	2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.4	30	7
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.4	0.4	30	2
SE200633.003	LB188894.014		Dichlorvos	mg/kg	0.5	<0.5	<0.5	200	0
			Dimethoate	mg/kg	0.5	<0.5	<0.5	200	0
			Diazinon (Dimpylate)	mg/kg	0.5	<0.5	<0.5	200	0
			Fenitrothion	mg/kg	0.2	<0.2	<0.2	200	0
			Malathion	mg/kg	0.2	<0.2	<0.2	200	0
			Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2	<0.2	200	0
			Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2	<0.2	200	0
			Bromophos Ethyl	mg/kg	0.2	<0.2	<0.2	200	0
			Methidathion	mg/kg	0.5	<0.5	<0.5	200	0
			Ethion	mg/kg	0.2	<0.2	<0.2	200	0
			Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	<0.2	200	0
			Total OP Pesticides*	mg/kg	1.7	<1.7	<1.7	200	0
		Surrogates	2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.4	30	1
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.4	0.4	30	4

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN420

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE200614.002	LB188894.023	Naphthalene	mg/kg	0.1	<0.1	<0.1	200	0
		2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	200	0
		1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	200	0
		Acenaphthylene	mg/kg	0.1	<0.1	<0.1	200	0
		Acenaphthene	mg/kg	0.1	<0.1	<0.1	200	0
		Fluorene	mg/kg	0.1	<0.1	<0.1	200	0
		Phenanthrene	mg/kg	0.1	<0.1	<0.1	200	0
		Anthracene	mg/kg	0.1	<0.1	<0.1	200	0
		Fluoranthene	mg/kg	0.1	<0.1	<0.1	200	0
		Pyrene	mg/kg	0.1	<0.1	<0.1	200	0
		Benzo(a)anthracene	mg/kg	0.1	<0.1	<0.1	200	0
		Chrysene	mg/kg	0.1	<0.1	<0.1	200	0
		Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	<0.1	200	0

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

PAH (Polynuclear Aromatic Hydrocarbons) in Soil (continued)

Method: ME-(AU)-[ENV]AN420

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE200614.002	LB188894.023		Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(a)pyrene	mg/kg	0.1	<0.1	<0.1	200	0
			Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	200	0
			Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	200	0
			Carcinogenic PAHs, BaP TEQ <LOR=0	mg/kg	0.2	<0.2	<0.2	200	0
			Carcinogenic PAHs, BaP TEQ <LOR=LOR	mg/kg	0.3	<0.3	<0.3	134	0
			Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	mg/kg	0.2	<0.2	<0.2	175	0
			Total PAH (18)	mg/kg	0.8	<0.8	<0.8	200	0
		Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.5	0.4	30	7
			2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.4	30	7
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.4	0.4	30	2
SE200633.003	LB188894.014		Naphthalene	mg/kg	0.1	<0.1	<0.1	200	0
			2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	200	0
			1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	200	0
			Acenaphthylene	mg/kg	0.1	<0.1	<0.1	200	0
			Acenaphthene	mg/kg	0.1	<0.1	<0.1	200	0
			Fluorene	mg/kg	0.1	<0.1	<0.1	200	0
			Phenanthrene	mg/kg	0.1	<0.1	<0.1	200	0
			Anthracene	mg/kg	0.1	<0.1	<0.1	200	0
			Fluoranthene	mg/kg	0.1	<0.1	<0.1	195	0
			Pyrene	mg/kg	0.1	<0.1	<0.1	188	0
			Benzo(a)anthracene	mg/kg	0.1	<0.1	<0.1	200	0
			Chrysene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	<0.1	177	0
			Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	175	0
			Benzo(a)pyrene	mg/kg	0.1	<0.1	<0.1	200	0
			Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	200	0
			Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	200	0
			Carcinogenic PAHs, BaP TEQ <LOR=0	mg/kg	0.2	<0.2	<0.2	200	0
			Carcinogenic PAHs, BaP TEQ <LOR=LOR	mg/kg	0.3	<0.3	<0.3	134	0
			Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	mg/kg	0.2	<0.2	<0.2	175	0
			Total PAH (18)	mg/kg	0.8	<0.8	<0.8	200	0
		Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.5	0.5	30	3
			2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.4	30	1
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.4	0.4	30	4

PCBs in Soil

Method: ME-(AU)-[ENV]AN420

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE200614.002	LB188894.023		Arochlor 1016	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1221	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1232	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1242	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1248	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1254	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1260	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1262	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1268	mg/kg	0.2	<0.2	<0.2	200	0
			Total PCBs (Arochlors)	mg/kg	1	<1	<1	200	0
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0	0	30	5
SE200633.003	LB188894.014		Arochlor 1016	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1221	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1232	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1242	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1248	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1254	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1260	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1262	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1268	mg/kg	0.2	<0.2	<0.2	200	0
			Total PCBs (Arochlors)	mg/kg	1	<1	<1	200	0

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

PCBs in Soil (continued)

Method: ME-(AU)-[ENV]AN420

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE200633.003	LB188894.014	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0	0	30	3

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

Method: ME-(AU)-[ENV]AN040/AN320

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE200611.031	LB188901.014	Arsenic, As	mg/kg	1	4	4	57	1
		Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	200	0
		Chromium, Cr	mg/kg	0.5	5.8	6.6	38	12
		Copper, Cu	mg/kg	0.5	14	13	34	5
		Nickel, Ni	mg/kg	0.5	5.3	5.8	39	8
		Lead, Pb	mg/kg	1	90	87	31	3
		Zinc, Zn	mg/kg	2	93	110	32	15
SE200614.002	LB188901.022	Arsenic, As	mg/kg	1	2	3	66	24
		Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	200	0
		Chromium, Cr	mg/kg	0.5	15	21	33	31
		Copper, Cu	mg/kg	0.5	2.8	2.2	50	24
		Nickel, Ni	mg/kg	0.5	<0.5	<0.5	200	0
		Lead, Pb	mg/kg	1	11	14	38	21
		Zinc, Zn	mg/kg	2	3.8	4.5	78	16

Trace Metals (Dissolved) in Water by ICPMS

Method: ME-(AU)-[ENV]AN318

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE200604.004	LB188925.014	Arsenic, As	µg/L	1	1.477	1.349	86	9
		Cadmium, Cd	µg/L	0.1	0.007	0.005	200	0
		Chromium, Cr	µg/L	1	0.98	0.948	119	0
		Copper, Cu	µg/L	1	1.941	1.949	66	0
		Lead, Pb	µg/L	1	0.783	0.79	142	0
		Zinc, Zn	µg/L	5	20.776	20.019	40	4
SE200615.004	LB188925.023	Arsenic, As	µg/L	1	2.157	2.275	60	5
		Cadmium, Cd	µg/L	0.1	0.169	0.154	77	9
		Chromium, Cr	µg/L	1	3.578	3.29	44	8
		Copper, Cu	µg/L	1	8.65	8.544	27	1
		Lead, Pb	µg/L	1	7.437	6.739	29	10
		Nickel, Ni	µg/L	1	1.507	1.391	84	8
		Zinc, Zn	µg/L	5	280.509	258.795	17	8

TRH (Total Recoverable Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN403

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE200614.002	LB188894.023		TRH C10-C14	mg/kg	20	<20	<20	200	0
			TRH C15-C28	mg/kg	45	<45	<45	200	0
			TRH C29-C36	mg/kg	45	<45	<45	200	0
			TRH C37-C40	mg/kg	100	<100	<100	200	0
			TRH C10-C36 Total	mg/kg	110	<110	<110	200	0
			TRH >C10-C40 Total (F bands)	mg/kg	210	<210	<210	200	0
		TRH F Bands	TRH >C10-C16	mg/kg	25	<25	<25	200	0
			TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25	<25	200	0
			TRH >C16-C34 (F3)	mg/kg	90	<90	<90	200	0
			TRH >C34-C40 (F4)	mg/kg	120	<120	<120	200	0
SE200633.003	LB188894.014		TRH C10-C14	mg/kg	20	<20	<20	200	0
			TRH C15-C28	mg/kg	45	<45	<45	200	0
			TRH C29-C36	mg/kg	45	<45	<45	200	0
			TRH C37-C40	mg/kg	100	<100	<100	200	0
			TRH C10-C36 Total	mg/kg	110	<110	<110	200	0
			TRH >C10-C40 Total (F bands)	mg/kg	210	<210	<210	200	0
		TRH F Bands	TRH >C10-C16	mg/kg	25	<25	<25	200	0
			TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25	<25	200	0
			TRH >C16-C34 (F3)	mg/kg	90	<90	<90	200	0
			TRH >C34-C40 (F4)	mg/kg	120	<120	<120	200	0

VOC's in Soil

Method: ME-(AU)-[ENV]AN433

Original	Duplicate	Parameter	Units	LOR

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

VOC's in Soil (continued)

Method: ME-(AU)-[ENV]AN433

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE200614.002	LB188893.029	Monocyclic Aromatic	Benzene	mg/kg	0.1	<0.1	<0.1	200	0
			Toluene	mg/kg	0.1	<0.1	<0.1	200	0
			Ethylbenzene	mg/kg	0.1	<0.1	<0.1	200	0
			m/p-xylene	mg/kg	0.2	<0.2	<0.2	200	0
			o-xylene	mg/kg	0.1	<0.1	<0.1	200	0
		Polycyclic	Naphthalene	mg/kg	0.1	<0.1	<0.1	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	9.3	9.1	50	3
			d8-toluene (Surrogate)	mg/kg	-	9.4	9.0	50	4
			Bromofluorobenzene (Surrogate)	mg/kg	-	9.3	8.8	50	6
		Totals	Total Xylenes	mg/kg	0.3	<0.3	<0.3	200	0
			Total BTEX	mg/kg	0.6	<0.6	<0.6	200	0
SE200633.003	LB188893.015	Monocyclic Aromatic	Benzene	mg/kg	0.1	<0.1	<0.1	200	0
			Toluene	mg/kg	0.1	<0.1	<0.1	200	0
			Ethylbenzene	mg/kg	0.1	<0.1	<0.1	200	0
			m/p-xylene	mg/kg	0.2	<0.2	<0.2	200	0
			o-xylene	mg/kg	0.1	<0.1	<0.1	200	0
		Polycyclic	Naphthalene	mg/kg	0.1	<0.1	<0.1	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	6.4	6.5	50	1
			d8-toluene (Surrogate)	mg/kg	-	8.6	8.6	50	0
			Bromofluorobenzene (Surrogate)	mg/kg	-	8.7	8.8	50	1
		Totals	Total Xylenes	mg/kg	0.3	<0.3	<0.3	200	0
			Total BTEX	mg/kg	0.6	<0.6	<0.6	200	0

VOCs in Water

Method: ME-(AU)-[ENV]AN433

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE200514.012	LB188926.022	Monocyclic Aromatic	Benzene	µg/L	0.5	<0.5	0.0854038759	200	0
			Toluene	µg/L	0.5	<0.5	0.2071980429	200	0
			Ethylbenzene	µg/L	0.5	<0.5	0.0505162977	200	0
			m/p-xylene	µg/L	1	<1	0.0896322645	200	0
			o-xylene	µg/L	0.5	<0.5	0.0265122635	200	0
		Polycyclic	Naphthalene	µg/L	0.5	<0.5	0.0124535640	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	10.2	10.5219615414	30	3
			d8-toluene (Surrogate)	µg/L	-	9.5	8.3740801435	30	13
			Bromofluorobenzene (Surrogate)	µg/L	-	9.5	9.9286916624	30	5

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE200614.002	LB188893.029		TRH C6-C10	mg/kg	25	<25	<25	200	0
			TRH C6-C9	mg/kg	20	<20	<20	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	9.3	9.1	30	3
			d8-toluene (Surrogate)	mg/kg	-	9.4	9.0	30	4
			Bromofluorobenzene (Surrogate)	mg/kg	-	9.3	8.8	30	6
		VPH F Bands	Benzene (F0)	mg/kg	0.1	<0.1	<0.1	200	0
			TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	200	0
SE200633.003	LB188893.015		TRH C6-C10	mg/kg	25	<25	<25	200	0
			TRH C6-C9	mg/kg	20	<20	<20	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	6.4	6.5	30	1
			d8-toluene (Surrogate)	mg/kg	-	8.6	8.6	30	0
			Bromofluorobenzene (Surrogate)	mg/kg	-	8.7	8.8	30	1
		VPH F Bands	Benzene (F0)	mg/kg	0.1	<0.1	<0.1	200	0
			TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	200	0

Volatile Petroleum Hydrocarbons in Water

Method: ME-(AU)-[ENV]AN433

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE200495.001	LB188926.023		TRH C6-C10	µg/L	50	0	0	200	0
			TRH C6-C9	µg/L	40	0	0	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	10.4850825419	8.3993568596	30	22
			d8-toluene (Surrogate)	µg/L	-	17.3083220109	16.9798986749	30	2
			Bromofluorobenzene (Surrogate)	µg/L	-	10.3327693423	10.6230443999	30	3
		VPH F Bands	Benzene (F0)	µg/L	0.5	0.0619599375	0.0947644652	200	0
			TRH C6-C10 minus BTEX (F1)	µg/L	50	0	0	200	0
SE200514.012	LB188926.022		TRH C6-C10	µg/L	50	<50	3.1799570338	200	0

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Volatile Petroleum Hydrocarbons in Water (continued) — **Method: ME-(AU)-[ENV]AN433**

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE200514.012	LB188926.022		TRH C6-C9	µg/L	40	<40	2.9939881161	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	10.2	10.5219615414	30	3
			d8-toluene (Surrogate)	µg/L	-	9.5	8.3740801435	30	13
			Bromofluorobenzene (Surrogate)	µg/L	-	9.5	9.9286916624	30	5
		VPH F Bands	Benzene (F0)	µg/L	0.5	<0.5	0.0854038759	200	0
			TRH C6-C10 minus BTEX (F1)	µg/L	50	<50	3.1799570338	200	0

Laboratory Control Standard (LCS) results are evaluated against an expected result, typically the concentration of analyte spiked into the control during the sample preparation stage, producing a percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Mercury in Soil

Method: ME-(AU)-[ENV]AN312

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB188903.002	Mercury	mg/kg	0.05	0.23	0.2	70 - 130	115

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB188894.002		Heptachlor	mg/kg	0.1	0.2	0.2	60 - 140	85
		Aldrin	mg/kg	0.1	0.2	0.2	60 - 140	84
		Delta BHC	mg/kg	0.1	0.2	0.2	60 - 140	75
		Dieldrin	mg/kg	0.2	<0.2	0.2	60 - 140	80
		Endrin	mg/kg	0.2	<0.2	0.2	60 - 140	80
		p,p'-DDT	mg/kg	0.1	0.2	0.2	60 - 140	75
	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.12	0.15	40 - 130	79

OP Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB188894.002		Dichlorvos	mg/kg	0.5	1.6	2	60 - 140	81
		Diazinon (Dimpylate)	mg/kg	0.5	2.1	2	60 - 140	106
		Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	2.1	2	60 - 140	105
		Ethion	mg/kg	0.2	1.5	2	60 - 140	76
	Surrogates	2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.5	40 - 130	90
		d14-p-terphenyl (Surrogate)	mg/kg	-	0.4	0.5	40 - 130	81

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB188894.002		Naphthalene	mg/kg	0.1	4.2	4	60 - 140	104
		Acenaphthylene	mg/kg	0.1	4.2	4	60 - 140	105
		Acenaphthene	mg/kg	0.1	4.4	4	60 - 140	111
		Phenanthrene	mg/kg	0.1	4.0	4	60 - 140	100
		Anthracene	mg/kg	0.1	3.5	4	60 - 140	87
		Fluoranthene	mg/kg	0.1	4.1	4	60 - 140	103
		Pyrene	mg/kg	0.1	4.4	4	60 - 140	109
		Benzo(a)pyrene	mg/kg	0.1	4.2	4	60 - 140	104
	Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.5	0.5	40 - 130	94
		2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.5	40 - 130	90
		d14-p-terphenyl (Surrogate)	mg/kg	-	0.4	0.5	40 - 130	81

PAH (Polynuclear Aromatic Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB188931.002		Naphthalene	µg/L	0.1	36	40	60 - 140	89
		Acenaphthylene	µg/L	0.1	38	40	60 - 140	94
		Acenaphthene	µg/L	0.1	39	40	60 - 140	99
		Phenanthrene	µg/L	0.1	37	40	60 - 140	92
		Anthracene	µg/L	0.1	37	40	60 - 140	92
		Fluoranthene	µg/L	0.1	36	40	60 - 140	90
		Pyrene	µg/L	0.1	38	40	60 - 140	94
		Benzo(a)pyrene	µg/L	0.1	42	40	60 - 140	104
	Surrogates	d5-nitrobenzene (Surrogate)	µg/L	-	0.5	0.5	40 - 130	106
		2-fluorobiphenyl (Surrogate)	µg/L	-	0.5	0.5	40 - 130	104
		d14-p-terphenyl (Surrogate)	µg/L	-	0.5	0.5	40 - 130	102

PCBs in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB188894.002	Arochlor 1260	mg/kg	0.2	0.4	0.4	60 - 140	92

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

Method: ME-(AU)-[ENV]AN040/AN320

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB188901.002	Arsenic, As	mg/kg	1	310	318.22	80 - 120	98
	Cadmium, Cd	mg/kg	0.3	5.0	4.62	80 - 120	107
	Chromium, Cr	mg/kg	0.5	33	38.31	80 - 120	85
	Copper, Cu	mg/kg	0.5	300	290	80 - 120	102
	Nickel, Ni	mg/kg	0.5	190	187	80 - 120	101

Laboratory Control Standard (LCS) results are evaluated against an expected result, typically the concentration of analyte spiked into the control during the sample preparation stage, producing a percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES (continued)

Method: ME-(AU)-[ENV]AN040/AN320

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB188901.002	Lead, Pb	mg/kg	1	95	89.9	80 - 120	105
	Zinc, Zn	mg/kg	2	260	273	80 - 120	96

Trace Metals (Dissolved) in Water by ICPMS

Method: ME-(AU)-[ENV]AN318

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB188925.002	Arsenic, As	µg/L	1	20	20	80 - 120	100
	Cadmium, Cd	µg/L	0.1	21	20	80 - 120	103
	Chromium, Cr	µg/L	1	22	20	80 - 120	108
	Copper, Cu	µg/L	1	22	20	80 - 120	110
	Lead, Pb	µg/L	1	21	20	80 - 120	104
	Nickel, Ni	µg/L	1	21	20	80 - 120	106
	Zinc, Zn	µg/L	5	22	20	80 - 120	108

TRH (Total Recoverable Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN403

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB188894.002		TRH C10-C14	mg/kg	20	50	40	60 - 140	125
		TRH C15-C28	mg/kg	45	47	40	60 - 140	118
		TRH C29-C36	mg/kg	45	<45	40	60 - 140	90
	TRH F Bands	TRH >C10-C16	mg/kg	25	49	40	60 - 140	123
		TRH >C16-C34 (F3)	mg/kg	90	<90	40	60 - 140	105
		TRH >C34-C40 (F4)	mg/kg	120	<120	20	60 - 140	85

TRH (Total Recoverable Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN403

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB188931.002		TRH C10-C14	µg/L	50	760	1200	60 - 140	64
		TRH C15-C28	µg/L	200	950	1200	60 - 140	80
		TRH C29-C36	µg/L	200	960	1200	60 - 140	80
	TRH F Bands	TRH >C10-C16	µg/L	60	850	1200	60 - 140	71
		TRH >C16-C34 (F3)	µg/L	500	1100	1200	60 - 140	94
		TRH >C34-C40 (F4)	µg/L	500	<500	600	60 - 140	66

VOC's in Soil

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB188893.002	Monocyclic	Benzene	mg/kg	0.1	5.5	5	60 - 140	111
	Aromatic	Toluene	mg/kg	0.1	5.4	5	60 - 140	109
		Ethylbenzene	mg/kg	0.1	5.7	5	60 - 140	113
		m/p-xylene	mg/kg	0.2	11	10	60 - 140	111
		o-xylene	mg/kg	0.1	5.4	5	60 - 140	108
	Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	9.7	10	70 - 130	97
		d8-toluene (Surrogate)	mg/kg	-	10.2	10	70 - 130	102
		Bromofluorobenzene (Surrogate)	mg/kg	-	9.4	10	70 - 130	94

VOCs in Water

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB188926.002	Monocyclic	Benzene	µg/L	0.5	60	45.45	60 - 140	131
	Aromatic	Toluene	µg/L	0.5	54	45.45	60 - 140	119
		Ethylbenzene	µg/L	0.5	53	45.45	60 - 140	117
		m/p-xylene	µg/L	1	100	90.9	60 - 140	115
		o-xylene	µg/L	0.5	51	45.45	60 - 140	113
	Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	9.5	10	60 - 140	95
		d8-toluene (Surrogate)	µg/L	-	11.6	10	70 - 130	116
		Bromofluorobenzene (Surrogate)	µg/L	-	11.7	10	70 - 130	117

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB188893.002		TRH C6-C10	mg/kg	25	110	92.5	60 - 140	123
		TRH C6-C9	mg/kg	20	98	80	60 - 140	123
	Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	9.7	10	70 - 130	97
		Bromofluorobenzene (Surrogate)	mg/kg	-	9.4	10	70 - 130	94
	VPH F Bands	TRH C6-C10 minus BTEX (F1)	mg/kg	25	80	62.5	60 - 140	128

Volatile Petroleum Hydrocarbons in Water

Method: ME-(AU)-[ENV]AN433

Sample Number	Parameter	Units	LOR

Laboratory Control Standard (LCS) results are evaluated against an expected result, typically the concentration of analyte spiked into the control during the sample preparation stage, producing a percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Volatile Petroleum Hydrocarbons in Water (continued) — **Method: ME-(AU)-[ENV]AN433**

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB188926.002		TRH C6-C10	µg/L	50	1000	946.63	60 - 140	111
		TRH C6-C9	µg/L	40	920	818.71	60 - 140	112
	Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	9.5	10	60 - 140	95
		d8-toluene (Surrogate)	µg/L	-	11.6	10	70 - 130	116
		Bromofluorobenzene (Surrogate)	µg/L	-	11.7	10	70 - 130	117
	VPH F Bands	TRH C6-C10 minus BTEX (F1)	µg/L	50	720	639.67	60 - 140	113

Matrix Spike (MS) results are evaluated as the percentage recovery of an expected result, typically the concentration of analyte spiked into a field sub -sample during the sample preparation stage. The original sample's result is subtracted from the sub-sample result before determining the percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA/QC plan (ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Mercury in Soil

Method: ME-(AU)-[ENV]AN312

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE200611.020	LB188903.004	Mercury	mg/kg	0.05	0.23	<0.05	0.2	100

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE200631.001	LB188894.004		Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	-	-
			Alpha BHC	mg/kg	0.1	<0.1	<0.1	-	-
			Lindane	mg/kg	0.1	<0.1	<0.1	-	-
			Heptachlor	mg/kg	0.1	0.2	<0.1	0.2	100
			Aldrin	mg/kg	0.1	0.5	0.2	0.2	151 ④
			Beta BHC	mg/kg	0.1	<0.1	<0.1	-	-
			Delta BHC	mg/kg	0.1	0.2	<0.1	0.2	90
			Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	-	-
			o,p'-DDE	mg/kg	0.1	<0.1	<0.1	-	-
			Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	-	-
			Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	-	-
			Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	-	-
			trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	-	-
			p,p'-DDE	mg/kg	0.1	<0.1	<0.1	-	-
			Dieldrin	mg/kg	0.2	0.4	0.2	0.2	76
			Endrin	mg/kg	0.2	0.2	<0.2	0.2	100
			o,p'-DDD	mg/kg	0.1	<0.1	<0.1	-	-
			o,p'-DDT	mg/kg	0.1	<0.1	<0.1	-	-
			Beta Endosulfan	mg/kg	0.2	<0.2	<0.2	-	-
			p,p'-DDD	mg/kg	0.1	<0.1	<0.1	-	-
			p,p'-DDT	mg/kg	0.1	0.2	<0.1	0.2	90
			Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	-	-
			Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1	-	-
			Methoxychlor	mg/kg	0.1	<0.1	<0.1	-	-
			Endrin Ketone	mg/kg	0.1	<0.1	<0.1	-	-
			Isodrin	mg/kg	0.1	<0.1	<0.1	-	-
			Mirex	mg/kg	0.1	<0.1	<0.1	-	-
			Total CLP OC Pesticides	mg/kg	1	2	<1	-	-
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.13	0.13	-	87

OP Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE200631.001	LB188894.004		Dichlorvos	mg/kg	0.5	1.3	<0.5	2	65
			Dimethoate	mg/kg	0.5	<0.5	<0.5	-	-
			Diazinon (Dimpylate)	mg/kg	0.5	2.4	<0.5	2	120
			Fenitrothion	mg/kg	0.2	<0.2	<0.2	-	-
			Malathion	mg/kg	0.2	<0.2	<0.2	-	-
			Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	2.5	<0.2	2	123
			Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2	<0.2	-	-
			Bromophos Ethyl	mg/kg	0.2	<0.2	<0.2	-	-
			Methidathion	mg/kg	0.5	<0.5	<0.5	-	-
			Ethion	mg/kg	0.2	1.9	<0.2	2	95
			Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	<0.2	-	-
			Total OP Pesticides*	mg/kg	1.7	8.1	<1.7	-	-
		Surrogates	2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.4	-	89
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.4	0.4	-	85

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN420

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE200631.001	LB188894.004	Naphthalene	mg/kg	0.1	4.8	<0.1	4	119
		2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	-	-
		1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	-	-
		Acenaphthylene	mg/kg	0.1	4.9	<0.1	4	123
		Acenaphthene	mg/kg	0.1	5.1	<0.1	4	128
		Fluorene	mg/kg	0.1	<0.1	<0.1	-	-
		Phenanthrene	mg/kg	0.1	4.6	<0.1	4	115

Matrix Spike (MS) results are evaluated as the percentage recovery of an expected result, typically the concentration of analyte spiked into a field sub -sample during the sample preparation stage. The original sample's result is subtracted from the sub-sample result before determining the percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA/QC plan (ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

PAH (Polynuclear Aromatic Hydrocarbons) in Soil (continued)

Method: ME-(AU)-[ENV]AN420

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE200631.001	LB188894.004		Anthracene	mg/kg	0.1	3.9	<0.1	4	98
			Fluoranthene	mg/kg	0.1	4.7	<0.1	4	116
			Pyrene	mg/kg	0.1	5.2	<0.1	4	127
			Benzo(a)anthracene	mg/kg	0.1	<0.1	<0.1	-	-
			Chrysene	mg/kg	0.1	<0.1	<0.1	-	-
			Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	<0.1	-	-
			Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	-	-
			Benzo(a)pyrene	mg/kg	0.1	4.9	<0.1	4	121
			Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	-	-
			Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1	-	-
			Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	-	-
			Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.2	4.9	<0.2	-	-
			Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	5.0	<0.3	-	-
			Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	5.0	<0.2	-	-
			Total PAH (18)	mg/kg	0.8	38	<0.8	-	-
		Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.5	0.5	-	96
			2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.4	-	89
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.4	0.4	-	85

PCBs in Soil

Method: ME-(AU)-[ENV]AN420

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE200631.001	LB188894.004		Arochlor 1016	mg/kg	0.2	<0.2	<0.2	-	-
			Arochlor 1221	mg/kg	0.2	<0.2	<0.2	-	-
			Arochlor 1232	mg/kg	0.2	<0.2	<0.2	-	-
			Arochlor 1242	mg/kg	0.2	<0.2	<0.2	-	-
			Arochlor 1248	mg/kg	0.2	<0.2	<0.2	-	-
			Arochlor 1254	mg/kg	0.2	<0.2	<0.2	-	-
			Arochlor 1260	mg/kg	0.2	0.4	<0.2	0.4	99
			Arochlor 1262	mg/kg	0.2	<0.2	<0.2	-	-
			Arochlor 1268	mg/kg	0.2	<0.2	<0.2	-	-
			Total PCBs (Arochlors)	mg/kg	1	<1	<1	-	-
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0	0	-	77

TRH (Total Recoverable Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN403

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE200631.001	LB188894.004		TRH C10-C14	mg/kg	20	48	<20	40	120
			TRH C15-C28	mg/kg	45	<45	<45	40	108
			TRH C29-C36	mg/kg	45	48	<45	40	120
			TRH C37-C40	mg/kg	100	<100	<100	-	-
			TRH C10-C36 Total	mg/kg	110	<110	<110	-	-
			TRH >C10-C40 Total (F bands)	mg/kg	210	<210	<210	-	-
		TRH F Bands	TRH >C10-C16	mg/kg	25	45	<25	40	113
			TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	45	<25	-	-
			TRH >C16-C34 (F3)	mg/kg	90	<90	<90	40	128
			TRH >C34-C40 (F4)	mg/kg	120	<120	<120	-	-

VOC's in Soil

Method: ME-(AU)-[ENV]AN433

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE200631.001	LB188893.004	Monocyclic	Benzene	mg/kg	0.1	5.6	<0.1	5	112
		Aromatic	Toluene	mg/kg	0.1	5.6	<0.1	5	110
			Ethylbenzene	mg/kg	0.1	5.8	<0.1	5	117
			m/p-xylene	mg/kg	0.2	11	<0.2	10	114
			o-xylene	mg/kg	0.1	5.6	<0.1	5	111
		Polycyclic	Naphthalene	mg/kg	0.1	5.9	<0.1	-	-
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	9.7	9.4	10	97
			d8-toluene (Surrogate)	mg/kg	-	10.4	9.5	10	104
			Bromofluorobenzene (Surrogate)	mg/kg	-	9.6	9.0	10	96
		Totals	Total Xylenes	mg/kg	0.3	17	<0.3	-	-
			Total BTEX	mg/kg	0.6	34	<0.6	-	-

VOCs in Water

Method: ME-(AU)-[ENV]AN433

QC Sample	Sample Number	Parameter	Units	LOR

Matrix Spike (MS) results are evaluated as the percentage recovery of an expected result, typically the concentration of analyte spiked into a field sub -sample during the sample preparation stage. The original sample's result is subtracted from the sub-sample result before determining the percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA/QC plan (ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

VOCs in Water (continued)

Method: ME-(AU)-[ENV]AN433

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE200615.004	LB188926.024	Monocyclic	Benzene	µg/L	0.5	49	0	45.45	109
		Aromatic	Toluene	µg/L	0.5	51	0.06534892181	45.45	112
			Ethylbenzene	µg/L	0.5	50	0.02441869327	45.45	110
			m/p-xylene	µg/L	1	100	0.08849301505	90.9	111
			o-xylene	µg/L	0.5	50	0.03988252350	45.45	111
		Polycyclic	Naphthalene	µg/L	0.5	49	0.03289381938	-	-
		Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	10	10.3151493035	-	104
			d8-toluene (Surrogate)	µg/L	-	10	8.90534944921	-	100
			Bromofluorobenzene (Surrogate)	µg/L	-	11	9.70121375688	-	106

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE200631.001	LB188893.005		TRH C6-C10	mg/kg	25	110	<25	92.5	115
			TRH C6-C9	mg/kg	20	91	<20	80	113
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	9.7	9.4	10	97
			d8-toluene (Surrogate)	mg/kg	-	10.4	9.5	10	104
			Bromofluorobenzene (Surrogate)	mg/kg	-	9.6	9.0	-	96
		VPH F	Benzene (F0)	mg/kg	0.1	5.6	<0.1	-	-
		Bands	TRH C6-C10 minus BTEX (F1)	mg/kg	25	72	<25	62.5	115

Volatile Petroleum Hydrocarbons in Water

Method: ME-(AU)-[ENV]AN433

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE200615.004	LB188926.024		TRH C6-C10	µg/L	50	700	5.12993130049	946.63	73
			TRH C6-C9	µg/L	40	640	4.84523933839	818.71	77
		Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	10	10.3151493035	-	104
			d8-toluene (Surrogate)	µg/L	-	10	8.90534944921	-	100
			Bromofluorobenzene (Surrogate)	µg/L	-	11	9.70121375688	-	106
		VPH F	Benzene (F0)	µg/L	0.5	49	0	-	-
		Bands	TRH C6-C10 minus BTEX (F1)	µg/L	50	400	5.12993130049	639.67	61

MATRIX SPIKE DUPLICATES

SE200614 R0

Matrix spike duplicates are calculated as Relative Percent Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The original result is the analyte concentration of the matrix spike. The Duplicate result is the analyte concentration of the matrix spike duplicate.

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

QC Sample	Sample Number	Parameter	Units	LOR

Samples analysed as received.

Solid samples expressed on a dry weight basis.

QC criteria are subject to internal review according to the SGS QA/QC plan and may be provided on request or alternatively can be found here: https://www.sgs.com.au/~/media/Local/Australia/Documents/Technical Documents/MP-AU-ENV-QU-022 QA QC Plan.pdf

*	NATA accreditation does not cover the performance of this service.
**	Indicative data, theoretical holding time exceeded.
-	Sample not analysed for this analyte.
IS	Insufficient sample for analysis.
LNR	Sample listed, but not received.
LOR	Limit of reporting.
QFH	QC result is above the upper tolerance.
QFL	QC result is below the lower tolerance.

①	At least 2 of 3 surrogates are within acceptance criteria.
②	RPD failed acceptance criteria due to sample heterogeneity.
③	Results less than 5 times LOR preclude acceptance criteria for RPD.
④	Recovery failed acceptance criteria due to matrix interference.
⑤	Recovery failed acceptance criteria due to the presence of significant concentration of analyte (i.e. the concentration of analyte exceeds the spike level).
⑥	LOR was raised due to sample matrix interference.
⑦	LOR was raised due to dilution of significantly high concentration of analyte in sample.
⑧	Reanalysis of sample in duplicate confirmed sample heterogeneity and inconsistency of results.
⑨	Recovery failed acceptance criteria due to sample heterogeneity.
⑩	LOR was raised due to high conductivity of the sample (required dilution).
†	Refer to Analytical Report comments for further information.

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CHAIN OF CUSTODY & ANALYSIS REQUEST

Page _1__ of _1___

SGS Environmental Services Sydney
Unit 16, 33 Maddox Street
Alexandria NSW 2015
Telephone No: (02) 85940400
Facsimile No: (02) 85940499
Email: au.samplereceipt.sydney@sgs.com

Lab ID Number: *(please quote on correspondence)*

Site: Gran Central, Granville

Company Name:	Golder Associates Pty Ltd	Project Name/No:	Gran Central - 19130799
Address:	Level 8, 40 Mount Street	Purchase Order No:	PO23977
	North Sydney NSW	Results Required Date:	5 day TAT
		Telephone:	0437 099 883 Fax:
Contact Name:	Cameron Williams	Email Results to:	cawilliams@golder.com.au; sdoyle@golder.com.au
Quotation No:			

SGS ID	Client Sample ID	Sampling Date/ Time	Matrix (Tick as appropriate) Soil Sample	Water Sample	Other___	NO. OF CONTAINERS	HOLD	HOLD (Freeze)	CL17 SUITE	ASBESTOS WA DOH NEPM	TRH/BTEXN/PAH/HM* 8	TRH F1/BTEXN (CL4 SUITE)	Notes/Guidelines/LOR/ Special instructions
1	BH102_0.11-0.16	18/11	✓			3				✓			
2	BH102_0.45-0.60	18/11	✓			2	✓		✓				
	BH102_1.15-1.20	18/11	✓			2	✓						
	BH102_1.5-1.95	18/11	✓			2	✓						
3	BH102_3.0-3.1	18/11	✓			1			✓				
4	RB	18/11		✓		4					✓		
5	TS	18/11			✓	1						✓	
6	TB	18/11			✓	1						✓	
	QCA100	18/11	✓			1			✓				
	~~QCB100~~	~~18/11~~	~~✓~~			~~1~~	~~✓~~						Sent to secondary lab.

Additional Report Formats

- ☐ NEPM
- ☐ CSV
- ☐ ESDAT
- ☐ DQO
- ☐ GO, Guidelines ---------
- ☐ Others _____

Relinquished By: Cameron Williams	Date/Time: 18/11 – 13:15	Received By: Tam Ho – Capital Transport	Date/Time: 18/11 – 13:15
Relinquished By:	Date/Time:	Received By: J.L	Date/Time: 18/11/19 2:55pm
Samples Intact: (Yes) / No	Temperature: 13.1 °C	Sample Security Sealed: Yes / (No)	Hazards: *e.g. may contain Asbestos*

Comments / Subcontracting details: COC Golder review: SPD 19/11/2019

SE200615

SGS

Cooling Method	SE200615	Matrix	Containers Supplied By	Storage Location	250 JAR	125 JAR	BAG	125 / 250 STERILE JAR	250 / 500 Zn-Ac/NaOH P	250 / 500 NaOH/Pb-Ac OPAQUE	1L UP P	500 UP P	250 UP P	125 UP P	125 / 250 Metal Total*	125 / 250 Metal Filtered*	125 HCl P	500 / 1L H_2SO_4 AG	125 / 250 H_2SO_4 P	500 / 1L UP AG	100 / 200 UP AG	40 NaThio / HCl GV	40 UP GV	500 NaThio STERILE P	10 Tube	Digitube	250 PFAS	70 PFAS			Comment
CIP																															
Temp, °C	1	S	SGS	S843 ASB	2		1																								full, 250g
13.1	2	↓		S843	2																										Fall
Good Order	3			S843	1																										↓
(Y) / N	4	W		WOO5											1						1	2									
Clearly Labelled	5-6	S	↓	S843																			1								
(Y) / N																															
Correct Pres.																															
(Y) / N	3 samples on hold Jars only (Soil)																														
No Head-space																															
(Y) N / NA																															
Sufficient Vol																															
(Y) / N																															
Doc Date																															
Doc Type																															
Complete Docs																															
Y / N																															
Requested TAT																															

CHAIN OF CUSTODY & ANALYSIS REQUEST

Page _1__ of _1___

SGS Environmental Services Sydney
Unit 16, 33 Maddox Street
Alexandria NSW 2015
Telephone No: (02) 85940400
Facsimile No: (02) 85940499
Email: au.samplereceipt.sydney@sgs.com

Lab ID Number: *(please quote on correspondence)*

Site: Gran Central, Granville

Company Name:	Golder Associates Pty Ltd	Project Name/No:	Gran Central - 19130799
Address:	Level 8, 40 Mount Street	Purchase Order No:	PO23977
	North Sydney NSW	Results Required Date:	5 day TAT
		Telephone:	Fax:
Contact Name:		Email Results to:	cawilliams@golder.com.au; sdoyle@golder.com.au
Quotation No:			

SGS ID	Client Sample ID	Sampling Date/ Time	Matrix (Tick as appropriate) Soil Sample	Water Sample	Other	NO. OF CONTAINERS	ANALYSIS REQUESTED HOLD	HOLD (Freeze)	CL17 SUITE	ASBESTOS WA DOH NEPM	TRH/BTEXN/PAH/HM* 8							Notes/Guidelines/LOR/ Special instructions
1	BH102_0.11-0.16	18/11	✓			3	✓											
2	BH102_0.45-0.60	18/11	✓			2	✓											
3	BH102_1.15-1.20	18/11	✓			2	✓											
4	BH102_1.5-1.95	18/11	✓			2	✓											
5	BH102_3.0-3.1	18/11	✓			1	✓											
6	RB	18/11		✓		4	✓											
7	TS	18/11			✓	1	✓											
8	TB	18/11			✓	1	✓											
9	QCA100	18/11	✓			1	✓											
	QCB100	18/11	✓			1	✓											Sent to secondary lab.
																	200122	

Additional Report Formats

- ☐ NEPM
- ☐ CSV
- ☐ ESDAT
- ☐ DQO
- ☐ GO, Guidelines ---------
- ☐ Others _____

Relinquished By: Cameron Williams	Date/Time: 18/11 – 13:15	Received By: Tam Ho – Capital Transport	Date/Time: 18/11 – 13:15
Relinquished By:	Date/Time:	Received By: DINESH.K	Date/Time: 18/11/19 1450
Samples Intact: (Yes) / No	Temperature: 13.1 °C	Sample Security Sealed: Yes / (No)	Hazards: e.g. may contain Asbestos

Comments / Subcontracting details: COC Golder review:

E-MAILED
18/11/19 1:31 pm

SAMPLE RECEIPT ADVICE

SE200615

CLIENT DETAILS

Contact	Cameron Williams
Client	GOLDER ASSOCIATES PTY LTD
Address	124 Pacific Hwy (PO Box 1302, CROWS NEST, NSW 2065) NSW 2065
Telephone	02 9478 3900
Facsimile	02 9478 3901
Email	cawilliams@golder.com.au
Project	**19130799 Gran Central**
Order Number	**PO23977**
Samples	6

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
Samples Received	Mon 18/11/2019
Report Due	Thu 5/12/2019
SGS Reference	**SE200615**

SUBMISSION DETAILS

This is to confirm that 6 samples were received on Monday 18/ 11/2019. Results are expected to be ready by COB Thursday 5/12/2019. Please quote SGS reference SE200615 when making enquiries. Refer below for details relating to sample integrity upon receipt.

Samples clearly labelled	Yes	Complete documentation received	Yes
Sample container provider	SGS	Sample cooling method	Ice Bricks
Samples received in correct containers	Yes	Sample counts by matrix	5 Soil, 1 Water
Date documentation received	19/11/2019	Type of documentation received	COC
Samples received in good order	Yes	Samples received without headspace	Yes
Sample temperature upon receipt	13.1°C	Sufficient sample for analysis	Yes
Turnaround time requested	Standard		

Unless otherwise instructed, water and bulk samples will be held for one month from date of report, and soil samples will be held for two months.

COMMENTS

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SAMPLE RECEIPT ADVICE

SE200615

CLIENT DETAILS

Client GOLDER ASSOCIATES PTY LTD

Project 19130799 Gran Central

SUMMARY OF ANALYSIS

No.	Sample ID	OC Pesticides in Soil	OP Pesticides in Soil	PAH (Polynuclear Aromatic Hydrocarbons) in Soil	PCBs in Soil	Total Recoverable Elements in Soil/Waste	TRH (Total Recoverable Hydrocarbons) in Soil	VOC's in Soil	Volatile Petroleum Hydrocarbons in Soil
002	BH102_0.45-0.60	29	14	26	11	7	10	11	7
003	BH102_3.0-3.1	29	14	26	11	7	10	11	7
005	TS	-	-	-	-	-	-	11	-
006	TB	-	-	-	-	-	-	11	7

CONTINUED OVERLEAF

The above table represents SGS' interpretation of the client-supplied Chain Of Custody document.
The numbers shown in the table indicate the number of results requested in each package.
Please indicate as soon as possible should your request differ from these details .
Testing as per this table shall commence immediately unless the client intervenes with a correction .

SAMPLE RECEIPT ADVICE

SE200615

CLIENT DETAILS

Client GOLDER ASSOCIATES PTY LTD

Project 19130799 Gran Central

SUMMARY OF ANALYSIS

No.	Sample ID	Fibre Identification in soil	Gravimetric Determination of Asbestos in Soil	Mercury in Soil	Moisture Content
001	BH102_0.11-0.16	2	9	-	-
002	BH102_0.45-0.60	-	-	1	1
003	BH102_3.0-3.1	-	-	1	1
006	TB	-	-	-	1

CONTINUED OVERLEAF

The above table represents SGS' interpretation of the client-supplied Chain Of Custody document.
The numbers shown in the table indicate the number of results requested in each package.
Please indicate as soon as possible should your request differ from these details .
Testing as per this table shall commence immediately unless the client intervenes with a correction .

SAMPLE RECEIPT ADVICE

SE200615

CLIENT DETAILS

Client GOLDER ASSOCIATES PTY LTD

Project 19130799 Gran Central

SUMMARY OF ANALYSIS

No.	Sample ID	Mercury (dissolved) in Water	PAH (Polynuclear Aromatic Hydrocarbons) in Water	Trace Metals (Dissolved) in Water by ICPMS	TRH (Total Recoverable Hydrocarbons) in Water	VOCs in Water	Volatile Petroleum Hydrocarbons in Water
004	RB	1	22	7	9	11	7

The above table represents SGS' interpretation of the client-supplied Chain Of Custody document.
The numbers shown in the table indicate the number of results requested in each package.
Please indicate as soon as possible should your request differ from these details .
Testing as per this table shall commence immediately unless the client intervenes with a correction .

ANALYTICAL REPORT

Accreditation No. 2562

CLIENT DETAILS

Contact	Cameron Williams
Client	GOLDER ASSOCIATES PTY LTD
Address	124 Pacific Hwy (PO Box 1302, CROWS NEST, NSW 2065) NSW 2065
Telephone	02 9478 3900
Facsimile	02 9478 3901
Email	cawilliams@golder.com.au
Project	**19130799 Gran Central**
Order Number	**PO23977**
Samples	6

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
SGS Reference	**SE200615 R0**
Date Received	18/11/2019
Date Reported	5/12/2019

COMMENTS

Accredited for compliance with ISO/IEC 17025 - Testing. NATA accredited laboratory 2562(4354).

No respirable fibres detected in all soil samples using trace analysis technique.

Asbestos analysed by Approved Identifier Yusuf Kuthpudin .

SIGNATORIES

Akheeqar BENIAMEEN
Chemist

Dong LIANG
Metals/Inorganics Team Leader

Huong CRAWFORD
Production Manager

Ly Kim HA
Organic Section Head

Ravee SIVASUBRAMANIAM
Hygiene Team Leader

VOC's in Soil [AN433] Tested: 2/12/2019

PARAMETER	UOM	LOR	BH102_0.45-0.60 SOIL - 18/11/2019 SE200615.002	BH102_3.0-3.1 SOIL - 18/11/2019 SE200615.003	TS SOIL - 18/11/2019 SE200615.005	TB SOIL - 18/11/2019 SE200615.006
Benzene	mg/kg	0.1	<0.1	<0.1	[107%]	<0.1
Toluene	mg/kg	0.1	<0.1	<0.1	[109%]	<0.1
Ethylbenzene	mg/kg	0.1	<0.1	<0.1	[113%]	<0.1
m/p-xylene	mg/kg	0.2	<0.2	<0.2	[113%]	<0.2
o-xylene	mg/kg	0.1	<0.1	<0.1	[109%]	<0.1
Total Xylenes	mg/kg	0.3	<0.3	<0.3	-	<0.3
Total BTEX	mg/kg	0.6	<0.6	<0.6	-	<0.6
Naphthalene	mg/kg	0.1	<0.1	<0.1	-	<0.1

Volatile Petroleum Hydrocarbons in Soil [AN433] Tested: 2/12/2019

PARAMETER	UOM	LOR	BH102_0.45-0.60 SOIL - 18/11/2019 SE200615.002	BH102_3.0-3.1 SOIL - 18/11/2019 SE200615.003	TB SOIL - 18/11/2019 SE200615.006
TRH C6-C9	mg/kg	20	<20	<20	<20
Benzene (F0)	mg/kg	0.1	<0.1	<0.1	<0.1
TRH C6-C10	mg/kg	25	<25	<25	<25
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	<25

TRH (Total Recoverable Hydrocarbons) in Soil [AN403] Tested: 2/12/2019

PARAMETER	UOM	LOR	BH102_0.45-0.60 SOIL - 18/11/2019 SE200615.002	BH102_3.0-3.1 SOIL - 18/11/2019 SE200615.003
TRH C10-C14	mg/kg	20	<20	<20
TRH C15-C28	mg/kg	45	<45	<45
TRH C29-C36	mg/kg	45	<45	<45
TRH C37-C40	mg/kg	100	<100	<100
TRH >C10-C16	mg/kg	25	<25	<25
TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25	<25
TRH >C16-C34 (F3)	mg/kg	90	<90	<90
TRH >C34-C40 (F4)	mg/kg	120	<120	<120
TRH C10-C36 Total	mg/kg	110	<110	<110
TRH >C10-C40 Total (F bands)	mg/kg	210	<210	<210

PAH (Polynuclear Aromatic Hydrocarbons) in Soil [AN420] Tested: 2/12/2019

PARAMETER	UOM	LOR	BH102_0.45-0.60 SOIL - 18/11/2019 SE200615.002	BH102_3.0-3.1 SOIL - 18/11/2019 SE200615.003
Naphthalene	mg/kg	0.1	<0.1	<0.1
2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1
1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1
Acenaphthylene	mg/kg	0.1	<0.1	<0.1
Acenaphthene	mg/kg	0.1	<0.1	<0.1
Fluorene	mg/kg	0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.1	<0.1	<0.1
Anthracene	mg/kg	0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.1	<0.1	<0.1
Pyrene	mg/kg	0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	0.1	<0.1	<0.1
Chrysene	mg/kg	0.1	<0.1	<0.1
Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	<0.1
Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1
Benzo(a)pyrene	mg/kg	0.1	<0.1	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1
Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1
Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.2	<0.2	<0.2
Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	<0.3	<0.3
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	<0.2	<0.2
Total PAH (18)	mg/kg	0.8	<0.8	<0.8
Total PAH (NEPM/WHO 16)	mg/kg	0.8	<0.8	<0.8

OC Pesticides in Soil [AN420] Tested: 2/12/2019

PARAMETER	UOM	LOR	BH102_0.45-0.60 SOIL - 18/11/2019 SE200615.002	BH102_3.0-3.1 SOIL - 18/11/2019 SE200615.003
Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1
Alpha BHC	mg/kg	0.1	<0.1	<0.1
Lindane	mg/kg	0.1	<0.1	<0.1
Heptachlor	mg/kg	0.1	<0.1	<0.1
Aldrin	mg/kg	0.1	<0.1	<0.1
Beta BHC	mg/kg	0.1	<0.1	<0.1
Delta BHC	mg/kg	0.1	<0.1	<0.1
Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1
o,p'-DDE	mg/kg	0.1	<0.1	<0.1
Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2
Gamma Chlordane	mg/kg	0.1	<0.1	<0.1
Alpha Chlordane	mg/kg	0.1	<0.1	<0.1
trans-Nonachlor	mg/kg	0.1	<0.1	<0.1
p,p'-DDE	mg/kg	0.1	<0.1	<0.1
Dieldrin	mg/kg	0.2	<0.2	<0.2
Endrin	mg/kg	0.2	<0.2	<0.2
o,p'-DDD	mg/kg	0.1	<0.1	<0.1
o,p'-DDT	mg/kg	0.1	<0.1	<0.1
Beta Endosulfan	mg/kg	0.2	<0.2	<0.2
p,p'-DDD	mg/kg	0.1	<0.1	<0.1
p,p'-DDT	mg/kg	0.1	<0.1	<0.1
Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1
Methoxychlor	mg/kg	0.1	<0.1	<0.1
Endrin Ketone	mg/kg	0.1	<0.1	<0.1
Isodrin	mg/kg	0.1	<0.1	<0.1
Mirex	mg/kg	0.1	<0.1	<0.1
Total CLP OC Pesticides	mg/kg	1	<1	<1

OP Pesticides in Soil [AN420] Tested: 2/12/2019

PARAMETER	UOM	LOR	BH102_0.45-0.60 SOIL - 18/11/2019 SE200615.002	BH102_3.0-3.1 SOIL - 18/11/2019 SE200615.003
Dichlorvos	mg/kg	0.5	<0.5	<0.5
Dimethoate	mg/kg	0.5	<0.5	<0.5
Diazinon (Dimpylate)	mg/kg	0.5	<0.5	<0.5
Fenitrothion	mg/kg	0.2	<0.2	<0.2
Malathion	mg/kg	0.2	<0.2	<0.2
Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2	<0.2
Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2	<0.2
Bromophos Ethyl	mg/kg	0.2	<0.2	<0.2
Methidathion	mg/kg	0.5	<0.5	<0.5
Ethion	mg/kg	0.2	<0.2	<0.2
Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	<0.2
Total OP Pesticides*	mg/kg	1.7	<1.7	<1.7

PCBs in Soil [AN420] Tested: 2/12/2019

PARAMETER	UOM	LOR	BH102_0.45-0.60 SOIL - 18/11/2019 SE200615.002	BH102_3.0-3.1 SOIL - 18/11/2019 SE200615.003
Arochlor 1016	mg/kg	0.2	<0.2	<0.2
Arochlor 1221	mg/kg	0.2	<0.2	<0.2
Arochlor 1232	mg/kg	0.2	<0.2	<0.2
Arochlor 1242	mg/kg	0.2	<0.2	<0.2
Arochlor 1248	mg/kg	0.2	<0.2	<0.2
Arochlor 1254	mg/kg	0.2	<0.2	<0.2
Arochlor 1260	mg/kg	0.2	<0.2	<0.2
Arochlor 1262	mg/kg	0.2	<0.2	<0.2
Arochlor 1268	mg/kg	0.2	<0.2	<0.2
Total PCBs (Arochlors)	mg/kg	1	<1	<1

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES [AN040/AN320] Tested: 2/12/2019

PARAMETER	UOM	LOR	BH102_0.45-0.60 SOIL - 18/11/2019 SE200615.002	BH102_3.0-3.1 SOIL - 18/11/2019 SE200615.003
Arsenic, As	mg/kg	1	**2**	<1
Cadmium, Cd	mg/kg	0.3	<0.3	<0.3
Chromium, Cr	mg/kg	0.5	**23**	**2.8**
Copper, Cu	mg/kg	0.5	**0.8**	**4.9**
Lead, Pb	mg/kg	1	**15**	**4**
Nickel, Ni	mg/kg	0.5	**1.5**	<0.5
Zinc, Zn	mg/kg	2	**5.1**	<2.0

Mercury in Soil [AN312] Tested: 2/12/2019

PARAMETER	UOM	LOR	BH102_0.45-0.60 SOIL - 18/11/2019 SE200615.002	BH102_3.0-3.1 SOIL - 18/11/2019 SE200615.003
Mercury	mg/kg	0.05	<0.05	<0.05

Moisture Content [AN002] Tested: 2/12/2019

PARAMETER	UOM	LOR	BH102_0.45-0.60 SOIL - 18/11/2019 SE200615.002	BH102_3.0-3.1 SOIL - 18/11/2019 SE200615.003	TB SOIL - 18/11/2019 SE200615.006
% Moisture	%w/w	1	**18.9**	**11.9**	<1.0

Fibre Identification in soil [AN602] Tested: 4/12/2019

PARAMETER	UOM	LOR	BH102_0.11-0.16 SOIL - 18/11/2019 SE200615.001
Asbestos Detected	No unit	-	No
Estimated Fibres*	%w/w	0.01	<0.01

Gravimetric Determination of Asbestos in Soil [AN605] Tested: 4/12/2019

PARAMETER	UOM	LOR	BH102_0.11-0.16 SOIL - 18/11/2019 SE200615.001
Total Sample Weight*	g	1	**415**
ACM in >7mm Sample*	g	0.01	<0.01
AF/FA in >2mm to <7mm Sample*	g	0.0001	<0.0001
AF/FA in <2mm Sample*	g	0.0001	<0.0001
Asbestos in soil (>7mm ACM)*	%w/w	0.01	<0.01
Asbestos in soil (>2mm to <7mm AF/FA)*	%w/w	0.001	<0.001
Asbestos in soil (<2mm AF/FA)*	%w/w	0.001	<0.001
Asbestos in soil (<7mm AF/FA)*	%w/w	0.001	<0.001
Fibre Type*	No unit	-	-

VOCs in Water [AN433] Tested: 3/12/2019

PARAMETER	UOM	LOR	RB WATER - 18/11/2019 SE200615.004
Benzene	µg/L	0.5	<0.5
Toluene	µg/L	0.5	<0.5
Ethylbenzene	µg/L	0.5	<0.5
m/p-xylene	µg/L	1	<1
o-xylene	µg/L	0.5	<0.5
Total Xylenes	µg/L	1.5	<1.5
Total BTEX	µg/L	3	<3
Naphthalene	µg/L	0.5	<0.5

Volatile Petroleum Hydrocarbons in Water [AN433] Tested: 3/12/2019

PARAMETER	UOM	LOR	RB WATER - 18/11/2019 SE200615.004
TRH C6-C9	µg/L	40	<40
Benzene (F0)	µg/L	0.5	<0.5
TRH C6-C10	µg/L	50	<50
TRH C6-C10 minus BTEX (F1)	µg/L	50	<50

TRH (Total Recoverable Hydrocarbons) in Water [AN403] Tested: 3/12/2019

PARAMETER	UOM	LOR	RB WATER - 18/11/2019 SE200615.004
TRH C10-C14	µg/L	50	<50
TRH C15-C28	µg/L	200	**280**
TRH C29-C36	µg/L	200	<200
TRH C37-C40	µg/L	200	<200
TRH >C10-C16	µg/L	60	<60
TRH >C10-C16 - Naphthalene (F2)	µg/L	60	<60
TRH >C16-C34 (F3)	µg/L	500	<500
TRH >C34-C40 (F4)	µg/L	500	<500
TRH C10-C40	µg/L	320	<320

PAH (Polynuclear Aromatic Hydrocarbons) in Water [AN420] Tested: 3/12/2019

PARAMETER	UOM	LOR	RB WATER - 18/11/2019 SE200615.004
Naphthalene	µg/L	0.1	<0.1
2-methylnaphthalene	µg/L	0.1	<0.1
1-methylnaphthalene	µg/L	0.1	<0.1
Acenaphthylene	µg/L	0.1	<0.1
Acenaphthene	µg/L	0.1	<0.1
Fluorene	µg/L	0.1	<0.1
Phenanthrene	µg/L	0.1	<0.1
Anthracene	µg/L	0.1	<0.1
Fluoranthene	µg/L	0.1	<0.1
Pyrene	µg/L	0.1	<0.1
Benzo(a)anthracene	µg/L	0.1	<0.1
Chrysene	µg/L	0.1	<0.1
Benzo(b&j)fluoranthene	µg/L	0.1	<0.1
Benzo(k)fluoranthene	µg/L	0.1	<0.1
Benzo(a)pyrene	µg/L	0.1	<0.1
Indeno(1,2,3-cd)pyrene	µg/L	0.1	<0.1
Dibenzo(ah)anthracene	µg/L	0.1	<0.1
Benzo(ghi)perylene	µg/L	0.1	<0.1
Total PAH (18)	µg/L	1	<1

Trace Metals (Dissolved) in Water by ICPMS [AN318] Tested: 3/12/2019

PARAMETER	UOM	LOR	RB WATER - 18/11/2019 SE200615.004
Arsenic, As	µg/L	1	**2**
Cadmium, Cd	µg/L	0.1	**0.2**
Chromium, Cr	µg/L	1	**4**
Copper, Cu	µg/L	1	**9**
Lead, Pb	µg/L	1	**7**
Nickel, Ni	µg/L	1	**2**
Zinc, Zn	µg/L	5	**280**

Mercury (dissolved) in Water [AN311(Perth)/AN312] Tested: 3/12/2019

PARAMETER	UOM	LOR	RB WATER - 18/11/2019 SE200615.004
Mercury	mg/L	0.0001	<0.0001

METHOD	METHODOLOGY SUMMARY
AN002	The test is carried out by drying (at either 40°C or 105°C) a known mass of sample in a weighed evaporating basin. After fully dry the sample is re-weighed. Samples such as sludge and sediment having high percentages of moisture will take some time in a drying oven for complete removal of water.
AN020	Unpreserved water sample is filtered through a 0.45µm membrane filter and acidified with nitric acid similar to APHA3030B.
AN040/AN320	A portion of sample is digested with nitric acid to decompose organic matter and hydrochloric acid to complete the digestion of metals. The digest is then analysed by ICP OES with metals results reported on the dried sample basis. Based on USEPA method 200.8 and 6010C.
AN040	A portion of sample is digested with Nitric acid to decompose organic matter and Hydrochloric acid to complete the digestion of metals and then filtered for analysis by ASS or ICP as per USEPA Method 200.8.
AN311(Perth)/AN312	Mercury by Cold Vapour AAS in Waters: Mercury ions are reduced by stannous chloride reagent in acidic solution to elemental mercury. This mercury vapour is purged by nitrogen into a cold cell in an atomic absorption spectrometer or mercury analyser. Quantification is made by comparing absorbances to those of the calibration standards. Reference APHA 3112/3500.
AN312	Mercury by Cold Vapour AAS in Soils: After digestion with nitric acid, hydrogen peroxide and hydrochloric acid , mercury ions are reduced by stannous chloride reagent in acidic solution to elemental mercury. This mercury vapour is purged by nitrogen into a cold cell in an atomic absorption spectrometer or mercury analyser . Quantification is made by comparing absorbances to those of the calibration standards. Reference APHA 3112/3500
AN318	Determination of elements at trace level in waters by ICP-MS technique, in accordance with USEPA 6020A.
AN403	Total Recoverable Hydrocarbons: Determination of Hydrocarbons by gas chromatography after a solvent extraction. Detection is by flame ionisation detector (FID) that produces an electronic signal in proportion to the combustible matter passing through it. Total Recoverable Hydrocarbons (TRH) are routinely reported as four alkane groupings based on the carbon chain length of the compounds: C6-C9, C10-C14, C15-C28 and C29-C36 and in recognition of the NEPM 1999 (2013), >C10-C16 (F2), >C16-C34 (F3) and >C34-C40 (F4). F2 is reported directly and also corrected by subtracting Naphthalene (from VOC method AN433) where available.
AN403	Additionally, the volatile C6-C9 fraction may be determined by a purge and trap technique and GC /MS because of the potential for volatiles loss. Total Recoverable Hydrocarbons - Silica (TRH-Si) follows the same method of analysis after silica gel cleanup of the solvent extract. Aliphatic/Aromatic Speciation follows the same method of analysis after fractionation of the solvent extract over silica with differential polarity of the eluent solvents .
AN403	The GC/FID method is not well suited to the analysis of refined high boiling point materials (ie lubricating oils or greases) but is particularly suited for measuring diesel, kerosene and petrol if care to control volatility is taken. This method will detect naturally occurring hydrocarbons, lipids, animal fats, phenols and PAHs if they are present at sufficient levels, dependent on the use of specific cleanup /fractionation techniques. Reference USEPA 3510B, 8015B.
AN420	(SVOCs) including OC, OP, PCB, Herbicides, PAH, Phthalates and Speciated Phenols (etc) in soils, sediments and waters are determined by GCMS/ECD technique following appropriate solvent extraction process (Based on USEPA 3500C and 8270D).
AN420	SVOC Compounds: Semi-Volatile Organic Compounds (SVOCs) including OC, OP, PCB, Herbicides, PAH, Phthalates and Speciated Phenols in soils, sediments and waters are determined by GCMS /ECD technique following appropriate solvent extraction process (Based on USEPA 3500C and 8270D).
AN433	VOCs and C6-C9 Hydrocarbons by GC-MS P&T: VOC`s are volatile organic compounds. The sample is presented to a gas chromatograph via a purge and trap (P&T) concentrator and autosampler and is detected with a Mass Spectrometer (MSD). Solid samples are initially extracted with methanol whilst liquid samples are processed directly. References: USEPA 5030B, 8020A, 8260.
AN602	Qualitative identification of chrysotile, amosite and crocidolite in bulk samples by polarised light microscopy (PLM) in conjunction with dispersion staining (DS). AS4964 provides the basis for this document. Unequivocal identification of the asbestos minerals present is made by obtaining sufficient diagnostic `clues`, which provide a reasonable degree of certainty, dispersion staining is a mandatory `clue` for positive identification. If sufficient `clues` are absent, then positive identification of asbestos is not possible. This procedure requires removal of suspect fibres/bundles from the sample which cannot be returned.
AN602	Fibres/material that cannot be unequivocably identified as one of the three asbestos forms, will be reported as unknown mineral fibres (umf) The fibres detected may or may not be asbestos fibres.
AN602	AS4964.2004 Method for the Qualitative Identification of Asbestos in Bulk Samples, Section 8.4, Trace Analysis Criteria, Note 4 states:"Depending upon sample condition and fibre type, the detection limit of this technique has been found to lie generally in the range of 1 in 1,000 to 1 in 10,000 parts by weight, equivalent to 1 to 0.1 g/kg."

AN602	The sample can be reported "no asbestos found at the reporting limit of 0.1 g/kg" (<0.01%w/w) where AN602 section 4.5 of this method has been followed, and if- (a) no trace asbestos fibres have been detected (i.e. no 'respirable' fibres): (b) the estimated weight of non-respirable asbestos fibre bundles and/or the estimated weight of asbestos in asbestos-containing materials are found to be less than 0.1g/kg: and (c) these non-respirable asbestos fibre bundles and/or the asbestos containing materials are only visible under stereo-microscope viewing conditions.
AN605	This technique gravimetrically determines the mass of Asbestos Containing Material retained on a 7mm Sieve and assumes that 15% of this ACM is asbestos. This calculated asbestos weight is then calculated as a percentage of the total sample weight.
AN605	This technique also gravimetrically determines the mass of Fibrous Asbestos (FA) and Asbestos Fines (AF) Containing Material retained on and passing a 2mm sieve post 7mm sieving. Assumes that FA and AF are 100% asbestos containing. This calculated asbestos weight is then calculated as a percentage of the total sample weight. This does not include free fibres which are only observed by standard trace analysis as per AN 602.
AN605	Insofar as is technically feasible, this report is consistent with the analytical reporting recommendations in the Western Australian Department of Health Guidelines for the Assessment Remediation and Management of Asbestos - Contaminated Sites in Western Australia - May 2009.

FOOTNOTES

*	NATA accreditation does not cover the performance of this service.	-	Not analysed.	UOM	Unit of Measure.
		NVL	Not validated.	LOR	Limit of Reporting.
**	Indicative data, theoretical holding time exceeded.	IS	Insufficient sample for analysis.	↑↓	Raised/lowered Limit of Reporting.
		LNR	Sample listed, but not received.		

Unless it is reported that sampling has been performed by SGS, the samples have been analysed as received.
Solid samples expressed on a dry weight basis.

Where "Total" analyte groups are reported (for example, Total PAHs, Total OC Pesticides) the total will be calculated as the sum of the individual analytes, with those analytes that are reported as <LOR being assumed to be zero. The summed (Total) limit of reporting is calculated by summing the individual analyte LORs and dividing by two. For example, where 16 individual analytes are being summed and each has an LOR of 0.1 mg/kg, the "Totals" LOR will be 1.6 / 2 (0.8 mg/kg). Where only 2 analytes are being summed, the " Total" LOR will be the sum of those two LORs.

Some totals may not appear to add up because the total is rounded after adding up the raw values.

If reported, measurement uncertainty follow the ± sign after the analytical result and is expressed as the expanded uncertainty calculated using a coverage factor of 2, providing a level of confidence of approximately 95%, unless stated otherwise in the comments section of this report.

Results reported for samples tested under test methods with codes starting with ARS-SOP, radionuclide or gross radioactivity concentrations are expressed in becquerel (Bq) per unit of mass or volume or per wipe as stated on the report. Becquerel is the SI unit for activity and equals one nuclear transformation per second.
Note that in terms of units of radioactivity:

a. 1 Bq is equivalent to 27 pCi
b. 37 MBq is equivalent to 1 mCi

For results reported for samples tested under test methods with codes starting with ARS-SOP, less than (<) values indicate the detection limit for each radionuclide or parameter for the measurement system used. The respective detection limits have been calculated in accordance with ISO 11929.

The QC and MU criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here: www.sgs.com.au.pv.sgsvr/en-gb/environment.

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STATEMENT OF QA/QC PERFORMANCE

SE200615 R0

CLIENT DETAILS

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Email	cawilliams@golder.com.au
Project	**19130799 Gran Central**
Order Number	**PO23977**
Samples	6

LABORATORY DETAILS

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Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
SGS Reference	**SE200615 R0**
Date Received	18 Nov 2019
Date Reported	05 Dec 2019

COMMENTS

All the laboratory data for each environmental matrix was compared to SGS' stated Data Quality Objectives (DQO). Comments arising from the comparison were made and are reported below.

The data relating to sampling was taken from the Chain of Custody document.
This QA/QC Statement must be read in conjunction with the referenced Analytical Report.
The Statement and the Analytical Report must not be reproduced except in full.

All Data Quality Objectives were met with the exception of the following:

Extraction Date	PAH (Polynuclear Aromatic Hydrocarbons) in Water	1 item
	TRH (Total Recoverable Hydrocarbons) in Water	1 item
	VOCs in Water	1 item
	Volatile Petroleum Hydrocarbons in Water	1 item
Matrix Spike	OC Pesticides in Soil	1 item

SAMPLE SUMMARY

HOLDING TIME SUMMARY

SE200615 R0

SGS holding time criteria are drawn from current regulations and are highly dependent on sample container preservation as specified in the SGS “Field Sampling Guide for Containers and Holding Time” (ref: GU-(AU)-ENV.001). Soil samples guidelines are derived from NEPM "Schedule B(3) Guideline on Laboratory Analysis of Potentially Contaminated Soils". Water sample guidelines are derived from "AS/NZS 5667.1 : 1998 Water Quality - sampling part 1" and APHA "Standard Methods for the Examination of Water and Wastewater" 21st edition 2005.

Extraction and analysis holding time due dates listed are calculated from the date sampled, although holding times may be extended after laboratory extraction for some analytes. The due dates are the suggested dates that samples may be held before extraction or analysis and still be considered valid.

Extraction and analysis dates are shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria. If the sampled date is not supplied then compliance with criteria cannot be determined. If the received date is after one or both due dates then holding time will fail by default.

Fibre Identification in soil

Method: ME-(AU)-[ENV]AN602

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH102_0.11-0.16	SE200615.001	LB189077	18 Nov 2019	18 Nov 2019	17 Nov 2020	04 Dec 2019	17 Nov 2020	05 Dec 2019

Gravimetric Determination of Asbestos in Soil

Method: ME-(AU)-[ENV]AN605

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH102_0.11-0.16	SE200615.001	LB189077	18 Nov 2019	18 Nov 2019	16 May 2020	04 Dec 2019	16 May 2020	05 Dec 2019

Mercury (dissolved) in Water

Method: ME-(AU)-[ENV]AN311(Perth)/AN312

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
RB	SE200615.004	LB188911	18 Nov 2019	18 Nov 2019	16 Dec 2019	03 Dec 2019	16 Dec 2019	03 Dec 2019

Mercury in Soil

Method: ME-(AU)-[ENV]AN312

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH102_0.45-0.60	SE200615.002	LB188903	18 Nov 2019	18 Nov 2019	16 Dec 2019	02 Dec 2019	16 Dec 2019	04 Dec 2019
BH102_3.0-3.1	SE200615.003	LB188903	18 Nov 2019	18 Nov 2019	16 Dec 2019	02 Dec 2019	16 Dec 2019	04 Dec 2019

Moisture Content

Method: ME-(AU)-[ENV]AN002

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH102_0.45-0.60	SE200615.002	LB188895	18 Nov 2019	18 Nov 2019	02 Dec 2019	02 Dec 2019	07 Dec 2019	03 Dec 2019
BH102_3.0-3.1	SE200615.003	LB188895	18 Nov 2019	18 Nov 2019	02 Dec 2019	02 Dec 2019	07 Dec 2019	03 Dec 2019
TB	SE200615.006	LB188895	18 Nov 2019	18 Nov 2019	02 Dec 2019	02 Dec 2019	07 Dec 2019	03 Dec 2019

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH102_0.45-0.60	SE200615.002	LB188894	18 Nov 2019	18 Nov 2019	02 Dec 2019	02 Dec 2019	11 Jan 2020	03 Dec 2019
BH102_3.0-3.1	SE200615.003	LB188894	18 Nov 2019	18 Nov 2019	02 Dec 2019	02 Dec 2019	11 Jan 2020	03 Dec 2019

OP Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH102_0.45-0.60	SE200615.002	LB188894	18 Nov 2019	18 Nov 2019	02 Dec 2019	02 Dec 2019	11 Jan 2020	04 Dec 2019
BH102_3.0-3.1	SE200615.003	LB188894	18 Nov 2019	18 Nov 2019	02 Dec 2019	02 Dec 2019	11 Jan 2020	04 Dec 2019

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN420

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH102_0.45-0.60	SE200615.002	LB188894	18 Nov 2019	18 Nov 2019	02 Dec 2019	02 Dec 2019	11 Jan 2020	04 Dec 2019
BH102_3.0-3.1	SE200615.003	LB188894	18 Nov 2019	18 Nov 2019	02 Dec 2019	02 Dec 2019	11 Jan 2020	04 Dec 2019

PAH (Polynuclear Aromatic Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN420

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
RB	SE200615.004	LB188931	18 Nov 2019	18 Nov 2019	25 Nov 2019	03 Dec 2019†	12 Jan 2020	04 Dec 2019

PCBs in Soil

Method: ME-(AU)-[ENV]AN420

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH102_0.45-0.60	SE200615.002	LB188894	18 Nov 2019	18 Nov 2019	02 Dec 2019	02 Dec 2019	11 Jan 2020	05 Dec 2019
BH102_3.0-3.1	SE200615.003	LB188894	18 Nov 2019	18 Nov 2019	02 Dec 2019	02 Dec 2019	11 Jan 2020	05 Dec 2019

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

Method: ME-(AU)-[ENV]AN040/AN320

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH102_0.45-0.60	SE200615.002	LB188901	18 Nov 2019	18 Nov 2019	16 May 2020	02 Dec 2019	16 May 2020	04 Dec 2019
BH102_3.0-3.1	SE200615.003	LB188901	18 Nov 2019	18 Nov 2019	16 May 2020	02 Dec 2019	16 May 2020	04 Dec 2019

Trace Metals (Dissolved) in Water by ICPMS

Method: ME-(AU)-[ENV]AN318

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
RB	SE200615.004	LB188925	18 Nov 2019	18 Nov 2019	16 May 2020	03 Dec 2019	16 May 2020	03 Dec 2019

TRH (Total Recoverable Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN403

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH102_0.45-0.60	SE200615.002	LB188894	18 Nov 2019	18 Nov 2019	02 Dec 2019	02 Dec 2019	11 Jan 2020	04 Dec 2019
BH102_3.0-3.1	SE200615.003	LB188894	18 Nov 2019	18 Nov 2019	02 Dec 2019	02 Dec 2019	11 Jan 2020	04 Dec 2019

TRH (Total Recoverable Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN403

Sample Name	Sample No.	QC Ref

HOLDING TIME SUMMARY

SE200615 R0

SGS holding time criteria are drawn from current regulations and are highly dependent on sample container preservation as specified in the SGS “Field Sampling Guide for Containers and Holding Time” (ref: GU-(AU)-ENV.001). Soil samples guidelines are derived from NEPM "Schedule B(3) Guideline on Laboratory Analysis of Potentially Contaminated Soils". Water sample guidelines are derived from "AS/NZS 5667.1 : 1998 Water Quality - sampling part 1" and APHA "Standard Methods for the Examination of Water and Wastewater" 21st edition 2005.

Extraction and analysis holding time due dates listed are calculated from the date sampled, although holding times may be extended after laboratory extraction for some analytes. The due dates are the suggested dates that samples may be held before extraction or analysis and still be considered valid.

Extraction and analysis dates are shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria. If the sampled date is not supplied then compliance with criteria cannot be determined. If the received date is after one or both due dates then holding time will fail by default.

TRH (Total Recoverable Hydrocarbons) in Water (continued)

Method: ME-(AU)-[ENV]AN403

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
RB	SE200615.004	LB188931	18 Nov 2019	18 Nov 2019	25 Nov 2019	03 Dec 2019†	12 Jan 2020	04 Dec 2019

VOC's in Soil

Method: ME-(AU)-[ENV]AN433

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH102_0.45-0.60	SE200615.002	LB188893	18 Nov 2019	18 Nov 2019	02 Dec 2019	02 Dec 2019	11 Jan 2020	04 Dec 2019
BH102_3.0-3.1	SE200615.003	LB188893	18 Nov 2019	18 Nov 2019	02 Dec 2019	02 Dec 2019	11 Jan 2020	04 Dec 2019
TS	SE200615.005	LB188893	18 Nov 2019	18 Nov 2019	02 Dec 2019	02 Dec 2019	11 Jan 2020	04 Dec 2019
TB	SE200615.006	LB188893	18 Nov 2019	18 Nov 2019	02 Dec 2019	02 Dec 2019	11 Jan 2020	04 Dec 2019

VOCs in Water

Method: ME-(AU)-[ENV]AN433

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
RB	SE200615.004	LB188926	18 Nov 2019	18 Nov 2019	25 Nov 2019	03 Dec 2019†	12 Jan 2020	05 Dec 2019

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH102_0.45-0.60	SE200615.002	LB188893	18 Nov 2019	18 Nov 2019	02 Dec 2019	02 Dec 2019	11 Jan 2020	04 Dec 2019
BH102_3.0-3.1	SE200615.003	LB188893	18 Nov 2019	18 Nov 2019	02 Dec 2019	02 Dec 2019	11 Jan 2020	04 Dec 2019
TS	SE200615.005	LB188893	18 Nov 2019	18 Nov 2019	02 Dec 2019	02 Dec 2019	11 Jan 2020	04 Dec 2019
TB	SE200615.006	LB188893	18 Nov 2019	18 Nov 2019	02 Dec 2019	02 Dec 2019	11 Jan 2020	04 Dec 2019

Volatile Petroleum Hydrocarbons in Water

Method: ME-(AU)-[ENV]AN433

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
RB	SE200615.004	LB188926	18 Nov 2019	18 Nov 2019	25 Nov 2019	03 Dec 2019†	12 Jan 2020	05 Dec 2019

Surrogate results are evaluated against upper and lower limit criteria established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). At least two of three routine level soil sample surrogate spike recoveries for BTEX/VOC are to be within 70-130% where control charts have not been developed and within the established control limits for charted surrogates. Matrix effects may void this as an acceptance criterion. Water sample surrogate spike recoveries are to be within 40-130%. The presence of emulsions, surfactants and particulates may void this as an acceptance criterion.

Result is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Tetrachloro-m-xylene (TCMX) (Surrogate)	BH102_0.45-0.60	SE200615.002	%	60 - 130%	89
	BH102_3.0-3.1	SE200615.003	%	60 - 130%	85

OP Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2-fluorobiphenyl (Surrogate)	BH102_0.45-0.60	SE200615.002	%	60 - 130%	83
	BH102_3.0-3.1	SE200615.003	%	60 - 130%	91
d14-p-terphenyl (Surrogate)	BH102_0.45-0.60	SE200615.002	%	60 - 130%	76
	BH102_3.0-3.1	SE200615.003	%	60 - 130%	77

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN420

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2-fluorobiphenyl (Surrogate)	BH102_0.45-0.60	SE200615.002	%	70 - 130%	83
	BH102_3.0-3.1	SE200615.003	%	70 - 130%	91
d14-p-terphenyl (Surrogate)	BH102_0.45-0.60	SE200615.002	%	70 - 130%	76
	BH102_3.0-3.1	SE200615.003	%	70 - 130%	77
d5-nitrobenzene (Surrogate)	BH102_0.45-0.60	SE200615.002	%	70 - 130%	89
	BH102_3.0-3.1	SE200615.003	%	70 - 130%	89

PAH (Polynuclear Aromatic Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN420

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2-fluorobiphenyl (Surrogate)	RB	SE200615.004	%	40 - 130%	40
d14-p-terphenyl (Surrogate)	RB	SE200615.004	%	40 - 130%	64
d5-nitrobenzene (Surrogate)	RB	SE200615.004	%	40 - 130%	40

PCBs in Soil

Method: ME-(AU)-[ENV]AN420

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Tetrachloro-m-xylene (TCMX) (Surrogate)	BH102_0.45-0.60	SE200615.002	%	60 - 130%	89
	BH102_3.0-3.1	SE200615.003	%	60 - 130%	85

VOC's in Soil

Method: ME-(AU)-[ENV]AN433

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	BH102_0.45-0.60	SE200615.002	%	60 - 130%	90
	BH102_3.0-3.1	SE200615.003	%	60 - 130%	89
	TS	SE200615.005	%	60 - 130%	84
	TB	SE200615.006	%	60 - 130%	91
d4-1,2-dichloroethane (Surrogate)	BH102_0.45-0.60	SE200615.002	%	60 - 130%	85
	BH102_3.0-3.1	SE200615.003	%	60 - 130%	87
	TS	SE200615.005	%	60 - 130%	89
	TB	SE200615.006	%	60 - 130%	92
d8-toluene (Surrogate)	BH102_0.45-0.60	SE200615.002	%	60 - 130%	89
	BH102_3.0-3.1	SE200615.003	%	60 - 130%	91
	TS	SE200615.005	%	60 - 130%	94
	TB	SE200615.006	%	60 - 130%	96

VOCs in Water

Method: ME-(AU)-[ENV]AN433

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	RB	SE200615.004	%	40 - 130%	97
d4-1,2-dichloroethane (Surrogate)	RB	SE200615.004	%	40 - 130%	103
d8-toluene (Surrogate)	RB	SE200615.004	%	40 - 130%	89

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	BH102_0.45-0.60	SE200615.002	%	60 - 130%	90
	BH102_3.0-3.1	SE200615.003	%	60 - 130%	89
	TB	SE200615.006	%	60 - 130%	91
d4-1,2-dichloroethane (Surrogate)	BH102_0.45-0.60	SE200615.002	%	60 - 130%	85
	BH102_3.0-3.1	SE200615.003	%	60 - 130%	87
	TB	SE200615.006	%	60 - 130%	92
d8-toluene (Surrogate)	BH102_0.45-0.60	SE200615.002	%	60 - 130%	89
	BH102_3.0-3.1	SE200615.003	%	60 - 130%	91
	TB	SE200615.006	%	60 - 130%	96

Surrogate results are evaluated against upper and lower limit criteria established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). At least two of three routine level soil sample surrogate spike recoveries for BTEX/VOC are to be within 70-130% where control charts have not been developed and within the established control limits for charted surrogates. Matrix effects may void this as an acceptance criterion. Water sample surrogate spike recoveries are to be within 40-130%. The presence of emulsions, surfactants and particulates may void this as an acceptance criterion.

Result is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Volatile Petroleum Hydrocarbons in Water — **Method: ME-(AU)-[ENV]AN433**

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	RB	SE200615.004	%	40 - 130%	97
d4-1,2-dichloroethane (Surrogate)	RB	SE200615.004	%	60 - 130%	103
d8-toluene (Surrogate)	RB	SE200615.004	%	40 - 130%	89

Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, typically 2.5 times the statistically determined method detection limit (MDL).

Result is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Mercury (dissolved) in Water

Method: ME-(AU)-[ENV]AN311(Perth)/AN312

Sample Number	Parameter	Units	LOR	Result
LB188911.001	Mercury	mg/L	0.0001	<0.0001

Mercury in Soil

Method: ME-(AU)-[ENV]AN312

Sample Number	Parameter	Units	LOR	Result
LB188903.001	Mercury	mg/kg	0.05	<0.05

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result
LB188894.001		Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1
		Alpha BHC	mg/kg	0.1	<0.1
		Lindane	mg/kg	0.1	<0.1
		Heptachlor	mg/kg	0.1	<0.1
		Aldrin	mg/kg	0.1	<0.1
		Beta BHC	mg/kg	0.1	<0.1
		Delta BHC	mg/kg	0.1	<0.1
		Heptachlor epoxide	mg/kg	0.1	<0.1
		Alpha Endosulfan	mg/kg	0.2	<0.2
		Gamma Chlordane	mg/kg	0.1	<0.1
		Alpha Chlordane	mg/kg	0.1	<0.1
		p,p'-DDE	mg/kg	0.1	<0.1
		Dieldrin	mg/kg	0.2	<0.2
		Endrin	mg/kg	0.2	<0.2
		Beta Endosulfan	mg/kg	0.2	<0.2
		p,p'-DDD	mg/kg	0.1	<0.1
		p,p'-DDT	mg/kg	0.1	<0.1
		Endosulfan sulphate	mg/kg	0.1	<0.1
		Endrin Aldehyde	mg/kg	0.1	<0.1
		Methoxychlor	mg/kg	0.1	<0.1
		Endrin Ketone	mg/kg	0.1	<0.1
		Isodrin	mg/kg	0.1	<0.1
		Mirex	mg/kg	0.1	<0.1
	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	97

OP Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result
LB188894.001		Dichlorvos	mg/kg	0.5	<0.5
		Dimethoate	mg/kg	0.5	<0.5
		Diazinon (Dimpylate)	mg/kg	0.5	<0.5
		Fenitrothion	mg/kg	0.2	<0.2
		Malathion	mg/kg	0.2	<0.2
		Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2
		Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2
		Bromophos Ethyl	mg/kg	0.2	<0.2
		Methidathion	mg/kg	0.5	<0.5
		Ethion	mg/kg	0.2	<0.2
		Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2
	Surrogates	2-fluorobiphenyl (Surrogate)	%	-	86
		d14-p-terphenyl (Surrogate)	%	-	87

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number	Parameter	Units	LOR	Result
LB188894.001	Naphthalene	mg/kg	0.1	<0.1
	2-methylnaphthalene	mg/kg	0.1	<0.1
	1-methylnaphthalene	mg/kg	0.1	<0.1
	Acenaphthylene	mg/kg	0.1	<0.1
	Acenaphthene	mg/kg	0.1	<0.1
	Fluorene	mg/kg	0.1	<0.1
	Phenanthrene	mg/kg	0.1	<0.1
	Anthracene	mg/kg	0.1	<0.1

Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, typically 2.5 times the statistically determined method detection limit (MDL).

Result is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

PAH (Polynuclear Aromatic Hydrocarbons) in Soil (continued)

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result
LB188894.001		Fluoranthene	mg/kg	0.1	<0.1
		Pyrene	mg/kg	0.1	<0.1
		Benzo(a)anthracene	mg/kg	0.1	<0.1
		Chrysene	mg/kg	0.1	<0.1
		Benzo(a)pyrene	mg/kg	0.1	<0.1
		Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1
		Dibenzo(ah)anthracene	mg/kg	0.1	<0.1
		Benzo(ghi)perylene	mg/kg	0.1	<0.1
		Total PAH (18)	mg/kg	0.8	<0.8
	Surrogates	d5-nitrobenzene (Surrogate)	%	-	92
		2-fluorobiphenyl (Surrogate)	%	-	86
		d14-p-terphenyl (Surrogate)	%	-	87

PAH (Polynuclear Aromatic Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result
LB188931.001		Naphthalene	µg/L	0.1	<0.1
		2-methylnaphthalene	µg/L	0.1	<0.1
		1-methylnaphthalene	µg/L	0.1	<0.1
		Acenaphthylene	µg/L	0.1	<0.1
		Acenaphthene	µg/L	0.1	<0.1
		Fluorene	µg/L	0.1	<0.1
		Phenanthrene	µg/L	0.1	<0.1
		Anthracene	µg/L	0.1	<0.1
		Fluoranthene	µg/L	0.1	<0.1
		Pyrene	µg/L	0.1	<0.1
		Benzo(a)anthracene	µg/L	0.1	<0.1
		Chrysene	µg/L	0.1	<0.1
		Benzo(a)pyrene	µg/L	0.1	<0.1
		Indeno(1,2,3-cd)pyrene	µg/L	0.1	<0.1
		Dibenzo(ah)anthracene	µg/L	0.1	<0.1
		Benzo(ghi)perylene	µg/L	0.1	<0.1
	Surrogates	d5-nitrobenzene (Surrogate)	%	-	102
		2-fluorobiphenyl (Surrogate)	%	-	102
		d14-p-terphenyl (Surrogate)	%	-	98

PCBs in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result
LB188894.001		Arochlor 1016	mg/kg	0.2	<0.2
		Arochlor 1221	mg/kg	0.2	<0.2
		Arochlor 1232	mg/kg	0.2	<0.2
		Arochlor 1242	mg/kg	0.2	<0.2
		Arochlor 1248	mg/kg	0.2	<0.2
		Arochlor 1254	mg/kg	0.2	<0.2
		Arochlor 1260	mg/kg	0.2	<0.2
		Arochlor 1262	mg/kg	0.2	<0.2
		Arochlor 1268	mg/kg	0.2	<0.2
		Total PCBs (Arochlors)	mg/kg	1	<1
	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	97

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

Method: ME-(AU)-[ENV]AN040/AN320

Sample Number	Parameter	Units	LOR	Result
LB188901.001	Arsenic, As	mg/kg	1	<1
	Cadmium, Cd	mg/kg	0.3	<0.3
	Chromium, Cr	mg/kg	0.5	<0.5
	Copper, Cu	mg/kg	0.5	<0.5
	Nickel, Ni	mg/kg	0.5	<0.5
	Lead, Pb	mg/kg	1	<1
	Zinc, Zn	mg/kg	2	<2.0

Trace Metals (Dissolved) in Water by ICPMS

Method: ME-(AU)-[ENV]AN318

Sample Number	Parameter	Units	LOR

Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, typically 2.5 times the statistically determined method detection limit (MDL).

Result is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Trace Metals (Dissolved) in Water by ICPMS (continued)

Method: ME-(AU)-[ENV]AN318

Sample Number	Parameter	Units	LOR	Result
LB188925.001	Arsenic, As	µg/L	1	<1
	Cadmium, Cd	µg/L	0.1	<0.1
	Chromium, Cr	µg/L	1	<1
	Copper, Cu	µg/L	1	<1
	Lead, Pb	µg/L	1	<1
	Nickel, Ni	µg/L	1	<1
	Zinc, Zn	µg/L	5	<5

TRH (Total Recoverable Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN403

Sample Number	Parameter	Units	LOR	Result
LB188894.001	TRH C10-C14	mg/kg	20	<20
	TRH C15-C28	mg/kg	45	<45
	TRH C29-C36	mg/kg	45	<45
	TRH C37-C40	mg/kg	100	<100
	TRH C10-C36 Total	mg/kg	110	<110

TRH (Total Recoverable Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN403

Sample Number	Parameter	Units	LOR	Result
LB188931.001	TRH C10-C14	µg/L	50	<50
	TRH C15-C28	µg/L	200	<200
	TRH C29-C36	µg/L	200	<200
	TRH C37-C40	µg/L	200	<200

VOC's in Soil

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result
LB188893.001	Monocyclic Aromatic Hydrocarbons	Benzene	mg/kg	0.1	<0.1
		Toluene	mg/kg	0.1	<0.1
		Ethylbenzene	mg/kg	0.1	<0.1
		m/p-xylene	mg/kg	0.2	<0.2
		o-xylene	mg/kg	0.1	<0.1
	Polycyclic VOCs	Naphthalene	mg/kg	0.1	<0.1
	Surrogates	d4-1,2-dichloroethane (Surrogate)	%	-	98
		d8-toluene (Surrogate)	%	-	98
		Bromofluorobenzene (Surrogate)	%	-	98
	Totals	Total BTEX	mg/kg	0.6	<0.6

VOCs in Water

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result
LB188926.001	Monocyclic Aromatic Hydrocarbons	Benzene	µg/L	0.5	<0.5
		Toluene	µg/L	0.5	<0.5
		Ethylbenzene	µg/L	0.5	<0.5
		m/p-xylene	µg/L	1	<1
		o-xylene	µg/L	0.5	<0.5
	Polycyclic VOCs	Naphthalene	µg/L	0.5	<0.5
	Surrogates	d4-1,2-dichloroethane (Surrogate)	%	-	102
		d8-toluene (Surrogate)	%	-	120
		Bromofluorobenzene (Surrogate)	%	-	110

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result
LB188893.001		TRH C6-C9	mg/kg	20	<20
	Surrogates	d4-1,2-dichloroethane (Surrogate)	%	-	98

Volatile Petroleum Hydrocarbons in Water

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result
LB188926.001		TRH C6-C9	µg/L	40	<40
	Surrogates	d4-1,2-dichloroethane (Surrogate)	%	-	102
		d8-toluene (Surrogate)	%	-	120
		Bromofluorobenzene (Surrogate)	%	-	110

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Mercury (dissolved) in Water

Method: ME-(AU)-[ENV]AN311(Perth)/AN312

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE200615.004	LB188911.008	Mercury	µg/L	0.0001	<0.0001	0.0000	156	6

Mercury in Soil

Method: ME-(AU)-[ENV]AN312

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE200611.031	LB188903.014	Mercury	mg/kg	0.05	0.14	0.14	66	0
SE200614.002	LB188903.022	Mercury	mg/kg	0.05	<0.05	<0.05	200	0

Moisture Content

Method: ME-(AU)-[ENV]AN002

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE200614.002	LB188895.022	% Moisture	%w/w	1	18.4	18.5	35	1
SE200614.005	LB188895.024	% Moisture	%w/w	1	<1.0	<1.0	200	0
SE200633.003	LB188895.011	% Moisture	%w/w	1	14.3	14.5	37	1

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE200614.002	LB188894.023		Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	200	0
			Alpha BHC	mg/kg	0.1	<0.1	<0.1	200	0
			Lindane	mg/kg	0.1	<0.1	<0.1	200	0
			Heptachlor	mg/kg	0.1	<0.1	<0.1	200	0
			Aldrin	mg/kg	0.1	<0.1	<0.1	200	0
			Beta BHC	mg/kg	0.1	<0.1	<0.1	200	0
			Delta BHC	mg/kg	0.1	<0.1	<0.1	200	0
			Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	200	0
			o,p'-DDE	mg/kg	0.1	<0.1	<0.1	200	0
			Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	200	0
			Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	200	0
			Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	200	0
			trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	200	0
			p,p'-DDE	mg/kg	0.1	<0.1	<0.1	200	0
			Dieldrin	mg/kg	0.2	<0.2	<0.2	200	0
			Endrin	mg/kg	0.2	<0.2	<0.2	200	0
			o,p'-DDD	mg/kg	0.1	<0.1	<0.1	200	0
			o,p'-DDT	mg/kg	0.1	<0.1	<0.1	200	0
			Beta Endosulfan	mg/kg	0.2	<0.2	<0.2	200	0
			p,p'-DDD	mg/kg	0.1	<0.1	<0.1	200	0
			p,p'-DDT	mg/kg	0.1	<0.1	<0.1	200	0
			Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	200	0
			Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1	200	0
			Methoxychlor	mg/kg	0.1	<0.1	<0.1	200	0
			Endrin Ketone	mg/kg	0.1	<0.1	<0.1	200	0
			Isodrin	mg/kg	0.1	<0.1	<0.1	200	0
			Mirex	mg/kg	0.1	<0.1	<0.1	200	0
			Total CLP OC Pesticides	mg/kg	1	<1	<1	200	0
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.13	0.13	30	5
SE200633.003	LB188894.014		Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	200	0
			Alpha BHC	mg/kg	0.1	<0.1	<0.1	200	0
			Lindane	mg/kg	0.1	<0.1	<0.1	200	0
			Heptachlor	mg/kg	0.1	<0.1	<0.1	200	0
			Aldrin	mg/kg	0.1	<0.1	<0.1	200	0
			Beta BHC	mg/kg	0.1	<0.1	<0.1	200	0
			Delta BHC	mg/kg	0.1	<0.1	<0.1	200	0
			Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	200	0
			o,p'-DDE	mg/kg	0.1	<0.1	<0.1	200	0
			Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	200	0
			Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	200	0
			Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	200	0
			trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	200	0
			p,p'-DDE	mg/kg	0.1	<0.1	<0.1	200	0

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

OC Pesticides in Soil (continued)

Method: ME-(AU)-[ENV]AN420

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE200633.003	LB188894.014		Dieldrin	mg/kg	0.2	<0.2	<0.2	200	0
			Endrin	mg/kg	0.2	<0.2	<0.2	200	0
			o,p'-DDD	mg/kg	0.1	<0.1	<0.1	200	0
			o,p'-DDT	mg/kg	0.1	<0.1	<0.1	200	0
			Beta Endosulfan	mg/kg	0.2	<0.2	<0.2	200	0
			p,p'-DDD	mg/kg	0.1	<0.1	<0.1	200	0
			p,p'-DDT	mg/kg	0.1	<0.1	<0.1	200	0
			Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	200	0
			Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1	200	0
			Methoxychlor	mg/kg	0.1	<0.1	<0.1	200	0
			Endrin Ketone	mg/kg	0.1	<0.1	<0.1	200	0
			Isodrin	mg/kg	0.1	<0.1	<0.1	200	0
			Mirex	mg/kg	0.1	<0.1	<0.1	200	0
			Total CLP OC Pesticides	mg/kg	1	<1	<1	200	0
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.13	0.12	30	3

OP Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE200614.002	LB188894.023		Dichlorvos	mg/kg	0.5	<0.5	<0.5	200	0
			Dimethoate	mg/kg	0.5	<0.5	<0.5	200	0
			Diazinon (Dimpylate)	mg/kg	0.5	<0.5	<0.5	200	0
			Fenitrothion	mg/kg	0.2	<0.2	<0.2	200	0
			Malathion	mg/kg	0.2	<0.2	<0.2	200	0
			Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2	<0.2	200	0
			Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2	<0.2	200	0
			Bromophos Ethyl	mg/kg	0.2	<0.2	<0.2	200	0
			Methidathion	mg/kg	0.5	<0.5	<0.5	200	0
			Ethion	mg/kg	0.2	<0.2	<0.2	200	0
			Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	<0.2	200	0
			Total OP Pesticides*	mg/kg	1.7	<1.7	<1.7	200	0
		Surrogates	2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.4	30	7
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.4	0.4	30	2
SE200633.003	LB188894.014		Dichlorvos	mg/kg	0.5	<0.5	<0.5	200	0
			Dimethoate	mg/kg	0.5	<0.5	<0.5	200	0
			Diazinon (Dimpylate)	mg/kg	0.5	<0.5	<0.5	200	0
			Fenitrothion	mg/kg	0.2	<0.2	<0.2	200	0
			Malathion	mg/kg	0.2	<0.2	<0.2	200	0
			Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2	<0.2	200	0
			Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2	<0.2	200	0
			Bromophos Ethyl	mg/kg	0.2	<0.2	<0.2	200	0
			Methidathion	mg/kg	0.5	<0.5	<0.5	200	0
			Ethion	mg/kg	0.2	<0.2	<0.2	200	0
			Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	<0.2	200	0
			Total OP Pesticides*	mg/kg	1.7	<1.7	<1.7	200	0
		Surrogates	2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.4	30	1
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.4	0.4	30	4

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN420

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE200614.002	LB188894.023	Naphthalene	mg/kg	0.1	<0.1	<0.1	200	0
		2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	200	0
		1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	200	0
		Acenaphthylene	mg/kg	0.1	<0.1	<0.1	200	0
		Acenaphthene	mg/kg	0.1	<0.1	<0.1	200	0
		Fluorene	mg/kg	0.1	<0.1	<0.1	200	0
		Phenanthrene	mg/kg	0.1	<0.1	<0.1	200	0
		Anthracene	mg/kg	0.1	<0.1	<0.1	200	0
		Fluoranthene	mg/kg	0.1	<0.1	<0.1	200	0
		Pyrene	mg/kg	0.1	<0.1	<0.1	200	0
		Benzo(a)anthracene	mg/kg	0.1	<0.1	<0.1	200	0
		Chrysene	mg/kg	0.1	<0.1	<0.1	200	0
		Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	<0.1	200	0

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

PAH (Polynuclear Aromatic Hydrocarbons) in Soil (continued)

Method: ME-(AU)-[ENV]AN420

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE200614.002	LB188894.023		Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(a)pyrene	mg/kg	0.1	<0.1	<0.1	200	0
			Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	200	0
			Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	200	0
			Carcinogenic PAHs, BaP TEQ <LOR=0	mg/kg	0.2	<0.2	<0.2	200	0
			Carcinogenic PAHs, BaP TEQ <LOR=LOR	mg/kg	0.3	<0.3	<0.3	134	0
			Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	mg/kg	0.2	<0.2	<0.2	175	0
			Total PAH (18)	mg/kg	0.8	<0.8	<0.8	200	0
		Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.5	0.4	30	7
			2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.4	30	7
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.4	0.4	30	2
SE200633.003	LB188894.014		Naphthalene	mg/kg	0.1	<0.1	<0.1	200	0
			2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	200	0
			1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	200	0
			Acenaphthylene	mg/kg	0.1	<0.1	<0.1	200	0
			Acenaphthene	mg/kg	0.1	<0.1	<0.1	200	0
			Fluorene	mg/kg	0.1	<0.1	<0.1	200	0
			Phenanthrene	mg/kg	0.1	<0.1	<0.1	200	0
			Anthracene	mg/kg	0.1	<0.1	<0.1	200	0
			Fluoranthene	mg/kg	0.1	<0.1	<0.1	195	0
			Pyrene	mg/kg	0.1	<0.1	<0.1	188	0
			Benzo(a)anthracene	mg/kg	0.1	<0.1	<0.1	200	0
			Chrysene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	<0.1	177	0
			Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	175	0
			Benzo(a)pyrene	mg/kg	0.1	<0.1	<0.1	200	0
			Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	200	0
			Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	200	0
			Carcinogenic PAHs, BaP TEQ <LOR=0	mg/kg	0.2	<0.2	<0.2	200	0
			Carcinogenic PAHs, BaP TEQ <LOR=LOR	mg/kg	0.3	<0.3	<0.3	134	0
			Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	mg/kg	0.2	<0.2	<0.2	175	0
			Total PAH (18)	mg/kg	0.8	<0.8	<0.8	200	0
		Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.5	0.5	30	3
			2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.4	30	1
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.4	0.4	30	4

PCBs in Soil

Method: ME-(AU)-[ENV]AN420

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE200614.002	LB188894.023		Arochlor 1016	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1221	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1232	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1242	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1248	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1254	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1260	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1262	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1268	mg/kg	0.2	<0.2	<0.2	200	0
			Total PCBs (Arochlors)	mg/kg	1	<1	<1	200	0
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0	0	30	5
SE200633.003	LB188894.014		Arochlor 1016	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1221	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1232	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1242	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1248	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1254	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1260	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1262	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1268	mg/kg	0.2	<0.2	<0.2	200	0
			Total PCBs (Arochlors)	mg/kg	1	<1	<1	200	0

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

PCBs in Soil (continued)

Method: ME-(AU)-[ENV]AN420

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE200633.003	LB188894.014	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0	0	30	3

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

Method: ME-(AU)-[ENV]AN040/AN320

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE200611.031	LB188901.014	Arsenic, As	mg/kg	1	4	4	57	1
		Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	200	0
		Chromium, Cr	mg/kg	0.5	5.8	6.6	38	12
		Copper, Cu	mg/kg	0.5	14	13	34	5
		Nickel, Ni	mg/kg	0.5	5.3	5.8	39	8
		Lead, Pb	mg/kg	1	90	87	31	3
		Zinc, Zn	mg/kg	2	93	110	32	15
SE200614.002	LB188901.022	Arsenic, As	mg/kg	1	2	3	66	24
		Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	200	0
		Chromium, Cr	mg/kg	0.5	15	21	33	31
		Copper, Cu	mg/kg	0.5	2.8	2.2	50	24
		Nickel, Ni	mg/kg	0.5	<0.5	<0.5	200	0
		Lead, Pb	mg/kg	1	11	14	38	21
		Zinc, Zn	mg/kg	2	3.8	4.5	78	16

Trace Metals (Dissolved) in Water by ICPMS

Method: ME-(AU)-[ENV]AN318

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE200604.004	LB188925.014	Arsenic, As	µg/L	1	1.477	1.349	86	9
		Cadmium, Cd	µg/L	0.1	0.007	0.005	200	0
		Chromium, Cr	µg/L	1	0.98	0.948	119	0
		Copper, Cu	µg/L	1	1.941	1.949	66	0
		Lead, Pb	µg/L	1	0.783	0.79	142	0
		Zinc, Zn	µg/L	5	20.776	20.019	40	4
SE200615.004	LB188925.023	Arsenic, As	µg/L	1	2	2	60	5
		Cadmium, Cd	µg/L	0.1	0.2	0.2	77	9
		Chromium, Cr	µg/L	1	4	3	44	8
		Copper, Cu	µg/L	1	9	9	27	1
		Lead, Pb	µg/L	1	7	7	29	10
		Nickel, Ni	µg/L	1	2	1	84	8
		Zinc, Zn	µg/L	5	280	260	17	8

TRH (Total Recoverable Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN403

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE200614.002	LB188894.023		TRH C10-C14	mg/kg	20	<20	<20	200	0
			TRH C15-C28	mg/kg	45	<45	<45	200	0
			TRH C29-C36	mg/kg	45	<45	<45	200	0
			TRH C37-C40	mg/kg	100	<100	<100	200	0
			TRH C10-C36 Total	mg/kg	110	<110	<110	200	0
			TRH >C10-C40 Total (F bands)	mg/kg	210	<210	<210	200	0
		TRH F Bands	TRH >C10-C16	mg/kg	25	<25	<25	200	0
			TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25	<25	200	0
			TRH >C16-C34 (F3)	mg/kg	90	<90	<90	200	0
			TRH >C34-C40 (F4)	mg/kg	120	<120	<120	200	0
SE200633.003	LB188894.014		TRH C10-C14	mg/kg	20	<20	<20	200	0
			TRH C15-C28	mg/kg	45	<45	<45	200	0
			TRH C29-C36	mg/kg	45	<45	<45	200	0
			TRH C37-C40	mg/kg	100	<100	<100	200	0
			TRH C10-C36 Total	mg/kg	110	<110	<110	200	0
			TRH >C10-C40 Total (F bands)	mg/kg	210	<210	<210	200	0
		TRH F Bands	TRH >C10-C16	mg/kg	25	<25	<25	200	0
			TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25	<25	200	0
			TRH >C16-C34 (F3)	mg/kg	90	<90	<90	200	0
			TRH >C34-C40 (F4)	mg/kg	120	<120	<120	200	0

VOC's in Soil

Method: ME-(AU)-[ENV]AN433

Original	Duplicate	Parameter	Units	LOR

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

VOC's in Soil (continued)

Method: ME-(AU)-[ENV]AN433

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE200614.002	LB188893.029	Monocyclic Aromatic	Benzene	mg/kg	0.1	<0.1	<0.1	200	0
			Toluene	mg/kg	0.1	<0.1	<0.1	200	0
			Ethylbenzene	mg/kg	0.1	<0.1	<0.1	200	0
			m/p-xylene	mg/kg	0.2	<0.2	<0.2	200	0
			o-xylene	mg/kg	0.1	<0.1	<0.1	200	0
		Polycyclic	Naphthalene	mg/kg	0.1	<0.1	<0.1	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	9.3	9.1	50	3
			d8-toluene (Surrogate)	mg/kg	-	9.4	9.0	50	4
			Bromofluorobenzene (Surrogate)	mg/kg	-	9.3	8.8	50	6
		Totals	Total Xylenes	mg/kg	0.3	<0.3	<0.3	200	0
			Total BTEX	mg/kg	0.6	<0.6	<0.6	200	0
SE200633.003	LB188893.015	Monocyclic Aromatic	Benzene	mg/kg	0.1	<0.1	<0.1	200	0
			Toluene	mg/kg	0.1	<0.1	<0.1	200	0
			Ethylbenzene	mg/kg	0.1	<0.1	<0.1	200	0
			m/p-xylene	mg/kg	0.2	<0.2	<0.2	200	0
			o-xylene	mg/kg	0.1	<0.1	<0.1	200	0
		Polycyclic	Naphthalene	mg/kg	0.1	<0.1	<0.1	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	6.4	6.5	50	1
			d8-toluene (Surrogate)	mg/kg	-	8.6	8.6	50	0
			Bromofluorobenzene (Surrogate)	mg/kg	-	8.7	8.8	50	1
		Totals	Total Xylenes	mg/kg	0.3	<0.3	<0.3	200	0
			Total BTEX	mg/kg	0.6	<0.6	<0.6	200	0

VOCs in Water

Method: ME-(AU)-[ENV]AN433

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE200514.012	LB188926.022	Monocyclic Aromatic	Benzene	µg/L	0.5	<0.5	0.0854038759	200	0
			Toluene	µg/L	0.5	<0.5	0.2071980429	200	0
			Ethylbenzene	µg/L	0.5	<0.5	0.0505162977	200	0
			m/p-xylene	µg/L	1	<1	0.0896322645	200	0
			o-xylene	µg/L	0.5	<0.5	0.0265122635	200	0
		Polycyclic	Naphthalene	µg/L	0.5	<0.5	0.0124535640	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	10.2	10.5219615414	30	3
			d8-toluene (Surrogate)	µg/L	-	9.5	8.3740801435	30	13
			Bromofluorobenzene (Surrogate)	µg/L	-	9.5	9.9286916624	30	5

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE200614.002	LB188893.029		TRH C6-C10	mg/kg	25	<25	<25	200	0
			TRH C6-C9	mg/kg	20	<20	<20	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	9.3	9.1	30	3
			d8-toluene (Surrogate)	mg/kg	-	9.4	9.0	30	4
			Bromofluorobenzene (Surrogate)	mg/kg	-	9.3	8.8	30	6
		VPH F Bands	Benzene (F0)	mg/kg	0.1	<0.1	<0.1	200	0
			TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	200	0
SE200633.003	LB188893.015		TRH C6-C10	mg/kg	25	<25	<25	200	0
			TRH C6-C9	mg/kg	20	<20	<20	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	6.4	6.5	30	1
			d8-toluene (Surrogate)	mg/kg	-	8.6	8.6	30	0
			Bromofluorobenzene (Surrogate)	mg/kg	-	8.7	8.8	30	1
		VPH F Bands	Benzene (F0)	mg/kg	0.1	<0.1	<0.1	200	0
			TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	200	0

Volatile Petroleum Hydrocarbons in Water

Method: ME-(AU)-[ENV]AN433

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE200495.001	LB188926.023		TRH C6-C10	µg/L	50	0	0	200	0
			TRH C6-C9	µg/L	40	0	0	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	10.4850825419	8.3993568596	30	22
			d8-toluene (Surrogate)	µg/L	-	17.3083220109	16.9798986749	30	2
			Bromofluorobenzene (Surrogate)	µg/L	-	10.3327693423	10.6230443999	30	3
		VPH F Bands	Benzene (F0)	µg/L	0.5	0.0619599375	0.0947644652	200	0
			TRH C6-C10 minus BTEX (F1)	µg/L	50	0	0	200	0
SE200514.012	LB188926.022		TRH C6-C10	µg/L	50	<50	3.1799570338	200	0

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Volatile Petroleum Hydrocarbons in Water (continued) — **Method: ME-(AU)-[ENV]AN433**

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE200514.012	LB188926.022		TRH C6-C9	µg/L	40	<40	2.9939881161	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	10.2	10.5219615414	30	3
			d8-toluene (Surrogate)	µg/L	-	9.5	8.3740801435	30	13
			Bromofluorobenzene (Surrogate)	µg/L	-	9.5	9.9286916624	30	5
		VPH F Bands	Benzene (F0)	µg/L	0.5	<0.5	0.0854038759	200	0
			TRH C6-C10 minus BTEX (F1)	µg/L	50	<50	3.1799570338	200	0

Laboratory Control Standard (LCS) results are evaluated against an expected result, typically the concentration of analyte spiked into the control during the sample preparation stage, producing a percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Mercury in Soil

Method: ME-(AU)-[ENV]AN312

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB188903.002	Mercury	mg/kg	0.05	0.23	0.2	70 - 130	115

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB188894.002		Heptachlor	mg/kg	0.1	0.2	0.2	60 - 140	85
		Aldrin	mg/kg	0.1	0.2	0.2	60 - 140	84
		Delta BHC	mg/kg	0.1	0.2	0.2	60 - 140	75
		Dieldrin	mg/kg	0.2	<0.2	0.2	60 - 140	80
		Endrin	mg/kg	0.2	<0.2	0.2	60 - 140	80
		p,p'-DDT	mg/kg	0.1	0.2	0.2	60 - 140	75
	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.12	0.15	40 - 130	79

OP Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB188894.002		Dichlorvos	mg/kg	0.5	1.6	2	60 - 140	81
		Diazinon (Dimpylate)	mg/kg	0.5	2.1	2	60 - 140	106
		Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	2.1	2	60 - 140	105
		Ethion	mg/kg	0.2	1.5	2	60 - 140	76
	Surrogates	2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.5	40 - 130	90
		d14-p-terphenyl (Surrogate)	mg/kg	-	0.4	0.5	40 - 130	81

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB188894.002		Naphthalene	mg/kg	0.1	4.2	4	60 - 140	104
		Acenaphthylene	mg/kg	0.1	4.2	4	60 - 140	105
		Acenaphthene	mg/kg	0.1	4.4	4	60 - 140	111
		Phenanthrene	mg/kg	0.1	4.0	4	60 - 140	100
		Anthracene	mg/kg	0.1	3.5	4	60 - 140	87
		Fluoranthene	mg/kg	0.1	4.1	4	60 - 140	103
		Pyrene	mg/kg	0.1	4.4	4	60 - 140	109
		Benzo(a)pyrene	mg/kg	0.1	4.2	4	60 - 140	104
	Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.5	0.5	40 - 130	94
		2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.5	40 - 130	90
		d14-p-terphenyl (Surrogate)	mg/kg	-	0.4	0.5	40 - 130	81

PAH (Polynuclear Aromatic Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB188931.002		Naphthalene	µg/L	0.1	36	40	60 - 140	89
		Acenaphthylene	µg/L	0.1	38	40	60 - 140	94
		Acenaphthene	µg/L	0.1	39	40	60 - 140	99
		Phenanthrene	µg/L	0.1	37	40	60 - 140	92
		Anthracene	µg/L	0.1	37	40	60 - 140	92
		Fluoranthene	µg/L	0.1	36	40	60 - 140	90
		Pyrene	µg/L	0.1	38	40	60 - 140	94
		Benzo(a)pyrene	µg/L	0.1	42	40	60 - 140	104
	Surrogates	d5-nitrobenzene (Surrogate)	µg/L	-	0.5	0.5	40 - 130	106
		2-fluorobiphenyl (Surrogate)	µg/L	-	0.5	0.5	40 - 130	104
		d14-p-terphenyl (Surrogate)	µg/L	-	0.5	0.5	40 - 130	102

PCBs in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB188894.002	Arochlor 1260	mg/kg	0.2	0.4	0.4	60 - 140	92

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

Method: ME-(AU)-[ENV]AN040/AN320

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB188901.002	Arsenic, As	mg/kg	1	310	318.22	80 - 120	98
	Cadmium, Cd	mg/kg	0.3	5.0	4.62	80 - 120	107
	Chromium, Cr	mg/kg	0.5	33	38.31	80 - 120	85
	Copper, Cu	mg/kg	0.5	300	290	80 - 120	102
	Nickel, Ni	mg/kg	0.5	190	187	80 - 120	101

Laboratory Control Standard (LCS) results are evaluated against an expected result, typically the concentration of analyte spiked into the control during the sample preparation stage, producing a percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES (continued)

Method: ME-(AU)-[ENV]AN040/AN320

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB188901.002		Lead, Pb	mg/kg	1	95	89.9	80 - 120	105
		Zinc, Zn	mg/kg	2	260	273	80 - 120	96

Trace Metals (Dissolved) in Water by ICPMS

Method: ME-(AU)-[ENV]AN318

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB188925.002		Arsenic, As	µg/L	1	20	20	80 - 120	100
		Cadmium, Cd	µg/L	0.1	21	20	80 - 120	103
		Chromium, Cr	µg/L	1	22	20	80 - 120	108
		Copper, Cu	µg/L	1	22	20	80 - 120	110
		Lead, Pb	µg/L	1	21	20	80 - 120	104
		Nickel, Ni	µg/L	1	21	20	80 - 120	106
		Zinc, Zn	µg/L	5	22	20	80 - 120	108

TRH (Total Recoverable Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN403

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB188894.002		TRH C10-C14	mg/kg	20	50	40	60 - 140	125
		TRH C15-C28	mg/kg	45	47	40	60 - 140	118
		TRH C29-C36	mg/kg	45	<45	40	60 - 140	90
	TRH F Bands	TRH >C10-C16	mg/kg	25	49	40	60 - 140	123
		TRH >C16-C34 (F3)	mg/kg	90	<90	40	60 - 140	105
		TRH >C34-C40 (F4)	mg/kg	120	<120	20	60 - 140	85

TRH (Total Recoverable Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN403

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB188931.002		TRH C10-C14	µg/L	50	760	1200	60 - 140	64
		TRH C15-C28	µg/L	200	950	1200	60 - 140	80
		TRH C29-C36	µg/L	200	960	1200	60 - 140	80
	TRH F Bands	TRH >C10-C16	µg/L	60	850	1200	60 - 140	71
		TRH >C16-C34 (F3)	µg/L	500	1100	1200	60 - 140	94
		TRH >C34-C40 (F4)	µg/L	500	<500	600	60 - 140	66

VOC's in Soil

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB188893.002	Monocyclic	Benzene	mg/kg	0.1	5.5	5	60 - 140	111
	Aromatic	Toluene	mg/kg	0.1	5.4	5	60 - 140	109
		Ethylbenzene	mg/kg	0.1	5.7	5	60 - 140	113
		m/p-xylene	mg/kg	0.2	11	10	60 - 140	111
		o-xylene	mg/kg	0.1	5.4	5	60 - 140	108
	Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	9.7	10	70 - 130	97
		d8-toluene (Surrogate)	mg/kg	-	10.2	10	70 - 130	102
		Bromofluorobenzene (Surrogate)	mg/kg	-	9.4	10	70 - 130	94

VOCs in Water

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB188926.002	Monocyclic	Benzene	µg/L	0.5	60	45.45	60 - 140	131
	Aromatic	Toluene	µg/L	0.5	54	45.45	60 - 140	119
		Ethylbenzene	µg/L	0.5	53	45.45	60 - 140	117
		m/p-xylene	µg/L	1	100	90.9	60 - 140	115
		o-xylene	µg/L	0.5	51	45.45	60 - 140	113
	Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	9.5	10	60 - 140	95
		d8-toluene (Surrogate)	µg/L	-	11.6	10	70 - 130	116
		Bromofluorobenzene (Surrogate)	µg/L	-	11.7	10	70 - 130	117

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB188893.002		TRH C6-C10	mg/kg	25	110	92.5	60 - 140	123
		TRH C6-C9	mg/kg	20	98	80	60 - 140	123
	Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	9.7	10	70 - 130	97
		Bromofluorobenzene (Surrogate)	mg/kg	-	9.4	10	70 - 130	94
	VPH F Bands	TRH C6-C10 minus BTEX (F1)	mg/kg	25	80	62.5	60 - 140	128

Volatile Petroleum Hydrocarbons in Water

Method: ME-(AU)-[ENV]AN433

Sample Number	Parameter	Units	LOR

Laboratory Control Standard (LCS) results are evaluated against an expected result, typically the concentration of analyte spiked into the control during the sample preparation stage, producing a percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Volatile Petroleum Hydrocarbons in Water (continued) — **Method: ME-(AU)-[ENV]AN433**

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB188926.002		TRH C6-C10	µg/L	50	1000	946.63	60 - 140	111
		TRH C6-C9	µg/L	40	920	818.71	60 - 140	112
	Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	9.5	10	60 - 140	95
		d8-toluene (Surrogate)	µg/L	-	11.6	10	70 - 130	116
		Bromofluorobenzene (Surrogate)	µg/L	-	11.7	10	70 - 130	117
	VPH F Bands	TRH C6-C10 minus BTEX (F1)	µg/L	50	720	639.67	60 - 140	113

Matrix Spike (MS) results are evaluated as the percentage recovery of an expected result, typically the concentration of analyte spiked into a field sub -sample during the sample preparation stage. The original sample's result is subtracted from the sub-sample result before determining the percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA/QC plan (ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Mercury in Soil

Method: ME-(AU)-[ENV]AN312

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE200611.020	LB188903.004	Mercury	mg/kg	0.05	0.23	<0.05	0.2	100

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE200631.001	LB188894.004		Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	-	-
			Alpha BHC	mg/kg	0.1	<0.1	<0.1	-	-
			Lindane	mg/kg	0.1	<0.1	<0.1	-	-
			Heptachlor	mg/kg	0.1	0.2	<0.1	0.2	100
			Aldrin	mg/kg	0.1	0.5	0.2	0.2	151 ④
			Beta BHC	mg/kg	0.1	<0.1	<0.1	-	-
			Delta BHC	mg/kg	0.1	0.2	<0.1	0.2	90
			Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	-	-
			o,p'-DDE	mg/kg	0.1	<0.1	<0.1	-	-
			Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	-	-
			Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	-	-
			Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	-	-
			trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	-	-
			p,p'-DDE	mg/kg	0.1	<0.1	<0.1	-	-
			Dieldrin	mg/kg	0.2	0.4	0.2	0.2	76
			Endrin	mg/kg	0.2	0.2	<0.2	0.2	100
			o,p'-DDD	mg/kg	0.1	<0.1	<0.1	-	-
			o,p'-DDT	mg/kg	0.1	<0.1	<0.1	-	-
			Beta Endosulfan	mg/kg	0.2	<0.2	<0.2	-	-
			p,p'-DDD	mg/kg	0.1	<0.1	<0.1	-	-
			p,p'-DDT	mg/kg	0.1	0.2	<0.1	0.2	90
			Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	-	-
			Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1	-	-
			Methoxychlor	mg/kg	0.1	<0.1	<0.1	-	-
			Endrin Ketone	mg/kg	0.1	<0.1	<0.1	-	-
			Isodrin	mg/kg	0.1	<0.1	<0.1	-	-
			Mirex	mg/kg	0.1	<0.1	<0.1	-	-
			Total CLP OC Pesticides	mg/kg	1	2	<1	-	-
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.13	0.13	-	87

OP Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE200631.001	LB188894.004		Dichlorvos	mg/kg	0.5	1.3	<0.5	2	65
			Dimethoate	mg/kg	0.5	<0.5	<0.5	-	-
			Diazinon (Dimpylate)	mg/kg	0.5	2.4	<0.5	2	120
			Fenitrothion	mg/kg	0.2	<0.2	<0.2	-	-
			Malathion	mg/kg	0.2	<0.2	<0.2	-	-
			Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	2.5	<0.2	2	123
			Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2	<0.2	-	-
			Bromophos Ethyl	mg/kg	0.2	<0.2	<0.2	-	-
			Methidathion	mg/kg	0.5	<0.5	<0.5	-	-
			Ethion	mg/kg	0.2	1.9	<0.2	2	95
			Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	<0.2	-	-
			Total OP Pesticides*	mg/kg	1.7	8.1	<1.7	-	-
		Surrogates	2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.4	-	89
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.4	0.4	-	85

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN420

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE200631.001	LB188894.004	Naphthalene	mg/kg	0.1	4.8	<0.1	4	119
		2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	-	-
		1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	-	-
		Acenaphthylene	mg/kg	0.1	4.9	<0.1	4	123
		Acenaphthene	mg/kg	0.1	5.1	<0.1	4	128
		Fluorene	mg/kg	0.1	<0.1	<0.1	-	-
		Phenanthrene	mg/kg	0.1	4.6	<0.1	4	115

Matrix Spike (MS) results are evaluated as the percentage recovery of an expected result, typically the concentration of analyte spiked into a field sub -sample during the sample preparation stage. The original sample's result is subtracted from the sub-sample result before determining the percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA/QC plan (ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

PAH (Polynuclear Aromatic Hydrocarbons) in Soil (continued)

Method: ME-(AU)-[ENV]AN420

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE200631.001	LB188894.004		Anthracene	mg/kg	0.1	3.9	<0.1	4	98
			Fluoranthene	mg/kg	0.1	4.7	<0.1	4	116
			Pyrene	mg/kg	0.1	5.2	<0.1	4	127
			Benzo(a)anthracene	mg/kg	0.1	<0.1	<0.1	-	-
			Chrysene	mg/kg	0.1	<0.1	<0.1	-	-
			Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	<0.1	-	-
			Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	-	-
			Benzo(a)pyrene	mg/kg	0.1	4.9	<0.1	4	121
			Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	-	-
			Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1	-	-
			Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	-	-
			Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.2	4.9	<0.2	-	-
			Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	5.0	<0.3	-	-
			Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	5.0	<0.2	-	-
			Total PAH (18)	mg/kg	0.8	38	<0.8	-	-
		Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.5	0.5	-	96
			2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.4	-	89
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.4	0.4	-	85

PCBs in Soil

Method: ME-(AU)-[ENV]AN420

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE200631.001	LB188894.004		Arochlor 1016	mg/kg	0.2	<0.2	<0.2	-	-
			Arochlor 1221	mg/kg	0.2	<0.2	<0.2	-	-
			Arochlor 1232	mg/kg	0.2	<0.2	<0.2	-	-
			Arochlor 1242	mg/kg	0.2	<0.2	<0.2	-	-
			Arochlor 1248	mg/kg	0.2	<0.2	<0.2	-	-
			Arochlor 1254	mg/kg	0.2	<0.2	<0.2	-	-
			Arochlor 1260	mg/kg	0.2	0.4	<0.2	0.4	99
			Arochlor 1262	mg/kg	0.2	<0.2	<0.2	-	-
			Arochlor 1268	mg/kg	0.2	<0.2	<0.2	-	-
			Total PCBs (Arochlors)	mg/kg	1	<1	<1	-	-
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0	0	-	77

TRH (Total Recoverable Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN403

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE200631.001	LB188894.004		TRH C10-C14	mg/kg	20	48	<20	40	120
			TRH C15-C28	mg/kg	45	<45	<45	40	108
			TRH C29-C36	mg/kg	45	48	<45	40	120
			TRH C37-C40	mg/kg	100	<100	<100	-	-
			TRH C10-C36 Total	mg/kg	110	<110	<110	-	-
			TRH >C10-C40 Total (F bands)	mg/kg	210	<210	<210	-	-
		TRH F Bands	TRH >C10-C16	mg/kg	25	45	<25	40	113
			TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	45	<25	-	-
			TRH >C16-C34 (F3)	mg/kg	90	<90	<90	40	128
			TRH >C34-C40 (F4)	mg/kg	120	<120	<120	-	-

VOC's in Soil

Method: ME-(AU)-[ENV]AN433

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE200631.001	LB188893.004	Monocyclic	Benzene	mg/kg	0.1	5.6	<0.1	5	112
		Aromatic	Toluene	mg/kg	0.1	5.6	<0.1	5	110
			Ethylbenzene	mg/kg	0.1	5.8	<0.1	5	117
			m/p-xylene	mg/kg	0.2	11	<0.2	10	114
			o-xylene	mg/kg	0.1	5.6	<0.1	5	111
		Polycyclic	Naphthalene	mg/kg	0.1	5.9	<0.1	-	-
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	9.7	9.4	10	97
			d8-toluene (Surrogate)	mg/kg	-	10.4	9.5	10	104
			Bromofluorobenzene (Surrogate)	mg/kg	-	9.6	9.0	10	96
		Totals	Total Xylenes	mg/kg	0.3	17	<0.3	-	-
			Total BTEX	mg/kg	0.6	34	<0.6	-	-

VOCs in Water

Method: ME-(AU)-[ENV]AN433

QC Sample	Sample Number	Parameter	Units	LOR

Matrix Spike (MS) results are evaluated as the percentage recovery of an expected result, typically the concentration of analyte spiked into a field sub -sample during the sample preparation stage. The original sample's result is subtracted from the sub-sample result before determining the percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA/QC plan (ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

VOCs in Water (continued)

Method: ME-(AU)-[ENV]AN433

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE200615.004	LB188926.024	Monocyclic	Benzene	µg/L	0.5	49	<0.5	45.45	109
		Aromatic	Toluene	µg/L	0.5	51	<0.5	45.45	112
			Ethylbenzene	µg/L	0.5	50	<0.5	45.45	110
			m/p-xylene	µg/L	1	100	<1	90.9	111
			o-xylene	µg/L	0.5	50	<0.5	45.45	111
		Polycyclic	Naphthalene	µg/L	0.5	49	<0.5	-	-
		Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	10	10.3	-	104
			d8-toluene (Surrogate)	µg/L	-	10	8.9	-	100
			Bromofluorobenzene (Surrogate)	µg/L	-	11	9.7	-	106

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE200631.001	LB188893.005		TRH C6-C10	mg/kg	25	110	<25	92.5	115
			TRH C6-C9	mg/kg	20	91	<20	80	113
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	9.7	9.4	10	97
			d8-toluene (Surrogate)	mg/kg	-	10.4	9.5	10	104
			Bromofluorobenzene (Surrogate)	mg/kg	-	9.6	9.0	-	96
		VPH F	Benzene (F0)	mg/kg	0.1	5.6	<0.1	-	-
		Bands	TRH C6-C10 minus BTEX (F1)	mg/kg	25	72	<25	62.5	115

Volatile Petroleum Hydrocarbons in Water

Method: ME-(AU)-[ENV]AN433

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE200615.004	LB188926.024		TRH C6-C10	µg/L	50	700	<50	946.63	73
			TRH C6-C9	µg/L	40	640	<40	818.71	77
		Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	10	10.3	-	104
			d8-toluene (Surrogate)	µg/L	-	10	8.9	-	100
			Bromofluorobenzene (Surrogate)	µg/L	-	11	9.7	-	106
		VPH F	Benzene (F0)	µg/L	0.5	49	<0.5	-	-
		Bands	TRH C6-C10 minus BTEX (F1)	µg/L	50	400	<50	639.67	61

MATRIX SPIKE DUPLICATES

SE200615 R0

Matrix spike duplicates are calculated as Relative Percent Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The original result is the analyte concentration of the matrix spike. The Duplicate result is the analyte concentration of the matrix spike duplicate.

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

QC Sample	Sample Number	Parameter	Units	LOR

Samples analysed as received.

Solid samples expressed on a dry weight basis.

QC criteria are subject to internal review according to the SGS QA/QC plan and may be provided on request or alternatively can be found here: https://www.sgs.com.au/~/media/Local/Australia/Documents/Technical Documents/MP-AU-ENV-QU-022 QA QC Plan.pdf

*	NATA accreditation does not cover the performance of this service.
**	Indicative data, theoretical holding time exceeded.
-	Sample not analysed for this analyte.
IS	Insufficient sample for analysis.
LNR	Sample listed, but not received.
LOR	Limit of reporting.
QFH	QC result is above the upper tolerance.
QFL	QC result is below the lower tolerance.

①	At least 2 of 3 surrogates are within acceptance criteria.
②	RPD failed acceptance criteria due to sample heterogeneity.
③	Results less than 5 times LOR preclude acceptance criteria for RPD.
④	Recovery failed acceptance criteria due to matrix interference.
⑤	Recovery failed acceptance criteria due to the presence of significant concentration of analyte (i.e. the concentration of analyte exceeds the spike level).
⑥	LOR was raised due to sample matrix interference.
⑦	LOR was raised due to dilution of significantly high concentration of analyte in sample.
⑧	Reanalysis of sample in duplicate confirmed sample heterogeneity and inconsistency of results.
⑨	Recovery failed acceptance criteria due to sample heterogeneity.
⑩	LOR was raised due to high conductivity of the sample (required dilution).
†	Refer to Analytical Report comments for further information.

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revised

CHAIN OF CUSTODY FORM - Client

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08 8967 1201 | darwin@envirolab.com.au

Client: Golder Associates	Client Project Name/Number/Site etc (le report title):
Contact Person: Cameron Williams	Gran Central 19130799
Project Mgr: Shane Doyle	PO No.:PO23978
Sampler: Cameron Williams	Envirolab Quote No. :
Address:	Date results required: Standard T/A
Level 8, 40 Mount Street	Or choose: standard / same day / 1 day / 2 day / 3 day
North Sydney NSW 2060	*Note: Inform lab in advance if urgent turnaround is required - surcharges apply*
Phone: Mob: 0437 099 883	Additional report format: esdat / equis /
Email: cawilliams@golder.com.au sdoyle@golder.com.au	Lab Comments:

Sample Information					Tests Required													Comments
Envirolab Sample ID	Client Sample ID or Information	Depth	Date sampled	Type of sample	Combination 6													Provide as much information about the sample as you can
1	QCB100	0.45-0.60	18/11/2019	Soil	✓													HOLD

☐ *Please tick the box if observed settled sediment present in water samples is to be included in the extraction and/or analysis*

Relinquished by (Golder):		Received by (Company): BONS	ELS	*Lab Use Only*	
Print Name:	Cameron Williams	Print Name: Kevin	JD / JYH	Job number: 231035	Cooling: Ice / Ice pack / None
Date & Time:	18/11/2019 - 14:45	Date & Time: 18/11 - 14:45	19/11 8:40am	Temperature: 13 - 1	Security seal: Intact / Broken / None
Signature:		Signature:		TAT Req - SAME day / 1 / 2 / 3 / 4 / STD	

Samples recd: 18/11 16:11.

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	Golder Associates Pty Ltd
Attention	Shane Doyle, Cameron Williams

Sample Login Details

Your reference	Gran Central 19130799
Envirolab Reference	231035
Date Sample Received	18/11/2019
Date Instructions Received	19/11/2019
Date Results Expected to be Reported	25/11/2019

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	1 Soil
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	13.1
Cooling Method	Ice + 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
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Sample ID	vTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticides in soil	Organophosphorus Pesticides in Soil	PCBsin Soil	Acid Extractable metalsin soil
QCB100-0.45-0.60	✓	✓	✓	✓	✓	✓	✓

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.
Please contact the laboratory immediately if observed settled sediment present in water samples is to be included in the extraction and/or analysis (exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS analysis where solids are included by default.
TAT for Micro is dependent on incubation. This varies from 3 to 6 days.

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www.envirolab.com.au

CERTIFICATE OF ANALYSIS 231035

Client Details

Client	Golder Associates Pty Ltd
Attention	Shane Doyle, Cameron Williams
Address	124 Pacific Highway, St Leonards, NSW, 2065

Sample Details

Your Reference	**Gran Central 19130799**
Number of Samples	1 Soil
Date samples received	18/11/2019
Date completed instructions received	19/11/2019

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.

Report Details

Date results requested by	25/11/2019
Date of Issue	22/11/2019

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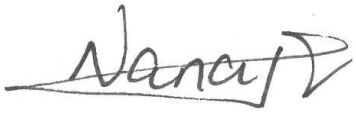
Results Approved By
Jaimie Loa-Kum-Cheung, Metals Supervisor
Josh Williams, Senior Chemist

Authorised By



Nancy Zhang, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil		
Our Reference		231035-1
Your Reference	UNITS	QCB100
Depth		0.45-0.60
Date Sampled		18/11/2019
Type of sample		Soil
Date extracted	-	20/11/2019
Date analysed	-	21/11/2019
TRH C_6 - C_9	mg/kg	<25
TRH C_6 - C_{10}	mg/kg	<25
vTPH 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	<3
Surrogate aaa-Trifluorotoluene	%	84

svTRH (C10-C40) in Soil		
Our Reference		231035-1
Your Reference	UNITS	QCB100
Depth		0.45-0.60
Date Sampled		18/11/2019
Type of sample		Soil
Date extracted	-	20/11/2019
Date analysed	-	21/11/2019
TRH C_{10} - C_{14}	mg/kg	<50
TRH C_{15} - C_{28}	mg/kg	<100
TRH C_{29} - C_{36}	mg/kg	<100
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	%	80

PAHs in Soil		
Our Reference		231035-1
Your Reference	UNITS	QCB100
Depth		0.45-0.60
Date Sampled		18/11/2019
Type of sample		Soil
Date extracted	-	20/11/2019
Date analysed	-	21/11/2019
Naphthalene	mg/kg	<0.1
Acenaphthylene	mg/kg	<0.1
Acenaphthene	mg/kg	<0.1
Fluorene	mg/kg	<0.1
Phenanthrene	mg/kg	<0.1
Anthracene	mg/kg	<0.1
Fluoranthene	mg/kg	<0.1
Pyrene	mg/kg	<0.1
Benzo(a)anthracene	mg/kg	<0.1
Chrysene	mg/kg	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2
Benzo(a)pyrene	mg/kg	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1
Total +ve PAH's	mg/kg	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5
Surrogate p-Terphenyl-d14	%	96

Organochlorine Pesticides in soil		
Our Reference		231035-1
Your Reference	UNITS	QCB100
Depth		0.45-0.60
Date Sampled		18/11/2019
Type of sample		Soil
Date extracted	-	20/11/2019
Date analysed	-	21/11/2019
alpha-BHC	mg/kg	<0.1
HCB	mg/kg	<0.1
beta-BHC	mg/kg	<0.1
gamma-BHC	mg/kg	<0.1
Heptachlor	mg/kg	<0.1
delta-BHC	mg/kg	<0.1
Aldrin	mg/kg	<0.1
Heptachlor Epoxide	mg/kg	<0.1
gamma-Chlordane	mg/kg	<0.1
alpha-chlordane	mg/kg	<0.1
Endosulfan I	mg/kg	<0.1
pp-DDE	mg/kg	<0.1
Dieldrin	mg/kg	<0.1
Endrin	mg/kg	<0.1
Endosulfan II	mg/kg	<0.1
pp-DDD	mg/kg	<0.1
Endrin Aldehyde	mg/kg	<0.1
pp-DDT	mg/kg	<0.1
Endosulfan Sulphate	mg/kg	<0.1
Methoxychlor	mg/kg	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1
Surrogate TCMX	%	93

Organophosphorus Pesticides in Soil		
Our Reference		231035-1
Your Reference	UNITS	QCB100
Depth		0.45-0.60
Date Sampled		18/11/2019
Type of sample		Soil
Date extracted	-	20/11/2019
Date analysed	-	21/11/2019
Dichlorvos	mg/kg	<0.1
Dimethoate	mg/kg	<0.1
Diazinon	mg/kg	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1
Ronnel	mg/kg	<0.1
Fenitrothion	mg/kg	<0.1
Malathion	mg/kg	<0.1
Chlorpyriphos	mg/kg	<0.1
Parathion	mg/kg	<0.1
Bromophos-ethyl	mg/kg	<0.1
Ethion	mg/kg	<0.1
Azinphos-methyl (Guthion)	mg/kg	<0.1
Surrogate TCMX	%	93

PCBs in Soil		
Our Reference		231035-1
Your Reference	UNITS	QCB100
Depth		0.45-0.60
Date Sampled		18/11/2019
Type of sample		Soil
Date extracted	-	20/11/2019
Date analysed	-	21/11/2019
Aroclor 1016	mg/kg	<0.1
Aroclor 1221	mg/kg	<0.1
Aroclor 1232	mg/kg	<0.1
Aroclor 1242	mg/kg	<0.1
Aroclor 1248	mg/kg	<0.1
Aroclor 1254	mg/kg	<0.1
Aroclor 1260	mg/kg	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1
Surrogate TCMX	%	93

Acid Extractable metals in soil		
Our Reference		231035-1
Your Reference	UNITS	QCB100
Depth		0.45-0.60
Date Sampled		18/11/2019
Type of sample		Soil
Date prepared	-	20/11/2019
Date analysed	-	20/11/2019
Arsenic	mg/kg	7
Cadmium	mg/kg	<0.4
Chromium	mg/kg	31
Copper	mg/kg	<1
Lead	mg/kg	10
Mercury	mg/kg	<0.1
Nickel	mg/kg	2
Zinc	mg/kg	3

Moisture		
Our Reference		231035-1
Your Reference	UNITS	QCB100
Depth		0.45-0.60
Date Sampled		18/11/2019
Type of sample		Soil
Date prepared	-	20/11/2019
Date analysed	-	21/11/2019
Moisture	%	24

Method ID	Methodology Summary
AT-008	Determination of VOCs sampled onto coconut shell charcoal sorbent tubes, that can be desorbed using carbon disulphide, and analysed by GC-MS.
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-021	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-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-012/017	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS and/or GC-MS/MS.
Org-012/017	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-MS and/or GC-MS/MS. 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.

Method ID	Methodology Summary
Org-012/017	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS and/or GC-MS/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-4	[NT]
Date extracted	-			20/11/2019	[NT]	[NT]	[NT]	[NT]	20/11/2019	[NT]
Date analysed	-			21/11/2019	[NT]	[NT]	[NT]	[NT]	21/11/2019	[NT]
TRH C_6 - C_9	mg/kg	25	Org-016	<25	[NT]	[NT]	[NT]	[NT]	104	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-016	<25	[NT]	[NT]	[NT]	[NT]	104	[NT]
Benzene	mg/kg	0.2	Org-016	<0.2	[NT]	[NT]	[NT]	[NT]	112	[NT]
Toluene	mg/kg	0.5	Org-016	<0.5	[NT]	[NT]	[NT]	[NT]	105	[NT]
Ethylbenzene	mg/kg	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	100	[NT]
m+p-xylene	mg/kg	2	Org-016	<2	[NT]	[NT]	[NT]	[NT]	101	[NT]
o-Xylene	mg/kg	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	101	[NT]
naphthalene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	91	[NT]	[NT]	[NT]	[NT]	93	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	[NT]
Date extracted	-			20/11/2019	[NT]	[NT]	[NT]	[NT]	20/11/2019	[NT]
Date analysed	-			21/11/2019	[NT]	[NT]	[NT]	[NT]	21/11/2019	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	121	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	103	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	123	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	121	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	103	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	123	[NT]
Surrogate o-Terphenyl	%		Org-003	101	[NT]	[NT]	[NT]	[NT]	98	[NT]

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	[NT]
Date extracted	-			20/11/2019	[NT]	[NT]	[NT]	[NT]	20/11/2019	[NT]
Date analysed	-			21/11/2019	[NT]	[NT]	[NT]	[NT]	21/11/2019	[NT]
Naphthalene	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	110	[NT]
Acenaphthylene	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	98	[NT]
Phenanthrene	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	96	[NT]
Anthracene	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	94	[NT]
Pyrene	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	98	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	102	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-012/017	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012/017	<0.05	[NT]	[NT]	[NT]	[NT]	104	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012/017	100	[NT]	[NT]	[NT]	[NT]	94	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	[NT]
Date extracted	-			20/11/2019	[NT]	[NT]	[NT]	[NT]	20/11/2019	[NT]
Date analysed	-			21/11/2019	[NT]	[NT]	[NT]	[NT]	21/11/2019	[NT]
alpha-BHC	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	106	[NT]
HCB	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	88	[NT]
gamma-BHC	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	92	[NT]
delta-BHC	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	100	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	96	[NT]
gamma-Chlordane	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	98	[NT]
Dieldrin	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	110	[NT]
Endrin	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	98	[NT]
Endosulfan II	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	96	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	96	[NT]
Methoxychlor	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-012/017	99	[NT]	[NT]	[NT]	[NT]	85	[NT]

QUALITY CONTROL: Organophosphorus Pesticides in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	[NT]
Date extracted	-			20/11/2019	[NT]	[NT]	[NT]	[NT]	20/11/2019	[NT]
Date analysed	-			21/11/2019	[NT]	[NT]	[NT]	[NT]	21/11/2019	[NT]
Dichlorvos	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	90	[NT]
Dimethoate	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chlorpyriphos-methyl	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	80	[NT]
Fenitrothion	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Malathion	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	72	[NT]
Chlorpyriphos	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	92	[NT]
Parathion	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	90	[NT]
Bromophos-ethyl	mg/kg	0.1	AT-008	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ethion	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	74	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-012/017	99	[NT]	[NT]	[NT]	[NT]	85	[NT]

QUALITY CONTROL: PCBs in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	[NT]
Date extracted	-			20/11/2019	[NT]	[NT]	[NT]	[NT]	20/11/2019	[NT]
Date analysed	-			21/11/2019	[NT]	[NT]	[NT]	[NT]	21/11/2019	[NT]
Aroclor 1016	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	74	[NT]
Aroclor 1260	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-006	99	[NT]	[NT]	[NT]	[NT]	85	[NT]

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	[NT]
Date prepared	-			20/11/2019	[NT]	[NT]	[NT]	[NT]	20/11/2019	[NT]
Date analysed	-			20/11/2019	[NT]	[NT]	[NT]	[NT]	20/11/2019	[NT]
Arsenic	mg/kg	4	Metals-020	<4	[NT]	[NT]	[NT]	[NT]	109	[NT]
Cadmium	mg/kg	0.4	Metals-020	<0.4	[NT]	[NT]	[NT]	[NT]	107	[NT]
Chromium	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	115	[NT]
Copper	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	113	[NT]
Lead	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	111	[NT]
Mercury	mg/kg	0.1	Metals-021	<0.1	[NT]	[NT]	[NT]	[NT]	95	[NT]
Nickel	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	107	[NT]
Zinc	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	113	[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: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-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 sam

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.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

APPENDIX F

Data Validation

GOLDER

DATA VALIDATION SUMMARY SHEET (Sydney)

Project Name:	**Gran Central Development**	**Project Number:**	**19122955**
Primary Laboratory:	**SGS**	**Work order Number:**	**SE196065**
Secondary Laboratory:	**N/A**	**Work order Number:**	**N/A**
Date Sampled:	**30/07/2019**	**Sample Medium:**	**Soil**

Sample Information

Number of Primary Samples:	**2**	**Number of Triplicate Samples:**	**0**
Number of Duplicate Samples:	**0**	**Number of Other QAQC Samples:**	**0**

Documentation and Sample Handling Information

	Y/N	Comments
COC completed properly?	Y	Signed by field staff and laboratory personnel.
All requested analysis completed?	Y	All requested analysis completed .
Samples received intact and chilled?	Y	4.8'C, ice present, samples received in good order.
Samples analysed within appropriate holding times?	Y	All samples were analysed within appropriate holding times.
Sample volumes sufficient for QC analysis?	Y	Sufficient sample volume was provided for laboratory tests.
Are there non-NATA accredited methods used?	N	SGS is not NATA accredited for Total OP Pesticides (accredited for individual pesticides), estimated asbestos fibres and asbestos quantification. SGS is NATA accredited for all other methods in this batch.
Chromatograms supplied as appropriate?	N/A	N/A
Laboratory reports signed by authorised personnel?	Y	All laboratory reports signed by authorised personnel.

QAQC Sample Information (Method Blank - MB, Rinsate Blank - RB, Field Blank - FB, Trip Blank - TB)

Type	Sample ID	Comments
Method Blank	MB	All results were below the LOR.

Trip Spike Information

Analyte	Control Spike Concentrations	Trip Spike Concentration	% Recovery	Comments
Sample ID: No TS analysed as part of this batch.				
-	-	-	-	-

Laboratory Control Spike (LCS) Analyses

Analyte Group	Comments
All	All laboratory control spike recoveries are within laboratory based DQOs.

Matrix Spike (MS) Analyses

Analyte Group	Comments
Metals	Matrix spike recovery for copper (67%), nickel (65%), lead (68%) and zinc (29%) in sample SE196065.001 (BH01_0.14-0.18) exceeded laboratory based data quality objectives (70-130%). *Refer to overall comments* .

Laboratory Duplicates (LD) Analyses

Analyte Group	Sample ID	Comments
All	-	All laboratory duplicate RPDs are within laboratory based DQOs.

Field Duplicates (FD) Analyses

Analyte Group	Primary ID	Duplicate ID	Comments
-	-	-	No FD analysed as part of this batch.

Field Triplicates (FT) Analyses

Analyte Group	Primary ID	Triplicate ID	Comments
-	-	-	No FT analysed as part of this batch.

Surrogate Compound Monitoring Analyses

Analyte Group	Analyte(s)	Comments
All	-	All surrogate recoveries are within laboratory based DQOs.

Overall Comments

MS recoveries for copper (67%), nickel (65%), lead (68%) and zinc (29%) in sample SE196065.001 (BH01_0.14-0.18) were below the acceptable data quality objectives, indicating the potential for under-reporting of these analytes. As reported by SGS: "Recovery failed acceptance criteria due to matrix interference". It is noted that with the exception of zinc, the MS recoveries were marginally (2-5%) less than the lower data quality objectives.

This batch has been validated and is considered suitable for environmental interpretive use.

Note: Data validation assesses each analyte in terms of all the data validation variables and only the exceedances and outliers are reported in this form.

*When concentrations are less than the LOR for both primary and duplicate/triplicate results, no RPDs are calculated

Performed By:	**Pauline Voukidis**	**Checked By:**	**Rita Bonetti**
Date:	**4/09/2019**	**Date:**	**5/09/2019**

GOLDER

DATA VALIDATION SUMMARY SHEET (Sydney)

Project Name:	**Gran Central Development**	**Project Number:**	**19122955**
Primary Laboratory:	**SGS**	**Work order Number:**	**SE196066**
Secondary Laboratory:	**N/A**	**Work order Number:**	**N/A**
Date Sampled:	**31/07/2019**	**Sample Medium:**	**Soil**

Sample Information

Number of Primary Samples:	**2**	**Number of Triplicate Samples:**	**0**
Number of Duplicate Samples:	**0**	**Number of Other QAQC Samples:**	**0**

Documentation and Sample Handling Information

	Y/N	Comments
COC completed properly?	Y	Signed by field staff and laboratory personnel.
All requested analysis completed?	Y	All requested analysis completed.
Samples received intact and chilled?	Y	4.8'C, ice present, samples received in good order.
Samples analysed within appropriate holding times?	Y	All samples were analysed within appropriate holding times.
Sample volumes sufficient for QC analysis?	Y	Sufficient sample volume was provided for laboratory tests.
Are there non-NATA accredited methods used?	N	SGS is not NATA accredited for Total OP Pesticides (accredited for individual pesticides), estimated asbestos fibres and asbestos quantification. SGS is NATA accredited for all other methods in this batch.
Chromatograms supplied as appropriate?	N/A	N/A
Laboratory reports signed by authorised personnel?	Y	Laboratory reports signed by authorised personnel.

QAQC Sample Information (Method Blank - MB, Rinsate Blank - RB, Field Blank - FB, Trip Blank - TB)

Type	Sample ID	Comments
Method Blank	MB	All results were below the LOR.

Trip Spike Information

Analyte	Control Spike Concentrations	Trip Spike Concentration	% Recovery	Comments
Sample ID: No TS analysed as part of this batch.				
-	-	-	-	-

Laboratory Control Spike (LCS) Analyses

Analyte Group	Comments
All	All laboratory control spike recoveries are within laboratory based DQOs.

Matrix Spike (MS) Analyses

Analyte Group	Comments
All	Matrix spike recovery for copper (67%), nickel (65%), lead (68%) and zinc (29%) in sample SE196065.001 (BH01_0.14-0.18) exceeded laboratory based data quality objectives (70-130%). *Refer to overall comments* .

Laboratory Duplicates (LD) Analyses

Analyte Group	Sample ID	Comments
All	-	All laboratory duplicate RPDs are within laboratory based DQOs.

Field Duplicates (FD) Analyses

Analyte Group	Primary ID	Duplicate ID	Comments
-	-	-	No FD analysed as part of this batch.

Field Triplicates (FT) Analyses

Analyte Group	Primary ID	Triplicate ID	Comments
-	-	-	No FT analysed as part of this batch.

Surrogate Compound Monitoring Analyses

Analyte Group	Analyte(s)	Comments
All	-	All surrogate recoveries are within laboratory based DQOs.

Overall Comments

MS recoveries for copper (67%), nickel (65%), lead (68%) and zinc (29%) in sample SE196065.001 (BH01_0.14-0.18) were below the acceptable data quality objectives, indicating the potential for under-reporting of these analytes. As reported by SGS: "Recovery failed acceptance criteria due to matrix interference". It is noted that while this sample (SE196065.001) is not directly associated with this batch (SE196066), it is not considered anonymous as this sample was analysed as part of another batch collected from the site. Refer to the data validation sheet for batch SE196065 for further discussion.

This batch has been validated and is considered suitable for environmental interpretive use.

Note: Data validation assesses each analyte in terms of all the data validation variables and only the exceedances and outliers are reported in this form.

*When concentrations are less than the LOR for both primary and duplicate/triplicate results, no RPDs are calculated

Performed By:	**Pauline Voukidis**	**Checked By:**	**Rita Bonetti**
Date:	**4/09/2019**	**Date:**	**5/09/2019**

GOLDER

DATA VALIDATION SUMMARY SHEET (Sydney)

Project Name:	**Gran Central Development**	**Project Number:**	**19122955**
Primary Laboratory:	**SGS**	**Work order Number:**	**SE196067**
Secondary Laboratory:	**Envirolab**	**Work order Number:**	**223049**
Date Sampled:	**1/08/2019**	**Sample Medium:**	**Soil**

Sample Information

Number of Primary Samples:	**3**	**Number of Triplicate Samples:**	**1**
Number of Duplicate Samples:	**1**	**Number of Other QAQC Samples:**	**0**

Documentation and Sample Handling Information

	Y/N	Comments
COC completed properly?	Y	Signed by field staff and laboratory personnel (SGS & Envirolab).
All requested analysis completed?	Y	All requested analysis completed (SGS & Envirolab).
Samples received intact and chilled?	N	SGS: 4.8'C, ice present, samples received in good order. Envirolab: 11.2'C, ice present, samples received in appropriate condition for analysis. *Refer to overall comments.*
Samples analysed within appropriate holding times?	Y	All samples were analysed within appropriate holding times (SGS & Envirolab).
Sample volumes sufficient for QC analysis?	Y	Sufficient sample volume was provided for laboratory tests (SGS & Envirolab).
Are there non-NATA accredited methods used?	N	SGS is not NATA accredited for Total OP Pesticides (accredited for individual pesticides), estimated asbestos fibres and asbestos quantification. SGS is NATA accredited for all other methods in this batch. Envirolab is NATA accredited for methods in this batch.
Chromatograms supplied as appropriate?	N/A	N/A
Laboratory reports signed by authorised personnel?	Y	All laboratory reports signed by authorised personnel (SGS & Envirolab).

QAQC Sample Information (Method Blank - MB, Rinsate Blank - RB, Field Blank - FB, Trip Blank - TB)

Type	Sample ID	Comments
Method Blank	MB	All results were below the LOR (SGS & Envirolab).

Trip Spike Information

Analyte	Control Spike Concentrations	Trip Spike Concentration	% Recovery	Comments
Sample ID: No TS analysed as part of this batch.				
-	-	-	-	-

Laboratory Control Spike (LCS) Analyses

Analyte Group	Comments
All	SGS & Envirolab: All laboratory control spike recoveries are within laboratory based DQOs.

Matrix Spike (MS) Analyses

Analyte Group	Comments
All	SGS: Matrix spike recovery for copper (67%), nickel (65%), lead (68%) and zinc (29%) in sample SE196065.001 (BH01_0.14-0.18) exceeded laboratory based data quality objectives (70-130%). *Refer to overall comments* .
-	Envirolab: No MS recoveries reported.

Laboratory Duplicates (LD) Analyses

Analyte Group	Sample ID	Comments
All	-	SGS: All laboratory duplicate RPDs are within laboratory based DQOs.
-	-	Envirolab: No LD RPDs reported.

Field Duplicates (FD) Analyses

Analyte Group	Primary ID	Duplicate ID	Comments
Metals	BH03_0.80-0.90	DU2	FD RPD for lead (57%) is not within data quality objectives. (*Refer to overall comments*).

Field Triplicates (FT) Analyses

Analyte Group	Primary ID	Triplicate ID	Comments
-	BH03_0.80-0.90	TR1	All field triplicate RPDs are within DQOs.

Surrogate Compound Monitoring Analyses

Analyte Group	Analyte(s)	Comments
All	-	SGS & Envirolab: All surrogate recoveries are within laboratory based DQOs.

Overall Comments

Envirolab: A sample receipt temperature (11.2˚C) above recommended sample temperature was reported. The elevated temperature is not expected to significantly impact the overall quality of the data as Envirolab was the secondary laboratory and all field triplicate RPDs were within acceptable data quality objectives.

Envirolab: "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."

MS recoveries for copper (67%), nickel (65%), lead (68%) and zinc (29%) in sample SE196065.001 (BH01_0.14-0.18) were below the acceptable data quality objectives, indicating the potential for under-reporting of these analytes. As reported by SGS: "Recovery failed acceptance criteria due to matrix interference". It is noted that while this sample (SE196065.001) is not directly associated with this batch (SE196066), it is not considered anonymous as this sample was analysed as part of another batch collected from the site. Refer to the data validation sheet for batch SE196065 for further discussion.

FD RPD for lead (57%) was not within data quality objectives. The high RPD may be attributed to the small laboratory sub-sample size and/or as samples were not homogenised during collection. As a conservative measure, the highest concentration will be used for interpretive purposes.

This batch has been validated and is considered suitable for environmental interpretive use.

Note: Data validation assesses each analyte in terms of all the data validation variables and only the exceedances and outliers are reported in this form.

*When concentrations are less than the LOR for both primary and duplicate/triplicate results, no RPDs are calculated

Performed By:	**Pauline Voukidis**	**Checked By:**	**Rita Bonetti**
Date:	**4/09/2019**	**Date:**	**5/09/2019**

GOLDER

DATA VALIDATION SUMMARY SHEET (Sydney)

Project Name:	**Gran Central Development**	**Project Number:**	**19122955**
Primary Laboratory:	**SGS**	**Work order Number:**	**SE196071**
Secondary Laboratory:	**N/A**	**Work order Number:**	**N/A**
Date Sampled:	**29/07/2019**	**Sample Medium:**	**Soil**

Sample Information

Number of Primary Samples:	**3**	**Number of Triplicate Samples:**	**0**
Number of Duplicate Samples:	**1**	**Number of Other QAQC Samples:**	**1**

Documentation and Sample Handling Information

	Y/N	Comments
COC completed properly?	Y	Signed by field staff and laboratory personnel.
All requested analysis completed?	N	Sample BH04_0.10-0.20 was not analysed for asbestos WA DoH NEPM due to insufficient sample volume. All other requested analysis completed.
Samples received intact and chilled?	Y	4.8'C, ice present, samples received in good order.
Samples analysed within appropriate holding times?	N	Sample 'Rinsate Water' was extracted one day overdue for TRH, VOCs and volatile petroleum hydrocarbons. All other samples were analysed within appropriate holding times.
Sample volumes sufficient for QC analysis?	Y	Sufficient sample volume was provided for laboratory tests.
Are there non-NATA accredited methods used?	N	SGS is not NATA accredited for Total OP Pesticides (accredited for individual pesticides) and estimated asbestos fibres. SGS is NATA accredited for all other methods in this batch.
Chromatograms supplied as appropriate?	N/A	N/A
Laboratory reports signed by authorised personnel?	Y	All laboratory reports signed by authorised personnel.

QAQC Sample Information (Method Blank - MB, Rinsate Blank - RB, Field Blank - FB, Trip Blank - TB)

Type	Sample ID	Comments
Method Blank	MB	All results were below the LOR. It is noted that surrogate exceedances were reported for the method blank for VOCs in water and volatile petroleum hydrocarbons in water. The surrogate recoveries ranged between 100% and 105% which is considered acceptable.
Rinsate Blank	Rinsate Water	All results were below the LOR.

Trip Spike Information

Analyte	Control Spike Concentrations	Trip Spike Concentration	% Recovery	Comments
Sample ID: No TS analysed as part of this batch.				
-	-	-	-	-

Laboratory Control Spike (LCS) Analyses

Analyte Group	Comments
All	All laboratory control spike recoveries are within laboratory based DQOs.

Matrix Spike (MS) Analyses

Analyte Group	Comments
All	Matrix spike recovery for copper (67%), nickel (65%), lead (68%) and zinc (29%) in sample SE196065.001 (BH01_0.14-0.18) exceeded laboratory based data quality objectives (70-130%). *Refer to overall comments* .

Laboratory Duplicates (LD) Analyses

Analyte Group	Sample ID	Comments
All	-	All laboratory duplicate RPDs are within laboratory based DQOs.

Field Duplicates (FD) Analyses

Analyte Group	Primary ID	Duplicate ID	Comments
PAH	BH04_1.05-1.15	DU1	FD RPDs for BaP (164%), benzo(b-j)fluoranthene (169%), fluoranthene (169%), pyrene (1713%) and sum of 16 PAHs (165%) are not within data quality objectives. *Refer to overall comments* .

Field Triplicates (FT) Analyses

Analyte Group	Primary ID	Triplicate ID	Comments
-	-	-	No FT analysed as part of this batch.

Surrogate Compound Monitoring Analyses

Analyte Group	Analyte(s)	Comments
All	-	All surrogate recoveries are within laboratory based DQOs.

Overall Comments

Sample 'Rinsate Water' was extracted one day overdue for TRH, VOCs and volatile petroleum hydrocarbons. This is not considered to significantly impact the interpretation of the dataset as the exceedance was marginal (1 day) and the sample is a quality control sample. It is further noted that the sample was received by the laboratory in good condition and chilled to 4.8'C.

MS recoveries for copper (67%), nickel (65%), lead (68%) and zinc (29%) in sample SE196065.001 (BH01_0.14-0.18) were below the acceptable data quality objectives, indicating the potential for under-reporting of these analytes. As reported by SGS: "Recovery failed acceptance criteria due to matrix interference". It is noted that while this sample (SE196065.001) is not directly associated with this batch (SE196066), it is not considered anonymous as this sample was analysed as part of another batch collected from the site. Refer to the data validation sheet for batch SE196065 for further discussion.

FD RPDs for BaP (164%), benzo(b-j)fluoranthene (169%), fluoranthene (169%), pyrene (1713%) and sum of 16 PAHs (165%) are not within data quality objectives. The high RPDs may be attributed to the small laboratory sub-sample size and/or as samples were not homogenised during collection. As a conservative measure, the highest concentration will be used for interpretive purposes.

This batch has been validated and is considered suitable for environmental interpretive use.

Note: Data validation assesses each analyte in terms of all the data validation variables and only the exceedances and outliers are reported in this form.

*When concentrations are less than the LOR for both primary and duplicate/triplicate results, no RPDs are calculated

Performed By:	**Pauline Voukidis**	**Checked By:**	**Rita Bonetti**
Date:	**4/09/2019**	**Date:**	**5/09/2019**

Project: Gran Central Development
Duplicate Analysis RPDs
Project No. : 19122955
Batch/es: SE196071

		Sample ID	BH04_1.05-1.15	DU1	N/A		
		Sample Type	Primary	Field Duplicate	Field Triplicate		
		Date Sampled	29/07/2019	29/07/2019	N/A		
						RPDs	
Analyte	**Units**	**LOR**				**Primary vs Duplicate**	**Primary vs Triplicate**
TRH							
TRH C6 - C10 Fraction F1	mg/kg	25	<25	<25	-	ND	-
TRH C6 - C10 Fraction Less BTEX F1	mg/kg	25	<25	<25	-	ND	-
TRH >C10 - C16 Fraction F2	mg/kg	25	<25	<25	-	ND	-
TRH >C10 - C16 Fraction Less Naphthalene (F2)	mg/kg	25	<25	<25	-	ND	-
TRH >C16 - C34 Fraction F3	mg/kg	90	**140**	<90	-	43%	-
TRH >C34 - C40 Fraction F4	mg/kg	120	<120	<120	-	ND	-
TRH C37 - C40 Fraction	mg/kg	100	<100	<100	-	ND	-
TRH+C10 - C40 (Sum of total) (Lab Reported)	mg/kg	210	<210	<210	-	ND	-
TPH							
TRH C6 - C9 Fraction	mg/kg	20	<20	<20	-	ND	-
TRH C10 - C14 Fraction	mg/kg	20	<20	<20	-	ND	-
TRH C15 - C28 Fraction	mg/kg	45	**69**	<45	-	42%	-
TRH C29 - C36 Fraction	mg/kg	45	**87**	<45	-	64%	-
TRH+C10 - C36 (Sum of total) (Lab Reported)	mg/kg	110	**160**	<110	-	37%	-
BTEX							
Benzene	mg/kg	0.1	<0.1	<0.1	-	ND	-
Toluene	mg/kg	0.1	<0.1	<0.1	-	ND	-
Ethylbenzene	mg/kg	0.1	<0.1	<0.1	-	ND	-
Xylenes (m & p)	mg/kg	0.2	<0.2	<0.2	-	ND	-
Xylene (o)	mg/kg	0.1	<0.1	<0.1	-	ND	-
Xylenes (Sum of total) (Lab Reported)	mg/kg	0.3	<0.3	<0.3	-	ND	-
Total BTEX	mg/kg	0.6	<0.6	<0.6	-	ND	-
Metals							
Arsenic	mg/kg	1	**8**	**7**	-	13%	-
Cadmium	mg/kg	0.3	<0.3	<0.3	-	ND	-
Chromium	mg/kg	0.5	**24**	**22**	-	9%	-
Copper	mg/kg	0.5	**3.4**	**3.4**	-	0%	-
Lead	mg/kg	1	**14**	**14**	-	0%	-
Mercury	mg/kg	0.05	<0.05	<0.05	-	ND	-
Nickel	mg/kg	0.5	<0.5	<0.5	-	ND	-
Zinc	mg/kg	2	**5.8**	**5.4**	-	7%	-
OCP							
p,p-DDE	mg/kg		<0.1	<0.1	-	ND	-
Heptachlor & heptachlor epoxide (Sum Lab Repo	mg/kg		<0.1	<0.1	-	ND	-
2,4-DDT	mg/kg	0.1	<0.1	<0.1	-	ND	-
a-BHC	mg/kg	0.1	<0.1	<0.1	-	ND	-
Aldrin	mg/kg	0.1	<0.1	<0.1	-	ND	-
Dieldrin	mg/kg	0.2	<0.2	<0.2	-	ND	-
b-BHC	mg/kg	0.1	<0.1	<0.1	-	ND	-
cis-Chlordane	mg/kg	0.1	<0.1	<0.1	-	ND	-
gamma-Chlordane	mg/kg	0.1	<0.1	<0.1	-	ND	-
d-BHC	mg/kg	0.1	<0.1	<0.1	-	ND	-
DDD	mg/kg	0.1	<0.1	<0.1	-	ND	-
DDT	mg/kg	0.1	<0.1	<0.1	-	ND	-
Endosulfan I	mg/kg	0.2	<0.2	<0.2	-	ND	-
Endosulfan II	mg/kg	0.2	<0.2	<0.2	-	ND	-
Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	-	ND	-
Endrin	mg/kg	0.2	<0.2	<0.2	-	ND	-
Endrin aldehyde	mg/kg	0.1	<0.1	<0.1	-	ND	-
Endrin ketone	mg/kg	0.1	<0.1	<0.1	-	ND	-
g-BHC	mg/kg	0.1	<0.1	<0.1	-	ND	-
Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	-	ND	-
Hexachlorobenzene	mg/kg	0.1	<0.1	<0.1	-	ND	-
Isodrin	mg/kg	0.1	<0.1	<0.1	-	ND	-
Methoxychlor	mg/kg	0.1	<0.1	<0.1	-	ND	-
Mirex	mg/kg	0.1	<0.1	<0.1	-	ND	-
o,p-DDD	mg/kg	0.1	<0.1	<0.1	-	ND	-
o,p-DDE	mg/kg	0.1	<0.1	<0.1	-	ND	-
trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	-	ND	-
OPP					-		
OPP (Sum of total)	mg/kg		<1.7	<1.7	-	ND	-
Azinphos-methyl	mg/kg	0.2	<0.2	<0.2	-	ND	-
Bromophos-ethyl	mg/kg	0.2	<0.2	<0.2	-	ND	-
Chlorpyriphos	mg/kg	0.2	<0.2	<0.2	-	ND	-
Diazinon	mg/kg	0.5	<0.5	<0.5	-	ND	-
Dichlorvos	mg/kg	0.5	<0.5	<0.5	-	ND	-
Dimethoate	mg/kg	0.5	<0.5	<0.5	-	ND	-
Ethion	mg/kg	0.2	<0.2	<0.2	-	ND	-
Fenitrothion	mg/kg	0.2	<0.2	<0.2	-	ND	-
Malathion	mg/kg	0.2	<0.2	<0.2	-	ND	-
Methidathion	mg/kg	0.5	<0.5	<0.5	-	ND	-
Parathion	mg/kg	0.2	<0.2	<0.2	-	ND	-
PAH					-		
Acenaphthene	mg/kg	0.1	<0.1	<0.1	-	ND	-
Acenaphthylene	mg/kg	0.1	<0.1	<0.1	-	ND	-
Anthracene	mg/kg	0.1	**0.1**	<0.1	-	0%	-
Benz(a)anthracene	mg/kg	0.1	**0.7**	<0.1	-	150%	-
Benzo(a)pyrene	mg/kg	0.1	**1**	<0.1	-	**164%**	-
Benzo(a)pyrene TEQ (lower bound)*	mg/kg	0.2	**1.3**	<0.2	-	147%	-
Benzo(a)pyrene TEQ (medium bound)*	mg/kg	0.2	**1.4**	<0.2	-	150%	-
Benzo(a)pyrene TEQ (upper bound)*	mg/kg	0.3	**1.4**	<0.3	-	129%	-
Benzo(b)&(j)fluoranthene	mg/kg	0.1	**1.2**	<0.1	-	**169%**	-
Benzo(g,h,i)perylene	mg/kg	0.1	**0.6**	<0.1	-	143%	-
Benzo(k)fluoranthene	mg/kg	0.1	**0.5**	<0.1	-	133%	-
Chrysene	mg/kg	0.1	**0.7**	<0.1	-	150%	-
Dibenz(a,h)anthracene	mg/kg	0.1	<0.1	<0.1	-	ND	-
Fluoranthene	mg/kg	0.1	**1.2**	<0.1	-	**169%**	-
Fluorene	mg/kg	0.1	<0.1	<0.1	-	ND	-
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	**0.6**	<0.1	-	143%	-
Naphthalene	mg/kg	0.1	**0.1**	<0.1	-	0%	-
Phenanthrene	mg/kg	0.1	**0.4**	<0.1	-	120%	-

Created by : PV 04/09/2019
Checked by: RB 05/09/2019

Project: Gran Central Development
Duplicate Analysis RPDs
Project No. : 19122955
Batch/es: SE196071

Sample ID	BH04_1.05-1.15	DU1	N/A	
Sample Type	Primary	Field Duplicate	Field Triplicate	
Date Sampled	29/07/2019	29/07/2019	N/A	

						RPDs	
Analyte	**Units**	**LOR**				**Primary vs Duplicate**	**Primary vs Triplicate**
Pyrene	mg/kg	0.1	**1.3**	<0.1	-	**171%**	-
PAH (Sum of Common 16 PAHs - Lab Reported)	mg/kg	0.8	**8.4**	<0.8	-	**165%**	-
1-Methylnaphthalene	mg/kg	0.1	<0.1	<0.1	-	ND	-
2-Methylnaphthalene	mg/kg	0.1	<0.1	<0.1	-	ND	-
Polychlorinated Biphenyls					-		
Aroclor 1016	mg/kg	0.2	<0.2	<0.2	-	ND	-
Aroclor 1232	mg/kg	0.2	<0.2	<0.2	-	ND	-
Aroclor 1242	mg/kg	0.2	<0.2	<0.2	-	ND	-
Aroclor 1248	mg/kg	0.2	<0.2	<0.2	-	ND	-
Aroclor 1254	mg/kg	0.2	<0.2	<0.2	-	ND	-
Aroclor 1260	mg/kg	0.2	<0.2	<0.2	-	ND	-
Aroclor 1268	mg/kg	0.2	<0.2	<0.2	-	ND	-
Aroclor 1221	mg/kg	0.2	<0.2	<0.2	-	ND	-
Aroclor 1262	mg/kg	0.2	<0.2	<0.2	-	ND	-
PCB (Sum of Total-Lab Reported)	mg/kg	1	<1	<1	-	ND	-

Legend

ND = Not Detected (RPDs not calculated if both primary and duplicate results are below LOR)

- = Not analysed/calculated

Indicates RPD result does not meet the acceptable criteria

Acceptable RPDs: RPD <= 30%

RPD > 30%, Analysis result < 10 times LOR

RPD <= 50%, Analysis result > 10 times LOR and < 20 times LOR

Created by : PV 04/09/2019
Checked by: RB 05/09/2019

GOLDER

DATA VALIDATION SUMMARY SHEET (Sydney)

Project Name:	**Gran Central Development**	**Project Number:**	**19122955**
Primary Laboratory:	**SGS**	**Work order Number:**	**SE196280**
Secondary Laboratory:	**N/A**	**Work order Number:**	**N/A**
Date Sampled:	**8/08/2019**	**Sample Medium:**	**Water**

Sample Information

Number of Primary Samples:	**1**	**Number of Triplicate Samples:**	**0**
Number of Duplicate Samples:	**0**	**Number of Other QAQC Samples:**	**0**

Documentation and Sample Handling Information

	Y/N	Comments
COC completed properly?	Y	Signed by field staff and laboratory personnel.
All requested analysis completed?	Y	All requested analysis completed .
Samples received intact and chilled?	Y	0.9'C, ice present, samples received in good order.
Samples analysed within appropriate holding times?	N	All samples were analysed within appropriate holding times, with exception of pH which was extracted and analysed 5 days overdue. *Refer to overall comments* .
Sample volumes sufficient for QC analysis?	Y	Sufficient sample volume was provided for laboratory tests.
Are there non-NATA accredited methods used?	N	SGS is NATA accredited for all methods used in this batch.
Chromatograms supplied as appropriate?	N/A	N/A
Laboratory reports signed by authorised personnel?	Y	All laboratory reports signed by authorised personnel.

QAQC Sample Information (Method Blank - MB, Rinsate Blank - RB, Field Blank - FB, Trip Blank - TB)

Type	Sample ID	Comments
Method Blank	MB	All results were below the LOR. It is noted that one surrogate exceedance was reported for the method blank for VOCs in water. The surrogate recovery was 94% which is considered acceptable.

Trip Spike Information

Analyte	Control Spike Concentrations	Trip Spike Concentration	% Recovery	Comments
Sample ID: No TS analysed as part of this batch.				
-	-	-	-	-

Laboratory Control Spike (LCS) Analyses

Analyte Group	Comments
All	All laboratory control spike recoveries are within laboratory based DQOs.

Matrix Spike (MS) Analyses

Analyte Group	Comments
All	All laboratory matrix spike recoveries are within laboratory based DQOs.

Laboratory Duplicates (LD) Analyses

Analyte Group	Sample ID	Comments
All	-	All laboratory duplicate RPDs are within laboratory based DQOs.

Field Duplicates (FD) Analyses

Analyte Group	Primary ID	Duplicate ID	Comments
-	-	-	-

Field Triplicates (FT) Analyses

Analyte Group	Primary ID	Triplicate ID	Comments
-	-	-	-

Surrogate Compound Monitoring Analyses

Analyte Group	Analyte(s)	Comments
All	-	All surrogate recoveries are within laboratory based DQOs.

Overall Comments

pH which was extracted and analysed 5 days overdue for the sample collected. As such it is considered that pH results should be used for indicative purposes only.

This batch has been validated and is considered suitable for environmental interpretive use.

Note: Data validation assesses each analyte in terms of all the data validation variables and only the exceedances and outliers are reported in this form.

*When concentrations are less than the LOR for both primary and duplicate/triplicate results, no RPDs are calculated

Performed By:	**Pauline Voukidis**	**Checked By:**	**Rita Bonetti**
Date:	**4/09/2019**	**Date:**	**5/09/2019**

GOLDER

DATA VALIDATION SUMMARY SHEET (Sydney)

Project Name:	**Gran Central, Granville**	**Project Number:**	**19130799**
Primary Laboratory:	**SGS Alexandria**	**Work order Number:**	**SE199950 / SE199950A**
Secondary Laboratory:	**-**	**Work order Number:**	**-**
Date Sampled:	**11/11/2019**	**Sample Medium:**	**Soil**

Sample Information

Number of Primary Samples:	**3**	**Number of Triplicate Samples:**	**0**
Number of Duplicate Samples:	**0**	**Number of Other QAQC Samples:**	**2**

Documentation and Sample Handling Information

	Y/N	Comments
COC completed properly?	Y	COC completed and signed by field and laboratory staff (SGS).
All requested analysis completed?	Y	SGS: All requested analyses on the COC completed.
Samples received intact and chilled?	Y	SGS: 5.3°C, ice present. Samples received in good order.
Samples analysed within appropriate holding times?	Y	SGS: All analyses were within appropriate holding times.
Sample volumes sufficient for QC analysis?	N	SGS: Insufficient sample volume provided for TCLP QC analysis. *Refer to overall comments.* Sufficient sample volumes were supplied for QC analysis.
Are there non-NATA accredited methods used?	Y	SGS and not NATA accredited for total OPPs (NATA accredited for individual analytes), estimated fibres, gravimetric determination of asbestos in soil, mass of sample used and volume of extraction solution used. All other methods used in this batch are NATA accredited.
Chromatograms supplied as appropriate?	N/A	N/A
Laboratory reports signed by authorised personnel?	Y	All laboratory reports signed by authorised personnel.

QAQC Sample Information (Method Blank - MB, Rinsate Blank - RB, Field Blank - FB, Trip Blank - TB)

Type	Sample ID	Comments
MB	Method Blank	SGS: All results were below the limit of reporting (LOR).
TB	TB	SGS: All results were below the LOR.

Trip Spike Information

Analyte	Control Spike Concentrations	Trip Spike Concentration	% Recovery	Comments
Sample ID: TS				
Benzene	-	-	100%	Result is within acceptable DQOs.
Toluene	-	-	96%	Result is within acceptable DQOs.
Ethylbenzene	-	-	97%	Result is within acceptable DQOs.
m/p-xylene	-	-	95%	Result is within acceptable DQOs.
o-xylene	-	-	92%	Result is within acceptable DQOs.

Laboratory Control Spike (LCS) Analyses

Analyte Group	Comments
All	SGS: All LCS recoveries were within laboratory based DQOs.

Matrix Spike (MS) Analyses

Analyte Group	Comments
Metals	SGS: The MS recovery for zinc (184%) was outside of laboratory based DQOs. *Refer to overall comments.*
-	SGS: All other MS recoveries were within laboratory based DQOs.

Laboratory Duplicates (LD) Analyses

Analyte Group	Sample ID	Comments
PAHs	SE199976.001 (anonymous)	SGS: The LD RPD for anthracene (57%) was outside of laboratory based DQOs. *Refer to overall comments.*
All	-	SGS: All other LD RPDs were within laboratory based DQOs.

Field Duplicates (FD) Analyses

Analyte Group	Primary ID	Duplicate ID	Comments
-	-	-	No FDs were required in this batch

Field Triplicates (FT) Analyses

Analyte Group	Primary ID	Triplicate ID	Comments
-	-	-	No FTs were required in this batch

Surrogate Compound Monitoring Analyses

Analyte Group	Analyte(s)	Comments
All	-	SGS: All surrogate recoveries were within laboratory based DQOs.

Overall Comments

SGS: Insufficient sample volume was provided for SE199950A. This is due to only one sample being submitted for analysis.
SGS: The MS recovery for zinc (184%) was outside of DQOs. As stated by SGS, "recovery failed acceptance criteria due to sample heterogeneity."
SGS: The LD RPD for anthracene (57%) was outside of DQOs. As stated by SGS, "Recovery failed acceptance criteria due to sample heterogeneity."

This batch has been validated and is considered suitable for environmental interpretive use.

Note: Data validation assesses each analyte in terms of all the data validation variables and only the exceedances and outliers are reported in this form.

*When concentrations are less than the LOR for both primary and duplicate/triplicate results, no RPDs are calculated

Performed By:	**Kate Robinson**	**Checked By:**	**Shane Doyle**
Date:	**17/02/2020**	**Date:**	**18/02/2020**

GOLDER

DATA VALIDATION SUMMARY SHEET (Sydney)

Project Name:	**Gran Central, Granville**	**Project Number:**	**19130799**
Primary Laboratory:	**SGS Alexandria**	**Work order Number:**	**SE200602**
Secondary Laboratory:	**-**	**Work order Number:**	**-**
Date Sampled:	**15/11/2019**	**Sample Medium:**	**Soil**

Sample Information

Number of Primary Samples:	**1**	**Number of Triplicate Samples:**	**0**
Number of Duplicate Samples:	**0**	**Number of Other QAQC Samples:**	**0**

Documentation and Sample Handling Information

	Y/N	Comments
COC completed properly?	Y	COC completed and signed by field and laboratory staff (SGS).
All requested analysis completed?	Y	SGS: All requested analyses on the COC completed.
Samples received intact and chilled?	Y	SGS: 1.1°C, ice present. Samples received in good order.
Samples analysed within appropriate holding times?	N	SGS: Sample BH104_0.50-0.58 breached holding times for the analyses moisture content, OCPs, OPPs, PAHs, PCBs, TRHs, VOCs and VHCs by 3 days. *Refer to overall comments.* All other analyses were within appropriate holding times.
Sample volumes sufficient for QC analysis?	Y	SGS: Sufficient sample volumes were supplied for QC analysis.
Are there non-NATA accredited methods used?	Y	SGS and not NATA accredited for total OPPs (NATA accredited for individual analytes). All other methods used in this batch are NATA accredited.
Chromatograms supplied as appropriate?	N/A	N/A
Laboratory reports signed by authorised personnel?	Y	All laboratory reports signed by authorised personnel.

QAQC Sample Information (Method Blank - MB, Rinsate Blank - RB, Field Blank - FB, Trip Blank - TB)

Type	Sample ID	Comments
MB	Method Blank	SGS: All results were below the limit of reporting (LOR).

Trip Spike Information

Analyte	Control Spike Concentrations	Trip Spike Concentration	% Recovery	Comments
Sample ID: No TS was required for this batch.				

Laboratory Control Spike (LCS) Analyses

Analyte Group	Comments
All	SGS: All LCS recoveries were within laboratory based DQOs.

Matrix Spike (MS) Analyses

Analyte Group	Comments
TRHs	SGS: The MS recoveries for TRH C10-C14 (215%), TRH C15-C28 (2,340%), TRH C29-C36 (2,138%), TRH >C10-C16 (278%) and TRH >C16-C34 (3,685%) were outside of laboratory based DQOs. *Refer to overall comments.*
VOCs	SGS: The surrogate MS recovery for d8-toluene (67%) was outside of laboratory based DQOs. *Refer to overall comments.*
-	SGS: All other MS recoveries were within laboratory based DQOs.

Laboratory Duplicates (LD) Analyses

Analyte Group	Sample ID	Comments
Metals	SE200646.008 (anonymous)	SGS: The LD RPD for lead (61%) and zinc (34%) were outside of laboratory based DQOs. *Refer to overall comments.*
All	-	SGS: All other LD RPDs were within laboratory based DQOs.

Field Duplicates (FD) Analyses

Analyte Group	Primary ID	Duplicate ID	Comments
-	-	-	No FDs were required in this batch

Field Triplicates (FT) Analyses

Analyte Group	Primary ID	Triplicate ID	Comments
-	-	-	No FTs were required in this batch

Surrogate Compound Monitoring Analyses

Analyte Group	Analyte(s)	Comments
All	-	SGS: All surrogate recoveries were within laboratory based DQOs.

Overall Comments

SGS: Sample BH104_0.50-0.58 breached holding times for various analyses by 3 days. This is not expected to affect the validity of this data set as this exceedance is considered minor.
SGS: The MS recoveries for TRH C10-C14 (215%), TRH C15-C28 (2,340%), TRH C29-C36 (2,138%), TRH >C10-C16 (278%) and TRH >C16-C34 (3,685%) were outside of DQOs. As stated by SGS, "recovery failed acceptance criteria due to the presence of significant concentration of analyte (i.e. the concentration of analyte exceeds the spike level)."
SGS: The surrogate MS recovery for d8-toluene (67%) was outside of DQOs. As stated by SGS, "at least 2 of 3 surrogates are within acceptance criteria."
SGS: The LD RPD for lead (61%) was outside of DQOs. As stated by SGS, "RPD failed acceptance criteria due to sample heterogeneity." The LD RPD for zinc (34%) was outside of DQOs (32%). This is not expected to affect the validity of this data set as this exceedance is considered marginal (<3%).

This batch has been validated and is considered suitable for environmental interpretive use.

Note: Data validation assesses each analyte in terms of all the data validation variables and only the exceedances and outliers are reported in this form.

*When concentrations are less than the LOR for both primary and duplicate/triplicate results, no RPDs are calculated

Performed By:	**Kate Robinson**	**Checked By:**	**Shane Doyle**
Date:	**17/02/2020**	**Date:**	**18/02/2020**

GOLDER

DATA VALIDATION SUMMARY SHEET (Sydney)

Project Name:	**Gran Central, Granville**	**Project Number:**	**19130799**
Primary Laboratory:	**SGS Alexandria**	**Work order Number:**	**SE200614**
Secondary Laboratory:	**-**	**Work order Number:**	**-**
Date Sampled:	**14/11/2019**	**Sample Medium:**	**Soil**

Sample Information

Number of Primary Samples:	**2**	**Number of Triplicate Samples:**	**0**
Number of Duplicate Samples:	**0**	**Number of Other QAQC Samples:**	**3**

Documentation and Sample Handling Information

	Y/N	Comments
COC completed properly?	Y	COC completed and signed by field and laboratory staff (SGS).
All requested analysis completed?	Y	SGS: All requested analyses on the COC completed.
Samples received intact and chilled?	Y	SGS: 4.6°C, ice present. Samples received in good order.
Samples analysed within appropriate holding times?	N	SGS: Samples BH101_0.15-0.17 and BH101_1.55-2.0 were analysed outside of holding times for moisture content, OCPs, OPPs, PAHs, PCBs, TRHs, metals, VOCs and VHCs by 4 - 12 days. Samples TB was analysed outside of holdings times for moisture content, and samples TS and TB were analysed outside of holding times for VOCs and VHCs by 4 days. Sample RB was outside of holding times for the analyses trace metals, mercury, PAHs, TRHs, VOCs and VHCs by 12 days. *Refer to overall comments.* All other analyses were within appropriate holding times.
Sample volumes sufficient for QC analysis?	Y	SGS: Sufficient sample volumes were supplied for QC analysis.
Are there non-NATA accredited methods used?	Y	SGS and not NATA accredited for total OPPs (NATA accredited for individual analytes), estimated fibres, and gravimetric determination of asbestos. All other methods used in this batch are NATA accredited.
Chromatograms supplied as appropriate?	N/A	N/A
Laboratory reports signed by authorised personnel?	Y	All laboratory reports signed by authorised personnel.

QAQC Sample Information (Method Blank - MB, Rinsate Blank - RB, Field Blank - FB, Trip Blank - TB)

Type	Sample ID	Comments
MB	Method Blank	SGS: All results were below the limit of reporting (LOR).
TB	TB	SGS: All results were below the LOR.
RB	RB	All results were NOT below the limit of reporting (LOR) (SGS). *Refer to overall comments.*

Trip Spike Information

Analyte	Control Spike Concentrations	Trip Spike Concentration	% Recovery	Comments
Sample ID: TS				
Benzene	-	-	93%	Result is within data quality objectives (DQOs) (70%-130%).
Toluene	-	-	92%	Result is within DQOs (70%-130%).
Ethylbenzene	-	-	93%	Result is within DQOs (70%-130%).
meta- & para-Xylene	-	-	93%	Result is within DQOs (70%-130%).
ortho-Xylene	-	-	95%	Result is within DQOs (70%-130%).

Laboratory Control Spike (LCS) Analyses

Analyte Group	Comments
All	SGS: All LCS recoveries were within laboratory based DQOs.

Matrix Spike (MS) Analyses

Analyte Group	Comments
OC Pesticides in Soil	SGS: MS recovery for aldrin (151%) for sample SE200631.001 (anonymous) was outside of laboratory based DQOs. *Refer to overall comments.*
-	SGS: All other MS recoveries were within laboratory based DQOs.

Laboratory Duplicates (LD) Analyses

Analyte Group	Sample ID	Comments
All	-	SGS: All LD RPDs were within laboratory based DQOs.

Field Duplicates (FD) Analyses

Analyte Group	Primary ID	Duplicate ID	Comments
-	-	-	No FDs were required in this batch

Field Triplicates (FT) Analyses

Analyte Group	Primary ID	Triplicate ID	Comments
-	-	-	No FTs were required in this batch

Surrogate Compound Monitoring Analyses

Analyte Group	Analyte(s)	Comments
All	-	SGS: All surrogate recoveries were within laboratory based DQOs.

Overall Comments

SGS: All samples exceeded holding times for some analyses by 4 - 12 days. This is not expected to affect the overall validity of the dataset as there were acceptable TS recoveries, and results for the MS, LD and LCS are acceptable and as such it is considered that the holding time exceedances have not impacted the integrity of the data.
SGS: The RB sample has reported concentrations of TRH C15 - C28 (320 µg/L), fluoranthene (0.1 µg/L), chromium (1µg/L), copper (3 µg/L), lead (2 µg/L) and zinc (10 µg/L). This is not expected to affect the validity of this data set as the reported concentrations for these analytes in the primary samples were below the LOR or within the same order of magnitude as the exceedances. This is not expected to affect the interpretation of this data set.
SGS: MS recovery for aldrin (151%) for sample SE200631.001 (anonymous) was outside of DQOs. This is not expected to impact the validity of the dataset given that the exceedance was from an anonymous sample which is unlikely to be representative of the project sample matrices.

This batch has been validated and is considered suitable for environmental interpretive use.

Note: Data validation assesses each analyte in terms of all the data validation variables and only the exceedances and outliers are reported in this form.

*When concentrations are less than the LOR for both primary and duplicate/triplicate results, no RPDs are calculated

Performed By:	**Kate Robinson**	**Checked By:**	**Shane Doyle**
Date:	**17/02/2020**	**Date:**	**18/02/2020**

GOLDER

DATA VALIDATION SUMMARY SHEET (Sydney)

Project Name:	**Gran Central, Granville**	**Project Number:**	**19130799**
Primary Laboratory:	**SGS Alexandria**	**Work order Number:**	**SE200615**
Secondary Laboratory:	**Envirolab Sydney**	**Work order Number:**	**231035**
Date Sampled:	**8/11/2019**	**Sample Medium:**	**Soil**

Sample Information

Number of Primary Samples:	**3**	**Number of Triplicate Samples:**	**1**
Number of Duplicate Samples:	**0**	**Number of Other QAQC Samples:**	**3**

Documentation and Sample Handling Information

	Y/N	Comments
COC completed properly?	Y	COC completed and signed by all staff (SGS & Envirolab).
All requested analysis completed?	N	SGS: All requested analyses on the COC not completed. *Refer to overall comments.* Envirolab: All requested analyses on the COC completed.
Samples received intact and chilled?	N	SGS: 13.1°C, ice present. *Refer to overall comments.* Envirolab: 13.1°C, ice present. *Refer to overall comments.*
Samples analysed within appropriate holding times?	Y	SGS: Holding time outliers exist. *Refer to overall comments.* Envirolab: All samples are within holding times.
Sample volumes sufficient for QC analysis?	Y	Sufficient sample volumes were supplied for QC analysis (SGS & Envirolab).
Are there non-NATA accredited methods used?	Y	SGS not NATA accredited for OP Pesticides, Fibre Identification in soil and Gravimetric Determination of Asbestos in Soil. All other methods used in this batch are NATA accredited (SGS & Envirolab).
Chromatograms supplied as appropriate?	N/A	N/A
Laboratory reports signed by authorised personnel?	Y	All laboratory reports signed by authorised personnel.

QAQC Sample Information (Method Blank - MB, Rinsate Blank - RB, Field Blank - FB, Trip Blank - TB)

Type	Sample ID	Comments
MB	Method Blank	All results were below the limit of reporting (LOR) (SGS & Envirolab).
TB	TB	All results were below the limit of reporting (LOR) (SGS)
RB	RB	All results were NOT below the limit of reporting (LOR) (SGS). *Refer to overall comments.*

Trip Spike Information

Analyte	Control Spike Concentrations	Trip Spike Concentration	% Recovery	Comments
Sample ID: TS				
Benzene	-	-	107%	Result is within DQOs (70%-130%).
Toluene	-	-	109%	Result is within DQOs (70%-130%).
Ethylbenzene	-	-	113%	Result is within DQOs (70%-130%).
meta- & para-Xylene	-	-	113%	Result is within DQOs (70%-130%).
ortho-Xylene	-	-	109%	Result is within DQOs (70%-130%).

Laboratory Control Spike (LCS) Analyses

Analyte Group	Comments
All	All LCS recoveries were within laboratory based DQOs (SGS & Envirolab).

Matrix Spike (MS) Analyses

Analyte Group	Comments
OC Pesticides in Soil	SGS: MS recovery for Aldrin (151%) for sample SE200631.001 (Anonymous) was outside data quality objectives. *Refer to overall comments.*
-	All other MS recoveries were within laboratory based DQOs (SGS & Envirolab).

Laboratory Duplicates (LD) Analyses

Analyte Group	Sample ID	Comments
All	-	All LD RPDs were within laboratory based DQOs (SGS & Envirolab).

Field Duplicates (FD) Analyses

Analyte Group	Primary ID	Duplicate ID	Comments
-	-	-	No FDs were analysed in this batch

Field Triplicates (FT) Analyses

Analyte Group	Primary ID	Triplicate ID	Comments
All	BH102_0.45-0.60	QCB100	All FT RPDs were within data quality objectives.

Surrogate Compound Monitoring Analyses

Analyte Group	Analyte(s)	Comments
All	-	All surrogate recoveries were within laboratory based DQOs (SGS & Envirolab).

Overall Comments

The sample receipt temperature reported by SGS (13.1'C) is above the recommended sample temperature (10'C). The soil samples were collected and placed directly on ice prior to delivery to the primary laboratory SGS. The elevated temperatures are not expected to significantly impact the overall quality of the data as samples were placed on ice immediately following collection and all RPDs were generally within acceptable data quality objectives.

The sample receipt temperature reported by Envirolab (13.1'C) is above the recommended sample temperature (10'C). The soil samples were collected and placed directly on ice prior to delivery to the primary laboratory SGS. The triplicate sample was then delivered to Envirolab (secondary laboratory) in a cool condition. The elevated temperatures are not expected to significantly impact the overall quality of the data as samples were placed on ice immediately following collection and all RPDs were generally within acceptable data quality objectives.

SGS did not analyse quality control sample QCA100 as requested

SGS reported holding time breaches for the extraction of PAH (Polynuclear Aromatic Hydrocarbons), TRH (Total Recoverable Hydrocarbons) , VOCs, Volatile Petroleum Hydrocarbons in Rinsate Sample RB.

SGS: MS recovery for Aldrin (151%) for sample SE200631.001 (Anonymous) was outside data quality objectives. This is not expected to impact the validity of the dataset given that the exceedance was from an anonymous sample that is not representative of the project sample matrices.

SGS: Rinsate blank exceedances exist for TRH C15-C28, Arsenic, Cadmium, Chromium, Copper, Lead, Nickel and Zinc which shows evidence of cross contamination. This is not expected to impact the validity of the results as the soil samples are less than the adopted criteria.

This batch has been validated and is considered suitable for environmental interpretive use.

Note: Data validation assesses each analyte in terms of all the data validation variables and only the exceedances and outliers are reported in this form.

*When concentrations are less than the LOR for both primary and duplicate/triplicate results, no RPDs are calculated

Performed By:	**Bianca Underwood**	**Checked By:**	**Shane Doyle**
Date:	**13/02/2020**	**Date:**	**18/02/2020**

Gran Central, Granville
Triplicate Analysis RPDs
Project Number: 19130799
Batche/s: SE200615

Sample ID	BH102_0.45-0.60	QCB100	
Sample Type	Primary	Triplicate	
Date Sampled	18/11/2019	18/11/2019	

Analyte	Units	LOR			RPDs Primary vsTriplicate
TRH - HSL					
TRH C6 - C10 Fraction F1	mg/kg	25	<25	<25	ND
TRH C6 - C10 Fraction Less BTEX F1	mg/kg	25	<25	<25	ND
TRH >C10 - C16 Fraction F2	mg/kg	25	<25	<25	ND
TRH >C10 - C16 Fraction Less Naphthalene (F2)	mg/kg	25	<25	<25	ND
TRH >C16 - C34 Fraction F3	mg/kg	90	<90	<100	ND
TRH >C34 - C40 Fraction F4	mg/kg	120	<120	<100	ND
TRH C37 - C40 Fraction	mg/kg	100	<100	-	-
TRH+C10 - C40 (Sum of total) (Lab Reported)	mg/kg	210	<210	<50	ND
TPH Group - Waste Classification					
TRH C6 - C9 Fraction	mg/kg	20	<20	<25	ND
TRH C10 - C14 Fraction	mg/kg	20	<20	<50	ND
TRH C15 - C28 Fraction	mg/kg	45	<45	<100	ND
TRH C29 - C36 Fraction	mg/kg	45	<45	<100	ND
TRH+C10 - C36 (Sum of total) (Lab Reported)	mg/kg	110	<110	-	-
BTEX					
Benzene	mg/kg	0.1	<0.1	<0.2	ND
Toluene	mg/kg	0.1	<0.1	<0.5	ND
Ethylbenzene	mg/kg	0.1	<0.1	<1	ND
Xylenes (m & p)	mg/kg	0.2	<0.2	<2	ND
Xylene (o)	mg/kg	0.1	<0.1	<1	ND
Xylenes (Sum of total) (Lab Reported)	mg/kg	0.3	<0.3	<3	ND
Total BTEX	mg/kg	0.6	<0.6	-	-
Heavy Metals					
Arsenic	mg/kg	1	2	7	111%
Cadmium	mg/kg	0.3	<0.3	<0.4	ND
Chromium	mg/kg	0.5	23	31	30%
Copper	mg/kg	0.5	0.8	<1	22%
Lead	mg/kg	1	15	10	40%
Mercury	mg/kg	0.05	<0.05	<0.1	ND
Nickel	mg/kg	0.5	1.5	2	29%
Zinc	mg/kg	2	5.1	3	52%
Organochlorine Pesticides					
a-BHC	mg/kg	0.1	<0.1	<0.1	ND
b-BHC	mg/kg	0.1	<0.1	<0.1	ND
g-BHC	mg/kg	0.1	<0.1	<0.1	ND
d-BHC	mg/kg	0.1	<0.1	<0.1	ND
Aldrin	mg/kg	0.1	<0.1	<0.1	ND
Dieldrin	mg/kg	0.2	<0.2	<0.1	ND
cis-Chlordane	mg/kg	0.1	<0.1	<0.1	ND
gamma-Chlordane	mg/kg	0.1	<0.1	-	-
trans-Chlordane	mg/kg	0.1	-	<0.1	-
DDD	mg/kg	0.1	<0.1	<0.1	ND
DDT	mg/kg	0.1	<0.1	<0.1	ND
o,p-DDD	mg/kg	0.1	<0.1	-	-
p,p-DDE	mg/kg	0.1	<0.1	<0.1	ND
o,p-DDE	mg/kg	0.1	<0.1	-	-
2,4-DDT	mg/kg	0.1	<0.1	-	-
DDT+DDE+DDD (Sum of total) (Lab Reported)	mg/kg	0.1	-	<0.1	-
Endosulfan I	mg/kg	0.2	<0.2	<0.1	ND
Endosulfan II	mg/kg	0.2	<0.2	<0.1	ND
Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	ND
Endrin	mg/kg	0.2	<0.2	<0.1	ND
Endrin aldehyde	mg/kg	0.1	<0.1	<0.1	ND
Endrin ketone	mg/kg	0.1	<0.1	-	-
Heptachlor	mg/kg	0.1	<0.1	<0.1	ND
Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	ND
Heptachlor & heptachlor epoxide (Sum Lab Reported)	mg/kg	0.1	-	-	ND
Hexachlorobenzene	mg/kg	0.1	<0.1	<0.1	ND
Isodrin	mg/kg	0.1	<0.1	-	ND
Methoxychlor	mg/kg	0.1	<0.1	<0.1	ND
Mirex	mg/kg	0.1	<0.1	-	-
trans-Nonachlor	mg/kg	0.1	<0.1	-	-
Organophosphorous Pesticides					
OPP (Sum of total)	mg/kg	1.7	<1.7	-	-
Azinphos-methyl	mg/kg	0.2	<0.2	<0.1	ND
Bromophos-ethyl	mg/kg	0.2	<0.2	<0.1	ND
Chlorpyriphos	mg/kg	0.2	<0.2	<0.1	ND

Created by: BU 13/2/2020
Checked by: SPD 18/2/2020

Gran Central, Granville
Triplicate Analysis RPDs
Project Number: 19130799
Batche/s: SE200615

Sample ID	BH102_0.45-0.60	QCB100	
Sample Type	Primary	Triplicate	
Date Sampled	18/11/2019	18/11/2019	

Analyte	Units	LOR			RPDs Primary vsTriplicate
Chlorpyriphos-methyl	mg/kg	0.1	-	<0.1	-
Diazinon	mg/kg	0.5	<0.5	<0.1	ND
Dichlorvos	mg/kg	0.5	<0.5	<0.1	ND
Dimethoate	mg/kg	0.5	<0.5	<0.1	ND
Ethion	mg/kg	0.2	<0.2	<0.1	ND
Fenitrothion	mg/kg	0.2	<0.2	<0.1	ND
Malathion	mg/kg	0.2	<0.2	<0.1	ND
Methidathion	mg/kg	0.5	<0.5	-	-
Parathion	mg/kg	0.2	<0.2	<0.1	ND
Ronnel	mg/kg	0.1	-	<0.1	-
PAH					
Benzo(b+j) & Benzo(k)fluoranthene	mg/kg	0.2	-	<0.2	-
Acenaphthene	mg/kg	0.1	<0.1	<0.1	ND
Acenaphthylene	mg/kg	0.1	<0.1	<0.1	ND
Anthracene	mg/kg	0.1	<0.1	<0.1	ND
Benz(a)anthracene	mg/kg	0.1	<0.1	<0.1	ND
Benzo(a)pyrene	mg/kg	0.1	<0.1	<0.05	ND
Benzo(a)pyrene TEQ (lower bound)*	mg/kg	0.2	<0.2	<0.5	ND
Benzo(a)pyrene TEQ (medium bound)*	mg/kg	0.2	<0.2	<0.5	ND
Benzo(a)pyrene TEQ (upper bound)*	mg/kg	0.3	<0.3	<0.5	ND
Benzo(b)&(j)fluoranthene	mg/kg	0.1	<0.1	-	-
Benzo(g,h,i)perylene	mg/kg	0.1	<0.1	<0.1	ND
Benzo(k)fluoranthene	mg/kg	0.1	<0.1	-	-
Chrysene	mg/kg	0.1	<0.1	<0.1	ND
Dibenz(a,h)anthracene	mg/kg	0.1	<0.1	<0.1	ND
Fluoranthene	mg/kg	0.1	<0.1	<0.1	ND
Fluorene	mg/kg	0.1	<0.1	<0.1	ND
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	<0.1	<0.1	ND
Naphthalene	mg/kg	0.1	<0.1	<0.1	ND
Phenanthrene	mg/kg	0.1	<0.1	<0.1	ND
Pyrene	mg/kg	0.1	<0.1	<0.1	ND
PAH (Sum of Common 16 PAHs - Lab Reported)	mg/kg	0.8	<0.8	-	-
Total PAH (NEPM/WHO 16)	mg/kg	0.8	<0.8	<0.05	ND
1-Methylnaphthalene	mg/kg	0.1	<0.1	-	-
2-Methylnaphthalene	mg/kg	0.1	<0.1	-	-
Polychlorinated Biphenyls					
Aroclor 1016	mg/kg	0.2	<0.2	<0.1	ND
Aroclor 1232	mg/kg	0.2	<0.2	<0.1	ND
Aroclor 1242	mg/kg	0.2	<0.2	<0.1	ND
Aroclor 1248	mg/kg	0.2	<0.2	<0.1	ND
Aroclor 1254	mg/kg	0.2	<0.2	<0.1	ND
Aroclor 1260	mg/kg	0.2	<0.2	<0.1	ND
Aroclor 1268	mg/kg	0.2	<0.2	-	-
Aroclor 1221	mg/kg	0.2	<0.2	<0.1	ND
Aroclor 1262	mg/kg	0.2	<0.2	-	-
PCB (Sum of Total-Lab Reported)	mg/kg	1	<1	<0.1	ND

Legend

ND = Not Detected (RPDs not calculated if both primary and duplicate results are below LOR)

- = Not analysed/calculated

Indicates RPD result does not meet the acceptable criteria

Acceptable RPDs: RPD <= 30%

RPD > 30%, Analysis result < 10 times LOR

RPD <= 50%, Analysis result > 10 times LOR and < 20 times LOR

Created by: BU 13/2/2020

Checked by: SPD 18/2/2020

APPENDIX G

UCL Average Calculation Outputs

UCL Statistics for Uncensored Full Data Sets

User Selected Options	
Date/Time of Computation	ProUCL 5.112/02/2020 1:24:41 PM
From File	WorkSheet.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Arsenic_Fill

General Statistics

Total Number of Observations	4	Number of Distinct Observations	4
		Number of Missing Observations	0
Minimum	2	Mean	38
Maximum	130	Median	10
SD	61.54	Std. Error of Mean	30.77
Coefficient of Variation	1.619	Skewness	1.961

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest. For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012). Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.702	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.748	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.402	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.375	Data Not Normal at 5% Significance Level

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	110.4	95% Adjusted-CLT UCL (Chen-1995)	120.8
		95% Modified-t UCL (Johnson-1978)	115.4

Gamma GOF Test

A-D Test Statistic	0.401	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.679	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.314	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.409	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.549	k star (bias corrected MLE)	0.304
Theta hat (MLE)	69.17	Theta star (bias corrected MLE)	125
nu hat (MLE)	4.395	nu star (bias corrected)	2.432
MLE Mean (bias corrected)	38	MLE Sd (bias corrected)	68.92
		Approximate Chi Square Value (0.05)	0.226
Adjusted Level of Significance	N/A	Adjusted Chi Square Value	N/A

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50)	408.6	95% Adjusted Gamma UCL (use when n<50)	N/A

56	**Lognormal GOF Test**											
57					Shapiro Wilk Test Statistic	0.965	**Shapiro Wilk Lognormal GOF Test**					
58					5% Shapiro Wilk Critical Value	0.748	Data appear Lognormal at 5% Significance Level					
59					Lilliefors Test Statistic	0.218	**Lilliefors Lognormal GOF Test**					
60					5% Lilliefors Critical Value	0.375	Data appear Lognormal at 5% Significance Level					
61	**Data appear Lognormal at 5% Significance Level**											
62												
63	**Lognormal Statistics**											
64					Minimum of Logged Data	0.693	Mean of logged Data	2.498				
65					Maximum of Logged Data	4.868	SD of logged Data	1.769				
66												
67	**Assuming Lognormal Distribution**											
68					95% H-UCL	8262327	90% Chebyshev (MVUE) UCL	101.7				
69					95% Chebyshev (MVUE) UCL	133	97.5% Chebyshev (MVUE) UCL	176.6				
70					99% Chebyshev (MVUE) UCL	262.1						
71												
72	**Nonparametric Distribution Free UCL Statistics**											
73	**Data appear to follow a Discernible Distribution at 5% Significance Level**											
74												
75	**Nonparametric Distribution Free UCLs**											
76					95% CLT UCL	88.61	95% Jackknife UCL	110.4				
77					95% Standard Bootstrap UCL	N/A	95% Bootstrap-t UCL	N/A				
78					95% Hall's Bootstrap UCL	N/A	95% Percentile Bootstrap UCL	N/A				
79					95% BCA Bootstrap UCL	N/A						
80					90% Chebyshev(Mean, Sd) UCL	130.3	95% Chebyshev(Mean, Sd) UCL	172.1				
81					97.5% Chebyshev(Mean, Sd) UCL	230.1	99% Chebyshev(Mean, Sd) UCL	344.1				
82												
83	**Suggested UCL to Use**											
84					95% Adjusted Gamma UCL	N/A						
85												
86	**Warning: One or more Recommended UCL(s) not available!**											
87												
88	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
89	Recommendations are based upon data size, data distribution, and skewness.											
90	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
91	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
92												
93												
94	**Lead_Fill**											
95												
96	**General Statistics**											
97					Total Number of Observations	4	Number of Distinct Observations	4				
98							Number of Missing Observations	0				
99					Minimum	20	Mean	444.5				
100					Maximum	930	Median	414				
101					SD	483.2	Std. Error of Mean	241.6				
102					Coefficient of Variation	1.087	Skewness	0.071				
103												
104	**Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use**											
105	**guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.**											
106	**For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).**											
107	**Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1**											
108												
109	**Normal GOF Test**											
110					Shapiro Wilk Test Statistic	0.806	**Shapiro Wilk GOF Test**					

111	5% Shapiro Wilk Critical Value					0.748	Data appear Normal at 5% Significance Level					
112	Lilliefors Test Statistic					0.3	**Lilliefors GOF Test**					
113	5% Lilliefors Critical Value					0.375	Data appear Normal at 5% Significance Level					
114	**Data appear Normal at 5% Significance Level**											
115												
116	**Assuming Normal Distribution**											
117	**95% Normal UCL**						**95% UCLs (Adjusted for Skewness)**					
118	95% Student's-t UCL					1013	95% Adjusted-CLT UCL (Chen-1995)					851.1
119							95% Modified-t UCL (Johnson-1978)					1015
120												
121	**Gamma GOF Test**											
122	A-D Test Statistic					0.546	**Anderson-Darling Gamma GOF Test**					
123	5% A-D Critical Value					0.677	Detected data appear Gamma Distributed at 5% Significance Level					
124	K-S Test Statistic					0.318	**Kolmogorov-Smirnov Gamma GOF Test**					
125	5% K-S Critical Value					0.408	Detected data appear Gamma Distributed at 5% Significance Level					
126	**Detected data appear Gamma Distributed at 5% Significance Level**											
127												
128	**Gamma Statistics**											
129	k hat (MLE)					0.584	k star (bias corrected MLE)					0.313
130	Theta hat (MLE)					760.9	Theta star (bias corrected MLE)					1421
131	nu hat (MLE)					4.674	nu star (bias corrected)					2.502
132	MLE Mean (bias corrected)					444.5	MLE Sd (bias corrected)					794.9
133							Approximate Chi Square Value (0.05)					0.242
134	Adjusted Level of Significance					N/A	Adjusted Chi Square Value					N/A
135												
136	**Assuming Gamma Distribution**											
137	95% Approximate Gamma UCL (use when n>=50))					4604	95% Adjusted Gamma UCL (use when n<50)					N/A
138												
139	**Lognormal GOF Test**											
140	Shapiro Wilk Test Statistic					0.823	**Shapiro Wilk Lognormal GOF Test**					
141	5% Shapiro Wilk Critical Value					0.748	Data appear Lognormal at 5% Significance Level					
142	Lilliefors Test Statistic					0.293	**Lilliefors Lognormal GOF Test**					
143	5% Lilliefors Critical Value					0.375	Data appear Lognormal at 5% Significance Level					
144	**Data appear Lognormal at 5% Significance Level**											
145												
146	**Lognormal Statistics**											
147	Minimum of Logged Data					2.996	Mean of logged Data					5.035
148	Maximum of Logged Data					6.835	SD of logged Data					2.003
149												
150	**Assuming Lognormal Distribution**											
151	95% H-UCL					4.461E+9	90% Chebyshev (MVUE) UCL					1698
152	95% Chebyshev (MVUE) UCL					2235	97.5% Chebyshev (MVUE) UCL					2979
153	99% Chebyshev (MVUE) UCL					4441						
154												
155	**Nonparametric Distribution Free UCL Statistics**											
156	**Data appear to follow a Discernible Distribution at 5% Significance Level**											
157												
158	**Nonparametric Distribution Free UCLs**											
159	95% CLT UCL					841.9	95% Jackknife UCL					1013
160	95% Standard Bootstrap UCL					N/A	95% Bootstrap-t UCL					N/A
161	95% Hall's Bootstrap UCL					N/A	95% Percentile Bootstrap UCL					N/A
162	95% BCA Bootstrap UCL					N/A						
163	90% Chebyshev(Mean, Sd) UCL					1169	95% Chebyshev(Mean, Sd) UCL					1498
164	97.5% Chebyshev(Mean, Sd) UCL					1953	99% Chebyshev(Mean, Sd) UCL					2849
165												

166	**Suggested UCL to Use**											
167					95% Student's-t UCL	1013						
168												
169	**Recommended UCL exceeds the maximum observation**											
170												
171	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
172	Recommendations are based upon data size, data distribution, and skewness.											
173	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
174	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
175												
176												
177	**BaP_Fill**											
178												
179	**General Statistics**											
180					Total Number of Observations	4			Number of Distinct Observations	4		
181									Number of Missing Observations	0		
182					Minimum	0.3			Mean	0.9		
183					Maximum	2.1			Median	0.6		
184					SD	0.816			Std. Error of Mean	0.408		
185					Coefficient of Variation	0.907			Skewness	1.764		
186												
187	**Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use**											
188	**guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.**											
189	**For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).**											
190	**Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1**											
191												
192	**Normal GOF Test**											
193					Shapiro Wilk Test Statistic	0.807			**Shapiro Wilk GOF Test**			
194					5% Shapiro Wilk Critical Value	0.748			Data appear Normal at 5% Significance Level			
195					Lilliefors Test Statistic	0.347			**Lilliefors GOF Test**			
196					5% Lilliefors Critical Value	0.375			Data appear Normal at 5% Significance Level			
197	**Data appear Normal at 5% Significance Level**											
198												
199	**Assuming Normal Distribution**											
200	**95% Normal UCL**								**95% UCLs (Adjusted for Skewness)**			
201					95% Student's-t UCL	1.861			95% Adjusted-CLT UCL (Chen-1995)	1.956		
202									95% Modified-t UCL (Johnson-1978)	1.921		
203												
204	**Gamma GOF Test**											
205					A-D Test Statistic	0.36			**Anderson-Darling Gamma GOF Test**			
206					5% A-D Critical Value	0.661			Detected data appear Gamma Distributed at 5% Significance Level			
207					K-S Test Statistic	0.289			**Kolmogorov-Smirnov Gamma GOF Test**			
208					5% K-S Critical Value	0.398			Detected data appear Gamma Distributed at 5% Significance Level			
209	**Detected data appear Gamma Distributed at 5% Significance Level**											
210												
211	**Gamma Statistics**											
212					k hat (MLE)	1.985			k star (bias corrected MLE)	0.663		
213					Theta hat (MLE)	0.453			Theta star (bias corrected MLE)	1.358		
214					nu hat (MLE)	15.88			nu star (bias corrected)	5.303		
215					MLE Mean (bias corrected)	0.9			MLE Sd (bias corrected)	1.105		
216									Approximate Chi Square Value (0.05)	1.295		
217					Adjusted Level of Significance	N/A			Adjusted Chi Square Value	N/A		
218												
219	**Assuming Gamma Distribution**											
220					95% Approximate Gamma UCL (use when n>=50))	3.687			95% Adjusted Gamma UCL (use when n<50)	N/A		

221												
222	**Lognormal GOF Test**											
223					Shapiro Wilk Test Statistic	0.954	**Shapiro Wilk Lognormal GOF Test**					
224					5% Shapiro Wilk Critical Value	0.748	Data appear Lognormal at 5% Significance Level					
225					Lilliefors Test Statistic	0.24	**Lilliefors Lognormal GOF Test**					
226					5% Lilliefors Critical Value	0.375	Data appear Lognormal at 5% Significance Level					
227	**Data appear Lognormal at 5% Significance Level**											
228												
229	**Lognormal Statistics**											
230					Minimum of Logged Data	-1.204	Mean of logged Data	-0.378				
231					Maximum of Logged Data	0.742	SD of logged Data	0.824				
232												
233	**Assuming Lognormal Distribution**											
234					95% H-UCL	13.56	90% Chebyshev (MVUE) UCL	1.9				
235					95% Chebyshev (MVUE) UCL	2.365	97.5% Chebyshev (MVUE) UCL	3.01				
236					99% Chebyshev (MVUE) UCL	4.277						
237												
238	**Nonparametric Distribution Free UCL Statistics**											
239	**Data appear to follow a Discernible Distribution at 5% Significance Level**											
240												
241	**Nonparametric Distribution Free UCLs**											
242					95% CLT UCL	1.572	95% Jackknife UCL	1.861				
243					95% Standard Bootstrap UCL	N/A	95% Bootstrap-t UCL	N/A				
244					95% Hall's Bootstrap UCL	N/A	95% Percentile Bootstrap UCL	N/A				
245					95% BCA Bootstrap UCL	N/A						
246					90% Chebyshev(Mean, Sd) UCL	2.125	95% Chebyshev(Mean, Sd) UCL	2.68				
247					97.5% Chebyshev(Mean, Sd) UCL	3.45	99% Chebyshev(Mean, Sd) UCL	4.962				
248												
249	**Suggested UCL to Use**											
250					95% Student's-t UCL	1.861						
251												
252	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
253	Recommendations are based upon data size, data distribution, and skewness.											
254	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
255	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
256												
257												
258	**Lead_Nat**											
259												
260	**General Statistics**											
261					Total Number of Observations	12	Number of Distinct Observations	9				
262							Number of Missing Observations	0				
263					Minimum	4	Mean	14.08				
264					Maximum	28	Median	14				
265					SD	7.354	Std. Error of Mean	2.123				
266					Coefficient of Variation	0.522	Skewness	0.794				
267												
268	**Normal GOF Test**											
269					Shapiro Wilk Test Statistic	0.897	**Shapiro Wilk GOF Test**					
270					5% Shapiro Wilk Critical Value	0.859	Data appear Normal at 5% Significance Level					
271					Lilliefors Test Statistic	0.231	**Lilliefors GOF Test**					
272					5% Lilliefors Critical Value	0.243	Data appear Normal at 5% Significance Level					
273	**Data appear Normal at 5% Significance Level**											
274												
275	**Assuming Normal Distribution**											

	A	B	C	D	E	F	G	H	I	J	K	L
276	**95% Normal UCL**						**95% UCLs (Adjusted for Skewness)**					
277					95% Student's-t UCL	17.9					95% Adjusted-CLT UCL (Chen-1995)	18.1
278											95% Modified-t UCL (Johnson-1978)	17.98
279												
280	**Gamma GOF Test**											
281					A-D Test Statistic	0.409	**Anderson-Darling Gamma GOF Test**					
282					5% A-D Critical Value	0.737	Detected data appear Gamma Distributed at 5% Significance Level					
283					K-S Test Statistic	0.169	**Kolmogorov-Smirnov Gamma GOF Test**					
284					5% K-S Critical Value	0.247	Detected data appear Gamma Distributed at 5% Significance Level					
285	**Detected data appear Gamma Distributed at 5% Significance Level**											
286												
287	**Gamma Statistics**											
288					k hat (MLE)	3.781	k star (bias corrected MLE)					2.891
289					Theta hat (MLE)	3.725	Theta star (bias corrected MLE)					4.871
290					nu hat (MLE)	90.75	nu star (bias corrected)					69.39
291					MLE Mean (bias corrected)	14.08	MLE Sd (bias corrected)					8.282
292							Approximate Chi Square Value (0.05)					51.22
293					Adjusted Level of Significance	0.029	Adjusted Chi Square Value					48.84
294												
295	**Assuming Gamma Distribution**											
296					95% Approximate Gamma UCL (use when n>=50))	19.08	95% Adjusted Gamma UCL (use when n<50)					20.01
297												
298	**Lognormal GOF Test**											
299					Shapiro Wilk Test Statistic	0.921	**Shapiro Wilk Lognormal GOF Test**					
300					5% Shapiro Wilk Critical Value	0.859	Data appear Lognormal at 5% Significance Level					
301					Lilliefors Test Statistic	0.175	**Lilliefors Lognormal GOF Test**					
302					5% Lilliefors Critical Value	0.243	Data appear Lognormal at 5% Significance Level					
303	**Data appear Lognormal at 5% Significance Level**											
304												
305	**Lognormal Statistics**											
306					Minimum of Logged Data	1.386	Mean of logged Data					2.507
307					Maximum of Logged Data	3.332	SD of logged Data					0.578
308												
309	**Assuming Lognormal Distribution**											
310					95% H-UCL	21.42	90% Chebyshev (MVUE) UCL					21.63
311					95% Chebyshev (MVUE) UCL	24.96	97.5% Chebyshev (MVUE) UCL					29.58
312					99% Chebyshev (MVUE) UCL	38.67						
313												
314	**Nonparametric Distribution Free UCL Statistics**											
315	**Data appear to follow a Discernible Distribution at 5% Significance Level**											
316												
317	**Nonparametric Distribution Free UCLs**											
318					95% CLT UCL	17.58	95% Jackknife UCL					17.9
319					95% Standard Bootstrap UCL	17.52	95% Bootstrap-t UCL					18.97
320					95% Hall's Bootstrap UCL	22.39	95% Percentile Bootstrap UCL					17.75
321					95% BCA Bootstrap UCL	17.67						
322					90% Chebyshev(Mean, Sd) UCL	20.45	95% Chebyshev(Mean, Sd) UCL					23.34
323					97.5% Chebyshev(Mean, Sd) UCL	27.34	99% Chebyshev(Mean, Sd) UCL					35.21
324												
325	**Suggested UCL to Use**											
326					95% Student's-t UCL	17.9						
327												
328	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
329	Recommendations are based upon data size, data distribution, and skewness.											
330	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											

	A	B	C	D	E	F	G	H	I	J	K	L
331	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
332												

UCL Statistics for Data Sets with Non-Detects		
User Selected Options		
Date/Time of Computation	ProUCL 5.112/02/2020 1:20:41 PM	
From File	WorkSheet.xls	
Full Precision	OFF	
Confidence Coefficient	95%	
Number of Bootstrap Operations	2000	

Arsenic_Nat

General Statistics

Total Number of Observations	12	Number of Distinct Observations	7
Number of Detects	11	Number of Non-Detects	1
Number of Distinct Detects	6	Number of Distinct Non-Detects	1
Minimum Detect	2	Minimum Non-Detect	1
Maximum Detect	9	Maximum Non-Detect	1
Variance Detects	6.6	Percent Non-Detects	8.333%
Mean Detects	6	SD Detects	2.569
Median Detects	7	CV Detects	0.428
Skewness Detects	-0.735	Kurtosis Detects	-1.111
Mean of Logged Detects	1.67	SD of Logged Detects	0.57

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.845	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.85	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.288	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.251	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	5.583	KM Standard Error of Mean	0.824
KM SD	2.722	95% KM (BCA) UCL	6.833
95% KM (t) UCL	7.063	95% KM (Percentile Bootstrap) UCL	6.833
95% KM (z) UCL	6.939	95% KM Bootstrap t UCL	6.928
90% KM Chebyshev UCL	8.056	95% KM Chebyshev UCL	9.176
97.5% KM Chebyshev UCL	10.73	99% KM Chebyshev UCL	13.78

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.053	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.732	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.323	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.256	Detected Data Not Gamma Distributed at 5% Significance Level

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	4.259	k star (bias corrected MLE)	3.158
Theta hat (MLE)	1.409	Theta star (bias corrected MLE)	1.9
nu hat (MLE)	93.69	nu star (bias corrected)	69.47
Mean (detects)	6		

Gamma ROS Statistics using Imputed Non-Detects

53	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
54	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)											
55	For such situations, GROS method may yield incorrect values of UCLs and BTVs											
56	This is especially true when the sample size is small.											
57	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
58					Minimum	1.809				Mean	5.651	
59					Maximum	9				Median	7	
60					SD	2.732				CV	0.483	
61					k hat (MLE)	3.453				k star (bias corrected MLE)	2.645	
62					Theta hat (MLE)	1.637				Theta star (bias corrected MLE)	2.136	
63					nu hat (MLE)	82.86				nu star (bias corrected)	63.48	
64					Adjusted Level of Significance (β)	0.029						
65					Approximate Chi Square Value (63.48, α)	46.15				Adjusted Chi Square Value (63.48, β)	43.9	
66					95% Gamma Approximate UCL (use when n>=50)	7.773				95% Gamma Adjusted UCL (use when n<50)	8.17	
67												
68	**Estimates of Gamma Parameters using KM Estimates**											
69					Mean (KM)	5.583				SD (KM)	2.722	
70					Variance (KM)	7.41				SE of Mean (KM)	0.824	
71					k hat (KM)	4.207				k star (KM)	3.211	
72					nu hat (KM)	101				nu star (KM)	77.06	
73					theta hat (KM)	1.327				theta star (KM)	1.739	
74					80% gamma percentile (KM)	7.9				90% gamma percentile (KM)	9.761	
75					95% gamma percentile (KM)	11.49				99% gamma percentile (KM)	15.23	
76												
77	**Gamma Kaplan-Meier (KM) Statistics**											
78					Approximate Chi Square Value (77.06, α)	57.84				Adjusted Chi Square Value (77.06, β)	55.3	
79					95% Gamma Approximate KM-UCL (use when n>=50)	7.439				95% Gamma Adjusted KM-UCL (use when n<50)	7.78	
80												
81	**Lognormal GOF Test on Detected Observations Only**											
82					Shapiro Wilk Test Statistic	0.779				**Shapiro Wilk GOF Test**		
83					5% Shapiro Wilk Critical Value	0.85				Detected Data Not Lognormal at 5% Significance Level		
84					Lilliefors Test Statistic	0.322				**Lilliefors GOF Test**		
85					5% Lilliefors Critical Value	0.251				Detected Data Not Lognormal at 5% Significance Level		
86	**Detected Data Not Lognormal at 5% Significance Level**											
87												
88	**Lognormal ROS Statistics Using Imputed Non-Detects**											
89					Mean in Original Scale	5.627				Mean in Log Scale	1.566	
90					SD in Original Scale	2.769				SD in Log Scale	0.652	
91					95% t UCL (assumes normality of ROS data)	7.063				95% Percentile Bootstrap UCL	6.833	
92					95% BCA Bootstrap UCL	6.833				95% Bootstrap t UCL	6.962	
93					95% H-UCL (Log ROS)	9.381						
94												
95	**Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution**											
96					KM Mean (logged)	1.531				KM Geo Mean	4.621	
97					KM SD (logged)	0.695				95% Critical H Value (KM-Log)	2.407	
98					KM Standard Error of Mean (logged)	0.211				95% H-UCL (KM -Log)	9.749	
99					KM SD (logged)	0.695				95% Critical H Value (KM-Log)	2.407	
100					KM Standard Error of Mean (logged)	0.211						
101												
102	**DL/2 Statistics**											
103	**DL/2 Normal**									**DL/2 Log-Transformed**		
104					Mean in Original Scale	5.542				Mean in Log Scale	1.473	

105					SD in Original Scale	2.919					SD in Log Scale	0.872
106					95% t UCL (Assumes normality)	7.055					95% H-Stat UCL	12.94
107	**DL/2 is not a recommended method, provided for comparisons and historical reasons**											
108												
109	**Nonparametric Distribution Free UCL Statistics**											
110	**Data do not follow a Discernible Distribution at 5% Significance Level**											
111												
112	**Suggested UCL to Use**											
113					95% KM (Chebyshev) UCL	9.176						
114	**Warning: Recommended UCL exceeds the maximum observation**											
115												
116	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
117	Recommendations are based upon data size, data distribution, and skewness.											
118	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
119	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
120												
121	**BaP_Nat**											
122												
123	**General Statistics**											
124					Total Number of Observations	12					Number of Distinct Observations	2
125					Number of Detects	1					Number of Non-Detects	11
126					Number of Distinct Detects	1					Number of Distinct Non-Detects	1
127												
128	**Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!**											
129	**It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).**											
130												
131	**The data set for variable BaP_Nat was not processed!**											
132												
133												

1	**UCL Statistics for Uncensored Full Data Sets**											
2												
3	User Selected Options											
4	Date/Time of Computation	ProUCL 5.112/02/2020 1:50:46 PM										
5	From File	WorkSheet.xls										
6	Full Precision	OFF										
7	Confidence Coefficient	95%										
8	Number of Bootstrap Operations	2000										
9												
10												
11	**BaP_Nat_0.5LOR**											
12												
13	**General Statistics**											
14	Total Number of Observations	12					Number of Distinct Observations	2				
15							Number of Missing Observations	0				
16	Minimum	0.05					Mean	0.129				
17	Maximum	1					Median	0.05				
18	SD	0.274					Std. Error of Mean	0.0792				
19	Coefficient of Variation	2.123					Skewness	3.464				
20												
21	**Normal GOF Test**											
22	Shapiro Wilk Test Statistic	0.327					**Shapiro Wilk GOF Test**					
23	5% Shapiro Wilk Critical Value	0.859					Data Not Normal at 5% Significance Level					
24	Lilliefors Test Statistic	0.53					**Lilliefors GOF Test**					
25	5% Lilliefors Critical Value	0.243					Data Not Normal at 5% Significance Level					
26	**Data Not Normal at 5% Significance Level**											
27												
28	**Assuming Normal Distribution**											
29	**95% Normal UCL**						**95% UCLs (Adjusted for Skewness)**					
30	95% Student's-t UCL	0.271					95% Adjusted-CLT UCL (Chen-1995)	0.344				
31							95% Modified-t UCL (Johnson-1978)	0.285				
32												
33	**Gamma GOF Test**											
34	A-D Test Statistic	4.231					**Anderson-Darling Gamma GOF Test**					
35	5% A-D Critical Value	0.762					Data Not Gamma Distributed at 5% Significance Level					
36	K-S Test Statistic	0.56					**Kolmogorov-Smirnov Gamma GOF Test**					
37	5% K-S Critical Value	0.254					Data Not Gamma Distributed at 5% Significance Level					
38	**Data Not Gamma Distributed at 5% Significance Level**											
39												
40	**Gamma Statistics**											
41	k hat (MLE)	0.843					k star (bias corrected MLE)	0.688				
42	Theta hat (MLE)	0.153					Theta star (bias corrected MLE)	0.188				
43	nu hat (MLE)	20.23					nu star (bias corrected)	16.5				
44	MLE Mean (bias corrected)	0.129					MLE Sd (bias corrected)	0.156				
45							Approximate Chi Square Value (0.05)	8.319				
46	Adjusted Level of Significance	0.029					Adjusted Chi Square Value	7.448				
47												
48	**Assuming Gamma Distribution**											
49	95% Approximate Gamma UCL (use when n>=50))	0.256					95% Adjusted Gamma UCL (use when n<50)	0.286				
50												
51	**Lognormal GOF Test**											
52	Shapiro Wilk Test Statistic	0.327					**Shapiro Wilk Lognormal GOF Test**					

53	5% Shapiro Wilk Critical Value					0.859	Data Not Lognormal at 5% Significance Level					
54	Lilliefors Test Statistic					0.53	**Lilliefors Lognormal GOF Test**					
55	5% Lilliefors Critical Value					0.243	Data Not Lognormal at 5% Significance Level					
56	**Data Not Lognormal at 5% Significance Level**											
57												
58	**Lognormal Statistics**											
59	Minimum of Logged Data					-2.996	Mean of logged Data					-2.746
60	Maximum of Logged Data					0	SD of logged Data					0.865
61												
62	**Assuming Lognormal Distribution**											
63	95% H-UCL					0.187	90% Chebyshev (MVUE) UCL					0.161
64	95% Chebyshev (MVUE) UCL					0.193	97.5% Chebyshev (MVUE) UCL					0.237
65	99% Chebyshev (MVUE) UCL					0.325						
66												
67	**Nonparametric Distribution Free UCL Statistics**											
68	**Data do not follow a Discernible Distribution (0.05)**											
69												
70	**Nonparametric Distribution Free UCLs**											
71	95% CLT UCL					0.259	95% Jackknife UCL					N/A
72	95% Standard Bootstrap UCL					N/A	95% Bootstrap-t UCL					N/A
73	95% Hall's Bootstrap UCL					N/A	95% Percentile Bootstrap UCL					N/A
74	95% BCA Bootstrap UCL					N/A						
75	90% Chebyshev(Mean, Sd) UCL					0.367	95% Chebyshev(Mean, Sd) UCL					0.474
76	97.5% Chebyshev(Mean, Sd) UCL					0.624	99% Chebyshev(Mean, Sd) UCL					0.917
77												
78	**Suggested UCL to Use**											
79	95% Chebyshev (Mean, Sd) UCL					0.474						
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	Recommendations are based upon data size, data distribution, and skewness.											
83	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
84	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
85												

APPENDIX H

Limitations

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Having regard to the matters referred to in the previous paragraphs on this page in particular, carrying out the Services has allowed Golder to form no more than an opinion as to the actual conditions at any relevant location. That opinion is necessarily constrained by the extent of the information collected by Golder or otherwise made available to Golder. Further, the passage of time may affect the accuracy, applicability or usefulness of the opinions, assessments or other information in this Report. This Report is based upon the information and other circumstances that existed and were known to Golder when the Services were performed and this Report was prepared. Golder has not considered the effect of any possible future developments including physical changes to any relevant location or changes to any laws or regulations relevant to such location.

Where permitted by the Contract, Golder may have retained subconsultants affiliated with Golder to provide some or all of the Services. However, it is Golder which remains solely responsible for the Services and there is no legal recourse against any of Golder's affiliated companies or the employees, officers or directors of any of them.

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