Accredited for compliance with ISO/IEC 17025

Amended Certificate of Analysis

Origin Energy Resources Ltd
GPO Box 148
Brisbane QLD 4001

Attention: Matt Kernke

Project **16PEBR0001462**
Collected by Lexi Byrant
Client Ref: 16252997

Customer Sample ID		**ORN-PW014**	**ORA-GP112**	**ORA-PW068**	**ORA-PW095**
Sample Type		**GAS**	**GAS**	**GAS**	**GAS**
Date Sampled		**08/03/2016**	**09/03/2016**	**10/03/2016**	**10/03/2016**
Time Sampled		**09:55**	**12:25**	**10:20**	**13:42**
Pressure		**280kPa**	**225kPa**	**325kPa**	**300kPa**
Temperature		**32°C**	**40°C**	**35°C**	**40°C**
Cylinder ID		**#455 and #6**	**#305 and #7**	**#205 and #8**	**#419 and #9**
Test/Reference	Unit				
Dräger Tube Test ASTM D4810					
Hydrogen Sulphide (ppm v/v)*	mL/m³	< 0.10	< 0.10	< 0.10	< 0.10
Hydrogen Sulphide (ppm w/v)*	mg/m³	< 0.14	< 0.14	< 0.14	< 0.14
Dräger Tube Test					
Mercaptans (ppm v/v)*	mL/m³	< 0.10	< 0.10	< 0.10	< 0.10
Carbon Disulphide (ppm v/v)*	mL/m³	<1.00	<1.00	<1.00	<1.00
Arsine (ppm v/v)*	mL/m³	<0.02	<0.02	<0.02	<0.02
Carbonyl Sulphide (ppm v/v)*	mL/m³	<5.00	<5.00	<5.00	<5.00
Total Mercury ISO 6978:1992 B (OS-02-02)					
Total Mercury*	ng/m³	-	130	-	-
Radioactive Material OS-03-01					
Radon-222	Bq/m³	-	72	-	-
Radon-222 Uncertainity	Bq/m³	-	45	-	-
GAS ANALYSIS					
Test/Reference	Unit				
Gas Analysis ASTM D1945-03 (2010)					
Oxygen (mol %)	Mol %	<0.01	<0.01	<0.01	<0.01
Nitrogen (mol %)	Mol %	3.07	2.70	2.70	3.08
Carbon Dioxide (mol %)	Mol %	0.21	0.19	0.16	0.18
Hydrogen (mol %)	Mol %	< 0.01	< 0.01	< 0.01	< 0.01
Carbon Monoxide (mol %)	Mol %	< 0.01	< 0.01	< 0.01	< 0.01
Methane (mol %)	Mol %	96.71	97.10	97.13	96.73
Ethane (mol %)	Mol %	0.01	0.01	0.01	0.01
Propane (mol %)	Mol %	< 0.01	< 0.01	< 0.01	< 0.01
I-Butane (mol %)	Mol %	< 0.01	< 0.01	< 0.01	< 0.01
N-Butane (mol %)	Mol %	< 0.01	< 0.01	< 0.01	< 0.01
Neo-Pentane	Mol %	< 0.01	< 0.01	< 0.01	< 0.01
I-Pentane (mol %)	Mol %	< 0.01	< 0.01	< 0.01	< 0.01
N-Pentane (mol %)	Mol %	< 0.01	< 0.01	< 0.01	< 0.01
Hexanes; C-6 (mol %)	Mol %	< 0.01	< 0.01	< 0.01	< 0.01
Heptanes; C-7 (mol %)	Mol %	< 0.01	< 0.01	< 0.01	< 0.01
Octanes and higher hydrocarbons; C-8+	Mol %	< 0.01	< 0.01	< 0.01	< 0.01
Total	Mol %	100.00	100.00	100.00	100.00

Customer Sample ID		ORN-PW014	ORA-GP112	ORA-PW068	ORA-PW095
Sample Type		GAS	GAS	GAS	GAS
Date Sampled		08/03/2016	09/03/2016	10/03/2016	10/03/2016
Time Sampled		09:55	12:25	10:20	13:42
Pressure		280kPa	225kPa	325kPa	300kPa
Temperature		32°C	40°C	35°C	40°C
Cylinder ID		#455 and #6	#305 and #7	#205 and #8	#419 and #9
GAS ANALYSIS					
Test/Reference	Unit				
Gas Parameters ASTM D1945-03 (2010)					
Average Molecular Weight		16.47	16.42	16.41	16.46
Lower Flammability Limit		5.17	5.15	5.15	5.17
Upper Flammability Limit		15.51	15.45	15.44	15.51
Ratio Of Upper To Lower		3.00	3.00	3.00	3.00
Wobbe Index		48.37	48.63	48.66	48.39
Compressibility Factor (Z)		0.9981	0.9981	0.9981	0.9981
Ideal Gas Density (Rel to Air = 1)		0.569	0.567	0.567	0.568
Real Gas Density (Rel to Air = 1)		0.570	0.568	0.568	0.569
Ideal Nett Calorific Value	MJ/m³	32.84	32.97	32.98	32.84
Ideal Gross Calorific Value	MJ/m³	36.47	36.62	36.63	36.48
Real Nett Calorific Value	MJ/m³	32.90	33.03	33.04	32.91
Real Gross Calorific Value	MJ/m³	36.54	36.69	36.70	36.55
Gross Calorific Val Water-Sat Gas	MJ/m³	35.83	35.97	35.98	35.84
Extended Gas In-house Method GC-04					
Nitrogen	Mol %	3.07	2.70	2.70	3.08
Carbon Dioxide	Mol %	0.21	0.19	0.16	0.18
Methane (mol %)	Mol %	96.71	97.10	97.13	96.73
Ethane (mol %)	Mol %	0.01	0.01	0.01	0.01
Propane	Mol %	<0.01	<0.01	<0.01	<0.01
I-Butane	Mol %	<0.01	<0.01	<0.01	<0.01
N-Butane	Mol %	<0.01	<0.01	<0.01	<0.01
I-Pentane	Mol %	<0.01	<0.01	<0.01	<0.01
N-Pentane	Mol %	<0.01	<0.01	<0.01	<0.01
Hexanes; C-6	Mol %	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Benzene (mol %)	Mol %	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Cyclohexane (mol %)	Mol %	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Heptanes; C-7	Mol %	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Methylcyclohexane (mol %)	Mol %	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Toluene (mol %)	Mol %	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Octanes; C-8	Mol %	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Ethylbenzene + Xylenes (mol %)	Mol %	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Nonanes; C-9 (mol %)	Mol %	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Decanes; C-10 (mol %)	Mol %	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Undecanes; C-11 (mol %)	Mol %	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Dodecanes; C-12 (mol %)	Mol %	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Tridecanes; C-13 (mol %)	Mol %	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Tetradecanes; C-14+ (mol %)	Mol %	< 0.0001	< 0.0001	< 0.0001	< 0.0001
SVOC Analysis					
Test/Reference	Unit				
Acenaphthene*	mg/m³	<0.01	<0.01	<0.01	<0.01
Acenaphthylene*	mg/m³	<0.01	<0.01	<0.01	<0.01

Customer Sample ID		ORN-PW014	ORA-GP112	ORA-PW068	ORA-PW095
Sample Type		GAS	GAS	GAS	GAS
Date Sampled		08/03/2016	09/03/2016	10/03/2016	10/03/2016
Time Sampled		09:55	12:25	10:20	13:42
Pressure		280kPa	225kPa	325kPa	300kPa
Temperature		32°C	40°C	35°C	40°C
Cylinder ID		#455 and #6	#305 and #7	#205 and #8	#419 and #9
SVOC Analysis					
Test/Reference	Unit				
Anthracene*	mg/m³	<0.01	<0.01	<0.01	<0.01
Benzo(a)anthracene*	mg/m³	<0.01	<0.01	<0.01	<0.01
Benzo(a)pyrene*	mg/m³	<0.01	<0.01	<0.01	<0.01
Benzo(b,j,k)fluoranthene*	mg/m³	<0.02	<0.02	<0.02	<0.02
Benzo(g,h,i)perylene*	mg/m³	<0.01	<0.01	<0.01	<0.01
Chrysene*	mg/m³	<0.01	<0.01	<0.01	<0.01
Dibenzo(a,h)anthracene*	mg/m³	<0.01	<0.01	<0.01	<0.01
Fluoranthene*	mg/m³	<0.01	<0.01	<0.01	<0.01
Fluorene*	mg/m³	<0.01	<0.01	<0.01	<0.01
Indeno(123-cd)pyrene*	mg/m³	<0.01	<0.01	<0.01	<0.01
Naphthalene*	mg/m³	<0.01	<0.01	<0.01	<0.01
Phenanthrene*	mg/m³	<0.01	<0.01	<0.01	<0.01
Pyrene*	mg/m³	<0.01	<0.01	<0.01	<0.01

Customer Sample ID		ORN-PW014	ORN-PW019	ORA-PW068	ORA-PW095
Sample Type		Water	Water	Water	Water
Date Sampled		08/03/2016	08/03/2016	10/03/2016	10/03/2016
Time Sampled		11:00	11:55	12:00	14:35
Description		Tubing sample	Tubing sample	Tubing sample	Tubing sample
Test/Reference	Unit				
Field Analysis					
Field pH*		8.06	8.11	7.98	8.01
Field Temperature*	°C	35.6	35.1	38.2	38.7
Field Conductivity*	mS/cm	4.305	4.106	6.032	5.111
Dissolved Oxygen*	mg/L	0.56	0.45	0.87	0.76
Sub Contracted					
Test/Reference	Unit				
Water Chemistry					
Symbio Alliance		Attached	Attached	Attached	Attached

Test Description

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 11 th Ed.

Radon-222 Measured as Radon-222 in the gas phase at 101.3 kPa abs @ 15°C.

Dräger Tube Test Hydrogen Sulphide results measured at 101.3 kPa abs @ 15°C.

Test Comments

ORN-PW014	**SVOC Analysis**	Sample filters and XAD sorbent tubes tested by Envirolab/MPL using method ORG-012/017/033 (Solvent extraction and GCMS analysis)
ORA-GP112	**SVOC Analysis**	Sample filters and XAD sorbent tubes tested by Envirolab/MPL using method ORG-012/017/033 (Solvent extraction and GCMS analysis)
ORA-PW068	**SVOC Analysis**	Sample filters and XAD sorbent tubes tested by Envirolab/MPL using method ORG-012/017/033 (Solvent extraction and GCMS analysis)
ORA-PW095	**SVOC Analysis**	Sample filters and XAD sorbent tubes tested by Envirolab/MPL using method ORG-012/017/033 (Solvent extraction and GCMS analysis)

External Testing Details

Water Chemistry — Symbio Alliance, Accreditation: 2455, Report No: 433643

Authorised By

Lexi Bryant	Chemist	
Paul Marty	Technical Manager, Petroleum Services	
Michelle Fordham	Chemist	Accreditation No 2013

Laboratory Manager

James Dennett — Operations Manager

Amended Report: Test for VOC by adsorption tube removed.
This report replaces report number 890323.
- Indicates Not Requested * Indicates NATA accreditation does not cover the performance of this service

Samples will be discarded after 30 days unless otherwise notified.

The samples were collected by Laboratory staff.

CERTIFICATE NO.: 433643 Page 1 of 5 **REVISION NO:** 02
ISSUE DATE: 4/04/16 This certificate supersedes any previous revisions

CLIENT DETAILS: Lexi Bryant
Bureau Veritas - QLD
7 Palmer Place
Murarrie QLD 4172

DATE RECEIVED: 11/03/2016
CLIENT REF. NO: 16PEBR0001462
ORDER NO: 16000078-498

CONDITIONS OF SAMPLE: Receipt Temp °C: 20
Storage Temp °C: 4

TEST DATE: Sample tested between date received and reported

RESULTS OF ANALYSIS:

Test	Method Code	LOR	Unit	433643-1 ORN-PW014 8/03/2016 11:00:00	433643-2 ORN-PW019 8/03/2016 11:55:00	433643-3 ORA-PW068 10/03/2016 12:00:00	433643-4 ORA-PW095 10/03/2016 2:35:00
Inorganics							
pH	EFF006	0.01	unit	8.35	8.39	8.28	8.36
Electrical Conductivity	EFF007	1	uS/cm	4,100	3,900	5,800	4,800
Dissolved Solids	EFF010	2	mg/L	2,500	2,300	3,300	2,900
Turbidity	EFF061	0.1	NTU	1.1	68.5	26.5	21.1
Fluoride	EFF015	0.05	mg/L	3.6	3.0	2.9	3.3
Chloride	EFF011	2	mg/L	560	520	1,200	860
Sulphur (as Sulphate)#	EWI02	0.3	mg/L	<0.3	0.3	0.40	0.50
Calcium (Dissolved)	EWI01	0.1	mg/L	2.6	1.4	3.0	2.8
Magnesium (Dissolved)	EWI01	0.01	mg/L	0.86	0.68	1.1	0.96
Sodium (Dissolved)	EWI01	1	mg/L	970	890	1,310	1,120
Sodium Absorption Ratio_S	EFF063	0.01		130	150	160	150
Potassium (Dissolved)	EWI01	0.2	mg/L	7.1	5.8	7.9	9.2
Bromide	EWMB	0.005	mg/L	1.76	2.01	5.09	3.27
Alkalinity Bicarb ($CaCO_3$)	EFF031	1	mg/L	1,500	1,380	1,350	1,430
Alkalinity Carbonate ($CaCO_3$)	EFF031	1	mg/L	59	44	23	41
Alkalinity Hydroxide($CaCO_3$)	EFF031	1	mg/L	<1	<1	<1	<1
Alkalinity Total ($CaCO_3$)	EFF031	1	mg/L	1,560	1,420	1,370	1,470
Alkalinity (Residual) #	EFF031		meq/L	16.14	14.61	13.89	15.02
Ammonia-Nitrogen	EFF044	0.005	mg/L	0.95	0.78	1.2	1.0

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Test	Method Code	LOR	Unit	433643-1 ORN-PW014 8/03/2016 11:00:00	433643-2 ORN-PW019 8/03/2016 11:55:00	433643-3 ORA-PW068 10/03/2016 12:00:00	433643-4 ORA-PW095 10/03/2016 2:35:00
Formaldehyde in Water	ENV137	0.05	mg/L	<0.05	<0.05	<0.05	<0.05
Ammonium	EFF044	0.006	mg/L	1.2	1.0	1.5	1.3
Metals							
Arsenic (Total)	EWM02	0.0005	mg/L	<0.0005	0.00084	0.00091	0.00075
Arsenic (Dissolved)	EWM01	0.0005	mg/L	<0.0005	<0.0005	<0.0005	<0.0005
Barium (Total)	EWM02	0.0001	mg/L	0.92	0.78	1.4	1.2
Barium (Dissolved)	EWM01	0.0001	mg/L	0.55	0.42	0.90	0.67
Beryllium (Total)	EWM02	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001
Beryllium (Dissolved)	EWM01	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001
Boron (Total)	EWM02	0.005	mg/L	1.1	0.68	0.81	0.97
Boron (Dissolved)	EWM01	0.005	mg/L	1.1	0.64	0.80	0.82
Cadmium (Total)	EWM02	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001
Cadmium (Dissolved)	EWM01	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001
Chromium (Total)	EWM02	0.0005	mg/L	0.00083	0.0051	0.0029	0.0031
Chromium (Dissolved)	EWM01	0.0005	mg/L	<0.0005	<0.0005	<0.0005	<0.0005
Cobalt (Total)	EWM02	0.0001	mg/L	<0.0001	0.0014	0.0010	0.00067
Cobalt (Dissolved)	EWM01	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001
Copper (Total)	EWM02	0.0005	mg/L	0.0014	0.0068	0.0050	0.0035
Copper (Dissolved)	EWM01	0.0005	mg/L	<0.0005	<0.0005	<0.0005	<0.0005
Iron (Total)	EWM02	0.005	mg/L	0.15	3.2	3.1	2.3
Iron (Dissolved)	EWM01	0.005	mg/L	0.048	0.027	0.016	0.027
Lead (Total)	EWM02	0.0001	mg/L	0.00018	0.0025	0.0016	0.0012
Lead (Dissolved)	EWM01	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001
Manganese (Total)	EWM02	0.0005	mg/L	0.0040	0.043	0.048	0.031
Manganese (Dissolved)	EWM01	0.0005	mg/L	0.0013	0.0042	0.0028	0.0054
Molybdenum (Total)	EWM02	0.0001	mg/L	0.00039	0.00073	0.00049	0.00094
Molybdenum (Dissolved)	EWM01	0.0001	mg/L	0.00029	0.00060	0.00038	0.00049
Nickel (Total)	EWM02	0.0001	mg/L	0.00078	0.0041	0.0024	0.0020
Nickel (Dissolved)	EWM01	0.0001	mg/L	<0.0001	0.00025	0.00015	0.00030
Selenium (Total)	EWM02	0.0005	mg/L	<0.0005	<0.0005	<0.0005	<0.0005
Selenium (Dissolved)	EWM01	0.0005	mg/L	<0.0005	<0.0005	<0.0005	<0.0005
Silver (Total)	EWM02	0.0001	mg/L	<0.0001	0.0001	<0.0001	0.00011
Silver (Dissolved)	EWM01	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001
Strontium (Total)	EWM02	0.0001	mg/L	1.3	1.1	1.8	1.7
Strontium (Dissolved)	EWM01	0.0001	mg/L	0.95	0.70	1.4	1.2
Tin (Total)	EWM02	0.0005	mg/L	<0.0005	<0.0005	<0.0005	<0.0005
Tin (Dissolved)	EWM01	0.0005	mg/L	<0.0005	<0.0005	<0.0005	<0.0005
Zinc (Total)	EWM02	0.0005	mg/L	0.016	0.027	0.028	0.030
Zinc (Dissolved)	EWM01	0.0005	mg/L	0.0029	0.0017	0.0012	0.0012

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Test	Method Code	LOR	Unit	433643-1 ORN-PW014 8/03/2016 11:00:00	433643-2 ORN-PW019 8/03/2016 11:55:00	433643-3 ORA-PW068 10/03/2016 12:00:00	433643-4 ORA-PW095 10/03/2016 2:35:00
Mercury (Total)	EWM02	0.0001	mg/L	0.00040	0.00017	<0.0001	0.0010
Mercury (Dissolved)	EWM01	0.0001	mg/L	0.00012	<0.0001	<0.0001	<0.0001
Aluminium (Total)	EWM02	0.005	mg/L	0.031	0.87	0.86	0.56
Aluminium (Dissolved)	EWM01	0.005	mg/L	<0.005	<0.005	<0.005	<0.005
Silicon (Dissolved)	EWI01	0.1	mg/L	9.9	8.2	10	10
Silica (from Si) #	EWI01	0.2	mg/L	21.2	17.6	21.4	21.4
Lithium (Dissolved)	EWM01	0.0001	mg/L	0.058	0.046	0.055	0.056
Lithium (Total)	EWM02	0.0001	mg/L	0.066	0.059	0.072	0.073
Uranium (Dissolved)	EWM01	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001
Uranium (Total)	EWM02	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001
Vanadium (Dissolved)	EWM01	0.0001	mg/L	<0.0001	<0.0001	0.00012	<0.0001
Vanadium (Total)	EWM02	0.0001	mg/L	0.0018	0.0037	0.0042	0.0033
Organics							
Benzene	ENV105	1	µg/L	<1	<1	<1	<1
Ethylbenzene	ENV105	1	µg/L	<1	<1	<1	<1
Toluene	ENV105	1	µg/L	<1	<1	<1	<1
ortho-Xylenes	ENV105	1	µg/L	<1	<1	<1	<1
meta- & para-Xylenes	ENV105	2	µg/L	<2.0	<2.0	<2.0	<2.0
Xylenes - Total	ENV105	3	µg/L	<3.0	<3.0	<3.0	<3.0
TPH C6-C9 Fraction	ENV105	10	µg/L	<10	<10	<10	<10
TRPH >C10-C16 Fraction	ENV102	50	µg/L	<50	<50	<50	<50
TRPH >C16-C34 Fraction	ENV102	100	µg/L	<100	<100	<100	<100
TRPH >C34-C40 Fraction	ENV102	100	µg/L	<100	<100	<100	<100
Surrogate o-Terphenyl	ENV102		%	90	99	110	110
ENV103 Phenols Water/Effluent							
2,3,4,6-Tetrachlorophenol	ENV103	10	µg/L	<10	<10	<10	<10
2,4,5-Trichlorophenol	ENV103	10	µg/L	<10	<10	<10	<10
2,4,6-Trichlorophenol	ENV103	10	µg/L	<10	<10	<10	<10
2,4-Dichlorophenol	ENV103	10	µg/L	<10	<10	<10	<10
2,4-Dimethylphenol	ENV103	10	µg/L	<10	<10	<10	<10
2,6-Dichlorophenol	ENV103	10	µg/L	<10	<10	<10	<10
2-Chlorophenol	ENV103	10	µg/L	<10	<10	<10	<10
2-Methylphenol	ENV103	10	µg/L	<10	<10	<10	<10
2-Nitrophenol	ENV103	10	µg/L	<10	<10	<10	<10
3 & 4-Methylphenol	ENV103	20	µg/L	<20	<20	<20	<20
4-chloro-3-methylphenol	ENV103	10	µg/L	<10	<10	<10	<10
Pentachlorophenol	ENV103	10	µg/L	<10	<10	<10	<10
Phenol	ENV103	10	µg/L	<10	<10	<10	<10

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▪ Rockhampton: Unit 3, 191 Berserker St, Berserker QLD 4701
▪ Wagga Wagga: Unit 5, 10-12 Kooringal Rd, Wagga Wagga NSW 2650

Test	Method Code	LOR	Unit	433643-1 ORN-PW014 8/03/2016 11:00:00	433643-2 ORN-PW019 8/03/2016 11:55:00	433643-3 ORA-PW068 10/03/2016 12:00:00	433643-4 ORA-PW095 10/03/2016 2:35:00
Surrogate 2-chlorophenol-d4	ENV103		%	100	96	98	96
Surrogate 2-fluorophenol	ENV103		%	53	62	54	53
Surrogate 246-Tribromophenol	ENV103		%	95	120	88	83
Organics - PAH							
Naphthalene	ENV103	1	µg/L	<1	<1	<1	<1
Acenaphthylene	ENV103	1	µg/L	<1	<1	<1	<1
Acenaphthene	ENV103	1	µg/L	<1	<1	<1	<1
Fluorene	ENV103	1	µg/L	<1	<1	<1	<1
Phenanthrene	ENV103	1	µg/L	<1	<1	<1	<1
Anthracene	ENV103	1	µg/L	<1	<1	<1	<1
Fluoranthene	ENV103	1	µg/L	<1	<1	<1	<1
Pyrene	ENV103	1	µg/L	<1	<1	<1	<1
Benz(a)anthracene	ENV103	1	µg/L	<1	<1	<1	<1
Chrysene	ENV103	1	µg/L	<1	<1	<1	<1
Benzo(b)fluoranthene	ENV103	1	µg/L	<1	<1	<1	<1
Benzo(k)fluoranthene	ENV103	1	µg/L	<1	<1	<1	<1
Benzo(a)pyrene	ENV103	1	µg/L	<1	<1	<1	<1
Indeno(1,2,3-cd)pyrene	ENV103	1	µg/L	<1	<1	<1	<1
Dibenz(a,h)anthracene	ENV103	1	µg/L	<1	<1	<1	<1
Benzo(g,h,i)perylene	ENV103	1	µg/L	<1	<1	<1	<1
Surrogate Nitrobenzene-d5	ENV103		%	107	116	117	107
Surrogate 2-fluorobiphenyl	ENV103		%	82	92	83	77
Surrogate Phenanthrene-d10	ENV103		%	84	93	96	86
Surrog 4-terphenyl-d14	ENV103		%	105	120	115	105
Total Reportable PAH	ENV103	1	µg/L	<1	<1	<1	<1

HPC Holdings Pty Ltd trading as Symbio Laboratories
ABN 93 621 286 928
▪ Tel: 1300 703 166 ▪ Fax: +61 7 3219 0333

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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.
^ Test result has been provided by the client.

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.

Jason Roumimper, Chemist
(Brisbane)

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Data Quality Report

Date 22/03/2016

CERTIFICATE No:	433643	Page 1 of 23	**REVISION NO;**	00
ISSUE DATE:	22/03/2016		This Certificate supersedes any previous revisions	

CLIENT DETAILS: Lexi Bryant
Bureau Veritas - QLD
7 Palmer Place
Murarrie QLD 4172

DATE RECEIVED:	11/03/2016	**CONDITIONS OF SAMPLE:**	Receipt Temperature: 20°C
CLIENT REF NO:	16PEBR0001462		Storage Temperature: 4°C
ORDER NO:	16000078-498	**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 re presentative 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 p rovides an estimation of method precision and sample heterogeneity.

Duplicate analyses are conducted at the minimum rate of one per batch or 5% which ever 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.

CERTIFICATE No: 433643

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	180	250	72	40	110
TRPH >C16-C34 Fraction	µg/L	100	<100	810	1050	77	60	130
TRPH >C34-C40 Fraction	µg/L	100	<100	1000	770	130	60	130
Method Code ENV105								
Benzene	µg/L	1	<1	13.0	10.0	130	70	130
Ethylbenzene	µg/L	1	<1	13.0	10.0	130	70	130
Toluene	µg/L	1	N/A	N/A	N/A	N/A	N/A	N/A
ortho-Xylenes	µg/L	1	<1	12.8	10.0	128	70	130
meta- & para-Xylenes	µg/L	2	<2	18.7	20.0	94	70	130
Xylenes - Total	µg/L	3	N/A	N/A	N/A	N/A	N/A	N/A
TPH C6-C9 Fraction	µg/L	10	<10	130	100	130	70	150
Method Code EFF006								

CERTIFICATE No: 433643

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		8.76	9.00	97	95	105
Method Code EFF007								
Electrical Conductivity	µS/cm	1	<1	11890	12880	92	80	120
Method Code EFF015								
Fluoride	mg/L	0.05	<0.05	0.52	0.50	104	80	120
Method Code EFF031								
Alkalinity Total (CaCO3)	mg/L	1	<1	220.5	250	88	71	129
Alkalinity Bicarb (CaCO3)	mg/L	1	N/A	N/A	N/A	N/A	N/A	N/A
Alkalinity Carbonate (CaCO3)	mg/L	1	N/A	N/A	N/A	N/A	N/A	N/A
Alkalinity Hydroxide (CaCO3)	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								

CERTIFICATE No: 433643

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	9.81	10.00	98	98	102
Method Code EWMB								
Bromide	mg/L	0.005	<0.005	0.0092	0.0100	92	80	120
Method Code ENV137								
Formaldehyde	mg/L	0.05	N/A	N/A	N/A	N/A	N/A	N/A
Method Code EWI01								
Calcium (Dissolved)	mg/L	0.1	<0.1	9.9	10.0	99	80	120
Magnesium (Dissolved)	mg/L	0.01	<0.01	9.5	10.0	95	80	120
Sodium (Dissolved)	mg/L	1	<1	16.3	15.0	109	80	120
Potassium (Dissolved)	mg/L	0.2	<0.2	20.9	20.0	105	80	120
Silicon (Dissolved)	mg/L	0.1	<0.1	10.0	10.0	100	80	120
Silica (from Si) #	mg/L	0.2	N/A	N/A	N/A	N/A	N/A	N/A
Method Code EFF063								

CERTIFICATE No: 433643

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)#	unit	0.8	N/A	N/A	N/A	N/A	N/A	N/A
Method Code EFF044								
Ammonia-Nitrogen	mg/L	0.005	<0.005	0.520	0.500	104	80	110
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	50.7	50.0	101	80	120
Method Code EWM01								
Aluminium (Dissolved)	mg/L	0.005	<0.005	0.0046	0.0050	92	80	120
Arsenic (Dissolved)	mg/L	0.0005	<0.0005	0.0049	0.0050	98	80	120
Barium (Dissolved)	mg/L	0.0001	<0.0001	0.0048	0.0050	96	80	120
Beryllium (Dissolved)	mg/L	0.0001	<0.0001	0.0045	0.0050	90	80	120
Boron (Dissolved)	mg/L	0.005	<0.005	0.0046	0.0050	92	80	120
Cobalt (Dissolved)	mg/L	0.0001	<0.0001	0.0046	0.0050	92	80	120

CERTIFICATE No: 433643

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 (Dissolved)	mg/L	0.0001	<0.0001	0.0051	0.0050	102	80	120
Chromium (Dissolved)	mg/L	0.0005	<0.0005	0.0047	0.0050	94	80	120
Copper (Dissolved)	mg/L	0.0005	<0.0005	0.0047	0.0050	94	80	120
Iron (Dissolved)	mg/L	0.005	<0.005	0.0047	0.0050	94	80	120
Lead (Dissolved)	mg/L	0.0001	<0.0001	0.0050	0.0050	100	80	120
Lithium (Dissolved)	mg/L	0.0001	<0.0001	0.0051	0.0050	102	80	120
Manganese (Dissolved)	mg/L	0.0005	<0.0005	0.0046	0.0050	92	80	120
Molybdenum (Dissolved)	mg/L	0.0001	<0.0001	0.0052	0.0050	104	80	120
Mercury (Dissolved)	mg/L	0.0001	<0.0001	0.0050	0.0050	100	80	120
Nickel (Dissolved)	mg/L	0.0001	<0.0001	0.0049	0.0050	98	80	120
Selenium (Dissolved)	mg/L	0.0005	<0.0005	0.0046	0.0050	92	80	120
Silver (Dissolved)	mg/L	0.0001	<0.0001	0.0050	0.0050	100	80	120
Strontium (Dissolved)	mg/L	0.0001	<0.0001	0.0047	0.0050	94	80	120

CERTIFICATE No: 433643

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 (Dissolved)	mg/L	0.0005	<0.0005	0.0046	0.0050	92	80	120
Uranium (Dissolved)	mg/L	0.0001	<0.0001	0.0052	0.0050	104	80	120
Vanadium (Dissolved)	mg/L	0.0001	<0.0001	0.0050	0.0050	100	80	120
Zinc (Dissolved)	mg/L	0.0005	<0.0005	0.0050	0.0050	100	80	120
Method Code EWM02								
Aluminium (Total)	mg/L	0.005	<0.005	0.0046	0.0050	92	80	120
Arsenic (Total)	mg/L	0.0005	<0.0005	0.0048	0.0050	96	80	120
Barium (Total)	mg/L	0.0001	<0.0001	0.0050	0.0050	100	80	120
Beryllium (Total)	mg/L	0.0001	<0.0001	0.0041	0.0050	82	80	120
Boron (Total)	mg/L	0.005	<0.005	0.0052	0.0050	104	80	120
Cobalt (Total)	mg/L	0.0001	<0.0001	0.0046	0.0050	92	80	120
Cadmium (Total)	mg/L	0.0001	<0.0001	0.0051	0.0050	102	80	120
Chromium (Total)	mg/L	0.0005	<0.0005	0.0046	0.0050	92	80	120

CERTIFICATE No: 433643

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
Copper (Total)	mg/L	0.0005	<0.0005	0.0046	0.0050	92	80	120
Iron (Total)	mg/L	0.005	<0.005	0.0046	0.0050	92	80	120
Lead (Total)	mg/L	0.0001	<0.0001	0.0051	0.0050	102	80	120
Lithium (Total)	mg/L	0.0001	<0.0001	0.0043	0.0050	86	80	120
Manganese (Total)	mg/L	0.0005	<0.0005	0.0044	0.0050	88	80	120
Molybdenum (Total)	mg/L	0.0001	<0.0001	0.0052	0.0050	104	80	120
Mercury (Total)	mg/L	0.0001	<0.0001	0.0051	0.0050	102	80	120
Nickel (Total)	mg/L	0.0001	<0.0001	0.0048	0.0050	96	80	120
Selenium (Total)	mg/L	0.0005	<0.0005	0.0045	0.0050	90	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
Tin (Total)	mg/L	0.0005	<0.0005	0.0046	0.0050	92	80	120
Uranium (Total)	mg/L	0.0001	<0.0001	0.0052	0.0050	104	80	120

CERTIFICATE No: 433643

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
Vanadium (Total)	mg/L	0.0001	<0.0001	0.0048	0.0050	96	80	120
Zinc (Total)	mg/L	0.0005	<0.0005	0.0050	0.0050	100	80	120
Method Code ENV103								
Naphthalene	µg/L	1	<1	0.75*	1	75	65	125
Acenaphthylene	µg/L	1	<1	0.88*	1	88	65	125
Acenaphthene	µg/L	1	<1	0.80*	1	80	65	125
Fluorene	µg/L	1	<1	0.81*	1	81	65	125
Phenanthrene	µg/L	1	<1	0.83*	1	83	65	125
Anthracene	µg/L	1	<1	0.83*	1	83	65	125
Fluoranthene	µg/L	1	<1	0.88*	1	88	65	125
Pyrene	µg/L	1	<1	0.86*	1	86	65	125
Benz(a)anthracene	µg/L	1	<1	1.25	1	125	65	125
Chrysene	µg/L	1	<1	1.08	1	108	65	125

CERTIFICATE No: 433643

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
Benzo(b)fluoranthene	µg/L	1	<1	1.20	1	120	65	125
Benzo(k)fluoranthene	µg/L	1	<1	0.92*	1	92	65	125
Benzo(a)pyrene	µg/L	1	<1	0.70*	1	70	65	125
Indeno(1,2,3-cd)pyrene	µg/L	1	<1	0.73*	1	73	65	125
Dibenz(a,h)anthracene	µg/L	1	N/A	N/A	N/A	N/A	N/A	N/A
Benzo(g,h,i)perylene	µg/L	1	N/A	N/A	N/A	N/A	N/A	N/A
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	83	100	83	60	130
2,4,5-Trichlorophenol	µg/L	10	<10	81	100	81	60	130
2,4,6-Trichlorophenol	µg/L	10	<10	85	100	85	60	130
2,4-Dichlorophenol	µg/L	10	<10	81	100	81	60	130
2,4-Dimethylphenol	µg/L	10	N/A	N/A	N/A	N/A	N/A	N/A
2,6-Dichlorophenol	µg/L	10	<10	80	100	80	60	130

CERTIFICATE No: 433643

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-Chlorophenol	µg/L	10	<10	78	100	78	60	130
2-Methylphenol	µg/L	10	<10	74	100	74	60	130
2-Nitrophenol	µg/L	10	<10	91	100	91	60	130
3 & 4-Methylphenol	µg/L	20	N/A	72	100	72	60	130
4-chloro-3-methylphenol	µg/L	10	<10	89	100	89	60	130
Pentachlorophenol	µg/L	10	N/A	N/A	N/A	N/A	N/A	N/A
Phenol	µg/L	10	<10	63	100	63	60	130

CERTIFICATE No: 433643

QC BATCH NO:

Laboratory Duplicate Report

Sample ID	Analyte	Units	LOR	Original Result	Duplicate Result	% RPD	Acceptance Criteria (%)
	Method Code ENV102						
433643-1	TRPH >C10-C16 Fraction	µg/L	50	<50	<50	0	50
433643-1	TRPH >C16-C34 Fraction	µg/L	100	<100	<100	0	50
433643-1	TRPH >C34-C40 Fraction	µg/L	100	<100	<100	0	50
	Method Code ENV105						
433643-1	Benzene	µg/L	1	<1	<1	0	50
433643-1	Ethylbenzene	µg/L	1	<1	<1	0	50
433643-1	Toluene	µg/L	1	<1	<1	0	50
433643-1	Ortho-Xylenes	µg/L	1	<1	<1	0	50
433643-1	meta- & para-Xylenes	µg/L	2	<2	<2	0	50
	Xylenes - Total	µg/L	3	N/A	N/A	N/A	N/A
433643-1	TPH C6-C9 Fraction	µg/L	10	<10	<10	0	50

CERTIFICATE No: 433643

QC BATCH NO:

Laboratory Duplicate Report

Sample ID	Analyte	Units	LOR	Original Result	Duplicate Result	% RPD	Acceptance Criteria (%)
	Method Code EFF006						
433471-1	pH	unit	0.01	7.48	7.47	0.1	2
	Method Code EFF007						
433471-1	Electrical Conductivity	µS/cm	1	419	422	0.7	10
	Method Code EFF015						
432379-1	Fluoride	mg/L	0.05	<0.05	<0.05	0	20
	Method Code EFF031						
433643-1	Alkalinity Total (CaCO3)	mg/L	1	1544	1579	2.2	20
	Alkalinity Bicarb (CaCO3)	mg/L	1	N/A	N/A	N/A	N/A
	Alkalinity Carbonate (CaCO3)	mg/L	1	N/A	N/A	N/A	N/A
	Alkalinity Hydroxide (CaCO3)	mg/L	1	N/A	N/A	N/A	N/A
	Method Code EFF063						

CERTIFICATE No: 433643

QC BATCH NO:

Laboratory Duplicate Report

Sample ID	Analyte	Units	LOR	Original Result	Duplicate Result	% RPD	Acceptance Criteria (%)
	SAR (Sodium Adsorption Ratio)#	unit	0.8	N/A	N/A	N/A	N/A
	Method Code EWMB						
433328-1	Bromide	mg/L	0.005	7.525	7.378	2.0	25
	Method Code ENV137						
	Formaldehyde	mg/L	0.05	N/A	N/A	N/A	N/A
	Method Code EFF011						
433411-B-1	Chloride	mg/L	2	64.7	65.2	1.4	20
	Method Code EWI01						
	Calcium (Dissolved)	mg/L	0.1	N/A	N/A	N/A	N/A
433643-1	Magnesium (Dissolved)	mg/L	0.05	0.84	0.89	5.8	15
433643-1	Sodium (Dissolved)	mg/L	1	950	969	2.0	15
433643-1	Potassium (Dissolved)	mg/L	0.2	7.1	7.1	0	15

CERTIFICATE No: 433643

QC BATCH NO:

Laboratory Duplicate Report

Sample ID	Analyte	Units	LOR	Original Result	Duplicate Result	% RPD	Acceptance Criteria (%)
433643-1	Silicon (Dissolved)	mg/L	0.1	9.9	9.9	0	15
	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						
433471-1	Turbidity	NTU	0.1	0.59	0.59	0	25
	Method Code EFF044						
433691-26	Ammonia-Nitrogen	mg/L	0.005	0.016	0.015	6.5	20
	Ammonium	mg/L	0.006	N/A	N/A	N/A	N/A
	Method Code EWM01						
433643-3	Aluminium (Dissolved)	mg/L	0.005	<0.005	<0.005	0	30
433643-3	Arsenic (Dissolved)	mg/L	0.0005	<0.0005	<0.0005	0	50

CERTIFICATE No: 433643

QC BATCH NO:

Laboratory Duplicate Report

Sample ID	Analyte	Units	LOR	Original Result	Duplicate Result	% RPD	Acceptance Criteria (%)
433643-3	Barium (Dissolved)	mg/L	0.0001	0.9046	0.9043	0	25
433643-3	Beryllium (Dissolved)	mg/L	0.0001	<0.0001	<0.0001	0	50
433643-3	Boron (Dissolved)	mg/L	0.005	0.785	0.816	3.9	25
433643-3	Cobalt (Dissolved)	mg/L	0.0001	<0.0001	<0.0001	0	50
433643-3	Cadmium (Dissolved)	mg/L	0.0001	<0.0001	<0.0001	0	50
433643-3	Chromium (Dissolved)	mg/L	0.0005	<0.0005	<0.0005	0	50
433643-3	Copper (Dissolved)	mg/L	0.0005	<0.0005	<0.0005	0	50
433643-3	Iron (Dissolved)	mg/L	0.005	0.016	0.017	6.1	25
433643-3	Lead (Dissolved)	mg/L	0.0001	<0.0001	<0.0001	0	50
433643-3	Lithium (Dissolved)	mg/L	0.0001	0.0523	0.0573	9.1	25
433643-3	Manganese (Dissolved)	mg/L	0.0005	0.0027	0.0028	3.6	30
433643-3	Molybdenum (Dissolved)	mg/L	0.0001	0.0004	0.0004	0	50

CERTIFICATE No: 433643

QC BATCH NO:

Laboratory Duplicate Report

Sample ID	Analyte	Units	LOR	Original Result	Duplicate Result	% RPD	Acceptance Criteria (%)
433643-3	Mercury (Dissolved)	mg/L	0.0001	<0.0001	<0.0001	0	50
433643-3	Nickel (Dissolved)	mg/L	0.0001	0.00015	0.00015	0	50
433643-3	Selenium (Dissolved)	mg/L	0.0005	<0.0005	<0.0005	0	50
433643-3	Silver (Dissolved)	mg/L	0.0001	<0.0001	<0.0001	0	50
433643-3	Strontium (Dissolved)	mg/L	0.0001	1.3995	1.3859	1.0	25
433643-3	Tin (Dissolved)	mg/L	0.0005	<0.0005	<0.0005	0	50
433643-3	Uranium (Dissolved)	mg/L	0.0001	<0.0001	<0.0001	0	50
433643-3	Vanadium (Dissolved)	mg/L	0.0001	0.0001	0.0001	0	50
433643-3	Zinc (Dissolved)	mg/L	0.0005	0.0011	0.0013	16.7	30
	Method Code EWM02						
433643-3	Aluminium (Total)	mg/L	0.005	0.909	0.809	11.7	25
433643-3	Arsenic (Total)	mg/L	0.0005	0.00085	0.00096	12	30

CERTIFICATE No: 433643

QC BATCH NO:

Laboratory Duplicate Report

Sample ID	Analyte	Units	LOR	Original Result	Duplicate Result	% RPD	Acceptance Criteria (%)
433643-3	Barium (Total)	mg/L	0.0001	1.4121	1.4385	1.9	25
433643-3	Beryllium (Total)	mg/L	0.0001	<0.0001	<0.0001	0	50
433643-3	Boron (Total)	mg/L	0.005	0.813	0.804	1.1	25
433643-3	Cobalt (Total)	mg/L	0.0001	0.0010	0.0010	0	30
433643-3	Cadmium (Total)	mg/L	0.0001	<0.0001	<0.0001	0	50
433643-3	Chromium (Total)	mg/L	0.0005	0.0030	0.0027	10	30
433643-3	Copper (Total)	mg/L	0.0005	0.0054	0.0047	14.4	25
433643-3	Iron (Total)	mg/L	0.005	3.196	2.943	8.2	25
433643-3	Lead (Total)	mg/L	0.0001	0.0016	0.0016	0	30
433643-3	Lithium (Total)	mg/L	0.0001	0.0715	0.0725	1.4	25
433643-3	Manganese (Total)	mg/L	0.0005	0.0499	0.0451	10.2	25
433643-3	Molybdenum (Total)	mg/L	0.0001	0.0005	0.0005	0	30

CERTIFICATE No: 433643

QC BATCH NO:

Laboratory Duplicate Report

Sample ID	Analyte	Units	LOR	Original Result	Duplicate Result	% RPD	Acceptance Criteria (%)
433643-3	Mercury (Total)	mg/L	0.0001	<0.0001	<0.0001	0	50
433643-3	Nickel (Total)	mg/L	0.0001	0.0024	0.0024	0	30
433643-3	Selenium (Total)	mg/L	0.0005	<0.0005	<0.0005	0	50
433643-3	Silver (Total)	mg/L	0.0001	<0.0001	<0.0001	0	50
433643-3	Strontium (Total)	mg/L	0.0001	1.7535	1.7984	2.5	25
433643-3	Tin (Total)	mg/L	0.0005	<0.0005	<0.0005	0	50
433643-3	Uranium (Total)	mg/L	0.0001	<0.0001	<0.0001	0	50
433643-3	Vanadium (Total)	mg/L	0.0001	0.0044	0.0040	7.8	30
433643-3	Zinc (Total)	mg/L	0.0005	0.0288	0.0276	4.3	25
	Method Code - ENV103						
433643-1	Naphthalene	µg/L	1	<1	<1	0	20
433643-1	Acenaphthylene	µg/L	1	<1	<1	0	20

CERTIFICATE No: 433643

QC BATCH NO:

Laboratory Duplicate Report

Sample ID	Analyte	Units	LOR	Original Result	Duplicate Result	% RPD	Acceptance Criteria (%)
433643-1	Acenaphthene	µg/L	1	<1	<1	0	20
433643-1	Fluorene	µg/L	1	<1	<1	0	20
433643-1	Phenanthrene	µg/L	1	<1	<1	0	20
433643-1	Anthracene	µg/L	1	<1	<1	0	20
433643-1	Fluoranthene	µg/L	1	<1	<1	0	20
433643-1	Pyrene	µg/L	1	<1	<1	0	20
433643-1	Benz(a)anthracene	µg/L	1	<1	<1	0	20
433643-1	Chrysene	µg/L	1	<1	<1	0	20
433643-1	Benzo(b)fluoranthene	µg/L	1	<1	<1	0	20
433643-1	Benzo(k)fluoranthene	µg/L	1	<1	<1	0	20
433643-1	Benzo(a)pyrene	µg/L	1	<1	<1	0	20
433643-1	Indeno(1,2,3-cd)pyrene	µg/L	1	<1	<1	0	20

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QC BATCH NO:

Laboratory Duplicate Report

Sample ID	Analyte	Units	LOR	Original Result	Duplicate Result	% RPD	Acceptance Criteria (%)
433643-1	Dibenz(a,h)anthracene	µg/L	1	<1	<1	0	20
433643-1	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
433643-1	2,3,4,6-Tetrachlorophenol	µg/L	10	<10	<10	0	20
433643-1	2,4,5-Trichlorophenol	µg/L	10	<10	<10	0	20
433643-1	2,4,6-Trichlorophenol	µg/L	10	<10	<10	0	20
433643-1	2,4-Dichlorophenol	µg/L	10	<10	<10	0	20
433643-1	2,4-Dimethylphenol	µg/L	10	<10	<10	0	20
433643-1	2,6-Dichlorophenol	µg/L	10	<10	<10	0	20
433643-1	2-Chlorophenol	µg/L	10	<10	<10	0	20
433643-1	2-Methylphenol	µg/L	10	<10	<10	0	20
433643-1	2-Nitrophenol	µg/L	10	<10	<10	0	20

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QC BATCH NO:

Laboratory Duplicate Report

Sample ID	Analyte	Units	LOR	Original Result	Duplicate Result	% RPD	Acceptance Criteria (%)
433643-1	3 & 4-Methylphenol	µg/L	20	<20	<20	0	20
433643-1	4-chloro-3-methylphenol	µg/L	10	<10	<10	0	20
	Pentachlorophenol	µg/L	10	N/A	N/A	N/A	N/A
433643-1	Phenol	µg/L	10	<10	<10	0	20

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QC BATCH NO:

Surrogate Control Limit Report

Surrogate	Acceptable Criteria	
	Lower limit	Upper limit
Method Code ENV102		
Surrogate o-Terphenyl	60	130
Method Code ENV103		
Surrogate Nitrobenzene-d5	65	125
Surrogate 2-fluorobiphenyl	65	125
Surrogate Phenanthrene-d10	65	125
Surrogate 4-terphenyl-d14	65	125
Surrogate 2-chlorophenol-d4	60	130
Surrogate 2-fluorophenol	50	100
Surrogate 2,4,6-Tribromophenol	60	130

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