

25th August 2016

Origin Energy Resources Ltd
GPO Box 148
BRISBANE QLD 4001



Attention: Mr Matthew Kernke

FINAL REPORT 16PEBR0004481

CLIENT REFERENCE: PO – 16252997

WELL NAME ORN0002, ORN0003, ORA050, ORA051, ORA052
sampled 27-28th of July 2016.

MATERIAL: Produced Water and Gas from Well

ANALYSES PERFORMED: Standard Water Analysis, Gas Analysis, Length of
Stain, Field Analytes.

AUTHOR'S NAME: Cheryl Rees

Please direct technical enquiries regarding this work to the signatory below under whose supervision the work was carried out. This report relates specifically to the sample or samples submitted for testing.

Cheryl Rees
Field Technician, Petroleum Services

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17025

Certificate of Analysis



BUREAU
VERITAS

Origin Energy Resources Ltd
GPO Box 148
Brisbane QLD 4001

Attention: Matt Kerneke

Project 16PEBR0004481
Collected by Cheryl Rees
Client Ref: 16252997

Customer Sample ID	ORA-PW052	ORA-PW051	ORA-PW050
	09:45 27/07/16	11:10 27/07/16	12:30 27/07/16
Well ID	ORA-PW052	ORA-PW051	ORA-PW050
Sample Type	Gas	Gas	Gas
Date Sampled	27/07/2016	27/07/2016	27/07/2016
Time Sampled	0945hr	1110hr	1230hr
Pressure	372kPa	377kPa	375kPa
Cylinder ID	#387	#465	#469
Description	ORA-PW052	ORA-PW051	ORA-PW050
	09:45 27/07/16	11:10 27/07/16	12:30 27/07/16
Test/Reference	Unit		
Dräger Tube Test ASTM D4810			
Hydrogen Sulphide (ppm v/v)*	mL/m³	< 0.10	< 0.10
Hydrogen Sulphide (ppm w/v)*	mg/m³	< 0.14	< 0.14
Dräger Tube Test			
Mercaptans (ppm v/v)*	mL/m³	< 0.10	< 0.10
Carbon Disulphide (ppm v/v)*	mL/m³	<1.00	<1.00
Arsine (ppm v/v)*	mL/m³	<0.02	<0.02
Carbonyl Sulphide (ppm v/v)*	mL/m³	<2.00	<2.00
GAS ANALYSIS			
Test/Reference	Unit		
Gas Analysis ASTM D 1945-03 (2010)			
Oxygen (mol %)	Mol %	<0.01	0.12
Nitrogen (mol %)	Mol %	2.46	2.84
Carbon Dioxide (mol %)	Mol %	0.11	0.11
Methane (mol %)	Mol %	97.43	96.93
Ethane (mol %)	Mol %	< 0.01	< 0.01
Propane (mol %)	Mol %	< 0.01	< 0.01
I-Butane (mol %)	Mol %	< 0.01	< 0.01
N-Butane (mol %)	Mol %	< 0.01	< 0.01
I-Pentane (mol %)	Mol %	< 0.01	< 0.01
N-Pentane (mol %)	Mol %	< 0.01	< 0.01
Hexanes; C-6 (mol %)	Mol %	< 0.01	< 0.01
Heptanes; C-7 (mol %)	Mol %	< 0.01	< 0.01
Octanesand higher hydrocarbons; C-8+	Mol %	< 0.01	< 0.01
Total	Mol %	100.00	100.00
Gas Parameters ASTM D 1945-03 (2010)			
Average Molecular Weight		16.37	16.43
Lower Flammability Limit		5.13	5.16
Upper Flammability Limit		15.40	15.47
Ratio Of Upper To Lower		3.00	3.00
Wobbe Index		48.87	48.53



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Customer Sample ID		ORA-PW052	ORA-PW051	ORA-PW050
Well ID		09:45 27/07/16	11:10 27/07/16	12:30 27/07/16
Sample Type		ORA-PW052	ORA-PW051	ORA-PW050
Date Sampled		Gas	Gas	Gas
Time Sampled		27/07/2016	27/07/2016	27/07/2016
Pressure		0945hr	1110hr	1230hr
Cylinder ID		372kPa	377kPa	375kPa
Description		#387	#465	#469
		ORA-PW052	ORA-PW051	ORA-PW050
		09:45 27/07/16	11:10 27/07/16	12:30 27/07/16
GAS ANALYSIS				
Test/Reference	Unit			
Compressibility Factor (Z)		0.9981	0.9981	0.9981
Ideal Gas Density (Rel to Air = 1)		0.565	0.567	0.568
Real Gas Density (Rel to Air = 1)		0.566	0.568	0.569
Ideal Nett Calorific Value	MJ/m ³	33.08	32.91	32.83
Ideal Gross Calorific Value	MJ/m ³	36.74	36.55	36.47
Real Nett Calorific Value	MJ/m ³	33.14	32.97	32.89
Real Gross Calorific Value	MJ/m ³	36.81	36.62	36.54
Gross Calorific Val Water-Sat Gas	MJ/m ³	36.09	35.91	35.82
Extended Gas In-house Method GC-04				
Nitrogen	Mol %	2.46	2.84	3.22
Carbon Dioxide	Mol %	0.11	0.11	0.07
Methane (mol %)	Mol %	97.43	96.93	96.71
Ethane (mol %)	Mol %	<0.01	<0.01	<0.01
Propane	Mol %	<0.01	<0.01	<0.01
I-Butane	Mol %	<0.01	<0.01	<0.01
N-Butane	Mol %	<0.01	<0.01	<0.01
I-Pentane	Mol %	<0.01	<0.01	<0.01
N-Pentane	Mol %	<0.01	<0.01	<0.01
Hexanes; C-6	Mol %	< 0.0001	< 0.0001	< 0.0001
Benzene (mol %)	Mol %	< 0.0001	< 0.0001	< 0.0001
Cyclohexane (mol %)	Mol %	< 0.0001	< 0.0001	< 0.0001
Heptanes; C-7	Mol %	< 0.0001	< 0.0001	< 0.0001
Methylcyclohexane (mol %)	Mol %	< 0.0001	< 0.0001	< 0.0001
Toluene (mol %)	Mol %	< 0.0001	< 0.0001	< 0.0001
Octanes; C-8	Mol %	< 0.0001	< 0.0001	< 0.0001
Ethylbenzene + Xylenes (mol %)	Mol %	< 0.0001	< 0.0001	< 0.0001
Nonanes; C-9 (mol %)	Mol %	< 0.0001	< 0.0001	< 0.0001
Decanes; C-10 (mol %)	Mol %	< 0.0001	< 0.0001	< 0.0001
Undecanes; C-11 (mol %)	Mol %	< 0.0001	< 0.0001	< 0.0001
Dodecanes; C-12 (mol %)	Mol %	< 0.0001	< 0.0001	< 0.0001
Tridecanes; C-13 (mol %)	Mol %	< 0.0001	< 0.0001	< 0.0001
Tetradecanes; C-14+ (mol %)	Mol %	< 0.0001	< 0.0001	< 0.0001



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Customer Sample ID		ORN-PW0002	ORN-PW0003	ORA-PW052
		16:30 27/07/16	09:45 28/07/16	08:45 27/07/16
Well ID		ORN-PW0002	ORN-PW0003	ORA-PW052
Sample Type		Gas	Gas	Water
Date Sampled		27/07/2016	28/07/2016	27/07/2016
Time Sampled		1630hr	0945hr	0845hr
Pressure		169kPa	180kPa	372kPa
Description		ORN-PW0002	ORN-PW0003	ORA-PW052
		16:30 27/07/16	09:45 28/07/16	08:45 27/07/16
Test/Reference	Unit			
Dräger Tube Test ASTM D4810				
Hydrogen Sulphide (ppm v/v)*	mL/m ³	< 0.10	0.2	-
Hydrogen Sulphide (ppm w/v)*	mg/m ³	< 0.14	0.29	-
Dräger Tube Test				
Mercaptans (ppm v/v)*	mL/m ³	< 0.10	< 0.10	-
Carbon Disulphide (ppm v/v)*	mL/m ³	<1.00	<1.00	-
Arsine (ppm v/v)*	mL/m ³	<0.02	<0.02	-
Carbonyl Sulphide (ppm v/v)*	mL/m ³	<2.00	<2.00	-
Field Analysis				
Field Dissolved Oxygen*	mg/L	-	-	3.56
Field Turbidity*	NTU	-	-	5.3
Field Calculated TDS*	g/L	-	-	3.453
GAS ANALYSIS				
Test/Reference	Unit			
Gas Analysis ASTM D 1945-03 (2010)				
Nitrogen (mol %)*	Mol %	3.24	3.41	-
Carbon Dioxide (mol %)*	Mol %	0.16	0.16	-
Methane (mol %)*	Mol %	96.60	96.42	-
Ethane (mol %)*	Mol %	< 0.01	0.01	-
Propane (mol %)*	Mol %	< 0.01	< 0.01	-
Total*	Mol %	100.00	100.00	-
Gas Parameters ASTM D 1945-03 (2010)				
Average Molecular Weight*		16.47	16.50	-
Lower Flammability Limit*		5.18	5.18	-
Upper Flammability Limit*		15.53	15.55	-
Ratio Of Upper To Lower*		3.00	3.00	-
Wobbe Index*		48.30	48.19	-
Compressibility Factor (Z)*		0.9981	0.9981	-
Ideal Gas Density (Rel to Air = 1)*		0.569	0.570	-
Real Gas Density (Rel to Air = 1)*		0.570	0.570	-
Ideal Nett Calorific Value*	MJ/m ³	32.80	32.74	-
Ideal Gross Calorific Value*	MJ/m ³	36.43	36.37	-
Real Nett Calorific Value*	MJ/m ³	32.86	32.80	-
Real Gross Calorific Value*	MJ/m ³	36.50	36.44	-
Gross Calorific Val Water-Sat Gas*	MJ/m ³	35.79	35.72	-
Subcontracted				
Test/Reference	Unit			
Water Chemistry				
Symbio Alliance*		-	-	Attached



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Customer Sample ID	ORA-PW051	ORA-PW050	ORN-PW0002
Well ID	10:05 27/07/16	11:25 27/07/16	15:30 27/07/16
Sample Type	ORA-PW051	ORA-PW050	ORN-PW0002
Date Sampled	Water	Water	Water
Time Sampled	27/07/2016	27/07/2016	27/07/2016
Pressure	1005hr	1125hr	1530hr
Description	372kPa	372kPa	372kPa
Test/Reference	ORA-PW051	ORA-PW050	ORN-PW0002
Unit	10:05 27/07/16	11:25 27/07/16	15:30 27/07/16
Field Analysis			
Field Dissolved Oxygen*	mg/L	5.23	3.38
Field Turbidity*	NTU	2.33	104
Field Calculated TDS*	g/L	3.832	1.949
Subcontracted			
Test/Reference	Unit		
Water Chemistry			
Symbio Alliance*	Attached	Attached	Attached

Customer Sample ID	ORN-PW0003
Well ID	09:45 28/07/16
Sample Type	ORN-PW0003
Date Sampled	Water
Time Sampled	28/07/2016
Pressure	0945hr
Description	372kPa
Test/Reference	ORN-PW0003
Unit	09:45 28/07/16
Field Analysis	
Field Dissolved Oxygen*	mg/L 4.69
Field Turbidity*	NTU 2.02
Field Calculated TDS*	g/L 2.891
Subcontracted	
Test/Reference	Unit
Water Chemistry	
Symbio Alliance*	Attached
Test Description	
Dräger Tube Test	Hydrogen Sulphide results measured at 101.3 kPa abs @ 15°C.
Gas Parameters	The above results are calculated on an air and water free basis assuming only the measured constituents are present. The following parameters are calculated from the above composition at 15°C and 101.325 kPa (abs) using ISO 6976 and the physical constants from the GPSA SI Engineering Data Handbook 11th Ed.

Authorised By

Cheryl Rees

Michelle Fordham

Field Technician

Chemist

Accreditation No 2013

Laboratory Manager

James Dennett

Operations Manager

Final Report

- Indicates Not Requested

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

Samples will be discarded after 30 days unless otherwise notified.

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The samples were collected by Laboratory staff.

CERTIFICATE OF ANALYSIS

CERTIFICATE NO.: 468051 Page 1 of 6
ISSUE DATE: 18/08/16

REVISION NO: 02
 This certificate supersedes any previous revisions

CLIENT DETAILS: Cheryl Rees
 Bureau Veritas - QLD
 7 Palmer Place
 Murarrie QLD 4172

SAMPLE INFORMATION: Water - 16PEBR0004481

DATE RECEIVED: 29/07/2016
CLIENT REF. NO:
ORDER NO: 16000078-498

CONDITIONS OF SAMPLE: Receipt Temp °C: 6.2
 Storage Temp °C: 4
TEST DATE: Sample tested between date received and reported

RESULTS OF ANALYSIS:

Test	Method Code	LOR	Unit	468051-1 ORN-PW0002 27/07/2016 2:30:00	468051-2 ORN-PW0003 28/07/2016 9:45:00	468051-3 ORA-PW050 27/07/2016 11:00:00	468051-4 ORA-PW051 27/07/2016 10:00:00	468051-5 ORA-PW052 27/07/2016 8:45:00
Inorganics								
pH	EFF006	0.01	unit	8.58	8.60	8.26	8.65	8.34
Electrical Conductivity	EFF007	5	uS/cm	4,200	4,300	2,900	5,800	5,200
Dissolved Solids	EFF010	2	mg/L	2,000	1,900	1,400	3,100	2,800
Turbidity	EFF061	0.1	NTU	1.8	1.2	130	1.9	2.2
Fluoride	EFF015	0.05	mg/L	3.4	3.5	3.2	4.5	9.9
Chloride	EFF011	2	mg/L	330	330	160	1,200	1000
Sodium Absorption Ratio_S	EFF063	0.01		110	120	100	140	130
Bromide	EWMB	0.005	mg/L	2.14	2.13	0.997	4.69	3.75
Alkalinity Bicarb (CaCO ₃)	EFF031	1	mg/L	1,280	1,190	1,020	1,140	1,190
Alkalinity Carbonate (CaCO ₃)	EFF031	1	mg/L	11	<1	<1	<1	<1
Alkalinity Hydroxide (CaCO ₃)	EFF031	1	mg/L	<1	<1	<1	<1	<1
Alkalinity Total (CaCO ₃)	EFF031	1	mg/L	1,290	1,190	1,020	1,140	1,190



The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.
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- Wagga Wagga: Unit 5, 10-12 Koorringal Rd, Wagga Wagga NSW 2650

Test	Method Code	LOR	Unit	468051-1 ORN-PW0002 27/07/2016 2:30:00	468051-2 ORN-PW0003 28/07/2016 9:45:00	468051-3 ORA-PW050 27/07/2016 11:00:00	468051-4 ORA-PW051 27/07/2016 10:00:00	468051-5 ORA-PW052 27/07/2016 8:45:00
Alkalinity (Residual) #	EFF031		meq/L	12.92	11.83	10.15	11.34	11.80
Ammonia-Nitrogen	EFF044	0.005	mg/L	0.98	1.0	0.72	1.2	1.1
Formaldehyde in Water	ENV137	0.05	mg/L	0.059	<0.05	<0.05	<0.05	<0.05
Ammonium	EFF044	0.006	mg/L	1.3	1.3	0.92	1.5	1.5
Field Elec. Conductivity BV^A	-	1	µS/cm	4,400	4,400	3,000	5,900	5,300
Field pH Water BV^A	-	0.01	-	8.48	8.48	8.17	8.48	8.10
Field Temp Water BV^A	-	0.1	°C	27.8	26.1	23.6	25.0	26.7
EFF089 Ion Balance								
Calcium (Dissolved)	EWI01	0.1	mg/L	2.6	2.4	1.7	3.6	3.2
Potassium (Dissolved)	EWI01	0.2	mg/L	5.2	5.1	3.8	7.2	6.5
Magnesium (Dissolved)	EWI01	0.01	mg/L	0.94	0.85	0.56	1.1	0.98
Sodium (Dissolved)	EWI01	1	mg/L	850	880	610	1,180	1,070
Ion Balance	EFF089		%	3.15	7.70	3.55	-4.57	-5.14
Metals								
Arsenic (Total)	EWM02	0.0005	mg/L	<0.0005	<0.0005	0.00081	<0.0005	<0.0005
Arsenic (Dissolved)	EWM01	0.0005	mg/L	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Barium (Total)	EWM02	0.0001	mg/L	0.86	1.0	0.37	1.2	1.2
Barium (Dissolved)	EWM01	0.0001	mg/L	0.82	0.90	0.34	1.1	1.1
Beryllium (Total)	EWM02	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Beryllium (Dissolved)	EWM01	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Boron (Total)	EWM02	0.005	mg/L	0.76	0.73	0.61	0.87	0.89
Boron (Dissolved)	EWM01	0.005	mg/L	0.69	0.69	0.57	0.79	0.79
Cadmium (Total)	EWM02	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Cadmium (Dissolved)	EWM01	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium (Total)	EWM02	0.0005	mg/L	0.00077	<0.0005	0.0061	<0.0005	0.00053
Chromium (Dissolved)	EWM01	0.0005	mg/L	<0.0005	<0.0005	0.0035	<0.0005	<0.0005
Cobalt (Total)	EWM02	0.0001	mg/L	<0.0001	<0.0001	0.0014	<0.0001	<0.0001
Cobalt (Dissolved)	EWM01	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Copper (Total)	EWM02	0.0005	mg/L	0.00068	0.0010	0.0035	0.00093	0.0041
Copper (Dissolved)	EWM01	0.0005	mg/L	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Iron (Total)	EWM02	0.005	mg/L	0.17	0.11	3.1	0.15	0.20
Iron (Dissolved)	EWM01	0.005	mg/L	0.043	0.058	0.21	0.055	0.056
Lead (Total)	EWM02	0.0001	mg/L	0.00011	<0.0001	0.0025	0.00012	0.00013
Lead (Dissolved)	EWM01	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001



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

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Test	Method Code	LOR	Unit	468051-1 ORN-PW0002 27/07/2016 2:30:00	468051-2 ORN-PW0003 28/07/2016 9:45:00	468051-3 ORA-PW050 27/07/2016 11:00:00	468051-4 ORA-PW051 27/07/2016 10:00:00	468051-5 ORA-PW052 27/07/2016 8:45:00
Manganese (Total)	EWM02	0.0005	mg/L	0.0033	0.0030	0.051	0.0031	0.0046
Manganese (Dissolved)	EWM01	0.0005	mg/L	0.0024	0.0025	0.015	0.0025	0.0042
Molybdenum (Total)	EWM02	0.0001	mg/L	0.00042	0.00027	0.00088	0.00024	0.00033
Molybdenum (Dissolved)	EWM01	0.0001	mg/L	0.00029	0.00023	0.00075	0.00024	0.00025
Nickel (Total)	EWM02	0.0001	mg/L	0.00066	0.00026	0.0019	0.00026	0.00040
Nickel (Dissolved)	EWM01	0.0001	mg/L	0.00014	0.00016	0.00040	<0.0001	0.00018
Selenium (Total)	EWM02	0.0005	mg/L	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Selenium (Dissolved)	EWM01	0.0005	mg/L	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Silver (Total)	EWM02	0.0001	mg/L	0.00021	<0.0001	<0.0001	<0.0001	<0.0001
Silver (Dissolved)	EWM01	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Strontium (Total)	EWM02	0.0001	mg/L	1.2	1.2	0.68	1.7	1.6
Strontium (Dissolved)	EWM01	0.0001	mg/L	1.1	1.1	0.60	1.4	1.3
Tin (Total)	EWM02	0.0005	mg/L	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tin (Dissolved)	EWM01	0.0005	mg/L	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Zinc (Total)	EWM02	0.0005	mg/L	0.011	0.033	0.018	0.0069	0.056
Zinc (Dissolved)	EWM01	0.0005	mg/L	0.0016	0.0012	0.0010	0.0010	0.0014
Mercury (Total)	EWM02	0.0001	mg/L	0.00067	<0.0001	<0.0001	<0.0001	<0.0001
Mercury (Dissolved)	EWM01	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Aluminium (Total)	EWM02	0.005	mg/L	0.055	0.028	1.3	0.054	0.045
Aluminium (Dissolved)	EWM01	0.005	mg/L	0.0067	0.0066	0.050	0.0068	0.0077
Silicon (Dissolved)	EWI01	0.1	mg/L	2.7	3.5	1.6	4.3	3.3
Silica (from Si) #	EWI01	0.2	mg/L	5.8	7.5	3.4	9.2	7.1
Lithium (Dissolved)	EWM01	0.0001	mg/L	0.074	0.075	0.050	0.071	0.081
Lithium (Total)	EWM02	0.0001	mg/L	0.077	0.085	0.062	0.078	0.088
Uranium (Dissolved)	EWM01	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Uranium (Total)	EWM02	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Vanadium (Dissolved)	EWM01	0.0001	mg/L	<0.0001	<0.0001	0.00021	<0.0001	<0.0001
Vanadium (Total)	EWM02	0.0001	mg/L	0.00089	0.00086	0.0039	0.00091	0.00093
Organics								
Benzene	ENV105	1	µg/L	<1	<1	<1	<1	<1
Ethylbenzene	ENV105	1	µg/L	<1	<1	<1	<1	<1
Toluene	ENV105	1	µg/L	<1	<1	<1	<1	<1
ortho-Xylenes	ENV105	1	µg/L	<1	<1	<1	<1	<1
meta- & para-Xylenes	ENV105	2	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0



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NATA Corporate Accreditation No.: 2455

HPC Holdings Pty Ltd trading as Symbio Laboratories

ABN 93 621 286 928

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Test	Method Code	LOR	Unit	468051-1 ORN-PW0002 27/07/2016 2:30:00	468051-2 ORN-PW0003 28/07/2016 9:45:00	468051-3 ORA-PW050 27/07/2016 11:00:00	468051-4 ORA-PW051 27/07/2016 10:00:00	468051-5 ORA-PW052 27/07/2016 8:45:00
Xylenes - Total	ENV105	3	µg/L	<3.0	<3.0	<3.0	<3.0	<3.0
TPH C6-C9 Fraction	ENV105	10	µg/L	<10	<10	<10	<10	<10
TRPH >C10-C16 Fraction	ENV102	50	µg/L	<50	<50	<50	<50	<50
TRPH >C16-C34 Fraction	ENV102	100	µg/L	<100	<100	<100	<100	<100
TRPH >C34-C40 Fraction	ENV102	100	µg/L	<100	<100	<100	<100	<100
Surrogate o-Terphenyl	ENV102		%	100	92	81	99	72
ENV103 Phenols Water/Effluent								
2,3,4,6-Tetrachlorophenol	ENV103	10	µg/L	<10	<10	<10	<10	<10
2,4,5-Trichlorophenol	ENV103	10	µg/L	<10	<10	<10	<10	<10
2,4,6-Trichlorophenol	ENV103	10	µg/L	<10	<10	<10	<10	<10
2,4-Dichlorophenol	ENV103	10	µg/L	<10	<10	<10	<10	<10
2,4-Dimethylphenol	ENV103	10	µg/L	<10	<10	<10	<10	<10
2,6-Dichlorophenol	ENV103	10	µg/L	<10	<10	<10	<10	<10
2-Chlorophenol	ENV103	10	µg/L	<10	<10	<10	<10	<10
2-Methylphenol	ENV103	10	µg/L	<10	<10	<10	<10	<10
2-Nitrophenol	ENV103	10	µg/L	<10	<10	<10	<10	<10
3 & 4-Methylphenol	ENV103	20	µg/L	<20	<20	<20	<20	<20
4-chloro-3-methylphenol	ENV103	10	µg/L	<10	<10	<10	<10	<10
Pentachlorophenol	ENV103	10	µg/L	<10	<10	<10	<10	<10
Phenol	ENV103	10	µg/L	<10	<10	<10	<10	<10
Surrogate 2-chlorophenol-d4	ENV103		%	89	79	73	85	84
Surrogate 2-fluorophenol	ENV103		%	59	50	50	54	56
Surrogate 246-Tribromophenol	ENV103		%	68	63	65	62	65
Organics - PAH								
Naphthalene	ENV103	1	µg/L	<1	<1	<1	<1	<1
Acenaphthylene	ENV103	1	µg/L	<1	<1	<1	<1	<1
Acenaphthene	ENV103	1	µg/L	<1	<1	<1	<1	<1
Fluorene	ENV103	1	µg/L	<1	<1	<1	<1	<1
Phenanthrene	ENV103	1	µg/L	<1	<1	<1	<1	<1
Anthracene	ENV103	1	µg/L	<1	<1	<1	<1	<1
Fluoranthene	ENV103	1	µg/L	<1	<1	<1	<1	<1
Pyrene	ENV103	1	µg/L	<1	<1	<1	<1	<1
Benz(a)anthracene	ENV103	1	µg/L	<1	<1	<1	<1	<1



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Test	Method Code	LOR	Unit	468051-1 ORN-PW0002 27/07/2016 2:30:00	468051-2 ORN-PW0003 28/07/2016 9:45:00	468051-3 ORA-PW050 27/07/2016 11:00:00	468051-4 ORA-PW051 27/07/2016 10:00:00	468051-5 ORA-PW052 27/07/2016 8:45:00
Chrysene	ENV103	1	µg/L	<1	<1	<1	<1	<1
Benzo(b)fluoranthene	ENV103	1	µg/L	<1	<1	<1	<1	<1
Benzo(k)fluoranthene	ENV103	1	µg/L	<1	<1	<1	<1	<1
Benzo(a)pyrene	ENV103	1	µg/L	<1	<1	<1	<1	<1
Indeno(1,2,3-cd)pyrene	ENV103	1	µg/L	<1	<1	<1	<1	<1
Dibenz(a,h)anthracene	ENV103	1	µg/L	<1	<1	<1	<1	<1
Benzo(g,h,i)perylene	ENV103	1	µg/L	<1	<1	<1	<1	<1
Surrogate Nitrobenzene-d5	ENV103		%	81	83	78	91	89
Surrogate 2-fluorobiphenyl	ENV103		%	89	90	82	90	95
Surrogate Phenanthrene-d10	ENV103		%	95	86	78	91	93
Surrog 4-terphenyl-d14	ENV103		%	103	90	83	93	96
Total Reportable PAH	ENV103	1	µg/L	<1	<1	<1	<1	<1



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DEFINITIONS: < : Less than, > : Greater than, - : Not Tested, DWB : Dry Weight Basis.

* Test not covered by NATA scope of accreditation

: The result is derived from a calculation. Only results above the LOR are included in the calculation.

Results were reported on an "as received" basis unless otherwise indicated.

Sampling was conducted by the customer and results reported pertain only to the samples submitted.

Responsibility for representative sampling rests with the customer.



Betty Bi, Analyst
(Brisbane)



Jason Roumimper, Chemist
(Brisbane)



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Data Quality Report

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CERTIFICATE No: 468051
ISSUE DATE: 11/08/2016

Page 1 of 23

REVISION NO: 00
This Certificate supersedes any previous revisions

CLIENT DETAILS: Cheryl Rees
Bureau Veritas - QLD
7 Palmer Place
Murarrie QLD 4172
DATE RECEIVED: 29/07/2016
CLIENT REF NO: 16PEBR0004481
ORDER NO: 16000078-498

CONDITIONS OF SAMPLE: Receipt Temperature: 6.2°C
Storage Temperature: 4°C
TEST DATE: Sample tested between date received and reported

This Data Quality Report contains information relating to:

Method Blank

Refers to the analytical signal derived from chemical reagents and equipment in the absence of a sample matrix. Method blanks provide an indication of potential method bias for the relevant analytes.

Method Blank analyses are conducted at the minimum rate of one per batch or 5% whichever the greater.

Laboratory Control Sample

The Laboratory Control Sample (LCS) comprises of a certified reference material or control matrix spiked with all analytes representative of the analyte class. The LCS recovery data is used to evaluate method performance.

LCS analyses are conducted at the minimum rate of one per batch or 5% whichever the greater.

Laboratory Duplicate

Involves the analyses of a duplicate sample from within the same analytical batch. The variation between duplicate analyses provides an estimation of method precision and sample heterogeneity.

Duplicate analyses are conducted at the minimum rate of one per batch or 5% whichever the greater

Samples selected for duplicate analysis may not be sourced from this registration.

Methods & Procedures

Analytical methodologies and quality control procedures used for environmental analyses are derived from a variety of reference standards and guidelines including but not limited to APHA, USEPA, AS and NEPM. These methods and procedures are designed to comply with NATA requirements for compliance to ISO/IEC 17025.

Data Quality Report

Date 11/08/2016

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CERTIFICATE No: 468051

QC BATCH NO:

Method Blank and Laboratory Control Sample Report

Analyte	Units	LOR	Blank Result	LCS Result	LCS Expected Level	Recovery (%)	Acceptable Recovery (%)	
							Low	High
Method Code ENV102								
TRPH >C10-C16 Fraction	µg/ L	50	<50	250	250	100	40	120
TRPH >C16-C34 Fraction	µg/ L	100	<100	1280	1050	122	60	130
TRPH >C34-C40 Fraction	µg/ L	100	<100	590	770	77	60	130
Method Code ENV105								
Benzene	µg/ L	1	<1	9.5	10.0	95	70	130
Ethylbenzene	µg/ L	1	<1	9.6	10.0	96	70	130
Toluene	µg/ L	1	<1	9.4	10.0	94	70	130
ortho-Xylenes	µg/ L	1	<1	10.8	10.0	108	70	130
meta- & para-Xylenes	µg/ L	2	<2	19.5	20.0	98	70	130
Xylenes - Total	µg/ L	3	<3	N/A	N/A	N/A	N/A	N/A
TPH C6-C9 Fraction	µg/ L	10	<10	110	100	110	70	150
Method Code EFF006								

Data Quality Report

Date 11/08/2016

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CERTIFICATE No: 468051

QC BATCH NO:

Method Blank and Laboratory Control Sample Report

Analyte	Units	LOR	Blank Result	LCS Result	LCS Expected Level	Recovery (%)	Acceptable Recovery (%)	
							Low	High
pH	unit	1		8.74	9.00	97	95	105
Method Code EFF007								
Electrical Conductivity	µS/ cm	1	<1	12215	12880	95	80	120
Method Code EFF015								
Fluoride	mg/ L	0.05	<0.05	0.49	0.50	98	80	120
Method Code EFF031								
Alkalinity Total (CaCO ₃)	mg/ L	1	<1	217	231.6	94	81	129
Alkalinity Bicarb (CaCO ₃)	mg/ L	1	N/ A	N/ A	N/ A	N/ A	N/ A	N/ A
Alkalinity Carbonate (CaCO ₃)	mg/ L	1	N/ A	N/ A	N/ A	N/ A	N/ A	N/ A
Alkalinity Hydroxide (CaCO ₃)	mg/ L	1	N/ A	N/ A	N/ A	N/ A	N/ A	N/ A
Method Code EFF010								
Solids (Dissolved)	mg/ L	2	N/ A	N/ A	N/ A	N/ A	N/ A	N/ A
Method Code EFF061								

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CERTIFICATE No: 468051

QC BATCH NO:

Method Blank and Laboratory Control Sample Report

Analyte	Units	LOR	Blank Result	LCS Result	LCS Expected Level	Recovery (%)	Acceptable Recovery (%)	
							Low	High
Turbidity	NTU	0.1	<0.1	9.9	10.0	99	98	102
Method Code EWMB								
Bromide	mg/ L	0.005	<0.005	0.0109	0.0100	109	80	120
Method Code ENV137								
Formaldehyde	mg/ L	0.05	N/ A	N/ A	N/ A	N/ A	N/ A	N/ A
Method Code EW101								
Calcium (Dissolved)	mg/ L	0.1	<0.1	9.7	10.0	97	80	120
Magnesium (Dissolved)	mg/ L	0.01	<0.01	9.2	10.0	92	80	120
Sodium (Dissolved)	mg/ L	1	<1	14.2	15.0	95	80	120
Potassium (Dissolved)	mg/ L	0.2	<0.2	20.6	20.0	103	80	120
Silicon (Dissolved)	mg/ L	0.1	N/ A	N/ A	N/ A	N/ A	N/ A	N/ A
Silica (from Si) #	mg/ L	0.2	N/ A	N/ A	N/ A	N/ A	N/ A	N/ A
Method Code EFF063								

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CERTIFICATE No: 468051

QC BATCH NO:

Method Blank and Laboratory Control Sample Report

Analyte	Units	LOR	Blank Result	LCS Result	LCS Expected Level	Recovery (%)	Acceptable Recovery (%)	
							Low	High
SAR (Sodium Adsorption Ratio)#		0.01	N/A	N/A	N/A	N/A	N/A	N/A
Method Code EFF044								
Ammonia-Nitrogen	mg/L	0.005	N/A	N/A	N/A	N/A	N/A	N/A
Ammonium	mg/L	0.006	N/A	N/A	N/A	N/A	N/A	N/A
Method Code EFF011								
Chloride	mg/L	2	<2	48.3	50.0	97	80	120
Method Code EFF089								
Ion Balance	%		N/A	N/A	N/A	N/A	N/A	N/A
Method Code EWM01								
Aluminium (Dissolved)	mg/L	0.005	<0.005	0.0050	0.0050	100	80	120
Arsenic (Dissolved)	mg/L	0.0005	<0.0005	0.0048	0.0050	96	80	120
Barium (Dissolved)	mg/L	0.0001	<0.0001	0.0046	0.0050	92	80	120
Beryllium (Dissolved)	mg/L	0.0001	<0.0001	0.0052	0.0050	104	80	120

Data Quality Report

Date 11/08/2016

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CERTIFICATE No: 468051

QC BATCH NO:

Method Blank and Laboratory Control Sample Report

Analyte	Units	LOR	Blank Result	LCS Result	LCS Expected Level	Recovery (%)	Acceptable Recovery (%)	
							Low	High
Boron (Dissolved)	mg/ L	0.005	<0.005	0.0053	0.0050	106	80	120
Cobalt (Dissolved)	mg/ L	0.0001	<0.0001	0.0050	0.0050	100	80	120
Cadmium (Dissolved)	mg/ L	0.0001	<0.0001	0.0049	0.0050	98	80	120
Chromium (Dissolved)	mg/ L	0.0005	<0.0005	0.0050	0.0050	100	80	120
Copper (Dissolved)	mg/ L	0.0005	<0.0005	0.0050	0.0050	100	80	120
Iron (Dissolved)	mg/ L	0.005	<0.005	0.0049	0.0050	98	80	120
Lead (Dissolved)	mg/ L	0.0001	<0.0001	0.0051	0.0050	102	80	120
Lithium (Dissolved)	mg/ L	0.0001	<0.0001	0.0055	0.0050	110	80	120
Manganese (Dissolved)	mg/ L	0.0005	<0.0005	0.0047	0.0050	94	80	120
Molybdenum (Dissolved)	mg/ L	0.0001	<0.0001	0.0049	0.0050	98	80	120
Mercury (Dissolved)	mg/ L	0.0001	<0.0001	0.0048	0.0050	96	80	120
Nickel (Dissolved)	mg/ L	0.0001	<0.0001	0.0050	0.0050	100	80	120
Selenium (Dissolved)	mg/ L	0.0005	<0.0005	0.0053	0.0050	106	80	120

Data Quality Report

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CERTIFICATE No: 468051

QC BATCH NO:

Method Blank and Laboratory Control Sample Report

Analyte	Units	LOR	Blank Result	LCS Result	LCS Expected Level	Recovery (%)	Acceptable Recovery (%)	
							Low	High
Silver (Dissolved)	mg/ L	0.0001	<0.0001	0.0051	0.0050	102	80	120
Strontium (Dissolved)	mg/ L	0.0001	<0.0001	0.0044	0.0050	88	80	120
Tin (Dissolved)	mg/ L	0.0005	<0.0005	0.0048	0.0050	96	80	120
Uranium (Dissolved)	mg/ L	0.0001	<0.0001	0.0050	0.0050	100	80	120
Vanadium (Dissolved)	mg/ L	0.0001	<0.0001	0.0049	0.0050	98	80	120
Zinc (Dissolved)	mg/ L	0.0005	<0.0005	0.0053	0.0050	106	80	120
Method Code EWM02								
Aluminium (Total)	mg/ L	0.005	<0.005	0.0053	0.0050	106	80	120
Arsenic (Total)	mg/ L	0.0005	<0.0005	0.0049	0.0050	98	80	120
Barium (Total)	mg/ L	0.0001	<0.0001	0.0047	0.0050	94	80	120
Beryllium (Total)	mg/ L	0.0001	<0.0001	0.0052	0.0050	104	80	120
Boron (Total)	mg/ L	0.005	<0.005	0.0053	0.0050	106	80	120
Cobalt (Total)	mg/ L	0.0001	<0.0001	0.0050	0.0050	100	80	120

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CERTIFICATE No: 468051

QC BATCH NO:

Method Blank and Laboratory Control Sample Report

Analyte	Units	LOR	Blank Result	LCS Result	LCS Expected Level	Recovery (%)	Acceptable Recovery (%)	
							Low	High
Cadmium (Total)	mg/ L	0.0001	<0.0001	0.0049	0.0050	98	80	120
Chromium (Total)	mg/ L	0.0005	<0.0005	0.0050	0.0050	100	80	120
Copper (Total)	mg/ L	0.0005	<0.0005	0.0050	0.0050	100	80	120
Iron (Total)	mg/ L	0.005	<0.005	0.0054	0.0050	108	80	120
Lead (Total)	mg/ L	0.0001	<0.0001	0.0050	0.0050	100	80	120
Lithium (Total)	mg/ L	0.0001	<0.0001	0.0054	0.0050	108	80	120
Manganese (Total)	mg/ L	0.0005	<0.0005	0.0051	0.0050	102	80	120
Molybdenum (Total)	mg/ L	0.0001	<0.0001	0.0049	0.0050	98	80	120
Mercury (Total)	mg/ L	0.0001	<0.0001	0.0049	0.0050	98	80	120
Nickel (Total)	mg/ L	0.0001	<0.0001	0.0049	0.0050	98	80	120
Selenium (Total)	mg/ L	0.0005	<0.0005	0.0053	0.0050	106	80	120
Silver (Total)	mg/ L	0.0001	<0.0001	0.0051	0.0050	102	80	120
Strontium (Total)	mg/ L	0.0001	<0.0001	0.0046	0.0050	92	80	120

Data Quality Report

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CERTIFICATE No: 468051

QC BATCH NO:

Method Blank and Laboratory Control Sample Report

Analyte	Units	LOR	Blank Result	LCS Result	LCS Expected Level	Recovery (%)	Acceptable Recovery (%)	
							Low	High
Tin (Total)	mg/ L	0.0005	<0.0005	0.0048	0.0050	96	80	120
Uranium (Total)	mg/ L	0.0001	<0.0001	0.0049	0.0050	98	80	120
Vanadium (Total)	mg/ L	0.0001	<0.0001	0.0051	0.0050	102	80	120
Zinc (Total)	mg/ L	0.0005	<0.0005	0.0058	0.0050	116	80	120
Method Code ENV103								
Naphthalene	µg/ L	1	<1	1.03	1	103	70	130
Acenaphthylene	µg/ L	1	<1	1.07	1	107	70	130
Acenaphthene	µg/ L	1	<1	1.03	1	103	70	130
Fluorene	µg/ L	1	<1	1.03	1	103	70	130
Phenanthrene	µg/ L	1	<1	1.09	1	109	70	130
Anthracene	µg/ L	1	<1	1.10	1	110	70	130
Fluoranthene	µg/ L	1	<1	1.16	1	116	70	130
Pyrene	µg/ L	1	<1	1.13	1	113	70	130

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CERTIFICATE No: 468051

QC BATCH NO:

Method Blank and Laboratory Control Sample Report

Analyte	Units	LOR	Blank Result	LCS Result	LCS Expected Level	Recovery (%)	Acceptable Recovery (%)	
							Low	High
Benz(a)anthracene	µg/ L	1	<1	1.00	1	100	70	130
Chrysene	µg/ L	1	<1	1.00	1	100	70	130
Benzo(b)fluoranthene	µg/ L	1	<1	0.95*	1	95	70	130
Benzo(k)fluoranthene	µg/ L	1	<1	0.95*	1	95	70	130
Benzo(a)pyrene	µg/ L	1	<1	1.01	1	101	70	130
Indeno(1,2,3-cd)pyrene	µg/ L	1	<1	0.93*	1	93	70	130
Dibenz(a,h)anthracene	µg/ L	1	<1	0.91*	1	91	70	130
Benzo(g,h,i)perylene	µg/ L	1	<1	0.86*	1	86	70	130
PAH Total	µg/ L	1	N/A	N/A	N/A	N/A	N/A	N/A
2,3,4,6-Tetrachlorophenol	µg/ L	10	<10	94	100	94	60	130
2,4,5-Trichlorophenol	µg/ L	10	<10	94	100	94	60	130
2,4,6-Trichlorophenol	µg/ L	10	<10	96	100	96	60	130
2,4-Dichlorophenol	µg/ L	10	<10	92	100	92	60	130

Data Quality Report

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CERTIFICATE No: 468051

QC BATCH NO:

Method Blank and Laboratory Control Sample Report

Analyte	Units	LOR	Blank Result	LCS Result	LCS Expected Level	Recovery (%)	Acceptable Recovery (%)	
							Low	High
2,4-Dimethylphenol	µg/ L	10	<10	94	100	94	60	130
2,6-Dichlorophenol	µg/ L	10	<10	92	100	92	60	130
2-Chlorophenol	µg/ L	10	<10	92	100	92	60	130
2-Methylphenol	µg/ L	10	<10	92	100	92	60	130
2-Nitrophenol	µg/ L	10	<10	96	100	96	60	130
3 & 4-Methylphenol	µg/ L	20	<20	93	100	93	60	130
4-chloro-3-methylphenol	µg/ L	10	<10	101	100	101	60	130
Pentachlorophenol	µg/ L	10	N/ A	N/ A	N/ A	N/ A	N/ A	N/ A
Phenol	µg/ L	10	<10	70	100	70	60	130

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CERTIFICATE No:

468051

QC BATCH NO:

Laboratory Duplicate Report

Sample ID	Analyte	Units	LOR	Original Result	Duplicate Result	% RPD	Acceptance Criteria (%)
	Method Code ENV102						
467817-8	TRPH >C10-C16 Fraction	µg/ L	50	<50	<50	0	50
467817-8	TRPH >C16-C34 Fraction	µg/ L	100	<100	<100	0	50
467817-8	TRPH >C34-C40 Fraction	µg/ L	100	<100	<100	0	50
	Method Code ENV105						
468051-2	Benzene	µg/ L	1	<1	<1	0	50
468051-2	Ethylbenzene	µg/ L	1	<1	<1	0	50
468051-2	Toluene	µg/ L	1	<1	<1	0	50
468051-2	Ortho-Xylenes	µg/ L	1	<1	<1	0	50
468051-2	meta- & para-Xylenes	µg/ L	2	<2	<2	0	50
	Xylenes - Total	µg/ L	3	N/A	N/A	N/A	N/A
468051-2	TPH C6-C9 Fraction	µg/ L	10	<10	<10	0	50

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	Method Code EFF006						
468051-1	pH	unit	0.01	8.57	8.60	0.3	2
	Method Code EFF007						
SEQ161746-1	Electrical Conductivity	µS/cm	1	449	446	0.7	10
	Method Code EFF015						
465832-B-3	Fluoride	mg/L	0.05	0.74	0.74	0	10
	Method Code EFF031						
468051-1	Alkalinity Total (CaCO ₃)	mg/L	1	1283.1	1279.6	0.3	10
	Alkalinity Bicarb (CaCO ₃)	mg/L	1	N/A	N/A	N/A	N/A
	Alkalinity Carbonate (CaCO ₃)	mg/L	1	N/A	N/A	N/A	N/A
	Alkalinity Hydroxide (CaCO ₃)	mg/L	1	N/A	N/A	N/A	N/A
	Method Code EFF063						

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	SAR (Sodium Adsorption Ratio)#		0.01	N/A	N/A	N/A	N/A
	Method Code EWMB						
468051-1	Bromide	mg/ L	0.005	2.137	2.151	0.7	25
	Method Code ENV137						
	Formaldehyde	mg/ L	0.05	N/A	N/A	N/A	N/A
	Method Code EFF011						
SEQ161629-1	Chloride	mg/ L	2	33.1	32.3	2.4	20
	Method Code EFF089						
	Ion Balance	%		N/A	N/A	N/A	N/A
	Method Code EW101						
465832-B-3	Calcium (Dissolved)	mg/ L	0.1	97.4	97.3	0.1	15
465832-B-3	Magnesium (Dissolved)	mg/ L	0.05	65.9	66.1	0.3	15

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465832-B-3	Sodium (Dissolved)	mg/ L	1	46.6	47.5	1.9	15
465832-B-3	Potassium (Dissolved)	mg/ L	0.2	59.8	59.8	0	15
	Silicon (Dissolved)	mg/ L	0.1	N/ A	N/ A	N/ A	N/ A
	Silica (from Si) #	mg/ L	0.2	N/ A	N/ A	N/ A	N/ A
	Method Code EFF010						
	Solids (Dissolved)	mg/ L	2	N/ A	N/ A	N/ A	N/ A
	Method Code EFF061						
467797-1	Turbidity	NTU	0.1	0.22	0.22	0	25
	Method Code EFF044						
	Ammonia-Nitrogen	mg/ L	0.005	N/ A	N/ A	N/ A	N/ A
	Ammonium	mg/ L	0.006	N/ A	N/ A	N/ A	N/ A
	Method Code EWM01						

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Sample ID	Analyte	Units	LOR	Original Result	Duplicate Result	% RPD	Acceptance Criteria (%)
468051-1	Aluminium (Dissolved)	mg/ L	0.005	0.0069	0.0065	6.9	25
468051-1	Arsenic (Dissolved)	mg/ L	0.0005	<0.0005	<0.0005	0	50
468051-1	Barium (Dissolved)	mg/ L	0.0001	0.8297	0.8120	2.2	25
468051-1	Beryllium (Dissolved)	mg/ L	0.0001	<0.0001	<0.0001	0	50
468051-1	Boron (Dissolved)	mg/ L	0.005	0.693	0.682	1.7	25
468051-1	Cobalt (Dissolved)	mg/ L	0.0001	<0.0001	<0.0001	0	50
468051-1	Cadmium (Dissolved)	mg/ L	0.0001	<0.0001	<0.0001	0	50
468051-1	Chromium (Dissolved)	mg/ L	0.0005	<0.0005	<0.0005	0	50
468051-1	Copper (Dissolved)	mg/ L	0.0005	<0.0005	<0.0005	0	50
468051-1	Iron (Dissolved)	mg/ L	0.005	0.043	0.043	0	25
468051-1	Lead (Dissolved)	mg/ L	0.0001	<0.0001	<0.0001	0	50
468051-1	Lithium (Dissolved)	mg/ L	0.0001	0.0754	0.0721	4.6	25

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Sample ID	Analyte	Units	LOR	Original Result	Duplicate Result	% RPD	Acceptance Criteria (%)
468051-1	Manganese (Dissolved)	mg/ L	0.0005	0.0024	0.0024	0	30
468051-1	Molybdenum (Dissolved)	mg/ L	0.0001	0.00031	0.00026	18.5	50
468051-1	Mercury (Dissolved)	mg/ L	0.0001	<0.0001	<0.0001	0	50
468051-1	Nickel (Dissolved)	mg/ L	0.0001	0.00014	0.00014	0	50
468051-1	Selenium (Dissolved)	mg/ L	0.0005	<0.0005	<0.0005	0	50
468051-1	Silver (Dissolved)	mg/ L	0.0001	<0.0001	<0.0001	0	50
468051-1	Strontium (Dissolved)	mg/ L	0.0001	1.1454	1.1081	3.3	25
468051-1	Tin (Dissolved)	mg/ L	0.0005	<0.0005	<0.0005	0	50
468051-1	Uranium (Dissolved)	mg/ L	0.0001	<0.0001	<0.0001	0	50
468051-1	Vanadium (Dissolved)	mg/ L	0.0001	<0.0001	<0.0001	0	50
468051-1	Zinc (Dissolved)	mg/ L	0.0005	0.0016	0.0015	8	30
	Method Code EWM02						

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Sample ID	Analyte	Units	LOR	Original Result	Duplicate Result	% RPD	Acceptance Criteria (%)
	Aluminium (Total)	mg/L	0.005	N/A	N/A	N/A	N/A
	Arsenic (Total)	mg/L	0.0005	N/A	N/A	N/A	N/A
	Barium (Total)	mg/L	0.0001	N/A	N/A	N/A	N/A
	Beryllium (Total)	mg/L	0.0001	N/A	N/A	N/A	N/A
	Boron (Total)	mg/L	0.005	N/A	N/A	N/A	N/A
	Cobalt (Total)	mg/L	0.0001	N/A	N/A	N/A	N/A
	Cadmium (Total)	mg/L	0.0001	N/A	N/A	N/A	N/A
	Chromium (Total)	mg/L	0.0005	N/A	N/A	N/A	N/A
	Copper (Total)	mg/L	0.0005	N/A	N/A	N/A	N/A
	Iron (Total)	mg/L	0.005	N/A	N/A	N/A	N/A
	Lead (Total)	mg/L	0.0001	N/A	N/A	N/A	N/A
	Lithium (Total)	mg/L	0.0001	N/A	N/A	N/A	N/A

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Sample ID	Analyte	Units	LOR	Original Result	Duplicate Result	% RPD	Acceptance Criteria (%)
	Manganese (Total)	mg/ L	0.0005	N/ A	N/ A	N/ A	N/ A
	Molybdenum (Total)	mg/ L	0.0001	N/ A	N/ A	N/ A	N/ A
	Mercury (Total)	mg/ L	0.0001	N/ A	N/ A	N/ A	N/ A
	Nickel (Total)	mg/ L	0.0001	N/ A	N/ A	N/ A	N/ A
	Selenium (Total)	mg/ L	0.0005	N/ A	N/ A	N/ A	N/ A
	Silver (Total)	mg/ L	0.0001	N/ A	N/ A	N/ A	N/ A
	Strontium (Total)	mg/ L	0.0001	N/ A	N/ A	N/ A	N/ A
	Tin (Total)	mg/ L	0.0005	N/ A	N/ A	N/ A	N/ A
	Uranium (Total)	mg/ L	0.0001	N/ A	N/ A	N/ A	N/ A
	Vanadium (Total)	mg/ L	0.0001	N/ A	N/ A	N/ A	N/ A
	Zinc (Total)	mg/ L	0.0005	N/ A	N/ A	N/ A	N/ A
	Method Code - ENV103						

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Sample ID	Analyte	Units	LOR	Original Result	Duplicate Result	% RPD	Acceptance Criteria (%)
468051-2	Naphthalene	µg/ L	1	<1	<1	0	20
468051-2	Acenaphthylene	µg/ L	1	<1	<1	0	20
468051-2	Acenaphthene	µg/ L	1	<1	<1	0	20
468051-2	Fluorene	µg/ L	1	<1	<1	0	20
468051-2	Phenanthrene	µg/ L	1	<1	<1	0	20
468051-2	Anthracene	µg/ L	1	<1	<1	0	20
468051-2	Fluoranthene	µg/ L	1	<1	<1	0	20
468051-2	Pyrene	µg/ L	1	<1	<1	0	20
468051-2	Benz(a)anthracene	µg/ L	1	<1	<1	0	20
468051-2	Chrysene	µg/ L	1	<1	<1	0	20
468051-2	Benzo(b)fluoranthene	µg/ L	1	<1	<1	0	20
468051-2	Benzo(k)fluoranthene	µg/ L	1	<1	<1	0	20

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Sample ID	Analyte	Units	LOR	Original Result	Duplicate Result	% RPD	Acceptance Criteria (%)
468051-2	Benzo(a)pyrene	µg/ L	1	<1	<1	0	20
468051-2	Indeno(1,2,3-cd)pyrene	µg/ L	1	<1	<1	0	20
468051-2	Dibenz(a,h)anthracene	µg/ L	1	<1	<1	0	20
468051-2	Benzo(g,h,i)perylene	µg/ L	1	<1	<1	0	20
	PAH Total	µg/ L	16	N/ A	N/ A	N/ A	N/ A
468051-2	2,3,4,6-Tetrachlorophenol	µg/ L	10	<10	<10	0	20
468051-2	2,4,5-Trichlorophenol	µg/ L	10	<10	<10	0	20
468051-2	2,4,6-Trichlorophenol	µg/ L	10	<10	<10	0	20
468051-2	2,4-Dichlorophenol	µg/ L	10	<10	<10	0	20
468051-2	2,4-Dimethylphenol	µg/ L	10	<10	<10	0	20
468051-2	2,6-Dichlorophenol	µg/ L	10	<10	<10	0	20
468051-2	2-Chlorophenol	µg/ L	10	<10	<10	0	20

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Sample ID	Analyte	Units	LOR	Original Result	Duplicate Result	% RPD	Acceptance Criteria (%)
468051-2	2-Methylphenol	µg/ L	10	<10	<10	0	20
468051-2	2-Nitrophenol	µg/ L	10	<10	<10	0	20
468051-2	3 & 4-Methylphenol	µg/ L	20	<20	<20	0	20
468051-2	4-chloro-3-methylphenol	µg/ L	10	<10	<10	0	20
	Pentachlorophenol	µg/ L	10	N/ A	N/ A	N/ A	N/ A
468051-2	Phenol	µg/ L	10	<10	<10	0	20

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Surrogate Control Limit Report

Surrogate	Acceptable Criteria	
	Lower limit	Upper limit
Method Code ENV102		
Surrogate o-Terphenyl	60	130
Method Code ENV103		
<i>Surrogate</i> Nitrobenzene-d5	65	130
<i>Surrogate</i> 2-fluorobiphenyl	65	130
<i>Surrogate</i> Phenanthrene-d10	65	130
<i>Surrogate</i> 4-terphenyl-d14	65	130
<i>Surrogate</i> 2-chlorophenol-d4	60	130
<i>Surrogate</i> 2-fluorophenol	50	100
<i>Surrogate</i> 2,4,6-Tribromophenol	60	130

* - LCS Result obtained is below the LOR owing to low spike concentrations involved.