KP42
KP41.5
KP41
KP39.5
CPT104
KP40
KP40.5

APA Transmission Pty Limited - 31-02984.00

Crib Point Pakenham Pipeline Project
Acid Sulfate Soil Sample Locations
Figure 10

WORK REQUEST NUMBER: 31-02984.00

DATA SOURCES:
Service Layer Credits: Copyright:© 2018 Garmin
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

LEGEND

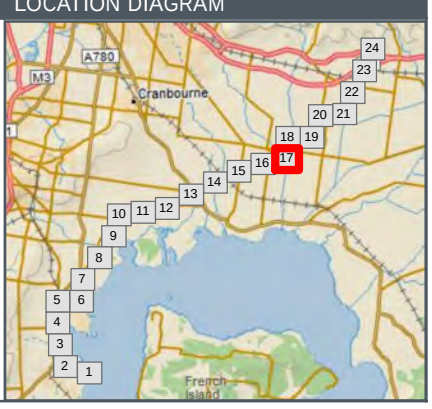
- Sample Location
- Kilometre Points
- Crib Point Pakenham Alignment
- Alignment Footprint

ISSUE DATE	AUTHOR	QA CHECK	APPROVED	MAP REV.	REVISION NOTE
17/08/2018	JT	AB	CC	A	Issued for Review
24/08/2018	JT	AB	MV	B	Issued for Review

monarc ENVIRONMENTAL
apa

0 100 200
Metres
1:8,500
(A3) GDA 1994 MGA Zone 55

LOCATION DIAGRAM



Path: \\logicamms.internal\LCM\Monarc\ESRI\Clients\APAGasnet\Crib Point to Pakenham\ASS_Figures\31-02984.00_ASS_F10_RB.mxd

Figure 11: Site Photos

Photo 1: CPT067 – Devon Meadows (KP25.48)

Photo 2: CPT073 – Devon Meadows (KP28.85)

Photo 3: CPT084 – Clyde (KP33.41)

Photo 4: CPT104 – Cardinia (KP39.67)

Photo 5: CPTP6 01 – Pearcedale (KP21.05)

Photo 6: Typical Soil Profile at Depth.

Photo 7: CPT006 – Crib Point Terminal, Hastings (KP1.15)

Photo 8: CPTP051 – Pearcedale (KP19.1)

Appendix A: Soil Bore Logs

BOREHOLE NUMBER BH1

CLIENT APA **PROJECT NAME** Acid Sulphate & Contamination Investigation

PROJECT NUMBER 31-02984.00 **PROJECT LOCATION** Wooleys Road, Crib Point

DATE STARTED **COMPLETED** **R.L. SURFACE** **DATUM**

DRILLING CONTRACTOR **SLOPE** 90° **BEARING** ---

EQUIPMENT **HOLE LOCATION** CPT008

HOLE SIZE **LOGGED BY** **CHECKED BY**

NOTES

Method	Graphic Log	Material Description	Depth (m)	Sample ID	V/O Rank	Additional Observations
HA		CLAY, yellow brown to grey, low to medium plasticity, soft, moist, firbous rootlets at surface	0.1	BH1-Surface	V=0, O=0	
			0.2			
			0.3	BH1-0.3	V=0, O=0	
		silty CLAY, orange/brown to red, low plasticity, dry, friable. Grey mottling at 0.9m bgl. Becoming red to light yellow/grey at 1.8m bgl	0.4			
			0.5	BH1-Natural	V=0, O=0	
			0.6			
			0.7			
			0.8			
			0.9			
			1.0	BH1-1.0	V=0, O=0	
			1.1			
			1.2			
			1.3			
			1.4			
			1.5			
			1.6			
			1.7			
			1.8			
			1.9			
			2.0	BH1-2.0	V=0, O=0	
			2.1			
			2.2			
			2.3	BH1-2.3	V=0, O=0	
		Borehole BH1 terminated at 2.4m	2.4			End of Investigation @ 2.4m bgl (Refusal on rock)

BOREHOLE NUMBER BH2

CLIENT APA **PROJECT NAME** Acid Sulphate & Contamination Investigation

PROJECT NUMBER 31-02984.00 **PROJECT LOCATION** Wooleys Road, Crib Point

DATE STARTED **COMPLETED** **R.L. SURFACE** **DATUM**

DRILLING CONTRACTOR **SLOPE** 90° **BEARING** ---

EQUIPMENT **HOLE LOCATION** CPT006

HOLE SIZE **LOGGED BY** **CHECKED BY**

NOTES

Method	Graphic Log	Material Description	Depth (m)	Sample ID	V/O Rank	Additional Observations
HA		CLAY, yellow brown to grey, low to medium plasticity, soft, moist, firbous rootlets at surface	0.1	BH1-Surface	V=0, O=0	
			0.2			
			0.3	BH1-0.3	V=0, O=0	
		silty CLAY, orange/brown to red, low plasticity, dry, friable. Grey mottling at 0.9m bgl. Becoming red to light yellow/grey at 1.8m bgl	0.4			
			0.5	BH1-Natural	V=0, O=0	
			0.6			
			0.7			
			0.8			
			0.9			
			1.0	BH1-1.0	V=0, O=0	
			1.1			
			1.2			
			1.3			
			1.4			
			1.5			
			1.6			
			1.7			
			1.8			
			1.9			
			2.0	BH1-2.0	V=0, O=0	
			2.1			
			2.2			
			2.3	BH1-2.3	V=0, O=0	
			2.4			
			2.5			
		Borehole BH2 terminated at 2.5m				End of Investigation @ 2.4m bgl (Refusal on rock)

BOREHOLE NUMBER BH1

CLIENT APA **PROJECT NAME** Acid Sulphate Investigation

PROJECT NUMBER 31-02984.00 **PROJECT LOCATION** Crib Point to Pakenham

DATE STARTED 20/6/18 **COMPLETED** 20/6/18 **R.L. SURFACE** _____ **DATUM** _____

DRILLING CONTRACTOR Matrix Drilling **SLOPE** 90° **BEARING** ---

EQUIPMENT Drill Rig - Push Tube **HOLE LOCATION** Warringinie Park, CPT012

HOLE SIZE _____ **LOGGED BY** AT **CHECKED BY** _____

NOTES _____

Method	Graphic Log	Material Description	Depth (m)	Sample ID	V/O Rank	Additional Observations
Push Tube		clayey SILT and TOPSOIL, brown, dry, rootlets	0.1			
			0.2			
		silty CLAY, light grey to yellow/brown, low plasticity, orange/brown mottling	0.3			
			0.4			
		CLAY, light brown, grey and orange mottling, high plasticity. Becoming yellow brown to pale yellow @ 0.6m bgl. Becoming yellow to blue/grey @ 0.8m bgl. Becoming orange to pale grey @ 1.2m bgl	0.5			
			0.6			
			0.7			
			0.8			
			0.9	BH1/1	V=0, O=0	
			1.0			
			1.1			
			1.2			
			1.3			
			1.4			
			1.5			
			1.6			
			1.7			
			1.8			
		silty CLAY, orange to grey, low plasticity, friable	1.9			
			2.0			
			2.1			
			2.2			
			2.3			
			2.4			
			2.5			
		CLAY, orange to plale grey, high degree of red mottling, friable	2.6	BH1/2	V=0, O=0	
			2.7			
			2.8			
			2.9			
			3.0			
			3.1			
			3.2	BH1/3	V=0, O=0	
			3.3			
			3.4			
			3.5			
			3.6			
		Borehole BH1 terminated at 3.6m				End of Investigation @ 3.6m bgl

BOREHOLE NUMBER BH1

CLIENT APA **PROJECT NAME** Crib Point to Pakenham

PROJECT NUMBER 31-02984.00 **PROJECT LOCATION** Pearcedale

DATE STARTED 9/7/18 **COMPLETED** 9/7/18 **R.L. SURFACE** **DATUM**

DRILLING CONTRACTOR **SLOPE** 90° **BEARING** ---

EQUIPMENT Hand Auger **HOLE LOCATION** CT051

HOLE SIZE 100mm **LOGGED BY** AT **CHECKED BY**

NOTES

Method	Graphic Log	Material Description	Depth (m)	Sample ID	V/O Rank	Additional Observations
HA		TOPSOIL and grass				
		SAND: dark brown to grey, slightly moist, soft, some tree root material. Becoming light brown/grey @ 0.7m bgl	0.1			
			0.2			
			0.3			
			0.4			
			0.5			
			0.6			
			0.7			
			0.8			
		clayey SAND, orange, fine grained with highly weathered dark brown pebble sized rock material	0.9			
			1.0	BH1/1.0	V=0, O=0	
			1.1			
		SAND, dark brown to light grey, large (>50mm) rock material, highley weathered	1.2			
			1.3			
		silty SAND, brown to orange, fine grained	1.4	BH1/1.4	V=0, O=0	
			1.5			
		clayey SAND, grey/white, soft, slightly plastic. Interbedded orange/brown sands at 2.2m bgl. Becoming wet @ 2.9m bgl	1.6			
			1.7			
			1.8			
			1.9			
			2.0	BH1/2.0	V=0, O=0	
			2.1			
			2.2			
			2.3			
			2.4			
			2.5	BH1/2.5	V=0, O=0	
			2.6			
			2.7			
			2.8			
			2.9			
			3.0	BH1/3.0	V=0, O=0	
		Borehole BH1 terminated at 3.1m	3.1			End of Investigation @ 3.1m bgl

BOREHOLE NUMBER BH2

CLIENT APA **PROJECT NAME** Acid Sulphate Investigation

PROJECT NUMBER 31-02984.00 **PROJECT LOCATION** Crib Point to Pakenham

DATE STARTED 20/6/18 **COMPLETED** 20/6/18 **R.L. SURFACE** _____ **DATUM** _____

DRILLING CONTRACTOR Matrix Drilling **SLOPE** 90° **BEARING** ---

EQUIPMENT Drill Rig - Push Tube **HOLE LOCATION** CPT057

HOLE SIZE _____ **LOGGED BY** AT **CHECKED BY** _____

NOTES _____

Method	Graphic Log	Material Description	Depth (m)	Sample ID	V/O Rank	Additional Observations
Push Tube		TOPSOIL	0.1			
		sandy CLAY, pale brown to yellow brown, low plasticity, moistm, soft	0.2			
			0.3			
			0.4			
			0.5			
		silty CLAY, pale brown to dark grey, low plasticity, orange mottling	0.6			
			0.7			
			0.8			
			0.9			
			1.0			
			1.1			
			1.2			
		CLAY, blue/grey, high plasticity, orange mottling. High degree of orange and dark grey mottling at 1.6m bgl. Becoming orange and dark grey at 3m bgl	1.3			
			1.4			
			1.5	BH2/1	V=0, O=0	
			1.6			
			1.7			
			1.8			
			1.9			
			2.0			
			2.1			
			2.2			
			2.3			
			2.4			
			2.5			
			2.6			
			2.7			
			2.8			
			2.9			
			3.0	BH2/2	V=0, O=0	
			3.1			
			3.2			
			3.3			
			3.4			
			3.5	BH2/3	V=0, O=0	
		Borehole BH2 terminated at 3.6m	3.6			End of Investigation @ 3.6m bgl

BOREHOLE NUMBER BH3

CLIENT APA **PROJECT NAME** Acid Sulphate Investigation

PROJECT NUMBER 31-02984.00 **PROJECT LOCATION** Crib Point to Pakenham

DATE STARTED 20/6/18 **COMPLETED** 20/6/18 **R.L. SURFACE** **DATUM**

DRILLING CONTRACTOR Matrix Drilling **SLOPE** 90° **BEARING** ---

EQUIPMENT Hand Auger **HOLE LOCATION** CPT601

HOLE SIZE **LOGGED BY** YH **CHECKED BY**

NOTES

Method	Graphic Log	Material Description	Depth (m)	Sample ID	V/O Rank	Additional Observations
HA		TOPSOIL SILT, dark brown, dry	0.1			
			0.2			
			0.3			
		silty CLAY, light brown, low plasticity, dark grey mottling	0.4			
			0.5			
			0.6			
			0.7			
			0.8			
			0.9			
		sandy CLAY, blue/grey, low plasticity, brown mottling	1.0			
			1.1			
			1.2			
			1.3			
			1.4	BH3/1	V=0, O=0	
			1.5			
			1.6			
			1.7			
			1.8			
			1.9			
			2.0			
			2.1			
			2.2			
			2.3			
		CLAY, blue/grey, high plasticity, light grey and red mottling	2.4			
			2.5			
			2.6	BH3/2	V=0, O=0	
			2.7			
			2.8			
		silty CLAY, blue/grey, light brown and dark brown mottling, soft, some trace gravels	2.9	BH3/3	V=0, O=0	
		Borehole BH3 terminated at 3m	3.0			End of Investigation @ 3m bgl

BOREHOLE NUMBER BH5

CLIENT APA **PROJECT NAME** Acid Sulphate Investigation

PROJECT NUMBER 31-02984.00 **PROJECT LOCATION** Crib Point to Pakenham

DATE STARTED 20/6/18 **COMPLETED** 20/6/18 **R.L. SURFACE** _____ **DATUM** _____

DRILLING CONTRACTOR Matrix Drilling **SLOPE** 90° **BEARING** ---

EQUIPMENT _____ **HOLE LOCATION** Baxter-Tooradin Road, CPT067

HOLE SIZE _____ **LOGGED BY** YH **CHECKED BY** _____

NOTES _____

Method	Graphic Log	Material Description	Depth (m)	Sample ID	V/O Rank	Additional Observations
Push Tube		SILT, dark brown, organic	0.1			
			0.2			
			0.3			
		sandy CLAY, dark brown, low plasticity	0.4			
			0.5			
			0.6			
			0.7			
		silty CLAY, yellow/brown to blue/grey. Becoming pale yellow/brown at 1.2m bgl	0.8			
			0.9			
			1.0			
			1.1			
			1.2			
			1.3			
			1.4			
			1.5			
		silty CLAY, light brown to grey/blue, red mottling, low plasticity, moist	1.6			
			1.7			
			1.8			
			1.9			
			2.0	BH5/1	V=0, O=0	
			2.1			
			2.2			
			2.3			
			2.4			
			2.5			
		CLAY, blue/grey, high plasticity, stiff, red mottling	2.6			
			2.7	BH5/2	V=0, O=0	
			2.8			
			2.9			
			3.0			
			3.1			
			3.2			
			3.3			
			3.4			
			3.5	BH5/3	V=0, O=0	
			3.6			
		Borehole BH5 terminated at 3.6m				End of Investigation @ 3.6m bgl

BOREHOLE NUMBER BH4

CLIENT APA **PROJECT NAME** Acid Sulphate Investigation

PROJECT NUMBER 31-02984.00 **PROJECT LOCATION** Crib Point to Pakenham

DATE STARTED 20/6/18 **COMPLETED** 20/6/18 **R.L. SURFACE** **DATUM**

DRILLING CONTRACTOR Matrix Drilling **SLOPE** 90° **BEARING** ---

EQUIPMENT Drill Rig - Push Tube **HOLE LOCATION** Adeneys Road, CPT073

HOLE SIZE **LOGGED BY** YH **CHECKED BY**

NOTES

Method	Graphic Log	Material Description	Depth (m)	Sample ID	V/O Rank	Additional Observations
HA		TOPSOIL				
		SILT, dark brown, organic	0.1			
			0.2			
			0.3			
		silty CLAY, dark brown, light brown mottling, low plasticity, stiff. Becoming light brown to blue/grey at 1.5m bgl	0.4			
			0.5			
			0.6			
			0.7			
			0.8			
			0.9			
			1.0			
			1.1			
			1.2			
			1.3			
			1.4			
			1.5			
			1.6			Perched water observed at 1.6m bgl
		silty CLAY, blue/grey, light brown mottling, wet	1.7	BH4/1	V=0, O=0	
			1.8			
			1.9			
			2.0			
			2.1			
			2.2			
			2.3			
			2.4			
			2.5	BH4/2	V=0, O=0	
			2.6			
		Borehole BH4 terminated at 2.6m				End of Investigation @ 2.6m bgl

BOREHOLE NUMBER BH6

CLIENT APA **PROJECT NAME** Acid Sulphate Investigation

PROJECT NUMBER 31-02984.00 **PROJECT LOCATION** Crib Point to Pakenham

DATE STARTED 21/6/18 **COMPLETED** 21/6/18 **R.L. SURFACE** _____ **DATUM** _____

DRILLING CONTRACTOR Matrix Drilling **SLOPE** 90° **BEARING** ---

EQUIPMENT Drill Rig - Push Tube **HOLE LOCATION** Manks Road, CPT084

HOLE SIZE _____ **LOGGED BY** AT **CHECKED BY** _____

NOTES _____

Method	Graphic Log	Material Description	Depth (m)	Sample ID	V/O Rank	Additional Observations
Push Tube		TOPSOIL CLAY, pale brown, low to medium plasticity, orange and dark grey mottling, hard, stiff, slightly moist	0.1 0.2 0.3			
		CLAY, light grey, high plasticity, soft, moist. Dark grey and orange mottling at 1.6m bgl	0.4 0.5 0.6 0.7 0.8 0.9 1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9 2.0 2.1 2.2 2.3 2.4 2.5 2.6 2.7 2.8 2.9 3.0 3.1 3.2			
		CLAY, light brown to grey/green, orange and red mottling, high plasticity	3.3	BH5/1	V=0, O=0	
			3.4 3.5	BH5/2	V=0, O=0	
		Borehole BH6 terminated at 3.6m	3.6			End of Investigation @ 3.6m bgl

BOREHOLE NUMBER BH7

CLIENT APA **PROJECT NAME** Acid Sulphate Investigation

PROJECT NUMBER 31-02984.00 **PROJECT LOCATION** Crib Point to Pakenham

DATE STARTED 21/6/18 **COMPLETED** 21/6/18 **R.L. SURFACE** _____ **DATUM** _____

DRILLING CONTRACTOR Matrix Drilling **SLOPE** 90° **BEARING** ---

EQUIPMENT Drill Rig - Push Tube **HOLE LOCATION** Bloomfield Lane, CPT104

HOLE SIZE _____ **LOGGED BY** AT **CHECKED BY** _____

NOTES _____

Method	Graphic Log	Material Description	Depth (m)	Sample ID	V/O Rank	Additional Observations
Push Tube		TOPSOIL with grassy surface	0.1			
		silty CLAY, dark grey, low plasticity, stiff, hard. Becoming light grey with orange mottling at 1m bgl	0.2 – 1.7			
		CLAY. pale brown to grey, brown to orange mottling, high plasticity. Becoming blue /grey at 2.7m bgl	1.8 – 3.5	BH7/1 BH7/2 BH7/3	V=0, O=0 V=0, O=0 V=0, O=0	
		Borehole BH7 terminated at 3.6m	3.6			End of Investigation @ 3.6m bgl

Appendix B: Chain of Custody Documentation and Laboratory Certificates of Analysis

CHAIN OF CUSTODY RECORD

ABN 50 005 085 521

☐ Sydney Laboratory
Unit F3 Bld F, 16 Mars Rd, Lane Cove West, NSW 2066
02 9900 8400 EnviroSampleNSW@eurofins.com

☐ Brisbane Laboratory
Unit 1, 21 Smallwood Pl, Murarrie, QLD 4172
07 3902 4600 EnviroSampleQLD@eurofins.com

☐ Perth Laboratory
Unit 2, 91 Leach Highway, Kewdale WA 6105
08 9251 9600 EnviroSampleWA@eurofins.com

☐ Melbourne Laboratory
2 Kingston Town Close, Oakleigh, VIC 3166
03 8564 5000 EnviroSampleVic@eurofins.com

Company	Monarc	Project №	31-02984.00	Project Manager	WENDY TSIVOULIDIS
Address	17 Cotham Rd, Kew.	Project Name	Contamination Investigation	EDD Format (ESdat, EQuIS, Custom)	
Contact Name	Adam Tripetto				
Phone №					
Special Directions					
Purchase Order					
Quote ID №					

Sampler(s)	Adam Tripetto
Handed over by	↓
Email for Invoice	wendy.tsivoulidis@monarcenviro.com
Email for Results	↓

Analyses (Note: Where metals are requested, please specify "Total" or "Filtered") SUITE code must be used to attract SUITE pricing

№	Client Sample ID	Sampled Date/Time (dd/mm/yy hh:mm)	Matrix (Solid (S) Water (W))	ASBESTOS	TRH, PAH, BTEXN	PFAS (including PFHxS, PFOS & PFOA)	Phenolics	M15 Metals	VHC	M8 Metals	Containers: 1L Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964: WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
1	BH1-Surface	4/7	S	X														X	BAG
2	BH1-0.3	↓	↓		X	X	X	X	X								X		Jar + PFAS
3	BH1-Natural				X	X	X		X	X							X		" "
4	BH2-Surface			X													X		BAG
5	BH2-0.3				X	X	X	X	X								X		Jar + PFAS
6	BH2-Natural				X	X	X		X	X							X		" "
7																			
8																			
9																			
10																			
	Total Counts																		

Turnaround Time (TAT) Requirements (Default will be 5 days if not ticked)

☐ Overnight (9am)*
☐ 1 Day* ☐ 2 Day*
☐ 3 Day* ☐ 5 Day
* Surcharges apply
☐ Other ( )

Method of Shipment	☐ Courier (#) ☐ Hand Delivered	☐ Postal	Name		Signature		Date	/ /	Time	:		
Eurofins | mgt Laboratory Use Only	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW		Signature		Date	/ /	Time	:	Temperature	
	Received By	Will O'Hare	SYD | BNE | MEL | PER | ADL | NTL | DRW		Signature		Date	4/7/16	Time	4:15	Report №	606037

Submission of samples to the laboratory will be deemed as acceptance of Eurofins | mgt Standard Terms and Conditions unless agreed otherwise. A copy of Eurofins | mgt Standard Terms and Conditions is available on request.

Eurofins Environment Testing Australia Pty Ltd trading as Eurofins | mgt

QS3009_R7 Modified by Dr R Symons Approved by T Lakeland Approved on 17 August 2017

CHAIN OF CUSTODY RECORD

ABN 50 005 085 521

☐ Sydney Laboratory
Unit F3 Bld F, 16 Mars Rd, Lane Cove West, NSW 2066
02 9900 8400 EnviroSampleNSW@eurofins.com

☐ Brisbane Laboratory
Unit 1, 21 Smallwood Pl, Murarrie, QLD 4172
07 3902 4600 EnviroSampleQLD@eurofins.com

☐ Perth Laboratory
Unit 2, 91 Leach Highway, Kewdale WA 6105
08 9251 9600 EnviroSampleWA@eurofins.com

☐ Melbourne Laboratory
2 Kingston Town Close, Oakleigh, VIC 3166
03 8564 5000 EnviroSampleVic@eurofins.com

Company	Monare	Project №	31-02984.00	Project Manager	WENDY TSIVOULIDIS
Address	17 Cobham Rd, Kew.	Project Name	ACID SULPHATE ASSESSMENT.	EDD Format (ESdat, EQuIS, Custom)	
Contact Name	Adam Tuffett				
Phone №	0447 464 466				
Special Directions	SAMPLES TO BE FROZEN.				
Purchase Order					
Quote ID №					

Sampler(s)	Adam Tuffett
Handed over by	↓
Email for Invoice	wendy.tsivoulidis@monarcenviro.com.
Email for Results	↓

Analyses (Note: Where metals are requested, please specify "Total" or "Filtered") SUITE code must be used to attract SUITE pricing

№	Client Sample ID	Sampled Date/Time (dd/mm/yy hh:mm)	Matrix (Solid (S) Water (W))	SPOCAS.	HOLD	Containers: 1L Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
1	BH1 – 1.0	4/7	S	[redacted]	X								X	BAGS
2	BH1 – 2.0	↓	↓	X									X	
3	BH1 – 2.3			X									X	
4	BH2 – 1.0			[redacted]	X								X	
5	BH2 – 2.0			X									X	
6	BH2 – 2.3			X									X	↓
7														
8														
9														
10														
	Total Counts													

Turnaround Time (TAT) Requirements (Default will be 5 days if not ticked)

☐ Overnight (9am)*
☐ 1 Day* ☐ 2 Day*
☐ 3 Day* ☐ 5 Day
* Surcharges apply
☐ Other ( )

Method of Shipment	☐ Courier (#)	☐ Hand Delivered	☐ Postal	Name		Signature		Date	__/__/__	Time	__:__
Eurofins | mgt Laboratory Use Only	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date	__/__/__	Time	__:__	Temperature	
	Received By	Will O'Hair	SYD | BNE (MEL) | PER | ADL | NTL | DRW	Signature	[signature]	Date	4/7/18	Time	4:00	Report №	606034

CHAIN OF CUSTODY RECORD

ABN 50 005 085 521

☐ Sydney Laboratory
Unit F3 Bld F, 16 Mars Rd, Lane Cove West, NSW 2066
02 9900 8400 EnviroSampleNSW@eurofins.com

☐ Brisbane Laboratory
Unit 1, 21 Smallwood Pl, Murarrie, QLD 4172
07 3902 4600 EnviroSampleQLD@eurofins.com

☐ Perth Laboratory
Unit 2, 91 Leach Highway, Kewdale WA 6105
08 9251 9600 EnviroSampleWA@eurofins.com

☐ Melbourne Laboratory
2 Kingston Town Close, Oakleigh, VIC 3166
03 8564 5000 EnviroSampleVic@eurofins.com

Company	MONARC	Project №	31-029847-00	Project Manager	Wendy Tsivoulidis
Address	17 Cochran Rd, Reen.	Project Name	Soil Contamination Investigation	EDD Format (ESdat, EQuIS, Custom)	
Contact Name	Wendy Tsivoulidis.				
Phone №					
Special Directions	Bags to be Frozen !				
Purchase Order					
Quote ID №					

Sampler(s)	Adam T.
Handed over by	
Email for Invoice	
Email for Results	Wendy.tsivoulidis@monarcenviro.com,

Analyses (Note: Where metals are requested, please specify "Total" or "Filtered"). SUITE codes must be used to attract SUITE pricing.

SPOCAS, Hold

Containers

1L Plastic | 250mL Plastic | 125mL Plastic | 200mL Amber Glass | 40mL VOA vial | 500mL PFAS Bottle | Jar (Glass or HDPE) | Other (Asbestos AS4964, WA Guidelines)

Turnaround Time (TAT) Requirements (Default will be 5 days if not ticked)

☐ Overnight (9am)*
☐ 1 Day* ☐ 2 Day*
☐ 3 Day* ☑ 5 Day
* Surcharges apply
☐ Other ( )

№	Client Sample ID	Sampled Date/Time (dd/mm/yy hh:mm)	Matrix (Solid (S) Water (W))	SPOCAS	Hold	Sample Comments / Dangerous Goods Hazard Warning
1	BH6/1	21/6/18	S		X	✓ Bag (1x).
2	BH6/2			X		
3	BH7/1				X	
4	BH7/2				X.	
5	BH7/3			X		
6						
7						
8						
9						
10						
	Total Counts					

Method of Shipment	☐ Courier (#)	☐ Hand Delivered	☐ Postal	Name		Signature		Date	__/__/__	Time	__:__
Eurofins | mgt Laboratory Use Only	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date	__/__/__	Time	__:__	Temperature	
	Received By	SS	SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date	21/6/18	Time	11:45	Report №	603972

Submission of samples to the laboratory will be deemed as acceptance of Eurofins | mgt Standard Terms and Conditions unless agreed otherwise. A copy of Eurofins | mgt Standard Terms and Conditions is available on request.

Eurofins Environment Testing Australia Pty Ltd trading as Eurofins | mgt

QS3009_R7 Modified by Dr R Symons Approved by T Lakeland Approved on 17 August 2017

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☐ Melbourne Laboratory
2 Kingston Town Close, Oakleigh, VIC 3166
03 8564 5000 EnviroSampleVic@eurofins.com

Company	Monaro.	Project №	31-02984.00	Project Manager	WENDY TSIVOULIDIS
Address	17 Cobham Rd, Kew	Project Name	SOIL CONTAMINATION INVESTIGATION	EDD Format (ESdat, EQuIS, Custom)	
Contact Name	WENDY TSIVOULIDIS	Analyses (Note: Where metals are requested, please specify "Total" or "Filtered". SUITE code must be used to attract SUITE pricing)	SPOCAS	HOLD	
Phone №					
Special Directions					
Purchase Order					
Quote ID №					

Sampler(s)	Adam T.				
Handed over by					
Email for Invoice					
Email for Results	WENDY.TSIVOULIDIS@MONAROENVIRO.COM				

№	Client Sample ID	Sampled Date/Time (dd/mm/yy hh:mm)	Matrix (Solid (S) Water (W))	SPOCAS	HOLD	Containers: 1L Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
1	BH1/1	20/6/18	S		X									
2	BH1/2				X									
3	BH1/3			X										
4	BH2/1				X									
5	BH2/2				X									
6	BH2/3			X										
7	BH3/1				X									
8	BH3/2				X									
9	BH3/3			X										
10														
	Total Counts													

Turnaround Time (TAT) Requirements (Default will be 5 days if not Sched)

☐ Overnight (9am)*
☐ 1 Day* ☐ 2 Day*
☐ 3 Day* ☒ 5 Day
* Surcharges apply
☐ Other ( )

Method of Shipment	☐ Courier (#)	☐ Hand Delivered	☐ Postal	Name		Signature		Date	__/__/__	Time	__:__
Eurofins | mgt Laboratory Use Only	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date	__/__/__	Time	__:__	Temperature	
	Received By	Julpa Rite	SYD | BNE | (MEL) | PER | ADL | NTL | DRW	Signature		Date	20/6/18	Time	5:35pm	Report №	603966

CHAIN OF CUSTODY RECORD

ABN 50 005 085 521

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03 8564 5000 EnviroSampleVic@eurofins.com

Company	MONARE	Project №	31-02984-00	Project Manager	WENDY TSIVOULIDIS
Address	17 Cobham Rd, Kew	Project Name	SOIL CONTAMINATION INVESTIGATION	EDD Format (ESdat, EQuIS, Custom)	
Contact Name					
Phone №					
Special Directions					
Purchase Order					
Quote ID №					

Sampler(s)	
Handed over by	
Email for Invoice	
Email for Results	WENDY.TSIVOULIDIS@MONAREENVIRO.COM

Analyses (Note: Where metals are requested, please specify "Total" or "Filtered") SUITE code must be used to attract SUITE pricing

№	Client Sample ID	Sampled Date/Time (dd/mm/yy hh:mm)	Matrix (Solid (S) Water (W))	SPOCAS	HOLD.														Containers: 1L Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
1	BH4/1	20/6/18	S		X																						
2	BH4/2	↓	↓	X																							
3	BH5/1			X	X																						
4	BH5/2			X	X																						
5	BH5/3	↓	↓	X																							
6																											
7																											
8																											
9																											
10																											
	Total Counts																										

Turnaround Time (TAT) Requirements (Default will be 5 days if not ticked)

- ☐ Overnight (9am)*
- ☐ 1 Day* ☐ 2 Day*
- ☐ 3 Day* ☑ 5 Day
- * Surcharges apply
- ☐ Other ( )

Method of Shipment	☐ Courier (#) ☐ Hand Delivered	☐ Postal	Name		Signature		Date	__/__/__	Time __:__
Eurofins | mgt Laboratory Use Only	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW		Signature		Date __/__/__	Time __:__	Temperature
	Received By	Julia Ruhi	SYD | BNE | (MEL) | PER | ADL | NTL | DRW		Signature		Date 20/6/18	Time 5:35 PM	Report № 603966

Submission of samples to the laboratory will be deemed as acceptance of Eurofins | mgt Standard Terms and Conditions unless agreed otherwise. A copy of Eurofins | mgt Standard Terms and Conditions is available on request.

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30 years Testing For Life 1987–2017
Celebrating 30 years Testing and Protecting Human Health

Certificate of Analysis

LogiCamms
Level 1, Suite 2, 17 Cotham Road
Kew
VIC 3101

NATA Accredited
Accreditation Number 1261
Site Number 1254

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

Attention: **Wendy Tsivoulidis**

Report **603966-S**
Project name SOIL CONTAMINATION INVESTIGATION
Project ID 31-02984.00
Received Date Jun 20, 2018

Client Sample ID			**BH1/3**	**BH2/3**	**BH3/3**	**BH4/2**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**M18-Jn23445**	**M18-Jn23446**	**M18-Jn23447**	**M18-Jn23448**
Date Sampled			**Jun 20, 2018**	**Jun 20, 2018**	**Jun 20, 2018**	**Jun 20, 2018**
Test/Reference	LOR	Unit				
SPOCAS Suite						
pH-KCL	0.1	pH Units	5.9	6.4	6.7	6.5
pH-OX	0.1	pH Units	6.7	6.3	6.4	6.5
Acid trail - Titratable Actual Acidity	2	mol H+/t	3.0	< 2	< 2	< 2
Acid trail - Titratable Peroxide Acidity	2	mol H+/t	< 2	6.0	4.0	3.0
Acid trail - Titratable Sulfidic Acidity	2	mol H+/t	< 2	6.0	4.0	3.0
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	< 0.02	< 0.02	< 0.02	< 0.02
sulfidic - TPA equiv. S% pyrite	0.02	% pyrite S	< 0.02	< 0.02	< 0.02	< 0.02
sulfidic - TSA equiv. S% pyrite	0.02	% pyrite S	< 0.02	< 0.02	< 0.02	< 0.02
Sulfur - KCl Extractable	0.02	% S	< 0.02	< 0.02	< 0.02	< 0.02
Sulfur - Peroxide	0.02	% S	< 0.02	< 0.02	< 0.02	0.02
Sulfur - Peroxide Oxidisable Sulfur	0.02	% S	< 0.02	< 0.02	< 0.02	0.02
acidity - Peroxide Oxidisable Sulfur	10	mol H+/t	< 10	< 10	< 10	13
HCl Extractable Sulfur	0.02	% S	n/a	n/a	n/a	n/a
Net Acid soluble sulfur	0.02	% S	n/a	n/a	n/a	n/a
Net Acid soluble sulfur - acidity units	10	mol H+/t	n/a	n/a	n/a	n/a
Net Acid soluble sulfur - equivalent S% pyrite[S02]	0.02	% S	n/a	n/a	n/a	n/a
Calcium - KCl Extractable	0.02	% Ca	0.07	0.02	0.08	0.17
Calcium - Peroxide	0.02	% Ca	0.07	< 0.02	0.08	0.17
Acid Reacted Calcium	0.02	% Ca	< 0.02	< 0.02	< 0.02	< 0.02
acidity - Acid Reacted Calcium	10	mol H+/t	< 10	< 10	< 10	< 10
sulfidic - Acid Reacted Ca equiv. S% pyrite	0.02	% S	< 0.02	< 0.02	< 0.02	< 0.02
Magnesium - KCl Extractable	0.02	% Mg	0.08	0.04	0.04	0.12
Magnesium - Peroxide	0.02	% Mg	0.09	0.03	0.05	0.11
Acid Reacted Magnesium	0.02	% Mg	< 0.02	< 0.02	< 0.02	< 0.02
acidity - Acid Reacted Magnesium	10	mol H+/t	< 10	< 10	< 10	< 10
sulfidic - Acid Reacted Mg equiv. S% pyrite	0.02	% S	< 0.02	< 0.02	< 0.02	< 0.02
Acid Neutralising Capacity (ANCE)	0.02	%CaCO3	< 0.02	n/a	n/a	#VALUE!
Acid Neutralising Capacity - Acidity units (a-ANCE)	10	mol H+/t	< 10	n/a	n/a	n/a
Acid Neutralising Capacity - equivalent S% pyrite(s-ANCE)	0.02	% S	< 0.02	n/a	n/a	n/a
ANC Fineness Factor		factor	1.5	1.5	1.5	1.5
SPOCAS - Net Acidity (Sulfur Units)	0.02	% S	< 0.02	< 0.02	< 0.02	0.02
SPOCAS - Net Acidity (Acidity Units)	10	mol H+/t	< 10	< 10	< 10	13
SPOCAS - Liming rate	1	kg CaCO3/t	< 1	< 1	< 1	1.0

Client Sample ID			BH1/3	BH2/3	BH3/3	BH4/2
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**M18-Jn23445**	**M18-Jn23446**	**M18-Jn23447**	**M18-Jn23448**
Date Sampled			**Jun 20, 2018**	**Jun 20, 2018**	**Jun 20, 2018**	**Jun 20, 2018**
Test/Reference	LOR	Unit				
Extraneous Material						
<2mm Fraction	0.005	g	88	130	95	76
>2mm Fraction	0.005	g	0.13	< 0.005	< 0.005	< 0.005
Analysed Material	0.1	%	100	100	100	100
Extraneous Material	0.1	%	0.2	< 0.1	< 0.1	< 0.1
% Moisture	1	%	19	16	20	30

Client Sample ID			BH5/3
Sample Matrix			**Soil**
Eurofins | mgt Sample No.			**M18-Jn23449**
Date Sampled			**Jun 20, 2018**
Test/Reference	LOR	Unit	
SPOCAS Suite			
pH-KCL	0.1	pH Units	5.8
pH-OX	0.1	pH Units	5.6
Acid trail - Titratable Actual Acidity	2	mol H+/t	2.0
Acid trail - Titratable Peroxide Acidity	2	mol H+/t	6.0
Acid trail - Titratable Sulfidic Acidity	2	mol H+/t	< 2
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	< 0.02
sulfidic - TPA equiv. S% pyrite	0.02	% pyrite S	< 0.02
sulfidic - TSA equiv. S% pyrite	0.02	% pyrite S	< 0.02
Sulfur - KCl Extractable	0.02	% S	0.02
Sulfur - Peroxide	0.02	% S	< 0.02
Sulfur - Peroxide Oxidisable Sulfur	0.02	% S	< 0.02
acidity - Peroxide Oxidisable Sulfur	10	mol H+/t	< 10
HCl Extractable Sulfur	0.02	% S	n/a
Net Acid soluble sulfur	0.02	% S	n/a
Net Acid soluble sulfur - acidity units	10	mol H+/t	n/a
Net Acid soluble sulfur - equivalent S% pyrite[S02]	0.02	% S	n/a
Calcium - KCl Extractable	0.02	% Ca	< 0.02
Calcium - Peroxide	0.02	% Ca	< 0.02
Acid Reacted Calcium	0.02	% Ca	< 0.02
acidity - Acid Reacted Calcium	10	mol H+/t	< 10
sulfidic - Acid Reacted Ca equiv. S% pyrite	0.02	% S	< 0.02
Magnesium - KCl Extractable	0.02	% Mg	0.03
Magnesium - Peroxide	0.02	% Mg	0.03
Acid Reacted Magnesium	0.02	% Mg	< 0.02
acidity - Acid Reacted Magnesium	10	mol H+/t	< 10
sulfidic - Acid Reacted Mg equiv. S% pyrite	0.02	% S	< 0.02
Acid Neutralising Capacity (ANCE)	0.02	%CaCO3	n/a
Acid Neutralising Capacity - Acidity units (a-ANCE)	10	mol H+/t	n/a
Acid Neutralising Capacity - equivalent S% pyrite(s-ANCE)	0.02	% S	n/a
ANC Fineness Factor		factor	1.5
SPOCAS - Net Acidity (Sulfur Units)	0.02	% S	< 0.02
SPOCAS - Net Acidity (Acidity Units)	10	mol H+/t	< 10
SPOCAS - Liming rate	1	kg CaCO3/t	< 1

Client Sample ID			BH5/3
Sample Matrix			**Soil**
Eurofins | mgt Sample No.			**M18-Jn23449**
Date Sampled			**Jun 20, 2018**
Test/Reference	LOR	Unit	
Extraneous Material			
<2mm Fraction	0.005	g	100
>2mm Fraction	0.005	g	< 0.005
Analysed Material	0.1	%	100
Extraneous Material	0.1	%	< 0.1
% Moisture	1	%	14

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

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

Description	Testing Site	Extracted	Holding Time
SPOCAS Suite			
SPOCAS Suite	Brisbane	Jun 27, 2018	6 Week
- Method: LTM-GEN-7050			
Extraneous Material	Brisbane	Jun 27, 2018	6 Week
- Method: LTM-GEN-7050/7070			
% Moisture	Brisbane	Jun 21, 2018	14 Day
- Method: LTM-GEN-7080 Moisture			

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

Melbourne
2-5 Kingston Town Close
Oakleigh VIC 3166
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

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

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

Company Name: LogiCamms
Address: Level 1, Suite 2, 17 Cotham Road
Kew
VIC 3101

Project Name: SOIL CONTAMINATION INVESTIGATION
Project ID: 31-02984.00

Order No.:
Report #: 603966
Phone: 03 9205 6000
Fax: 9836 0801

Received: Jun 20, 2018 5:35 PM
Due: Jun 28, 2018
Priority: 5 Day
Contact Name: Wendy Tsivoulidis

Eurofins | mgt Analytical Services Manager : Liam Prescott

Sample Detail						HOLD	SPOCAS Suite	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
External Laboratory								
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**			
1	BH1/3	Jun 20, 2018		Soil	M18-Jn23445		X	X
2	BH2/3	Jun 20, 2018		Soil	M18-Jn23446		X	X
3	BH3/3	Jun 20, 2018		Soil	M18-Jn23447		X	X
4	BH4/2	Jun 20, 2018		Soil	M18-Jn23448		X	X
5	BH5/3	Jun 20, 2018		Soil	M18-Jn23449		X	X
6	BH1/1	Jun 20, 2018		Soil	M18-Jn23450	X		
7	BH1/2	Jun 20, 2018		Soil	M18-Jn23451	X		
8	BH2/1	Jun 20, 2018		Soil	M18-Jn23452	X		
9	BH2/2	Jun 20, 2018		Soil	M18-Jn23453	X		

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e.mail : EnviroSales@eurofins.com
web : www.eurofins.com.au

Melbourne
2-5 Kingston Town Close
Oakleigh VIC 3166
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NATA # 1261
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Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
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Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

Company Name:	LogiCamms	**Order No.:**		**Received:**	Jun 20, 2018 5:35 PM
Address:	Level 1, Suite 2, 17 Cotham Road Kew VIC 3101	**Report #:**	603966	**Due:**	Jun 28, 2018
		Phone:	03 9205 6000	**Priority:**	5 Day
		Fax:	9836 0801	**Contact Name:**	Wendy Tsivoulidis
Project Name:	SOIL CONTAMINATION INVESTIGATION				
Project ID:	31-02984.00				

Eurofins | mgt Analytical Services Manager : Liam Prescott

Sample Detail						HOLD	SPOCAS Suite	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
10	BH3/1	Jun 20, 2018		Soil	M18-Jn23454	X		
11	BH3/2	Jun 20, 2018		Soil	M18-Jn23455	X		
12	BH4/1	Jun 20, 2018		Soil	M18-Jn23456	X		
13	BH5/1	Jun 20, 2018		Soil	M18-Jn23457	X		
14	BH5/2	Jun 20, 2018		Soil	M18-Jn23458	X		
Test Counts						9	5	5

Internal Quality Control Review and Glossary

General

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

Holding Times

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

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

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

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

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

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

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

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

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	Quality Systems Manual ver 5.1 US Department of Defense
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

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

Results <10 times the LOR : No Limit

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

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

Surrogate Recoveries: Recoveries must lie between 50-150%-Phenols & PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.1 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

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

Quality Control Results

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
SPOCAS Suite				Result 1	Result 2	RPD			
pH-KCL	M18-Jn23445	CP	pH Units	5.9	5.9	<1	30%	Pass	
pH-OX	M18-Jn23445	CP	pH Units	6.7	6.7	<1	30%	Pass	
Acid trail - Titratable Actual Acidity	M18-Jn23445	CP	mol H+/t	3.0	3.0	2.0	30%	Pass	
Acid trail - Titratable Peroxide Acidity	M18-Jn23445	CP	mol H+/t	< 2	< 2	<1	30%	Pass	
Acid trail - Titratable Sulfidic Acidity	M18-Jn23445	CP	mol H+/t	< 2	< 2	<1	30%	Pass	
sulfidic - TAA equiv. S% pyrite	M18-Jn23445	CP	% pyrite S	< 0.02	< 0.02	<1	30%	Pass	
sulfidic - TPA equiv. S% pyrite	M18-Jn23445	CP	% pyrite S	< 0.02	< 0.02	<1	30%	Pass	
sulfidic - TSA equiv. S% pyrite	M18-Jn23445	CP	% pyrite S	< 0.02	< 0.02	<1	30%	Pass	
Sulfur - KCl Extractable	M18-Jn23445	CP	% S	< 0.02	< 0.02	<1	30%	Pass	
Sulfur - Peroxide	M18-Jn23445	CP	% S	< 0.02	< 0.02	<1	30%	Pass	
Sulfur - Peroxide Oxidisable Sulfur	M18-Jn23445	CP	% S	< 0.02	< 0.02	<1	30%	Pass	
acidity - Peroxide Oxidisable Sulfur	M18-Jn23445	CP	mol H+/t	< 10	< 10	<1	30%	Pass	
Calcium - KCl Extractable	M18-Jn23445	CP	% Ca	0.07	0.07	3.0	30%	Pass	
Calcium - Peroxide	M18-Jn23445	CP	% Ca	0.07	0.08	8.0	30%	Pass	
Acid Reacted Calcium	M18-Jn23445	CP	% Ca	< 0.02	< 0.02	<1	30%	Pass	
acidity - Acid Reacted Calcium	M18-Jn23445	CP	mol H+/t	< 10	< 10	<1	30%	Pass	
sulfidic - Acid Reacted Ca equiv. S% pyrite	M18-Jn23445	CP	% S	< 0.02	< 0.02	<1	30%	Pass	
Magnesium - KCl Extractable	M18-Jn23445	CP	% Mg	0.08	0.08	4.0	30%	Pass	
Magnesium - Peroxide	M18-Jn23445	CP	% Mg	0.09	0.10	8.0	30%	Pass	
Acid Reacted Magnesium	M18-Jn23445	CP	% Mg	< 0.02	< 0.02	<1	30%	Pass	
acidity - Acid Reacted Magnesium	M18-Jn23445	CP	mol H+/t	< 10	< 10	<1	30%	Pass	
sulfidic - Acid Reacted Mg equiv. S% pyrite	M18-Jn23445	CP	% S	< 0.02	< 0.02	<1	30%	Pass	
Acid Neutralising Capacity (ANCE)	M18-Jn23445	CP	%CaCO3	< 0.02	0.02	19	30%	Pass	
Acid Neutralising Capacity - Acidity units (a-ANCE)	M18-Jn23445	CP	mol H+/t	< 10	< 10	<1	30%	Pass	
ANC Fineness Factor	M18-Jn23445	CP	factor	1.5	1.5	<1	30%	Pass	
SPOCAS - Liming rate	M18-Jn23445	CP	kg CaCO3/t	< 1	< 1	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	B18-Jn29061	NCP	%	14	14	3.0	30%	Pass	

Comments

Sample Integrity

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

Qualifier Codes/Comments

Code	Description
S02	Retained Acidity is Reported when the pHKCl is less than pH 4.5

Authorised By

Liam Prescott	Analytical Services Manager
Steven Trout	Senior Analyst-Metal (QLD)

Glenn Jackson
National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

Measurement uncertainty of test data is available on request or please click here.

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

Attention: **Wendy Tsivoulidis**

Report **603972-S**
Project name SOIL CONTAMINATION INVESTIGATION
Project ID 31-02984.00
Received Date Jun 21, 2018

Client Sample ID			**BH6/2**	**BH7/3**
Sample Matrix			**Soil**	**Soil**
Eurofins | mgt Sample No.			**M18-Jn23473**	**M18-Jn23474**
Date Sampled			**Jun 21, 2018**	**Jun 21, 2018**
Test/Reference	LOR	Unit		
SPOCAS Suite				
pH-KCL	0.1	pH Units	6.6	6.2
pH-OX	0.1	pH Units	7.2	6.7
Acid trail - Titratable Actual Acidity	2	mol H+/t	< 2	2.0
Acid trail - Titratable Peroxide Acidity	2	mol H+/t	< 2	< 2
Acid trail - Titratable Sulfidic Acidity	2	mol H+/t	< 2	< 2
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	< 0.02	< 0.02
sulfidic - TPA equiv. S% pyrite	0.02	% pyrite S	< 0.02	< 0.02
sulfidic - TSA equiv. S% pyrite	0.02	% pyrite S	< 0.02	< 0.02
Sulfur - KCl Extractable	0.02	% S	0.03	< 0.02
Sulfur - Peroxide	0.02	% S	0.04	< 0.02
Sulfur - Peroxide Oxidisable Sulfur	0.02	% S	< 0.02	< 0.02
acidity - Peroxide Oxidisable Sulfur	10	mol H+/t	< 10	< 10
HCl Extractable Sulfur	0.02	% S	n/a	n/a
Net Acid soluble sulfur	0.02	% S	n/a	n/a
Net Acid soluble sulfur - acidity units	10	mol H+/t	n/a	n/a
Net Acid soluble sulfur - equivalent S% pyrite[S02]	0.02	% S	n/a	n/a
Calcium - KCl Extractable	0.02	% Ca	0.42	0.16
Calcium - Peroxide	0.02	% Ca	0.38	0.15
Acid Reacted Calcium	0.02	% Ca	< 0.02	< 0.02
acidity - Acid Reacted Calcium	10	mol H+/t	< 10	< 10
sulfidic - Acid Reacted Ca equiv. S% pyrite	0.02	% S	< 0.02	< 0.02
Magnesium - KCl Extractable	0.02	% Mg	0.30	0.19
Magnesium - Peroxide	0.02	% Mg	0.28	0.18
Acid Reacted Magnesium	0.02	% Mg	< 0.02	< 0.02
acidity - Acid Reacted Magnesium	10	mol H+/t	< 10	< 10
sulfidic - Acid Reacted Mg equiv. S% pyrite	0.02	% S	< 0.02	< 0.02
Acid Neutralising Capacity (ANCE)	0.02	%CaCO3	0.22	0.10
Acid Neutralising Capacity - Acidity units (a-ANCE)	10	mol H+/t	44	21
Acid Neutralising Capacity - equivalent S% pyrite(s-ANCE)	0.02	% S	0.07	0.03
ANC Fineness Factor		factor	1.5	1.5
SPOCAS - Net Acidity (Sulfur Units)	0.02	% S	< 0.02	< 0.02
SPOCAS - Net Acidity (Acidity Units)	10	mol H+/t	< 10	< 10
SPOCAS - Liming rate	1	kg CaCO3/t	< 1	< 1

Client Sample ID			BH6/2	BH7/3
Sample Matrix			**Soil**	**Soil**
Eurofins | mgt Sample No.			**M18-Jn23473**	**M18-Jn23474**
Date Sampled			**Jun 21, 2018**	**Jun 21, 2018**
Test/Reference	LOR	Unit		
Extraneous Material				
<2mm Fraction	0.005	g	67	97
>2mm Fraction	0.005	g	< 0.005	< 0.005
Analysed Material	0.1	%	100	100
Extraneous Material	0.1	%	< 0.1	< 0.1
% Moisture	1	%	36	28

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

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

Description	Testing Site	Extracted	Holding Time
SPOCAS Suite			
SPOCAS Suite	Brisbane	Jun 27, 2018	6 Week
- Method: LTM-GEN-7050			
Extraneous Material	Brisbane	Jun 27, 2018	6 Week
- Method: LTM-GEN-7050/7070			
% Moisture	Brisbane	Jun 21, 2018	14 Day
- Method: LTM-GEN-7080 Moisture			

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

Melbourne
2-5 Kingston Town Close
Oakleigh VIC 3166
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

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

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

Company Name:	LogiCamms	**Order No.:**		**Received:**	Jun 21, 2018 11:49 AM
Address:	Level 1, Suite 2, 17 Cotham Road Kew VIC 3101	**Report #:** **Phone:** **Fax:**	603972 03 9205 6000 9836 0801	**Due:** **Priority:** **Contact Name:**	Jun 28, 2018 5 Day Wendy Tsivoulidis
Project Name:	SOIL CONTAMINATION INVESTIGATION				
Project ID:	31-02984.00				

Eurofins | mgt Analytical Services Manager : Liam Prescott

Sample Detail						HOLD	SPOCAS Suite	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
External Laboratory								
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**			
1	BH6/2	Jun 21, 2018		Soil	M18-Jn23473		X	X
2	BH7/3	Jun 21, 2018		Soil	M18-Jn23474		X	X
3	BH6/1	Jun 21, 2018		Soil	M18-Jn23475	X		
4	BH7/1	Jun 21, 2018		Soil	M18-Jn23476	X		
5	BH7/2	Jun 21, 2018		Soil	M18-Jn23477	X		
Test Counts						3	2	2

Internal Quality Control Review and Glossary

General

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

Holding Times

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

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

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

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

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

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

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

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

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	Quality Systems Manual ver 5.1 US Department of Defense
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

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

Results <10 times the LOR : No Limit

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

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

Surrogate Recoveries: Recoveries must lie between 50-150%-Phenols & PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.1 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

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

Quality Control Results

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
SPOCAS Suite				Result 1	Result 2	RPD			
pH-KCL	M18-Jn23473	CP	pH Units	6.6	6.6	<1	30%	Pass	
pH-OX	M18-Jn23473	CP	pH Units	7.2	7.2	<1	30%	Pass	
Acid trail - Titratable Actual Acidity	M18-Jn23473	CP	mol H+/t	< 2	< 2	<1	30%	Pass	
Acid trail - Titratable Peroxide Acidity	M18-Jn23473	CP	mol H+/t	< 2	< 2	<1	30%	Pass	
Acid trail - Titratable Sulfidic Acidity	M18-Jn23473	CP	mol H+/t	< 2	< 2	<1	30%	Pass	
sulfidic - TAA equiv. S% pyrite	M18-Jn23473	CP	% pyrite S	< 0.02	< 0.02	<1	30%	Pass	
sulfidic - TPA equiv. S% pyrite	M18-Jn23473	CP	% pyrite S	< 0.02	< 0.02	<1	30%	Pass	
sulfidic - TSA equiv. S% pyrite	M18-Jn23473	CP	% pyrite S	< 0.02	< 0.02	<1	30%	Pass	
Sulfur - KCl Extractable	M18-Jn23473	CP	% S	0.03	0.03	9.0	30%	Pass	
Sulfur - Peroxide	M18-Jn23473	CP	% S	0.04	0.04	4.0	30%	Pass	
Sulfur - Peroxide Oxidisable Sulfur	M18-Jn23473	CP	% S	< 0.02	< 0.02	<1	30%	Pass	
acidity - Peroxide Oxidisable Sulfur	M18-Jn23473	CP	mol H+/t	< 10	< 10	<1	30%	Pass	
Calcium - KCl Extractable	M18-Jn23473	CP	% Ca	0.42	0.39	8.0	30%	Pass	
Calcium - Peroxide	M18-Jn23473	CP	% Ca	0.38	0.37	3.0	30%	Pass	
Acid Reacted Calcium	M18-Jn23473	CP	% Ca	< 0.02	< 0.02	<1	30%	Pass	
acidity - Acid Reacted Calcium	M18-Jn23473	CP	mol H+/t	< 10	< 10	<1	30%	Pass	
sulfidic - Acid Reacted Ca equiv. S% pyrite	M18-Jn23473	CP	% S	< 0.02	< 0.02	<1	30%	Pass	
Magnesium - KCl Extractable	M18-Jn23473	CP	% Mg	0.30	0.27	9.0	30%	Pass	
Magnesium - Peroxide	M18-Jn23473	CP	% Mg	0.28	0.27	4.0	30%	Pass	
Acid Reacted Magnesium	M18-Jn23473	CP	% Mg	< 0.02	< 0.02	<1	30%	Pass	
acidity - Acid Reacted Magnesium	M18-Jn23473	CP	mol H+/t	< 10	< 10	<1	30%	Pass	
sulfidic - Acid Reacted Mg equiv. S% pyrite	M18-Jn23473	CP	% S	< 0.02	< 0.02	<1	30%	Pass	
Acid Neutralising Capacity (ANCE)	M18-Jn23473	CP	%CaCO3	0.22	0.23	5.0	30%	Pass	
Acid Neutralising Capacity - Acidity units (a-ANCE)	M18-Jn23473	CP	mol H+/t	44	46	5.0	30%	Pass	
ANC Fineness Factor	M18-Jn23473	CP	factor	1.5	1.5	<1	30%	Pass	
SPOCAS - Liming rate	M18-Jn23473	CP	kg CaCO3/t	< 1	< 1	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	P18-Jn11468	NCP	%	6.2	6.1	2.0	30%	Pass	

Comments

Sample Integrity

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

Qualifier Codes/Comments

Code	Description
S02	Retained Acidity is Reported when the pHKCl is less than pH 4.5

Authorised By

Liam Prescott	Analytical Services Manager
Steven Trout	Senior Analyst-Metal (QLD)

Glenn Jackson
National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

Measurement uncertainty of test data is available on request or please click here.

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Site Number 1254

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

Attention: **Wendy Tsivoulidis**

Report **606710-S**
Project name ACID SULPHATE INVESTIGATION
Project ID 31-02984.00
Received Date Jul 09, 2018

Client Sample ID			**BH1/2.5**	**BH1/3.0**
Sample Matrix			**Soil**	**Soil**
Eurofins | mgt Sample No.			**M18-Jl09303**	**M18-Jl09304**
Date Sampled			**Jul 09, 2018**	**Jul 09, 2018**
Test/Reference	LOR	Unit		
SPOCAS Suite				
pH-KCL	0.1	pH Units	6.2	6.2
pH-OX	0.1	pH Units	6.3	5.8
Acid trail - Titratable Actual Acidity	2	mol H+/t	2.0	< 2
Acid trail - Titratable Peroxide Acidity	2	mol H+/t	< 2	< 2
Acid trail - Titratable Sulfidic Acidity	2	mol H+/t	< 2	< 2
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	< 0.02	< 0.02
sulfidic - TPA equiv. S% pyrite	0.02	% pyrite S	< 0.02	< 0.02
sulfidic - TSA equiv. S% pyrite	0.02	% pyrite S	< 0.02	< 0.02
Sulfur - KCl Extractable	0.02	% S	< 0.02	< 0.02
Sulfur - Peroxide	0.02	% S	< 0.02	< 0.02
Sulfur - Peroxide Oxidisable Sulfur	0.02	% S	< 0.02	< 0.02
acidity - Peroxide Oxidisable Sulfur	10	mol H+/t	< 10	< 10
HCl Extractable Sulfur	0.02	% S	n/a	n/a
Net Acid soluble sulfur	0.02	% S	n/a	n/a
Net Acid soluble sulfur - acidity units	10	mol H+/t	n/a	n/a
Net Acid soluble sulfur - equivalent S% pyrite[S02]	0.02	% S	n/a	n/a
Calcium - KCl Extractable	0.02	% Ca	< 0.02	< 0.02
Calcium - Peroxide	0.02	% Ca	< 0.02	< 0.02
Acid Reacted Calcium	0.02	% Ca	< 0.02	< 0.02
acidity - Acid Reacted Calcium	10	mol H+/t	< 10	< 10
sulfidic - Acid Reacted Ca equiv. S% pyrite	0.02	% S	< 0.02	< 0.02
Magnesium - KCl Extractable	0.02	% Mg	0.03	< 0.02
Magnesium - Peroxide	0.02	% Mg	0.02	< 0.02
Acid Reacted Magnesium	0.02	% Mg	< 0.02	< 0.02
acidity - Acid Reacted Magnesium	10	mol H+/t	< 10	< 10
sulfidic - Acid Reacted Mg equiv. S% pyrite	0.02	% S	< 0.02	< 0.02
Acid Neutralising Capacity (ANCE)	0.02	%CaCO3	n/a	n/a
Acid Neutralising Capacity - Acidity units (a-ANCE)	10	mol H+/t	n/a	n/a
Acid Neutralising Capacity - equivalent S% pyrite(s-ANCE)	0.02	% S	n/a	n/a
ANC Fineness Factor		factor	1.5	1.5
SPOCAS - Net Acidity (Sulfur Units)	0.02	% S	< 0.02	< 0.02
SPOCAS - Net Acidity (Acidity Units)	10	mol H+/t	< 10	< 10
SPOCAS - Liming rate	1	kg CaCO3/t	< 1	< 1

Client Sample ID			BH1/2.5	BH1/3.0
Sample Matrix			**Soil**	**Soil**
Eurofins | mgt Sample No.			**M18-Jl09303**	**M18-Jl09304**
Date Sampled			**Jul 09, 2018**	**Jul 09, 2018**
Test/Reference	LOR	Unit		
Extraneous Material				
<2mm Fraction	0.005	g	180	160
>2mm Fraction	0.005	g	< 0.005	< 0.005
Analysed Material	0.1	%	100	100
Extraneous Material	0.1	%	< 0.1	< 0.1

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

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

Description	Testing Site	Extracted	Holding Time
SPOCAS Suite			
SPOCAS Suite	Brisbane	Jul 11, 2018	6 Week
- Method: LTM-GEN-7050			
Extraneous Material	Brisbane	Jul 11, 2018	6 Week
- Method: LTM-GEN-7050/7070			

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

Melbourne
2-5 Kingston Town Close
Oakleigh VIC 3166
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

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

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

Company Name: LogiCamms
Address: Level 1, Suite 2, 17 Cotham Road
Kew
VIC 3101

Project Name: ACID SULPHATE INVESTIGATION
Project ID: 31-02984.00

Order No.:
Report #: 606710
Phone: 03 9205 6000
Fax: 9836 0801

Received: Jul 9, 2018 12:20 PM
Due: Jul 16, 2018
Priority: 5 Day
Contact Name: Wendy Tsivoulidis

Eurofins | mgt Analytical Services Manager : Liam Prescott

Sample Detail						HOLD	SPOCAS Suite
Melbourne Laboratory - NATA Site # 1254 & 14271							
Sydney Laboratory - NATA Site # 18217							
Brisbane Laboratory - NATA Site # 20794						X	X
Perth Laboratory - NATA Site # 23736							
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	BH1/2.5	Jul 09, 2018		Soil	M18-Jl09303		X
2	BH1/3.0	Jul 09, 2018		Soil	M18-Jl09304		X
3	BH1/1	Jul 09, 2018		Soil	M18-Jl09305	X	
4	BH1/1.4	Jul 09, 2018		Soil	M18-Jl09306	X	
5	BH1/2.0	Jul 09, 2018		Soil	M18-Jl09307	X	
Test Counts						3	2

Internal Quality Control Review and Glossary

General

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

Holding Times

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

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

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

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

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

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

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

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

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	Quality Systems Manual ver 5.1 US Department of Defense
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

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

Results <10 times the LOR : No Limit

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

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

Surrogate Recoveries: Recoveries must lie between 50-150%-Phenols & PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.1 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

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

Quality Control Results

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
SPOCAS Suite				Result 1	Result 2	RPD			
pH-KCL	S18-Jl11283	NCP	pH Units	7.0	7.0	<1	30%	Pass	
pH-OX	S18-Jl11283	NCP	pH Units	5.3	5.4	<1	30%	Pass	
Acid trail - Titratable Actual Acidity	S18-Jl11283	NCP	mol H+/t	< 2	< 2	<1	30%	Pass	
Acid trail - Titratable Peroxide Acidity	S18-Jl11283	NCP	mol H+/t	< 2	< 2	<1	30%	Pass	
Acid trail - Titratable Sulfidic Acidity	S18-Jl11283	NCP	mol H+/t	< 2	< 2	<1	30%	Pass	
sulfidic - TAA equiv. S% pyrite	S18-Jl11283	NCP	% pyrite S	< 0.02	< 0.02	<1	30%	Pass	
sulfidic - TPA equiv. S% pyrite	S18-Jl11283	NCP	% pyrite S	< 0.02	< 0.02	<1	30%	Pass	
sulfidic - TSA equiv. S% pyrite	S18-Jl11283	NCP	% pyrite S	< 0.02	< 0.02	<1	30%	Pass	
Sulfur - KCl Extractable	S18-Jl11283	NCP	% S	< 0.02	< 0.02	<1	30%	Pass	
Sulfur - Peroxide	S18-Jl11283	NCP	% S	< 0.02	< 0.02	<1	30%	Pass	
Sulfur - Peroxide Oxidisable Sulfur	S18-Jl11283	NCP	% S	< 0.02	< 0.02	<1	30%	Pass	
acidity - Peroxide Oxidisable Sulfur	S18-Jl11283	NCP	mol H+/t	< 10	< 10	<1	30%	Pass	
HCl Extractable Sulfur	S18-Jl11283	NCP	% S	n/a	n/a	n/a	30%	Pass	
Net Acid soluble sulfur	S18-Jl11283	NCP	% S	n/a	n/a	n/a	30%	Pass	
Net Acid soluble sulfur - acidity units	S18-Jl11283	NCP	mol H+/t	n/a	n/a	n/a	30%	Pass	
Net Acid soluble sulfur - equivalent S% pyrite	S18-Jl11283	NCP	% S	n/a	n/a	n/a	30%	Pass	
Calcium - KCl Extractable	S18-Jl11283	NCP	% Ca	< 0.02	< 0.02	<1	30%	Pass	
Calcium - Peroxide	S18-Jl11283	NCP	% Ca	< 0.02	< 0.02	<1	30%	Pass	
Acid Reacted Calcium	S18-Jl11283	NCP	% Ca	< 0.02	< 0.02	<1	30%	Pass	
acidity - Acid Reacted Calcium	S18-Jl11283	NCP	mol H+/t	< 10	< 10	<1	30%	Pass	
sulfidic - Acid Reacted Ca equiv. S% pyrite	S18-Jl11283	NCP	% S	< 0.02	< 0.02	<1	30%	Pass	
Magnesium - KCl Extractable	S18-Jl11283	NCP	% Mg	< 0.02	< 0.02	<1	30%	Pass	
Magnesium - Peroxide	S18-Jl11283	NCP	% Mg	< 0.02	< 0.02	<1	30%	Pass	
Acid Reacted Magnesium	S18-Jl11283	NCP	% Mg	< 0.02	< 0.02	<1	30%	Pass	
acidity - Acid Reacted Magnesium	S18-Jl11283	NCP	mol H+/t	< 10	< 10	<1	30%	Pass	
sulfidic - Acid Reacted Mg equiv. S% pyrite	S18-Jl11283	NCP	% S	< 0.02	< 0.02	<1	30%	Pass	
Acid Neutralising Capacity (ANCE)	S18-Jl11283	NCP	%CaCO3	n/a	n/a	n/a	30%	Pass	
Acid Neutralising Capacity - Acidity units (a-ANCE)	S18-Jl11283	NCP	mol H+/t	n/a	n/a	n/a	30%	Pass	
ANC Fineness Factor	S18-Jl11283	NCP	factor	1.5	1.5	<1	30%	Pass	
SPOCAS - Liming rate	S18-Jl11283	NCP	kg CaCO3/t	< 1	< 1	<1	30%	Pass	

Comments

Sample Integrity

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

Qualifier Codes/Comments

Code	Description
S02	Retained Acidity is Reported when the pHKCl is less than pH 4.5

Authorised By

Liam Prescott Analytical Services Manager

Glenn Jackson
National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

Measurement uncertainty of test data is available on request or please click here.

eurofins | mgt

30 years Testing For Life 1987–2017
Celebrating 30 years Testing and Protecting Human Health

Certificate of Analysis

LogiCamms
Level 1, Suite 2, 17 Cotham Road
Kew
VIC 3101

NATA Accredited
Accreditation Number 1261
Site Number 1254

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

Attention: **Wendy Tsivoulidis**

Report **606034-S**
Project name ACID SULPHATE ASSESSMENT
Project ID 31-02984.00
Received Date Jul 04, 2018

Client Sample ID			**BH1-2.0**	**BH1-2.3**	**BH2-2.0**	**BH2-2.3**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**M18-Jl04153**	**M18-Jl04154**	**M18-Jl04155**	**M18-Jl04156**
Date Sampled			**Jul 04, 2018**	**Jul 04, 2018**	**Jul 04, 2018**	**Jul 04, 2018**
Test/Reference	LOR	Unit				
SPOCAS Suite						
pH-KCL	0.1	pH Units	4.5	4.5	4.6	4.4
pH-OX	0.1	pH Units	4.8	4.8	4.5	4.6
Acid trail - Titratable Actual Acidity	2	mol H+/t	36	36	41	46
Acid trail - Titratable Peroxide Acidity	2	mol H+/t	65	61	81	75
Acid trail - Titratable Sulfidic Acidity	2	mol H+/t	29	24	40	29
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	0.06	0.06	0.07	0.07
sulfidic - TPA equiv. S% pyrite	0.02	% pyrite S	0.10	0.10	0.13	0.12
sulfidic - TSA equiv. S% pyrite	0.02	% pyrite S	0.05	0.04	0.06	0.05
Sulfur - KCl Extractable	0.02	% S	< 0.02	0.03	0.04	0.04
Sulfur - Peroxide	0.02	% S	0.02	0.04	0.05	0.06
Sulfur - Peroxide Oxidisable Sulfur	0.02	% S	0.02	< 0.02	< 0.02	0.02
acidity - Peroxide Oxidisable Sulfur	10	mol H+/t	14	< 10	< 10	10
HCl Extractable Sulfur	0.02	% S	n/a	n/a	n/a	0.05
Net Acid soluble sulfur	0.02	% S	n/a	n/a	n/a	< 0.02
Net Acid soluble sulfur - acidity units	10	mol H+/t	n/a	n/a	n/a	< 10
Net Acid soluble sulfur - equivalent S% pyrite[S02]	0.02	% S	n/a	n/a	n/a	< 0.02
Calcium - KCl Extractable	0.02	% Ca	< 0.02	< 0.02	< 0.02	< 0.02
Calcium - Peroxide	0.02	% Ca	< 0.02	< 0.02	< 0.02	< 0.02
Acid Reacted Calcium	0.02	% Ca	< 0.02	< 0.02	< 0.02	< 0.02
acidity - Acid Reacted Calcium	10	mol H+/t	< 10	< 10	< 10	< 10
sulfidic - Acid Reacted Ca equiv. S% pyrite	0.02	% S	< 0.02	< 0.02	< 0.02	< 0.02
Magnesium - KCl Extractable	0.02	% Mg	0.11	0.10	0.08	0.08
Magnesium - Peroxide	0.02	% Mg	0.09	0.08	0.08	0.06
Acid Reacted Magnesium	0.02	% Mg	< 0.02	< 0.02	< 0.02	< 0.02
acidity - Acid Reacted Magnesium	10	mol H+/t	< 10	< 10	< 10	< 10
sulfidic - Acid Reacted Mg equiv. S% pyrite	0.02	% S	< 0.02	< 0.02	< 0.02	< 0.02
Acid Neutralising Capacity (ANCE)	0.02	%CaCO3	n/a	n/a	n/a	n/a
Acid Neutralising Capacity - Acidity units (a-ANCE)	10	mol H+/t	n/a	n/a	n/a	n/a
Acid Neutralising Capacity - equivalent S% pyrite(s-ANCE)	0.02	% S	n/a	n/a	n/a	n/a
ANC Fineness Factor		factor	1.5	1.5	1.5	1.5
SPOCAS - Net Acidity (Sulfur Units)	0.02	% S	0.08	0.07	0.07	0.09
SPOCAS - Net Acidity (Acidity Units)	10	mol H+/t	49	42	45	57
SPOCAS - Liming rate	1	kg CaCO3/t	4.0	3.0	3.0	4.0

Client Sample ID			BH1-2.0	BH1-2.3	BH2-2.0	BH2-2.3
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**M18-Jl04153**	**M18-Jl04154**	**M18-Jl04155**	**M18-Jl04156**
Date Sampled			**Jul 04, 2018**	**Jul 04, 2018**	**Jul 04, 2018**	**Jul 04, 2018**
Test/Reference	LOR	Unit				
Extraneous Material						
<2mm Fraction	0.005	g	150	150	120	150
>2mm Fraction	0.005	g	< 0.005	< 0.005	< 0.005	< 0.005
Analysed Material	0.1	%	100	100	100	100
Extraneous Material	0.1	%	< 0.1	< 0.1	< 0.1	< 0.1

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

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

Description	Testing Site	Extracted	Holding Time
SPOCAS Suite			
SPOCAS Suite	Brisbane	Jul 09, 2018	6 Week
- Method: LTM-GEN-7050			
Extraneous Material	Brisbane	Jul 09, 2018	6 Week
- Method: LTM-GEN-7050/7070			

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

Melbourne
2-5 Kingston Town Close
Oakleigh VIC 3166
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

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

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

Company Name:	LogiCamms	**Order No.:**	
Address:	Level 1, Suite 2, 17 Cotham Road Kew VIC 3101	**Report #:** **Phone:** **Fax:**	606034 03 9205 6000 9836 0801
Project Name:	ACID SULPHATE ASSESSMENT		
Project ID:	31-02984.00		

Received:	Jul 4, 2018 4:00 PM		
Due:	Jul 11, 2018		
Priority:	5 Day		
Contact Name:	Wendy Tsivoulidis		

Eurofins | mgt Analytical Services Manager : Liam Prescott

Sample Detail						HOLD	SPOCAS Suite
Melbourne Laboratory - NATA Site # 1254 & 14271							
Sydney Laboratory - NATA Site # 18217							
Brisbane Laboratory - NATA Site # 20794						X	X
Perth Laboratory - NATA Site # 23736							
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	BH1-2.0	Jul 04, 2018		Soil	M18-Jl04153		X
2	BH1-2.3	Jul 04, 2018		Soil	M18-Jl04154		X
3	BH2-2.0	Jul 04, 2018		Soil	M18-Jl04155		X
4	BH2-2.3	Jul 04, 2018		Soil	M18-Jl04156		X
5	BH1-1.0	Jul 04, 2018		Soil	M18-Jl04157	X	
6	BH2-1.0	Jul 04, 2018		Soil	M18-Jl04158	X	
Test Counts						2	4

Internal Quality Control Review and Glossary

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8. This report replaces any interim results previously issued.

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

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

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

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

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

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

Surrogate Recoveries: Recoveries must lie between 50-150%-Phenols & PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.1 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
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5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
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7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
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9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
SPOCAS Suite				Result 1	Result 2	RPD			
pH-KCL	M18-Jl04153	CP	pH Units	4.5	4.5	<1	30%	Pass	
pH-OX	M18-Jl04153	CP	pH Units	4.8	4.9	<1	30%	Pass	
Acid trail - Titratable Actual Acidity	M18-Jl04153	CP	mol H+/t	36	36	1.0	30%	Pass	
Acid trail - Titratable Peroxide Acidity	M18-Jl04153	CP	mol H+/t	65	64	1.0	30%	Pass	
Acid trail - Titratable Sulfidic Acidity	M18-Jl04153	CP	mol H+/t	29	28	3.0	30%	Pass	
sulfidic - TAA equiv. S% pyrite	M18-Jl04153	CP	% pyrite S	0.06	0.06	1.0	30%	Pass	
sulfidic - TPA equiv. S% pyrite	M18-Jl04153	CP	% pyrite S	0.10	0.10	1.0	30%	Pass	
sulfidic - TSA equiv. S% pyrite	M18-Jl04153	CP	% pyrite S	0.05	0.04	3.0	30%	Pass	
Sulfur - KCl Extractable	M18-Jl04153	CP	% S	< 0.02	< 0.02	<1	30%	Pass	
Sulfur - Peroxide	M18-Jl04153	CP	% S	0.02	0.02	11	30%	Pass	
Sulfur - Peroxide Oxidisable Sulfur	M18-Jl04153	CP	% S	0.02	0.02	11	30%	Pass	
acidity - Peroxide Oxidisable Sulfur	M18-Jl04153	CP	mol H+/t	14	15	11	30%	Pass	
HCl Extractable Sulfur	M18-Jl04153	CP	% S	n/a	n/a	n/a	30%	Pass	
Net Acid soluble sulfur	M18-Jl04153	CP	% S	n/a	n/a	n/a	30%	Pass	
Net Acid soluble sulfur - acidity units	M18-Jl04153	CP	mol H+/t	n/a	n/a	n/a	30%	Pass	
Net Acid soluble sulfur - equivalent S% pyrite	M18-Jl04153	CP	% S	n/a	n/a	n/a	30%	Pass	
Calcium - KCl Extractable	M18-Jl04153	CP	% Ca	< 0.02	< 0.02	<1	30%	Pass	
Calcium - Peroxide	M18-Jl04153	CP	% Ca	< 0.02	< 0.02	<1	30%	Pass	
Acid Reacted Calcium	M18-Jl04153	CP	% Ca	< 0.02	< 0.02	<1	30%	Pass	
acidity - Acid Reacted Calcium	M18-Jl04153	CP	mol H+/t	< 10	< 10	<1	30%	Pass	
sulfidic - Acid Reacted Ca equiv. S% pyrite	M18-Jl04153	CP	% S	< 0.02	< 0.02	<1	30%	Pass	
Magnesium - KCl Extractable	M18-Jl04153	CP	% Mg	0.11	0.11	4.0	30%	Pass	
Magnesium - Peroxide	M18-Jl04153	CP	% Mg	0.09	0.09	2.0	30%	Pass	
Acid Reacted Magnesium	M18-Jl04153	CP	% Mg	< 0.02	< 0.02	<1	30%	Pass	
acidity - Acid Reacted Magnesium	M18-Jl04153	CP	mol H+/t	< 10	< 10	<1	30%	Pass	
sulfidic - Acid Reacted Mg equiv. S% pyrite	M18-Jl04153	CP	% S	< 0.02	< 0.02	<1	30%	Pass	
Acid Neutralising Capacity (ANCE)	M18-Jl04153	CP	%CaCO3	n/a	n/a	n/a	30%	Pass	
Acid Neutralising Capacity - Acidity units (a-ANCE)	M18-Jl04153	CP	mol H+/t	n/a	n/a	n/a	30%	Pass	
ANC Fineness Factor	M18-Jl04153	CP	factor	1.5	1.5	<1	30%	Pass	
SPOCAS - Liming rate	M18-Jl04153	CP	kg CaCO3/t	4.0	4.0	3.0	30%	Pass	

Comments

Sample Integrity

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

Qualifier Codes/Comments

Code	Description
S02	Retained Acidity is Reported when the pHKCl is less than pH 4.5

Authorised By

Liam Prescott Analytical Services Manager

Glenn Jackson
National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

Measurement uncertainty of test data is available on request or please click here.

Appendix C: Analytical Data Summary - SPOCAS Suite

LOCATION	1		2		3	4	5	6	7	8	9	10	
MONARC VIC	BH2-2.0	BH2-2.3	BH1-2.0	BH1-2.3	BH1/3	BH1/3.0	BH2/3	BH3/3	BH5/3	BH4/2	BH6/2	BH7/3	
SOIL CONTAMINATION INVESTIGATION (31-02984.00)	M18-JI04155	M18-JI04156	M18-JI04153	M18-JI04154	M18-Jn23445	M18-JI09304	M18-Jn23446	M18-Jn23447	M18-Jn23449	M18-Jn23448	M18-Jn23473	M18-Jn23474	
Date	4/07/2018	4/07/2018	4/07/2018	4/07/2018	20/06/2018	9/07/2018	20/06/2018	20/06/2018	20/06/2018	20/06/2018	21/06/2018	21/06/2018	
Map Identifier	CPT006		CPT008		CPT012	CPT051	CPT057	CPTP6 01	CPT067	CTP073	CPT084	CPT104	CRITERIA
Extraneous Material													
<2mm Fraction	120	150	150	150	88	160	130	95	100	76	67	97	
>2mm Fraction	< 0.005	< 0.005	< 0.005	< 0.005	0.13	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	
Analysed Material	100	100	100	100	100	100	100	100	100	100	100	100	
Extraneous Material	< 0.1	< 0.1	< 0.1	< 0.1	0.2	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	
SPOCAS Suite													
Acid Neutralising Capacity - Acidity units (a-ANCE)	n/a	n/a	n/a	n/a	< 10	n/a	n/a	n/a	n/a	n/a	44	21	
Acid Neutralising Capacity - equivalent S% pyrite(s-ANCE)	n/a	n/a	n/a	n/a	< 0.02	n/a	n/a	n/a	n/a	n/a	0.07	0.03	
Acid Neutralising Capacity (ANCE)	n/a	n/a	n/a	n/a	< 0.02	n/a	n/a	n/a	n/a	nv	0.22	0.1	
Acid Reacted Calcium	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	
Acid Reacted Magnesium	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	
Acid trail - Titratable Actual Acidity	41	46	36	36	3	< 2	< 2	< 2	2	< 2	< 2	2	
Acid trail - Titratable Peroxide Acidity	81	75	65	61	< 2	< 2	6	4	6	3	< 2	< 2	
Acid trail - Titratable Sulfidic Acidity	40	29	29	24	< 2	< 2	6	4	< 2	3	< 2	< 2	
acidity - Acid Reacted Calcium	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	
acidity - Acid Reacted Magnesium	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	
acidity - Peroxide Oxidisable Sulfur	< 10	10	14	< 10	< 10	< 10	< 10	< 10	< 10	13	< 10	< 10	
ANC Fineness Factor	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	
Calcium - KCl Extractable	< 0.02	< 0.02	< 0.02	< 0.02	0.07	< 0.02	0.02	0.08	< 0.02	0.17	0.42	0.16	
Calcium - Peroxide	< 0.02	< 0.02	< 0.02	< 0.02	0.07	< 0.02	< 0.02	0.08	< 0.02	0.17	0.38	0.15	
HCl Extractable Sulfur	n/a	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
Magnesium - KCl Extractable	0.08	0.08	0.11	0.1	0.08	< 0.02	0.04	0.04	0.03	0.12	0.3	0.19	
Magnesium - Peroxide	0.08	0.06	0.09	0.08	0.09	< 0.02	0.03	0.05	0.03	0.11	0.28	0.18	
Net Acid soluble sulfur	n/a	< 0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
Net Acid soluble sulfur - acidity units	n/a	< 10	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
Net Acid soluble sulfur - equivalent S% pyrite	n/a	< 0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
pH-KCL	4.6	4.4	4.5	4.5	5.9	6.2	6.4	6.7	5.8	6.5	6.6	6.2	<5
pH-OX	4.5	4.6	4.8	4.8	6.7	5.8	6.3	6.4	5.6	6.5	7.2	6.7	<3
SPOCAS - Liming rate	3	4	4	3	< 1	< 1	< 1	< 1	< 1	1	< 1	< 1	
SPOCAS - Net Acidity (Acidity Units)	45	57	49	42	< 10	< 10	< 10	< 10	< 10	13	< 10	< 10	>18
SPOCAS - Net Acidity (Sulfur Units)	0.07	0.09	0.08	0.07	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.02	< 0.02	< 0.02	>0.03
sulfidic - Acid Reacted Ca equiv. S% pyrite	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	
sulfidic - Acid Reacted Mg equiv. S% pyrite	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	
sulfidic - TAA equiv. S% pyrite	0.07	0.07	0.06	0.06	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	
sulfidic - TPA equiv. S% pyrite	0.13	0.12	0.1	0.1	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	
sulfidic - TSA equiv. S% pyrite	0.06	0.05	0.05	0.04	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	
Sulfur - KCl Extractable	0.04	0.04	< 0.02	0.03	< 0.02	< 0.02	< 0.02	< 0.02	0.02	< 0.02	0.03	< 0.02	
Sulfur - Peroxide	0.05	0.06	0.02	0.04	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.02	0.04	< 0.02	
Sulfur - Peroxide Oxidisable Sulfur	< 0.02	0.02	0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.02	< 0.02	< 0.02	